



County of Santa Cruz

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131

KATHLEEN MOLLOY, PLANNING DIRECTOR

www.sccoplanning.com

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD

Pursuant to the California Environmental Quality Act, the following project has been reviewed by the County Environmental Coordinator to determine if it has a potential to create significant impacts to the environment and, if so, how such impacts could be solved. A Negative Declaration is prepared in cases where the project is determined not to have any significant environmental impacts. Either a Mitigated Negative Declaration or Environmental Impact Report (EIR) is prepared for projects that may result in a significant impact to the environment.

Public review periods are provided for these Environmental Determinations according to the requirements of the County Environmental Review Guidelines. The environmental document is available for review at the County Planning Department located at 701 Ocean Street, in Santa Cruz. You may also view the environmental document on the web at www.sccoplanning.com under the Planning Department menu. If you have questions or comments about this Notice of Intent, please contact Todd Sexauer of the Environmental Review staff at (831) 454-3511.

The County of Santa Cruz does not discriminate on the basis of disability, and no person shall, by reason of a disability, be denied the benefits of its services, programs or activities. If you require special assistance in order to review this information, please contact Bernice Shawver at (831) 454-3137 to make arrangements.

PROJECT: San Vicente Redwoods

APP #: 181146

APN(S):

Main Tract: 058-011-01, 058-011-10, 058-011-11, 058-022-04, 063-011-01, 063-011-09, 063-031-02, 063-071-01, 080-011-03, 080-011-06, 080-011-09, 080-011-10, 080-011-12, 080-011-14, 080-011-36, 080-011-37, 080-011-38, 080-011-39, 080-011-41, 080-011-42, 080-021-05, 080-021-07, 080-331-01, 080-331-02

Laguna Tract: 062-101-01, 063-101-09

PROJECT DESCRIPTION: The project consists of two main components: 1) the approval and implementation of the proposed San Vicente Redwoods Public Access Plan, and 2) the construction and operation of an approximately 38-mile multiple use trail system over approximately 8,500 acres and a parking area in the San Vicente Redwoods of the Santa Cruz Mountains. The trail system and the parking area (with approximately 90 parking spaces) would be developed in phases. The proposed trails would be available for: hiking, biking, horse riding, dog walking (on-leash only), small group gatherings, as well as nature observation.

PROJECT LOCATION: The project site, comprised of the main tract and Laguna Tract properties, is located in the Santa Cruz Mountains in unincorporated Santa Cruz County. The main tract is located north of Highway 1, east of Swanton Road, south of Jamison Creek Road, and west of Empire Grade. The Laguna Tract is located north of Smith Grade, east of Pine Flat Grade, south of Ice Cream Grade and west of Empire Grade in the Bonny Doon planning area of Santa Cruz County. Santa Cruz County. Santa Cruz County is bounded on the north by San Mateo County, on the south by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean. Santa Cruz County is bounded on the north by San Mateo County, on the south

by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean.

APPLICANT/OWNER: Land Trust of Santa Cruz County for Peninsula Open Space Trust

PROJECT PLANNER: Randall Adams

EMAIL: Randall.Adams@santacruzcounty.us

ACTION: Negative Declaration with Mitigations

REVIEW PERIOD: February 12, 2019 through March 14, 2019

This project will be considered at a public hearing before the Zoning Administrator. The time, date and location have not been set. When scheduling does occur, these items will be included in all public hearing notices for the project.



COUNTY OF SANTA CRUZ

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KATHLEEN MOLLOY, PLANNING DIRECTOR

<http://www.sccoplanning.com/>

MITIGATED NEGATIVE DECLARATION

Project: San Vicente Redwoods

APPLICATION #: 181146

APN(S):

Main Tract: 058-011-01, 058-011-10, 058-011-11, 058-022-04, 063-011-01, 063-011-09, 063-031-02, 063-071-01, 080-011-03, 080-011-06, 080-011-09, 080-011-10, 080-011-12, 080-011-14, 080-011-36, 080-011-37, 080-011-38, 080-011-39, 080-011-41, 080-011-42, 080-021-05, 080-021-07, 080-331-01, 080-331-02

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Owner: Peninsula Open Space Trust and Sempervirens Fund

Applicant: Land Trust of Santa Cruz County

Staff Planner: Randall Adams, (831) 454-3218

Email: Randall.Adams@santacruzcounty.us

This project will be considered at a public hearing before the Zoning Administrator. The time, date and location have not been set. When scheduling does occur, these items will be included in all public hearing notices for the project

California Environmental Quality Act Negative Declaration Findings:

Find, that this Negative Declaration reflects the decision-making body's independent judgment and analysis, and; that the decision-making body has reviewed and considered the information contained in this Negative Declaration and the comments received during the public review period, and; on the basis of the whole record before the decision-making body (including this Negative Declaration) that there is no substantial evidence that the project will have a significant effect on the environment. The expected

environmental impacts of the project are documented in the attached Initial Study on file with the County of Santa Cruz Clerk of the Board located at 701 Ocean Street, 5th Floor, Santa Cruz, California.

Review Period Ends: March 14, 2019

Date: _____

STEPHANIE HANSEN, Environmental Coordinator
(831) 454-3112



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CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) INITIAL STUDY/ENVIRONMENTAL CHECKLIST

Date: December 11, 2018

**Application
Number:** 181146

Project Name: San Vicente Redwoods

Staff Planner: Randall Adams

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT: Land Trust of Santa Cruz County will oversee the construction of trails and implementation of the San Vincente Redwoods Public Access Plan.

APN(s):	Main tract:	058-011-01	063-031-02	080-011-12	080-011-41
		058-011-10	063-071-01	080-011-14	080-011-42
		058-011-11	080-011-03	080-011-36	080-021-05
		058-022-04	080-011-06	080-011-37	080-021-07
		063-011-01	080-011-09	080-011-38	080-331-01
		063-011-09	080-011-10	080-011-39	080-331-02
	Laguna Tract:	062-101-01	063-101-09		

OWNER: Peninsula Open Space Trust and Sempervirens Fund own the property. The Save the Redwoods League holds the Conservation Easement.

SUPERVISORAL DISTRICT: 3

PROJECT LOCATION: The project site, comprised of the main tract and Laguna Tract properties, is located in the Santa Cruz Mountains in unincorporated Santa Cruz County. The main tract is located north of Highway 1, east of Swanton Road, south of Jamison Creek Road, and west of Empire Grade. The Laguna Tract is located north of Smith Grade, east of Pine Flat Grade, south of Ice Cream Grade and west of Empire Grade. As shown on Figure 1, the project site is in the Bonny Doon planning area of the *County of Santa Cruz General Plan and Local Coastal Program*.

Santa Cruz County is bounded on the north by San Mateo County, on the south by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean.

SUMMARY PROJECT DESCRIPTION:

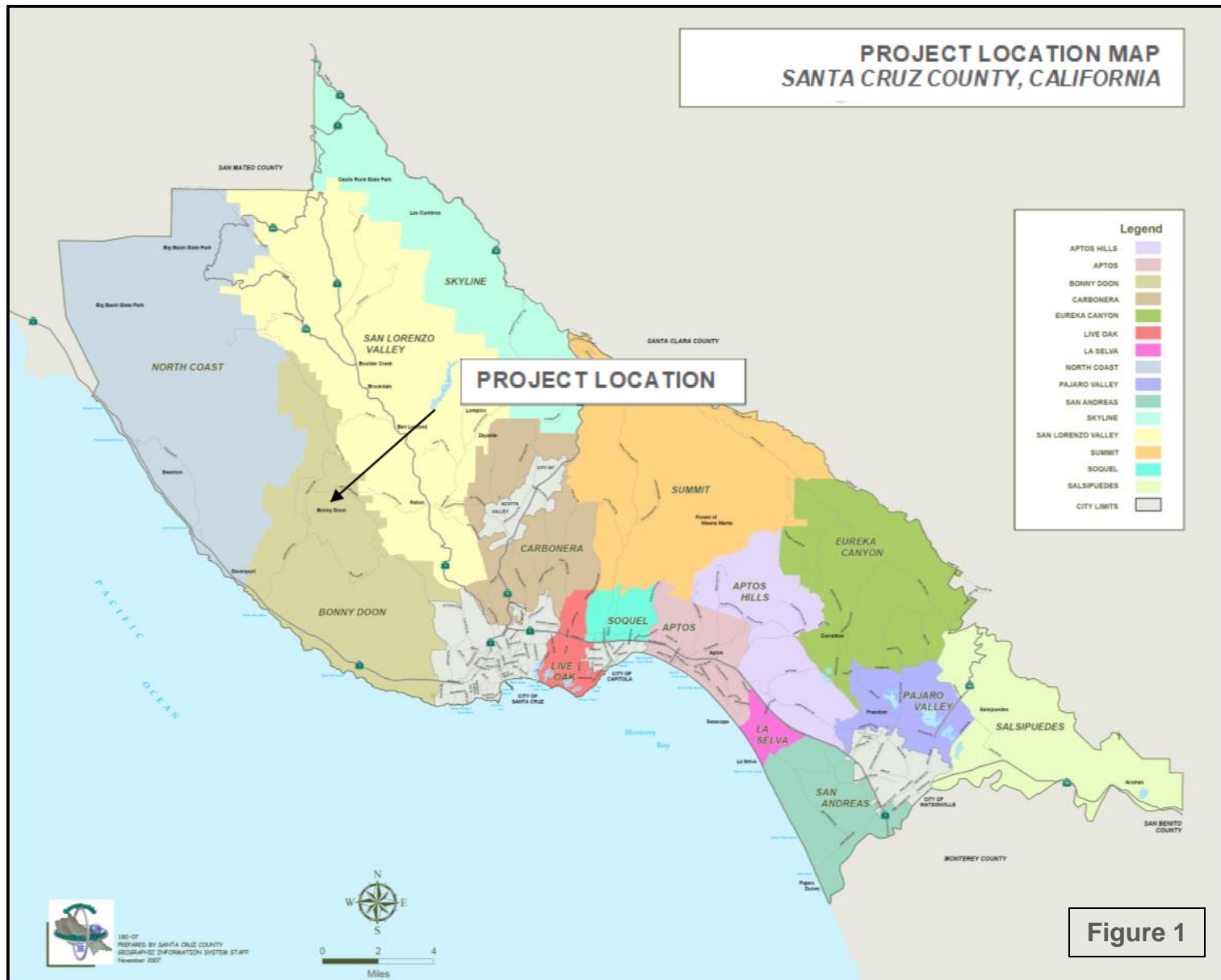
The project consists of two main components: 1) the approval and implementation of the proposed San Vincente Redwoods Public Access Plan, and 2) the construction and operation of a parking area and multiple use trail system in the San Vicente Redwoods of the Santa Cruz Mountains. As shown on

Figure 2, the project site is composed of multiple parcels (and APNs) in two separate areas that make up approximately 8,500 acres: 1) the main tract, an 8,160-acre property is located between the California Department of Corrections and Rehabilitation's (CDCR) Ben Lomond Conservation Camp off of Empire Grade to the north and the Bureau of Land Management's (BLM) Cotoni-Coast Dairies property (part of the California Coastal National Monument) off of Highway 1 to the south, and 2) the Laguna Tract, a 373-acre property located to the southeast of the main tract and adjacent to the California Department of Fish and Wildlife's (CDFW's) Bonny Doon Ecological Reserve.

The proposed San Vicente Redwoods Public Access Plan would provide a phased program for public access on the property for recreation, research, and education. The proposed San Vicente Redwoods Public Access Plan includes goals, policies, and implementation strategies, as well as design and maintenance guidelines, and construction protocols to ensure resource protection.

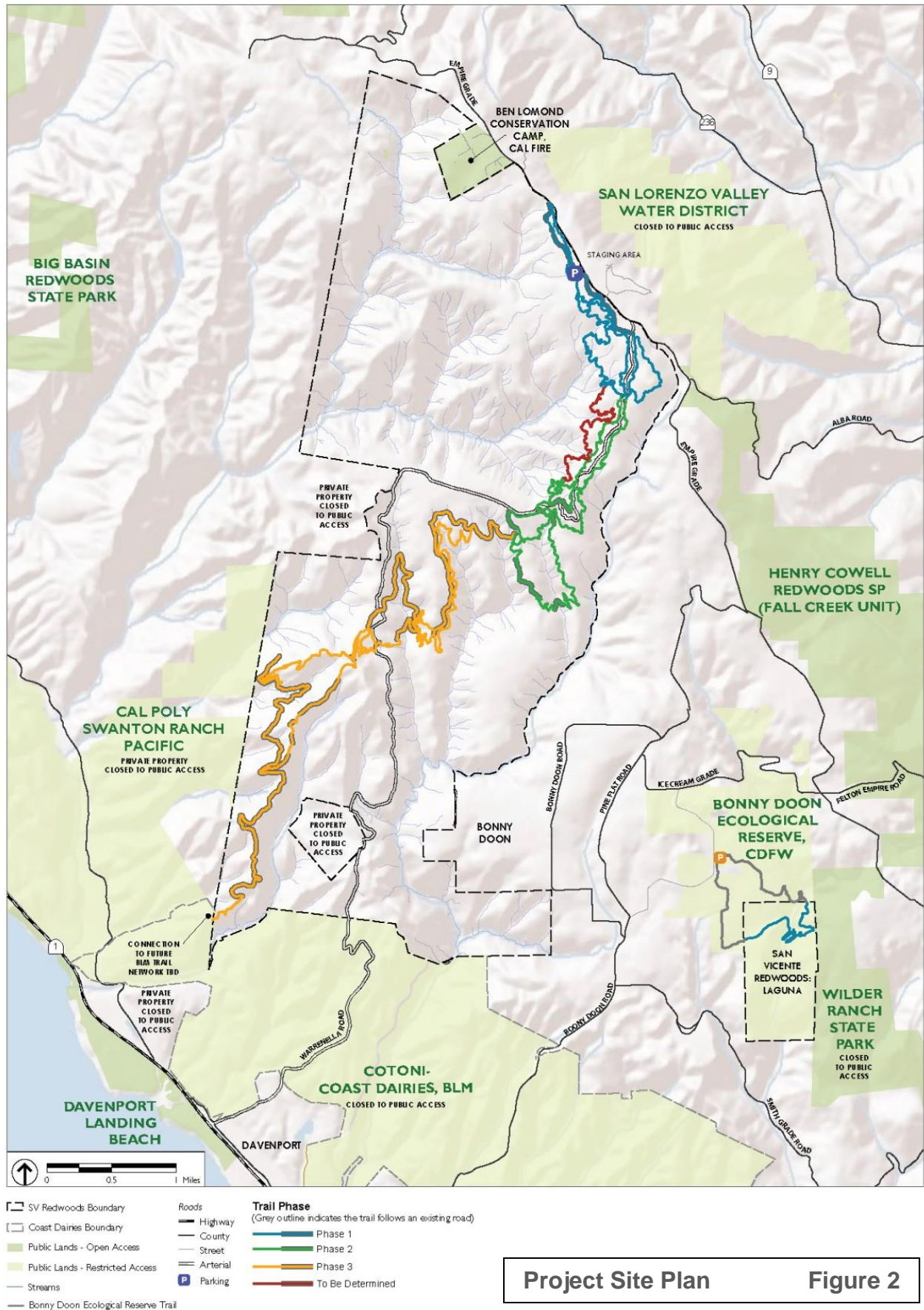
The proposed parking area would include roads for access and circulation, parking for vehicles and bicycles, and access features such as gates, restroom building with vault toilets, trailheads, and storage. The conceptual trail alignment would be located on a combination of newly constructed trails and existing timber harvest roads on the main tract and would be located on existing informal trails on the Laguna Tract. The proposed trails would be available for: hiking, biking, horse riding, dog walking (on-leash only), small group gatherings, as well as nature observation. Areas to be closed to public access were identified based on review of sensitive biotic resources, erosion risk, water resources and potential hazards, and the plan for public access was developed in consultation with ecologists and wildlife biologists. The conceptual trail alignment was prepared through an iterative process including field review by professional trail designers, civil engineers, biologists, and archaeologists, and reviewed by a geotechnical engineer.

The proposed San Vicente Redwoods Public Access Plan would be implemented in multiple phases as shown on Figure 2. The first phase would include the construction of the parking area with up to 50 parking spaces, 8.4 miles of trails on the main tract that would be easily accessible from the parking area, and 1.5 miles of trails on the Laguna Tract to form a connecting loop to the existing adjacent trails in CDFW's Bonny Doon Ecological Reserve. The second phase would include 9.3 more miles of trails on the main tract and up to 40 more parking spaces. The third phase would include 16.5 more miles of trails on the main tract. Subsequent phases would include 2.3 more miles of trails near previously built trails on the main tract. The phase one trails would occur over a one-year period, while phases two and three would occur over separate and subsequent three-year periods.





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Project Site Plan

Figure 2



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ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- | | |
|--|---|
| <input type="checkbox"/> Aesthetics and Visual Resources | <input type="checkbox"/> Mineral Resources |
| <input checked="" type="checkbox"/> Agriculture and Forestry Resources | <input checked="" type="checkbox"/> Noise |
| <input checked="" type="checkbox"/> Air Quality | <input type="checkbox"/> Population and Housing |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Public Services |
| <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Energy | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Geology and Soils | <input checked="" type="checkbox"/> Tribal Cultural Resources |
| <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Utilities and Service Systems |
| <input type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Wildfire |
| <input checked="" type="checkbox"/> Hydrology/Water Supply/Water Quality | <input type="checkbox"/> Mandatory Findings of Significance |
| <input type="checkbox"/> Land Use and Planning | |

DISCRETIONARY APPROVAL(S) BEING CONSIDERED:

- | | |
|--|--|
| <input type="checkbox"/> General Plan Amendment | <input checked="" type="checkbox"/> Coastal Development Permit |
| <input type="checkbox"/> Land Division | <input checked="" type="checkbox"/> Grading Permit |
| <input type="checkbox"/> Rezoning | <input checked="" type="checkbox"/> Riparian Exception |
| <input checked="" type="checkbox"/> Development Permit | <input type="checkbox"/> LAFCO Annexation |
| <input type="checkbox"/> Sewer Connection Permit | <input type="checkbox"/> Other: |

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED (e.g., permits, financing approval, or participation agreement):

Permit Type/Action

Agency

Coastal Development Permit

County of Santa Cruz & California Coastal Commission

Streambed Alteration Agreement

California Department of Fish and Wildlife

Wetland Delineation*

State Water Resources Control Board & United States Army Corps of Engineers

*Wetland delineation will determine if Section 401 and Section 404 permits will be required

CONSULTATION WITH NATIVE AMERICAN TRIBES: *Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?*

No California Native American tribes traditionally and culturally affiliated with the area of Santa Cruz County have requested consultation pursuant to Public Resources Code section 21080.3.1.

DETERMINATION:

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



STEPHANIE HANSEN, Environmental Coordinator

February 7, 2019
Date

II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS:

Parcel Size (acres): Main tract: 8,159 acres on twenty-four contiguous parcels
Laguna Tract: 373 acres on two contiguous parcels

Existing Land Use: Historically used for timber harvesting and contain dirt logging roads; some active logging operations also occur

Vegetation: Mixed evergreen forest, live oak woodland, chaparral, seasonal wetlands, and streams/riparian

Slope in area affected by project (parking area): ☒ 0 - 30% ☐ 31 – 100% ☐ N/A

Nearby Watercourse: Big Creek, Little Creek, San Vicente Creek, Molino Creek, and Laguna Creek

ENVIRONMENTAL RESOURCES AND CONSTRAINTS:

Water Supply Watershed:	Mapped WSW on portions of site	Fault Zone:	Not mapped or identified on site
Groundwater Recharge:	Mapped GW Recharge	Scenic Corridor:	Empire Grade
Timber or Mineral:	Mapped Timber resource	Historic:	Not designated
Agricultural Resource:	Not mapped or identified on site	Archaeology:	Mapped arch. Resource
Biologically Sensitive Habitat:	Mapped biotic resource	Noise Constraint:	Not mapped or identified on site
Fire Hazard:	Mapped critical fire hazard on portions of site	Electric Power Lines:	Electric transmission lines on site
Floodplain:	Not mapped	Solar Access:	N/A
Erosion:	Areas of increased erosion potential on portions site	Solar Orientation:	N/A
Landslide:	Areas of potential landslides mapped on portions site	Hazardous Materials:	None
Liquefaction:	Not mapped or identified on site	Other:	N/A

SERVICES:

Fire Protection:	CAL FIRE (County Fire Department)	Drainage District:	None
School District:	Bonny Doon Union Elementary and San Lorenzo Valley Unified	Project Access:	Empire Grade
Sewage Disposal:	Septic/vault toilets	Water Supply:	N/A

PLANNING POLICIES:

Zone District:	TP (Timber Production) & SU (Special Use)	Special Designation:	N/A
General Plan:	R-M (Mountain Residential) & AG (Agricultural)		
Urban Services Line:	<input type="checkbox"/> Inside	<input checked="" type="checkbox"/> Outside	
Coastal Zone:	<input checked="" type="checkbox"/> Inside (Laguna tract & lower portion of Main tract)	<input checked="" type="checkbox"/> Outside (Upper portion of Main tract including parking area and upper trails)	

A. ENVIRONMENTAL SETTING AND PROJECT BACKGROUND:

The project site is located in unincorporated Santa Cruz County in the San Vicente Redwoods of the Santa Cruz Mountains. The main portion of the project site is an 8,159-acre property (main tract) that is generally situated between the Ben Lomond Conservation Camp off of Empire Grade to the north and the BLM Cotoni-Coast Dairies property to the south. The second, smaller portion of the project site is a 373-acre property (Laguna tract) to the south of the Bonny Doon Ecological Reserve with access from Martin Road.

Regional access to the project area is provided via Highway 1 (Cabrillo Highway) to the southwest, as well as Highway 17 to the east. Connecting roadways in the area include Empire Grade Road and Bonny Doon/Pine Flat Roads. Perimeter and internal gates on the main tract currently restrict access to the existing unpaved roads in the San Vicente Redwoods. Existing perimeter access points are located along the northern edge of the main tract off Empire Grade, the western edge of the main tract off Bonny Doon Road, and along the southern edge of the main tract that borders the BLM's Cotoni-Coast Dairies property. Vehicular access to the trail at the site of the Laguna tract would be via the existing parking area off Martin Road.

There are a variety of existing roads and trails on the San Vicente Redwoods property, including over 80 miles of double lane and single lane roads, a railroad line, tractor roads used for timber harvest operations, and narrow trails. Many of the roads were developed for historic timber and quarry operations, and some continue to provide access for ongoing timber operations, fire, utility access, private easements, and general property management. The primary road that extends from the north to the south of the property is the private Warrenella Road. Warrenella Road is used for timber harvest activities and serves as the sole access road for several private properties. While the Warrenella Road and many other existing roads are currently used and actively maintained, others are not currently passable due to overgrowth of vegetation and maintenance needs.

A utility road for existing high-tension electric transmission lines (operated and maintained by Pacific Gas and Electric Company) passes through the northern portion of the main tract (roughly parallel with Empire Grade). The main tract also contains a former quarry pit and a private inholding; however, the proposed parking area and trails would not occur at those locations. Otherwise, both the main and Laguna tract properties are undeveloped and provide opportunity for public access and conservation.

The areas where the proposed parking area and trails would occur include eight terrestrial habitat communities (madrone forest, tanoak forest, redwood forest, canyon live oak forest, California bay

forest, coast live oak woodland, Anderson's manzanita chaparral, and brittle leaf manzanita chaparral) and three aquatic habitat communities (seasonal wetlands, shrub-scrub wetlands, and streams.)

Elevations within the main tract range from approximately 500 to 2,500 above mean sea level. The main tract contains a number of east-west trending ridges extending from Empire Grade transitioning into a north-south trending ridge that dips down into the BLM's Cotoni-Coast Dairies at the southern end of the main tract. The largest creek on the main tract is San Vicente Creek, a perennial stream with its headwaters near Empire Grade. Upper watersheds for Scott Creek and Molina Creek also exist on the main tract. The Laguna tract has elevations that range from approximately 700 to 1,500 feet above mean sea level. Laguna Creek passes through the Laguna tract. There are also a number of ephemeral, intermittent, and perennial streams and drainages on the two properties that feed into these larger creeks.

The parking area for the proposed recreational trail system on the main tract would be located on the south side of Empire Grade Road, across the street from the Crest Ranch Christmas tree farm (Figure 2). The proposed parking area location is currently improved with an existing unpaved road with a gate at the entrance off Empire Grade and an existing unpaved trail. This area is currently forested with the primary tree species of Coulter Pine, a non-native species. The parking area location is situated on a northwest facing hillside with an average slope of 10%. The soils at this location are well drained with moderate permeability and are considered as appropriate for storm water infiltration in vegetated basins. The runoff from the parking area location currently flows from east to west in undeveloped forested areas to a swale downslope, which eventually feeds into Big Creek located approximately 1.5 miles downstream of the parking area.

San Vicente Redwoods is surrounded by single-family residential, institutional, and recreational land uses. The following properties border San Vicente Redwoods:

- Ben Lomond Conservation Camp, a California Department of Corrections and Rehabilitation facility, to the north, on the same side of Empire Grade Road.
- The unincorporated residential communities of Bonny Doon (to the north and east) and Davenport (to the south).
- BLM Cotoni-Coast Dairies, a unit of the California Coastal National Monument to the south.
- Private residential property and timberland at various surrounding locations, including the Swanton Road area to the southwest.

San Vicente Redwoods is situated between inland and coastal areas, and public and private open space. Adjacent and nearby open space includes, but is not limited to, Big Basin Redwoods State Park (including Little Basin), Henry Cowell Redwoods State Park (Fall Creek Unit), San Lorenzo Valley Water District property (closed to the public), the CDFW's Bonny Doon Ecological Reserve, and the BLM's Cotoni-Coast Dairies property.

DETAILED PROJECT DESCRIPTION:

San Vicente Redwoods Public Access Plan

Overview and Purpose

The purchase of the San Vicente Redwoods by the Peninsula Open Space Trust (POST), Sempervirens Fund, Redwoods League (SRL), and the Land Trust of Santa Cruz County (LTSCC) (jointly referred to as the Conservation Partners) in December 2011 resulted in the combination of approximately 27,500 acres of contiguous protected land, as the San Vicente Redwoods fills a long-standing gap between numerous protected lands that surround it. The protection and management of San Vicente Redwoods has been undertaken by a collaboration of the Conservation Partners. In December 2014 a Conservation Easement was executed for the San Vicente Redwoods to preserve and protect in perpetuity the natural, ecological, habitat, scenic, open space, and forestry resources located on the property. POST and Sempervirens Fund are currently responsible for the protection and management of the property, the SRL is responsible for the monitoring and enforcement of the Conservation Easement, and the LTSCC would be responsible for implementing the proposed San Vicente Redwoods Public Access Plan as the Public Access Manager.

The purpose of the proposed San Vicente Redwoods Public Access Plan is to identify the short-and long-term vision and tools to initiate and maintain public access for at least 10 years. Following this time period, the proposed San Vicente Redwoods Public Access Plan may be revisited in accordance with the Conservation Easement (2014) due to changes in circumstances, including the possibility of a future change in land ownership. In the event of an ownership change, where there is a transfer fee title for the property to another entity, the parties to that transfer will reexamine the San Vicente Redwoods Public Access Plan and amend as appropriate. The proposed San Vicente Redwoods Public Access Plan would be used by the Conservation Partners and any other partners to guide the management of public access on the property.

Project Vision and Conservation Strategies

The Conservation Vision (established by the Conservation Partners in 2011) includes integrating preservation, restoration, and sustainable timber harvesting with research, education, and recreation. Providing access for research, education, and recreation is also a core component of the Conservation Vision and allowing for public access is a requirement of the Conservation Easement (2014) that protects the property.

The conservation strategies were informed in part by the planning process described below, which entailed mapping and analyzing various features of the site, including aquatic, marbled murrelet, and mountain lion habitat; climate resilience based on stream buffers and topographic shading; vegetation communities; geology, soils, and erosion sensitivity; and road density, usage, steepness, and hydrologic connectivity. Relative conservation values were then applied for each feature type to the 21 planning watershed units that were identified on the property. Based on the cumulative analysis, the planning watersheds were further grouped and delineated as Management Areas, listed below, to form the basis for the conservation strategies:

- **Preservation Reserve.** Two areas of the project site were delineated as Preservation Reserves, totaling about 900 acres. These areas would be managed to preserve and maintain existing old forest and other rare plant communities.

- **Restoration Reserve.** Three areas were delineated as Restoration Reserves, totaling about 4,000 acres. These areas would be managed to allow limited timber harvesting primarily for the restoration and enhancement of native ecosystem values.
- **Working Forest.** Two areas were delineated as Working Forest, totaling about 3,700 acres that are areas to be managed to emphasize Sustainable Forest Management.

The proposed San Vicente Redwoods Public Access Plan includes policies, design guidelines, construction protocols, trail maintenance guidelines, and rules and regulations, that have been carefully prepared to reduce and/or avoid impacts to the environment as a result of construction and operation of the proposed parking area and trails to the extent feasible. The proposed policies, guidelines, and construction protocols aim increase opportunities for pedestrian and bicycle access and connectivity; protect open space and cultural resources; and conserve natural resources. The proposed San Vicente Redwoods Public Access Plan policies also aim to avoid hazardous conditions and facilitate a healthy and safe environment for visitors to San Vicente Redwoods. In addition, the San Vicente Redwoods Public Access Plan policies ensure the proposed parking area and trails are compatible with neighboring land uses. Extensive rules and regulations would include, but are not limited to, restricting access to the designated trails and the parking area, enforcing compliance with allowed uses and prohibiting uses that are not allowed, restricting dog access to on-leash only designated trails and parking area, and limiting public access to daylight hours.

A comprehensive list of proposed policies, guidelines, and construction protocols, and rules and regulations is provided in the San Vicente Redwoods Public Access Plan (Attachment 2).

Planning Process and Alternatives

Following the purchase of the property in 2011, the Conservation Partners established a Conservation Vision (2011), Conservation Easement (2014), and the first Timber Harvest Plan (THP# 1-14-117 SCR) approved by CAL FIRE (2015). Prior to the development of the proposed Public Access Plan an extensive existing conditions analysis (including background and on-site research) was prepared, in coordination with related planning efforts, consultation with experts and regulatory agencies, and extensive public outreach.

The Conservation Partners Working Group comprised of a member of each partner provided guidance throughout the planning process at meetings held almost every week from 2013 to the present. The Working Group consulted the University of California Santa Cruz Puma Project to understand the areas of the property that support mountain lion denning, movement and foraging, and supplemented the University's data with game camera data managed by the current San Vicente Property Manager. Potential trail corridors and parking area locations were flagged on site by professional trail designers and builders; evaluated by the civil and environmental engineers for stability related to erosion and geotechnical considerations; and surveyed by biological and cultural resource experts. Through close coordination with technical experts, trail alignments were refined to minimize potential impacts to resources. Site visits were conducted with representatives from the County of Santa Cruz and CDFW. In addition, the project was presented to California Coastal Commission (CCC).

Public outreach for the project consisted of interviews and small meetings, stakeholder interviews, an online questionnaire, community meetings, and neighborhood outreach. The public was notified of the opportunity to participate through extensive media coverage of the topic, including newspaper articles, television news broadcasts, and news websites. Adjacent property owners and several government

agencies were contacted by phone or email. Throughout the planning process, the community was engaged through over 130 separate meetings and interviews with a cumulative attendance of over 1,600. Outreach efforts are summarized as follows:

- **Interviews and Small Meetings:** Interviews and small meetings with interested parties conducted by the LTSCC between 2013 and 2018. Interested parties included owners of adjacent lands, emergency service providers, water purveyors, utilities, law enforcement, and local community groups. Local experts and agencies were also consulted from the following fields: biology, geology, forestry, cultural resources, recreation, and education. Approximately 150 individuals and groups were identified and contacted. In total, such meetings were held with approximately 190 people.
- **Stakeholder Meetings:** Two stakeholder meetings were held for education and research interests, and representatives of recreational user groups. Attendees of the education meeting included representatives from Swanton Pacific Ranch and University of California, Santa Cruz. Attendees of the recreational meeting included hikers, mountain bikers, equestrians, dog-walkers, nature interpreters, representatives from the Sierra Club, the Mountain Bikers of Santa Cruz, BLM, the Santa Cruz Bird Club, the 8 Shields Institute, and the Fungus Federation.
- **Online Engagement:** An online questionnaire was hosted from November 2013 through April 2014 to seek public input from neighbors, residents, agency staff and others. Additionally, in May 2014, questionnaires were also shared with a local non-profit to interface with the local Spanish speaking community. In total 2,326 people filled out the questionnaire.
- **Community Meetings:** A community meeting was held in March 2014 with over 300 people who shared their views on public access. An additional community meeting was held in September 2014 with approximately 150 attendees to provide input on the preliminary draft San Vicente Redwoods Public Access Plan regarding preferences, priorities and concerns.
- **Neighborhood Outreach:** Neighborhood outreach included presentations at four meetings of the Rural Bonny Doon Association and more than 20 smaller meetings, including five meetings in the spring of 2018 attended by over 120 people in total.

Alternatives with respect to the location of the parking area, trailhead access points, the general location and extent of trails, and the types of allowed uses were considered during the planning process. The following provides a description of these alternatives and the basis for the selection of the project:

- **Parking Areas:** All locations considered for a parking area were on Empire Grade, which is the only public road with access to the portion of the property planned to be open to the public. Alternative parking area sites were considered at Warrenella Road, near the CDCR's Ben Lomond Conservation Camp, and near the Crest Ranch Christmas Tree Farm. Both of these sites have existing entrances from Empire Grade, and gates, fire roads and small clearings that could support a parking area. Parking areas were evaluated at these locations to be at least 300 feet from occupied residences to increase privacy for neighbors and minimize aesthetic impacts.
 - **Warrenella Road Parking Area Alternative:** The entrance to this location is an existing fire road located at approximately 11297 Empire Grade. The parking area would be set back approximately 50 to 350 feet from Empire Grade. This parking area alternative is dominated by large native trees, the removal of several of which would be required for construction. Warrenella Road is used to access Empire Grade by the residents of

inholdings, timber trucks and emergency vehicles. These uses would conflict with use by recreational visitors at this site. There are no residences within the 300-foot buffer described above. The closest residences include approximately 15 homes within 1,500 feet of the parking area at this location. A curve on Empire Grade is located approximately 300 feet south of this location.

- **Parking Area Alternative near Ben Lomond Conservation Camp:** The entrance to this location is an existing fire road located at approximately 13435 Empire Grade. The parking area would be set back approximately 50 to 150 feet from Empire Grade. This parking area predominantly hosts native shrubs such as ceanothus and manzanita. The area around this alternative location is planned to remain closed to the public. Fire roads in this area are used by the Ben Lomond Conservation Camp for training exercises. This alternative location would conflict with the routine operations of this CDCR facility. There are no residences within the 300-foot buffer described above. The closest residences include approximately five single-family homes within 1,500 feet of the parking area at this location. A curve on Empire Grade is located approximately 350 feet north of this location.
- **Parking Area Alternative near Crest Ranch Christmas Tree Farm:** The entrance to this location is an existing fire road located at approximately 11851 Empire Grade. The parking area would be set back 150 to 350 feet from Empire Grade. This parking area alternative location hosts a large stand of non-native pines. The fire roads in this area are infrequently used. Selection of this area would cluster development near other developed areas, such as the Crest Ranch Christmas Tree Farm, while maintaining the 300-foot setback described above. The closest residences include approximately 50 single-family homes with the closest being approximately 950 feet from the parking area at this location. Empire Grade is straight for greater than 700 feet to the north and south of this location to allow for safe vehicular turning movements.
- **Trailhead Access Points:** An access point on Bonny Doon Road and two trailhead access points from Cotoni-Coast Dairies were considered, one in the northwest portion of this area and one is near Warrenella Road.
 - **Bonny Doon Road Trailhead Alternative:** This alternative trailhead access point would enter at a portion of the San Vicente Redwoods that is planned to remain closed to the public.
 - **Warrenella Road Cotoni-Coast Dairies Trailhead Alternative:** This alternative trailhead access point is on the Cotoni-Coast Dairies and would conflict with other uses of Warrenella Road including residential traffic, timber hauling, and emergency vehicles.
 - **Northwest Cotoni-Coast Dairies Trailhead Alternative:** This trailhead access point alternative is located on the northwest portion of Cotoni-Coast Dairies and would allow trail connections between the and portions of San Vicente Redwoods that are planned to be opened to the public.
- **Location and Extent of Trails:** A range of options were considered for the general trail locations as well as areas that should be opened and closed to public. These included large loop trails, use of existing fire roads as trails, use of the Warrenella Road, and a combination of trails and existing fire roads that contained access to a portion of the property while still allowing a variety of trail experiences.

- **Large Loop Trails Alternative:** Large loop trails were considered that could have spanned large portions of the property. These trails would have traversed steep and unstable terrain and taken visitors to remote portions of the property where emergency services would be difficult to provide. Some of these areas are prime habitat for wildlife, supporting sensitive life stages such as breeding and denning, based on interviews and data provided by the University of Santa Cruz Puma Project. Minimizing visitor entry into these areas to protect the conservation values of the property associated with biodiversity and wildlife habitat is a fundamental part of the Conservation Partner's conservation strategies for the San Vicente Redwoods.
- **Existing Fire Road Trails Alternative:** Some existing fire roads were found to be suitable for use as trails, but most were found to be unsuitable. The existing fire roads are typically too steep and would require extensive winterization. They are not designed for year-round use, and such use would result in excessive erosion. Additionally, many fire roads would direct visitors into areas that support sensitive wildlife life stages such as breeding and denning.
- **Warrenella Road Trail Alternative:** The Warrenella Road was briefly considered as a trail. However, this road is used by the residents of inholdings, timber trucks, and emergency vehicles. This road is deeply incised in many sections. Extensive portions of it are poorly drained, and routine closures are necessary to prevent excessive erosion. It is unsuitable for use by recreational visitors.
- **Combination of New Trails and Existing Fire Road Trails Alternative:** This option with a combination of new trails and existing fire roads that are located near, but not on the Warrenella Road, and other major fire roads would allow for sustainable trails to be established, through both new construction and renovation of the fire roads to be used as trails. Proximity to the Warrenella and other major fire roads enables improved access for emergency response, compared to the large loop trail option. This combination approach also directs visitors into areas of the property that are less used for sensitive wildlife life stages.
- **Allowed uses:** Options for allowed uses were considered by eliminating uses that were already prohibited and by determining what would allow people to connect with nature in a manner that accomplishes their personal preferences, so long as their activities do not compromise environmental quality or the experience of others. Accordingly, activities prohibited by the 2014 Conservation Easement (e.g., motor vehicles) and by State regulations (e.g., fishing) were eliminated. Allowed uses considered the following:
 - **Hiking, Bike Riding, Horseback Riding, and Dog Walking:** These uses result in similar effects in regard to trail erosion, in that trail design and maintenance have a greater effect on erosion than the type of use. These four uses also have been found to have similar impacts on wildlife. Based on consultation with experts at the University of California Santa Cruz Puma Project, dog walking is understood to deter use of the area by medium and large mammals for sensitive life stage activities such as breeding and denning. However, during the planning process it was reported from many hikers that they would feel unsafe hiking without their dogs, and from nearby residents who expressed that dog walking would be a primary activity on the property. It is recognized

that hiking, bike riding, horseback riding and dog walking on the same trails sometimes results in conflict between visitors.

- **Back Country Style Camping:** This use requires a higher level of management than other recreational uses. Relatively few locations on the property have the combination of a level area with good access by roads for servicing the area. Those that do are in parts of the property closed to public access for safety, forest management, and wildlife habitat.

On the basis of these alternatives, the proposal includes a parking area near the Crest Ranch Christmas Tree Farm, a trailhead access point in the northwest portion of the Cotoni-Coast Dairies, a combination of new trails and existing fire roads located near major fire roads, and allows hiking, bike riding, horseback riding and dog walking (on leash). These sites were selected due to the distance to existing residences, compatibility with adjacent land uses, avoidance of impacts to plants and wildlife, and reduced potential for accelerated erosion. The allowed uses were assigned to the various trails so visitors whose experience is impacted by a particular use can avoid visitors engaging in that use. Dog walking trails were restricted to the trails adjacent to Empire Grade, where transportation, residential, agricultural, commercial, and government use is likely to already deter use of this area by wildlife for sensitive life stages.

Parking Area and Trails

With the exception of trails that are designated for public access and posted as open, all areas of the property would be closed to public access unless a special permit is issued by the Property Manager. The proposed parking area and trails would occur in two of the three management zones. These zones and the implications to management, maintenance, and operations are identified below.

- **Parking Area (4.7 acres):** This zone would be limited to the parking area vicinity and would receive the highest level of concentrated use. Regular management and maintenance would be provided in this area.
- **Public Access Area (460 acres):** This zone would include a 100-foot-wide corridor centered on the trail, with 50 feet on either side, for routine access. Ongoing maintenance and management would be provided to ensure resource protection, including monitoring to ensure that recreational use is limited to designated trail alignments.
- **Closed Area:** Most of the property (approximately 94%) would be closed to public access. As part of the research and education component of the proposed San Vicente Redwoods Public Access Plan, these uses would be permitted throughout the property on a case-by-case basis. For this zone, the Management Team would focus management efforts on approving appropriate research and education uses and preventing inappropriate access and addressing any trespass.

The use of the proposed parking area and trails would be limited to daylight hours, with public access facilities generally opening a half hour after sunrise and closing a half hour before sunset. The construction and operation of the proposed parking area and trails would be implemented in multiple phases. The following describes the project features and phasing.

Parking Area

The proposed 4.7-acre parking area would include primary access points off of Empire Grade, internal roads for access and circulation, parking areas for vehicles and bicycles, and other access features described below (see Figure 3).

Entry Features

Two access points to the parking area are proposed, an entrance and an exit. Each would include a 16-foot wide locked gate that would be opened and closed by the Public Access Manager or their designee. The entrance to the parking area would be constructed with natural materials that are visible and also blend in with the surrounding environment, such as stone, concrete, metal, and/or wood. A conceptual simulation is included (Figure 4) to provide a general idea of the view from Empire Grade. Signage at the entrance would be visible for approaching vehicles coming in both directions on Empire Grade Road and to discourage roadside parking outside of the parking area. Another access point would be a future connection to an anticipated, but not formally planned, trail network on Cotoni-Coast Dairies.

Parking Area Features

Access features associated with the parking area would include signage, benches, trash receptacles, dog facilities, restrooms, safety and security features, and temporary construction trailer. All parking area features would be constructed with durable and framing/support structures made of natural materials, where possible. These features are described as follows:

- **Signage:** Clear signage would be installed and maintained at the parking area for wayfinding, and education and information about the natural resources, and to convey the trail rules, allowed uses, trail etiquette, safety features, and hours of operation. Signage would be on posts, kiosks, or bulletin boards.
- **Site Furnishings:** Up to two picnic tables and four benches would be provided at the parking area with a visual buffer between the parking area and restroom building. Tables would be located outside the dripline of any redwood trees. Clear signage would be posted near the picnic area to indicate that all trash is required to be packed out or put in the trash receptacle.
- **Trash Receptacles:** Up to four trash and recycling receptacles with an approximate 110-gallon capacity to hold two standard 55 gallon recycle-type bags would be located at the parking area. Trash receptacles would be ADA-compliant with a wildlife-proof internal single point self-latching system on the service hatch. Trash receptacles would be welded with 14-gauge construction and mounted on concrete pads at the restroom buildings.
- **Dog-courtesy stations:** A dog-courtesy station with bags for waste would be mounted on the restroom building or the information kiosk.
- **Restroom Building:** A single prefabricated restroom building with two vault toilets would be installed on a building pad approximately 15 feet by 15 feet. Vents would be located in the prevailing wind direction. No potable water or associated infrastructure is proposed.

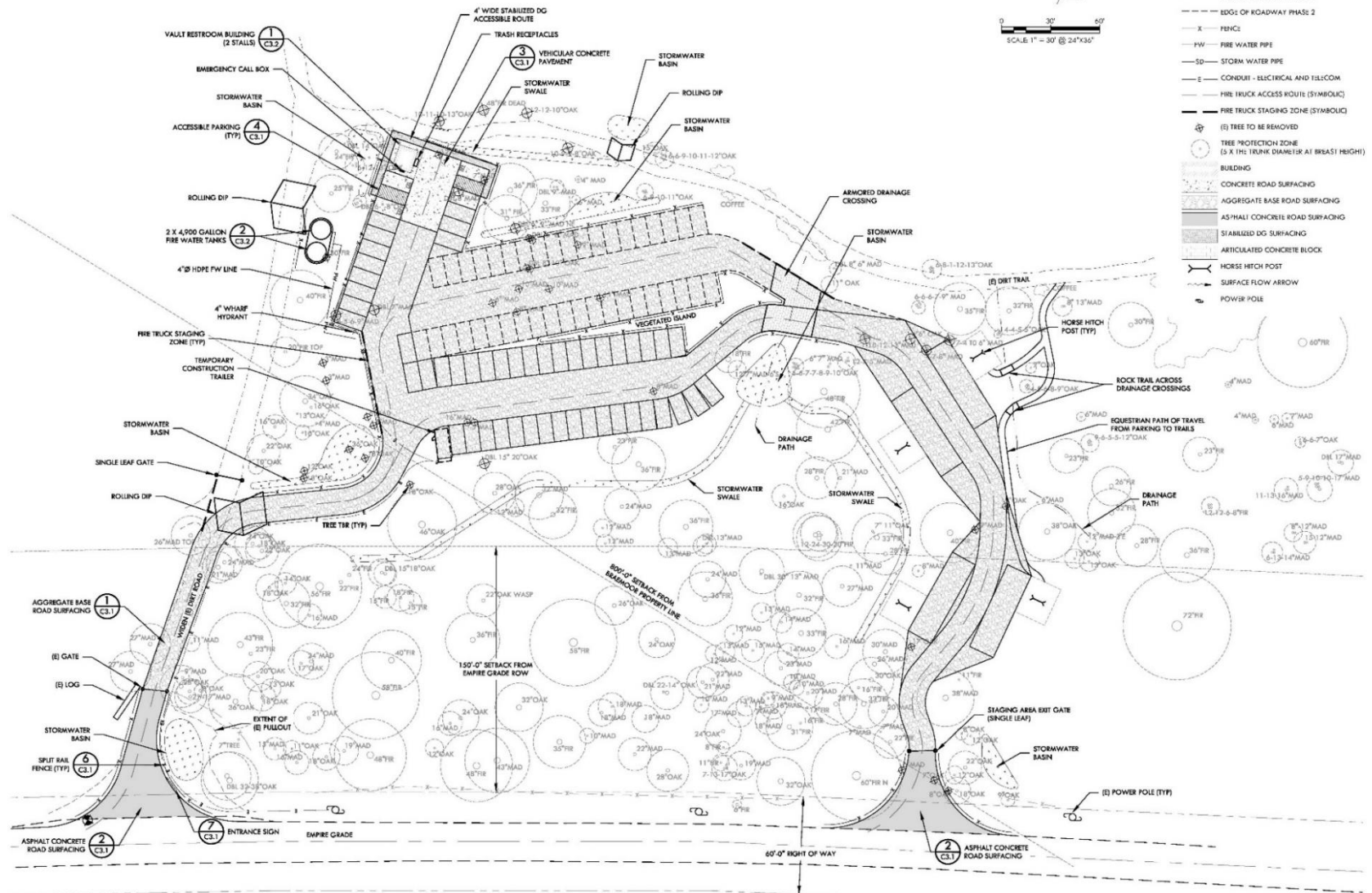
Safety Features: For fire protection services, filled from a water truck through an access manway and a 4-inch wharf hydrant would be installed. The fire hydrant would be located a minimum 50 feet and a maximum 150 feet from the restroom building. The water tanks would be

mounted on an 8-inch prepared and compacted subgrade. Circulation design within the parking area would be constructed to meet all emergency vehicle turning radii standards and clear signage would mark these locations. Cameras and a standard emergency call box would be installed and routinely monitored by the Property Manager. Cameras would be installed at various locations and the emergency call box would be mounted on the restroom building. The single-speaker emergency call box would have a water tight enclosure and be vandal resistant.

- **Temporary Construction Trailer:** A construction trailer that would be sized to fit within a standard-vehicular parking space (18 feet by 9 feet) would be located at the parking area for use as staff offices and equipment storage during the construction phase. Electricity would be wired to the trailer by a certified electrician.

Proposed Parking Area

Figure 3





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Conceptual Entry Features

Figure 4



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Roads and Parking

The proposed roads and parking would maximize permeable surfaces and shade, minimize vegetation disturbance, and meet ADA standards at the trailhead. The two access points would form a loop driveway and link the parking area features, which are set back from Empire Grade. The circulation and parking would be developed over two phases to provide sufficient parking as the trail system is expanded over time. The first phase would include parking for up to 44 standard vehicles, four spaces for horse trailers, and two ADA-compliant spaces. The second phase would include up to 40 additional standard-vehicle spaces. The proposed parking area would meet the accessibility requirements of the United States Access Board's Final Guidelines for Outdoor Developed Areas (ODA). Bicycle parking at the parking area would be galvanized steel U-racks, looped-racks, or racks of a similar design, with a metal finish and, if necessary, the racks would be painted with neutral tones. No overnight parking would be allowed.

The parking area roads and parking spaces would be primarily surfaced with compacted aggregate base. The ODA-compliant parking and the restroom building pad would be surfaced with concrete. The ODA-compliant "paths of travel" would be surfaced with stabilized decomposed granite. The existing unpaved access points off Empire Grade would be surfaced with asphalt. The existing unpaved road would be re-graded and filled, to properly route stormwater drainage. The elevation of the existing road would be increased, and the existing trail would be graded in order to meet the elevation of the restroom building. Both the existing road and existing trail would have a finished surfaced of compacted native soil, similar to their current condition. As shown in Table 1, the total impervious area would be 30,259 square feet.

Table 1: Parking Area Impervious Use by Use and Type				
Use	Area (sf)	Surface Type/Material	Weight	Impervious Area (sf)
Restroom Building	171	Roof	100%	171
ODA Parking and Driving Aisle	2,243	Concrete	100%	2,243
Fire Storage Water Tanks	226	Roof	100%	226
Accessible Access Trail*	489	Stabilized Decomposed Granite	100%	489
Armored Drainage Crossing	1,003	Articulated Concrete Mat	100%	1,003
Roads and Parking Areas	44,196	Compacted Aggregate Base	50%**	22,098
Entrance and Exit	4,029	Asphalt Concrete	100%	4,029
Total Impervious Area Created by the Project				30,259
<p>*United States Access Board's Final Guidelines for Outdoor Developed Areas (ODA)</p> <p>**The compacted aggregate base surfacing is assigned 50% because it is considered a "semi-pervious" material. Source: Fall Creek Engineering, Inc., Drainage Analysis. San Vicente Redwoods Staging Area, Assessor's Parcel Number (APN) 080-011-42, Empire Grade, Santa Cruz County, California, August 2017.</p>				

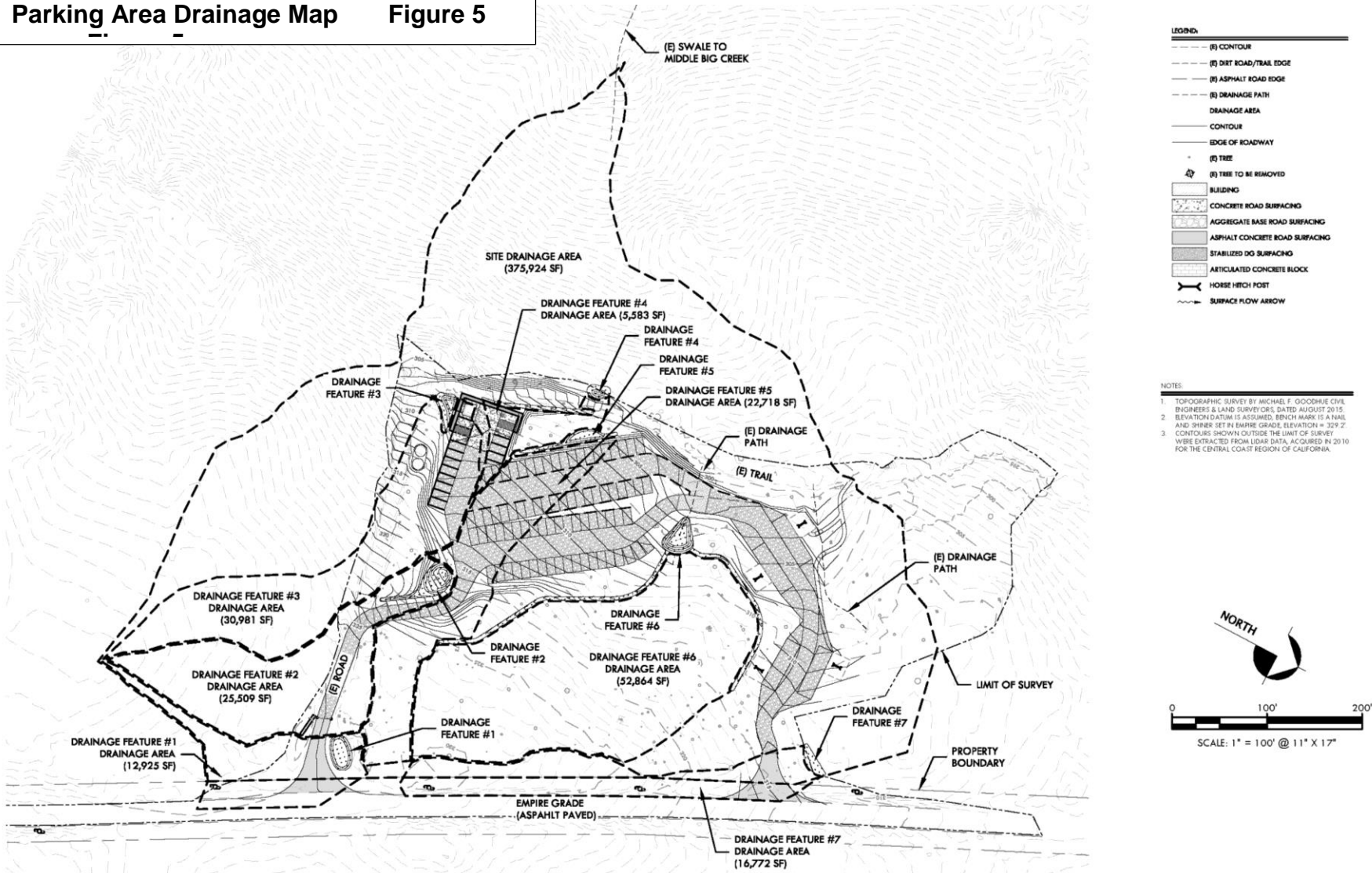
The proposed parking area would include seven vegetated basins to manage both concentrated storm water runoff from the proposed impervious areas and runoff from areas with existing drainage issues.

The seven vegetated basins are labeled storm water basins on Figure 3 and Drainage Features #1 through #7 on Figure 5 and described as follows:

- **Feature #1** would collect and manage run-on to the site from existing Empire Grade, which is paved with asphalt concrete, as well as run-off from the adjacent entrance to the parking area, which is also paved with asphalt concrete.
- **Feature #2** would collect and manage runoff from the top of the existing entrance road to the parking area in order to minimize storm water runoff down the existing road, which is currently a drainage issue on the parking area.
- **Feature #3** would collect and manage runoff from the adjacent concrete paved accessible parking area and roof runoff from the restroom building.
- **Feature #4** would collect and manage runoff from the concrete paved accessible parking areas.
- **Feature #5** would collect and manage runoff from a portion of the main aggregate base paved parking area.
- **Feature #6** would collect and manage run-on to the site from undeveloped areas. An existing drainage path crosses Drainage Feature #6, and the intention of this vegetated basin is to minimize concentrated flow over the parking area circulation road. In addition to the vegetated basin, an armored drainage crossing would be installed on the road where the drainage path leaves from the vegetated basin.
- **Feature #7** would collect and manage run-off from the adjacent exit from the site, which is paved with asphalt concrete.

Other areas of the parking area that are surfaced by semi-pervious surfaces, such as aggregate base road surfacing, have been designed to sheetflow to vegetated areas where natural soil infiltration would occur. Additionally, any overflow from the proposed vegetated basins will sheetflow to natural, vegetated areas.

Parking Area Drainage Map Figure 5





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Trails

At full build-out, the proposed trail network would include approximately 38 miles of single-use, dual-use, and multi-use trails. The trail system allows for a number of loop options on the upper are of the Main tract. The trail system design for the Main tract would also allow for a through connection from Empire Grade to the Cotoni-Coast Dairies property when the trail system for that property is completed. The Laguna tract improvements would be to an existing trail and is limited to minor reroutes to reduce the potential for erosion from the existing trail. The Laguna tract trail would be accessible only through existing trails on the CDFW Bonny Doon Ecological Reserve, which are accessed at the existing CDFW parking area on Martin Road. Trail planning for the Laguna tract has been conducted in coordination with CDFW and no mountain biking would be permitted on this section of trail. Conceptual trail alignments that indicate appropriate trail corridors where trails could be located are shown on Figure 2. The exact alignment may vary as necessary to address field conditions and meet the trail design guidelines of the San Vicente Redwoods Public Access Plan. The following describes the proposed types of trails and the permitted uses, creek and drainage crossings, trail design guidelines, and other trail features that are proposed as part of this project.

Trail Type and Uses

Trail use designations are subject to change in response to trail conditions, feedback on visitor experiences, and adaptive management over the lifetime of the project. Conceptual trail alignments are described below.

- **Single-Use Trails:** Single-use trails would be limited to the 1.5-mile hiking-only trail on the Laguna Tract (no mountain biking would be permitted on this section of trail). A short 0.2-mile trail horse-only connection would be on the main tract.
- **Dual-Use Trails:** Dual-use trails allow hiking and either biking or equestrian uses. There would be 19.1 miles of dual use trails that allow hiking and biking, with connections from the Empire Grade to the multi-use trail in the southern portion of the property. Loop hiking and biking trails would be concentrated in the northern portion of the property. The 11.9 miles of dual-use trails that allow hiking and equestrian would comprise most of the through-trail experience for equestrian uses, with connections to multi-use trails to the north and south part of the site.
- **Multi-Use Trails:** There would be 5.4 miles of multi-use trails that allow hiking, biking, and equestrian use. These trail segments would be located in constrained areas where separate use trails are less feasible, including the southern end of the through-trail and a short segment in the central area of the through-trail. On-leash dogs are limited to 2.5 miles of the multi-use trails. These trails would be located primarily along an existing frontage road that parallels Empire Grade, and is the only trail where dogs are allowed on the property.

Trail mileage at buildout is summarized in Table 2 according to potential designated uses. As shown in Table 2, of the proposed 38 miles of trails, approximately 30% or 12 miles would be on existing timber harvest roads and 26 miles would be new trails. Trails within the Laguna Tract would be primarily on existing trails and within existing trail alignments, with improvements to the existing trail conditions where needed.

Table 2: Trail Network Summary at Buildout

Initial Trail Use*	Located on Existing Road/Trails (Miles)	New Construction* (Miles)	Total Trails at Buildout (Miles)
Main tract			
Horse	0	0.2	0.2
Hike and Horse	5.0	6.8	11.8
Hike and Bike	2	17.1	19.1
Hike, Bike, Horse	2.4	0.5	2.9
Hike, Bike, Horse, Dog	1.3	1.2	2.5
<i>Subtotal (Main Property)</i>	<i>10.7</i>	<i>25.8</i>	<i>36.5</i>
Laguna Tract			
Hike	1.3	0.2	1.5
<i>Subtotal (Laguna Tract)</i>	<i>1.3</i>	<i>0.2</i>	<i>1.5</i>
Total	12	26	38
*Trail mileage estimates for newly constructed trails is measured based on 100-foot corridor study areas using GIS and increased by 13% to allow for sinuosity, grade changes, and other anticipated variations in trail alignment.			

Trail Drainage and Creek Crossings

The conceptual trail network would include multiple drainage, creek, and swale crossings. Each potential crossing was evaluated during field review of the proposed trail network by Fall Creek Engineering, Inc. During the field evaluation, geometric and qualitative data was collected for each existing crossing and a preliminary determination was made for the proposed crossing improvement.

The project would include armored crossings, puncheons, and bridges. In addition, in some cases improvements to existing culverts on the project site are proposed to improve the culvert condition. These crossings are described as follows:

- **Armored Crossings:** These crossings are proposed for small ephemeral drainages that are generally classified as non-jurisdictional crossings. These crossings have poorly defined bed and bank, and crossings can be made without steep trail sections along the approach and departure to the crossing. An armored crossing is a minimally invasive improvement that will reduce erosion in the drainage from trail use. In addition, armored crossings are proposed for some crossings along existing roads and trails despite the crossing classified as jurisdictional. The decision for armored crossings for these situations was made to avoid any new impacts that would be created by a new trail off of the road where a pedestrian puncheon or bridge could be built across the drainage and to eliminate impacts that would result if a large traffic rated bridge was constructed to fully span the crossing.
- **Puncheons and Bridges:** Puncheons and bridges are proposed for all new stream crossings over sensitive habitat. Puncheons are small bridges without railings. These crossings would be

located over intermittent and perennial streams that are generally classified as jurisdictional crossings. These crossings would have defined bed and bank, where an armored crossing would result in steep trail slopes along the crossing approach and departure. The puncheons and bridges would be sized to span from top of bank to top of bank¹ at a minimum. Railings are required on bridge structures with a height above ground exceeding 30 inches. To allow for variation in the height of bridge structures during construction, any bridge structure with a height greater than 24 inches based on the collected field data is proposed to be a bridge. Bridge structures with a height less than 24 inches are proposed as puncheons.

- **Culverts:** Culverts are tunnels that carry a stream or open drain under a road or railroad. Existing culverts were evaluated based on their condition and capacity. Culverts with adequate condition and capacity would remain as is. Culverts with adequate condition but inadequate capacity would remain as is with road armor proposed to manage overflow from the culvert. Additionally, improvements to culvert inlets and outlets are proposed to minimize erosion at the inlet and outlet of the culvert. Culverts with adequate capacity, but inadequate condition would have proposed improvements to the culvert structure itself to allow for continued use. In some cases, culverts are not serving their intended purpose and are recommended for removal and replacement with an armored road crossing.

Of the proposed armored crossings, some are classified as “wait and watch” crossings and would be improved in the future if necessary after monitoring. There are 21 existing culverts, 5 of which are recommended for removal and replacement with an armored crossing, 9 have other improvements, and 7 would have no improvement. The 9 culverts with improvements would include removing chutes after culverts, installing downstream armor, installing a headwall at the culvert inlet, and replacing a section of broken pipe. In addition to these crossings, the project would include one crossing with no crossing improvement where trail users would cross using an existing rock hop.

The proposed drainage and creek crossings were designed to be compliant with the Santa Cruz County Design Criteria, which requires that all drainage improvements are sized to convey a minimum 10-year storm. In addition, drainage improvements are required to be sized to convey flood overflows based on the drainage area size and the type of improvement. For drainage areas less than 100 acres, a minimum return period design flow of 25 years is required for conveyance of the flood overflow. For bridge structures a return period design flow of 100 years for the flood overflow is required. Under the project, all but three of proposed crossings would have drainage areas that are less than 100 acres. Of these three crossings, two crossings would not have any proposed improvements because one is a recently replaced culvert and the other is a culvert was replaced under the current Timber Harvest Plan (THP). The third proposed crossing would be improved with a bridge structure and would be designed to accommodate the flow associated with the 100-year storm. All crossings designed to convey the flow associated with the 100-year storm. The proposed bridge abutments would be located outside of the top of bank for the drainages and puncheons are designed to lift off their foundations during large flows, while begin

¹ Top of bank designates the first major change in the slope of the incline from the ordinary high-water level of a water body.

tethered for retrieval and replacement after the storm. In all cases the crossings would safely convey the flow associated 100-year storm event for that drainage area.

Trail Design Guidelines

The project includes trail design guidelines that are intended to facilitate the design and construction of trails. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed.

The trail design guidelines are organized based on construction-type rather than trail type: (1) roads to be maintained for vehicles and used as trails, (2) roads to be decommissioned and converted into trails, and (3) trails to be built along completely new alignments. While the San Vicente Redwoods Public Access Plan includes a robust and detailed set of design guidelines, those described in this Initial Study focus on the guidelines designed to avoid environmental impacts. These are described as follows:

- **Roads to be Maintained for Vehicles and used as Trails:** The project would upgrade existing timber harvest roads to minimize erosion and extend the life of the trails while avoiding disturbance of the surrounding landscape. Signage and design would depend on whether the road would be used for regular, intermittent, or emergencies only.
- **Roads to be Decommissioned and Converted into Trails:** The historic railroad grade, which also served as a road historically, would be converted to use as a trail. Most of this landform is stable and would not be regraded. In these segments, the proposed trail would be installed on the inboard edge of the road. Existing stream crossings at these locations would be fully excavated during road-to-trail conversions and may be narrowed and upgraded for trail use. As the road approaches the crossing, the trail alignment would meander toward the inboard edge of the road to intersect with the stream on contour. Appropriate crossing structure would be installed at stream crossings; refer to discussion of stream crossings for new trails (above) for preferred crossings. To facilitate storm water management, the trail will occasionally meander across the retired road bed to create grade reversals that outlet to stable slopes away from streams. To facilitate storm water management, the trail would occasionally meander across the retired road bed to create grade reversals that outlet to stable slopes away from streams.
- **New Trails:** New routes would be created when existing routes are not able to provide desired connectivity or have drainage issues or other problems that make trail sustainability infeasible. New trails would conform to the natural terrain, minimize erosion and fall-line orientation, avoid the removal of trees larger than 12 inches in diameter at breast height (DBH) and damage to roots, and avoid active unstable and other hazardous areas, sensitive plant and animal habitats, archaeological resources, steep sideslopes, and unstable watercourse crossings. New trails would have a grade no steeper than half the grade of the native hillside and less than 15% except for sections shorter than 50 feet. New trails would avoid watercourse crossings where channel gradient is steep, as well as at deeply entrenched streams with potential unstable streamside slopes. Routes would generally be located such that drainage areas are crossed high

in their watershed locations where streams are less defined in order to avoid stream disturbance.

Trail dimensions would be determined based on the type or use of trail as shown on Table 3.

Table 3: Trail Dimensions by Use Type*			
Trail Type	Tread Width	Vegetation Clearance	Maximum Grade
Accessible Trails	Constructed Width: 5 feet + Maintained Width: 5 feet +	2 feet horizontal; 10 feet vertical	<5% (ADA)** 10% (ODA)***
Multi-Use Trails	Constructed Width: 5 feet+ Maintained Width: 2 to 5 feet +	1-foot horizontal; 10 feet vertical	15% for any extended section
Equestrian Hiking Trails	Constructed Width: 2 to 5 feet Maintained Width: 2 to 5 feet	1-foot horizontal; 10 feet vertical	15% for any extended section
Mountain Biking Hiking Trails	Constructed Width: 2 to 4 feet Maintained Width: 2 to 4 feet	1-foot horizontal; 10 feet vertical	15% for any extended section
<small>*Where trails utilize roads that are to be maintained for vehicle use, dimensions will be dictated by vehicular requirements. **Americans with Disabilities Act (ADA) *** United States Access Board Final Guidelines for Outdoor Developed Areas (ODA)</small>			

Other Trail Features

Other access features would include gates and fencing for security and safety, picnic areas, informal and semi-formal gathering areas, including up to 10 overlooks, plantings, signage, and other site furnishings. Limited site furnishings may include benches along the trail network and at scenic vistas or other destinations, as well as picnic tables in designated areas. These features are described as follows:

- **Security Gates and Fencing:** Gates and/or appropriate signage would be installed at certain roads and trails to allow for areas/trails to be closed off to the public when needed. Gates would be designed for utility and resistant to vandalism, to the extent feasible. All gates and bollards would be made of durable materials, such as metal, with a natural color finish except where safety marking (e.g., yellow color) is required. Fencing would be provided at entrances to the property and where necessary to restrict access. Three-strand wire, split-rail fencing, or other low, rustic fencing constructed of natural materials and designed to ensure permeability for local wildlife, is preferred when the purpose is to visually communicate restrictions where security concerns exist. However, chainlink fence and guardrails would be used when necessary to protect resources and ensure safety, but without impeding wildlife movement.
- **Picnic Areas:** The proposed picnic areas would include one or two tables near the parking area, yet have some visual buffer from the parking area. Picnic tables and benches would be located

outside of the dripline of redwood trees. Picnic areas would either include wildlife-proof trash receptacles or clear signage stating that trash must be packed out.

- Informal and Semi-Formal Gathering Areas:** The proposed informal gathering areas do not require tree removal and/or vegetation clearing. The proposed gathering areas would be up to 20 feet by 40 feet. Gathering spaces would be developed where regular and/or on-going use is anticipated and supported by the Public Access Manager and its partners. As part of the research and education access, some informal gathering spaces for occasional use for certain education projects and programs could be located in closed areas outside of the 460-acre area of the property where the trails would be located. Vegetation would be maintained for views and seating at up to 10 overlooks. Maintenance may include removal of trees and shrubs less than 12 inches in diameter. An overlook may be up to 10 feet by 20 feet. These spaces would be considered on a case-by-case basis depending on the specific project and the number of individuals involved. Elements within semi-formal gathering areas should be limited to seating, preferably constructed with onsite materials such as fallen logs.
- Plantings:** All new planting on the property would be native, regionally appropriate, and consistent with applicable regulations. Any cut surfaces or fill would be planted with native groundcovers.
- Signage:** In addition to the signage at the parking area, clear signage would be installed and maintained at property boundaries and on all trails that include allowable uses, proper trail etiquette, and wayfinding. Trailhead signage would include length, surface type, typical and minimum trail width, and typical and minimum running and cross slopes. Interpretative and educational signage would communicate rules while also fostering a stewardship ethic. Trail closures would also be identified through clear onsite signage and gates, if warranted. Signage would be durable and framing/support structures would be made of natural materials, where possible.
- Other Site Furnishings:** In addition to the site furnishings located at the parking area, rest stops with benches would be strategically located along trails to emphasize scenic views, encourage a diversity of experiences, and provide shade and other pedestrian comforts. Site furnishings would be located outside of the dripline of redwood trees. As true for all park features, site furnishings would be made of durable materials, such as concrete, metal, wood, or locally sourced stone, and would have natural or neutral colored finishes. For example, cut log stools for gathering areas.

Construction and Operation Phasing

The proposed San Vicente Redwoods Public Access Plan would be implemented in three phases as shown on Figure 2. For the purposes of this environmental analysis construction is anticipated to occur over limited time-periods throughout an approximately 9-year period at various locations on the staging and public access areas (i.e., approximately 460-acre area). However, adjustments may be required based on future unknown conditions such as available funding, contributions of partner organizations, opportunities for creating regional connections, and changes in ownership and management. The three phases of implementation identified for San Vicente Redwoods are summarized in Table 4 and further described below.

Table 4: Construction and Operation Phasing				
Phase	Estimated Timeline for Phase Initiation	Located on Existing Road/Trails (Miles)	New Construction (Miles)	Total Trails (Miles)
Phase 1	Year 1, parking area and trails available at opening	2.6*	7.3**	9.9
Phase 2	Year 3, 4 or 5, assuming success in Phase 2	1	8.3	9.3
Phase 3	Year 5, 6 or 7, assuming success in Phase 3 and completion of connecting trails at the Cotoni-Coast Dairies	8.4	8.1	16.5
To Be Determined	To be determined	0	2.3	2.3
Total Trails at Buildout (Miles)		12	26	38
*Includes 1.3 miles on the main tract and 1.3 miles on the Laguna Tract.				
**Includes 7.1 miles on the main tract and 0.2 miles on the Laguna Tract.				

Phase 1

The first phase would provide the baseline level of public access, which would include the parking area and 8.4 miles of trails on the main tract. The proposed parking area would include two gated access points off of Empire Grade and an internal loop road, parking for up to 50 standard vehicles, two spaces for horse trailers and two ADA-compliant parking spaces, seven vegetated basins, fire storage water tanks, restroom building, and other features (e.g., benches, signage, trash receptacles). This parking area and this section of the proposed trail network is intended to be complete prior to the opening of the property for public access and is envisioned to provide visitors the opportunity to recreate on the property for at least two hours if bicycling and four hours if hiking. Phase 1 would also include the opening of a 1.5-mile trail within the Laguna Tract for hiking-only use.

Phase 2

Phase 2 would include up to 8.3 miles of new trails and 1 mile of improved existing road. To accommodate additional visitors, the second phase would include up to 40 additional standard-vehicle parking spaces within the parking area.

Phase 3

Phase 3 would extend the trail network and establish regional trail connections. Up to 16.5 miles of trail would be added, with trail connections from the San Vicente Redwoods parking area through the property to BLM's Cotoni-Coast Dairies. Implementation of this phase would be dependent on establishment of connecting trails at the Cotoni-Coast Dairies.

Additional Trails

An additional 2.3 miles of trails would be established if adaptive management monitoring determines that management of public access in previous phases were successfully implemented. These additional trails include three segments, each of which would offer a unique loop experience that connects to Phase 1 or Phase 2 trails. Implementation of these trails would be independent of Phase 3 implementation but would not be established until successful implementation of Phase 2 trails.

Construction

Equipment

Most trail construction would occur by hand with limited use of heavy machinery or vehicles. The use of heavy machinery or vehicles would be limited to areas with existing vehicular access (such as former logging roads) with the exception of the parking area, which would require the use of standard construction machinery and equipment. A temporary construction trailer would be located at the parking area.

Grading, Fill, and Tree Removal

Grading would occur for the proposed parking area only and would include 2,719 cubic yards of cut, 2,867 cubic yards of fill, for a net increase of 76 cubic yards of clean fill to be transported to the site. Preparation of the parking area would require the removal of up to 40 non-native trees and 15 native trees that are 12 inches or greater in DBH. Over 150 native trees that are 12 inches DBH or greater would be retained.

Operation

Visitors

A *Projected Visitor Counts and Parking Needs* report dated January 12, 2016 was prepared by PlaceWorks (see Attachment 10). The visitor counts and parking needs projections were based on attendee levels at comparable parks and open spaces in the area, including The Forest of Nisene Marks State Park, Wilder Ranch State Park, and Soquel Demonstration State Forest. The project is estimated to attract 13,140 to 14,600 people per year at initial opening, and as much as 83,220 to 97,090 people per year in the future. Note that future conditions are greater because they assume the opening of all proposed 38 miles of trails and the opening of planned parking area at BLM's Cotoni-Coast Dairies property, which could facilitate more visitors to the project site.

Management and Maintenance

The project would require ongoing management and maintenance. The proposed San Vicente Redwoods Public Access Plan includes roles for a Public Access Manager and Property Manager to ensure the implementation of the policies, design guidelines, construction protocols, trail maintenance

guidelines, and rules and regulations are strictly enforced. The LTSCC would be the Public Access Manager while the Property Manager would be a contractor to the property owners with expertise in forestry, ecology, and land management. While these managers would have many responsibilities, the following would help to reduce and/or avoid impacts to the environment to the extent feasible.

Visitor Registration and Special Use Permits

All recreational visitors would be required to register using the free Visitor Registration System prior to use of public access. To register, individuals would be required to provide contact information to the Public Access Manager to be used in case of an emergency and also sign up to receive updates on site conditions and status. Once registered, visitors would be required to sign-in upon arrival to the property. Following registration, visitors would be issued a pass (or permit). Permits may also be required for parking at the designated parking area and/or for certain on-trail recreational use at the discretion of the Public Access Manager, Owner(s), and Conservation Easement Holder. Visitors would be required to carry their permits on their person and display a copy on the dashboard of their car when parked at the parking area. Failure to comply with rules may result in the revocation of access permits, as well as citation.

Recreational activities would require a special use permit if they are either (1) not identified as an allowed use, (2) would take place outside of daylight hours, or (3) would not be limited to designated public access trails and use areas. Permits will also be required for groups with more than 20 individuals, any special events (such as organized trail runs), or any off-trail activities.

Recreational uses that would not be allowed on the property through special use permits or under any circumstance include, but are not limited to, fire making, collecting, hunting, fishing, off-leash dogs, off-road vehicles or motorized dirt biking (including electric bikes), trail building and rock climbing, and rappelling. No commercial uses, defined as activities where a fee is charged for a good or service with the intention of making a profit, would be allowed on the property under any circumstances. The designated Closed Area would be managed to receive minimal visitor activity. Smoking and unpermitted alcohol use would not be allowed on the property under any circumstance.

Litter and Waste Management

Trash would be removed at least weekly, and at a frequency sufficient to prevent trash overflow at the receptacles and to minimize wildlife-attracting odors. All trash and recycling receptacles would be wildlife-proof. Signage and visitor education would instruct visitors to pack out and/or properly dispose of all waste. Litter, food scraps, and dog waste would be picked up and disposed of as part of regular monitoring and patrol activities.

Visitor Education

The Property Manager would routinely engage visitors to increase user compliance with closed area designations, and rules regarding litter, food scraps and dog waste, and provide verbal reinforcement of posted rules. Such responsibilities would include educating horseback riders and other visitors about actions they should take to avoid the introduction of non-native plants and animals. Educating horse and dog owners in the actions they must take to protect water quality by cleaning up their animal waste, especially in proximity to streams. Provide bags and trash receptacles in convenient locations. Educating mountain bike riders about actions they must take to avoid erosion and habitat impacts from

unauthorized trail use and/or construction of unauthorized trails. The Laguna tract would be managed as closed to mountain bike use. The Public Access Manager would also collaborate with the Santa Cruz County Department of Public Works to ensure that road shoulder parking would not become an established pattern, through the use of strategies such as no-parking zones and towing.

Monitor and Maintain Public Access Features

The monitoring and maintenance of the parking area, trails, and other public access features (such as fire storage water tanks, signage, furnishings, and monitoring equipment) would be overseen by the Public Access Manager. Monitoring of the parking area and trails would inform the adaptive management strategies and decisions, and a trail maintenance program requiring that trails be inspected every spring and fall would ensure the protection of natural resources on the property.

III. ENVIRONMENTAL REVIEW CHECKLIST

A. AESTHETICS AND VISUAL RESOURCES

Except as provided in Public Resources Code section 21099, would the project:

1. Have a substantial adverse effect on a scenic vista? ☐ ☐ ☐ ☒

Discussion: The project is a multiple-use trail system with a parking area that would be set back from Empire Grade. The parking area would be primarily screened from the views of Empire Grade by vegetation. The proposed parking area features (e.g., gates, surface parking, drainage features, signage, benches, picnic tables, restroom building, temporary construction trailer, and fire storage water tanks) and trail features (e.g., water crossings and signage) would not be of a great enough size (height or width) or located in an area that would be visible from a scenic vista or block or obstruct any views of a scenic vista. Although the main tract parking area is located along a County-designated scenic road (discussed under A.2 below), there are no notable scenic vistas in the immediate vicinity of the proposed parking area. Existing trees and vegetation block any sweeping or distant scenic vistas from Empire Grade along the property frontage. All project features would be well below the tree canopy and constructed with natural materials that are visible yet would still blend in with the surrounding environment, such as stone, concrete, metal, and/or wood. Trail users would be able to access scenic vistas of the Santa Cruz Mountains, San Vicente Redwoods, Cotoni-Coast Dairies, and the Pacific Ocean coastline from certain points within the trail system, but the parking area and conceptual trail alignment would have no impact on any existing scenic vista.

2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? ☐ ☐ ☒ ☐

Discussion: The main tract access point is located along Empire Grade, which is identified as a scenic roadway in General Plan Policy 5.10.10 (Designated Scenic Roads). The existing views along this section of Empire Grade are primarily of dense forest and vegetation lining the roadway on the west side of the road and the limited views of the residential development and the open area associated with the Crest Ranch Christmas Tree Farm on the east. Approaching the parking area from the north or the south on Empire Grade, the natural topography and vegetation currently screen the parking area location from this rural scenic road. General Plan Policy 5.10.11 (Development Visible from Rural Scenic Roads) requires that visual qualities worthy of protection be identified and the development be designed to mitigate any impacts on those visual qualities through siting, architectural design, and landscaping. In this case, the visual qualities worthy of protection are the tree-lined character of Empire Grade which would not be adversely impacted by the construction of the parking/parking area or the trail system due to the preservation of existing vegetation.

The proposed parking area would be set back up to 150 feet at its closest point from Empire Grade (see Figure 3). Due to the setback distance, natural topography, and vegetation, the visible parking area features would be the proposed signage directing users to the parking area, a vegetated storm water basin at the south entrance point to collect runoff from Empire Grade, and gates.

Up to 40 non-native trees and 15 native trees 12 inches or greater DBH would be removed at the parking area and over 150 native trees greater than 12 inches DBH would be retained. All new plantings would be native and regionally appropriate. (See Figure 4)

The Laguna Tract would be accessible only through existing trails on the CDFW Bonny Doon Ecological Reserve. Martin Road (where the CDFW parking area is located) is designated as a scenic road in the County General Plan. However, the existing trails and improvements on the Laguna tract are located approximately 1/2 mile or further from Martin Road and the CDFW parking area and are not visible from the parking area or Martin Road. No impact to scenic resources along Martin Road is anticipated as a result.

The proposed multi-purpose trails at the main tract and the Laguna tract would not be directly visible from any designated scenic roadway, including Empire Grade or Martin Road.

The proposed San Vicente Redwoods Public Access Plan includes the following goals and policies that are required to ensure the protection of public views of the natural and scenic setting of the project site:

Goal Access 4. Minimize the impact on the security, privacy and rural character of the neighborhoods near the property, while achieving the other goals of the Plan.

Policy Access 4.1. Provide buffers between public access features and neighboring properties where feasible.

Policy Access 4.3. Design access features to complement the natural character of the San Vicente Redwoods property and the Santa Cruz Mountains, as well as adjacent rural neighborhoods.

Goal Recreation 3. Provide a trail network that supports multiple uses while minimizing conflicts.

Policy Recreation 3.2. Follow appropriate steps to ensure that trail routes avoid the following, to the extent possible: neighbor views, safety hazards, impacts to sensitive resources, and interference with timber harvest operations, other natural resource management, and ongoing general operations.

In addition to these goals and policies, the proposed San Vicente Redwoods Public Access Plan's adaptive management approach would ensure the scenic qualities are preserved and protected in perpetuity. A complete list of the adaptive management strategies is provided the proposed San Vicente Redwoods Public Access Plan. However, the following specific strategies relate to the scenic qualities of the project site:

- Design new trails with a narrow tread to retain full canopy cover
- Inspect trails routinely for widening and erosion; adjust maintenance effort; adjust alignments and grade
- Design the parking area to expand to accommodate demand, minimizing road shoulder and neighborhood parking

Track the availability of parking and expand the parking area only as needed. Due to the presence of extensive natural vegetation and the minimal nature of the proposed improvements, impacts to scenic resources would be less than significant.

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| <p>3. <i>In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?</i></p> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Discussion: As discussed in A.2 above, the project is located in a non-urbanized area and would result in some physical changes that would alter the existing visual character of the site, but due to the 150-foot setback from Empire Grade and the presence of existing topography and vegetation between the parking area and Empire Grade, the parking area would not be readily visible to users of Empire Grade. Any new plantings at the parking area would replace non-native trees and be comprised of native species and regionally appropriate species consistent with the natural backdrop in the surrounding area.

Overall, the project would not substantially degrade the existing visual character or quality of the site because it would include parking area and trail features that would be well below the tree canopy and would be constructed with natural materials that are visible yet blend in with the surrounding environment, such as stone, concrete, metal, and/or wood. The views of the site would not be altered due to the natural topography and vegetation. As described in A.2, 40 non-native and 15 native trees that are 12 inches DBH or greater would be removed for the parking area and 150 native trees that are 12 inches DBH or greater would be retained. No large trees (over 40 inches DBH) would be removed. No tree removal would occur in the 150-foot setback between the parking area and Empire Grade.

Furthermore, as described in A.2, the proposed San Vicente Redwoods Public Access Plan includes goals, policies, and adaptive management strategies that would ensure the protection of public views of the natural and scenic setting of the project site and surrounding area. Specifically, Policy Access 4.1 requires that buffers between public access features and neighboring properties be provided and Policy Access 4.3 requires that all design access features complement the natural character of the San Vicente Redwoods property and the Santa Cruz Mountains, as well as adjacent rural neighborhoods. Impacts would be less than significant.

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| <p>4. <i>Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?</i></p> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: Projects resulting in significant light or glare impacts include substantial new light sources, especially in an area (such as the project vicinity) that includes very few artificial light

sources, or if they include highly reflective surfaces that can reflect light towards drivers or existing residences. The current visual nighttime setting is very dark with no noticeable light sources visible from adjacent properties. The only proposed lighting would be inside the temporary construction trailer and would not be visible from any off-site properties. The parking spaces at the parking area would be beneath the existing tree-canopy and therefore, there would be limited opportunity from day time glare associated with parked automobiles. Any such glare would not be visible from any off-site properties. Therefore, the project would not be expected to create a new source of light or glare due to the location of the parking area and the limited lighting that is proposed.

B. AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

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| 1. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project site does not contain any lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. In addition, the project does not contain Farmland of Local Importance. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide or Farmland of Local Importance would be converted to a non-agricultural use. No impact would occur from project implementation.

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| 2. Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project site is primarily zoned Timber Production (TP) and includes limited areas zoned Special Use (SU), which are not agricultural zoning designations. Additionally, no portion of the subject property is under a Williamson Act Contract. Therefore, the project does not conflict with existing zoning for agricultural use, or a Williamson Act Contract. No impact is anticipated.

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| 3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

Discussion: Although the project site is zoned Timber Resource (TP), the project would not conflict with existing zoning for forest land. The project would not affect the resource or access to harvest the resource in the future. As described above in section II, Background Information, under the subheading “Detailed Project Description,” Timber Harvest Plan (THP# 1-14-117 SCR) was approved by CAL FIRE (2015) for the project site. The Conservation Vision (2011) established by the Conservation Partners includes integrating preservation, restoration, and sustainable timber harvesting practices with research, education, and recreation. Therefore, the timber resources on the project site may continue be harvested in accordance with California Department of Forestry timber harvest rules and regulations.

In addition, the proposed San Vicente Redwoods Public Access Plan includes the following goals and policies that are required to ensure the ongoing production of timber harvest on the project site:

Goal Access 1. Provide sustainable access consistent with the conservation values of the property.

Policy Access 1.5. Coordinate public access with other property uses, including timber harvest, restoration, and conservation.

Goal Recreation 3. Provide a trail network that supports multiple uses while minimizing conflicts.

Policy Recreation 3.1. Provide trail opportunities that offer a variety of experiences through different habitats, different trail lengths, and difficulty levels.

Goal Education 1. Provide the opportunity for partners to conduct research and education about the resources and activities at San Vicente Redwoods.

Policy Education 1.1. Allow partners to interpret the natural and cultural resources of San Vicente Redwoods, as well as active uses of the property (sustainable timber harvest and restoration activities).

4. *Result in the loss of forest land or conversion of forest land to non-forest use?* ☐ ☐ ☒ ☐

Discussion: Forest land does occur on the subject property and the property is actively used for timber harvests. The property will continue to be available for timber harvests and timber harvesting will not be adversely impacted as a result of the project. Proposed trails have been designed in a manner that would not reduce available timber or prevent future timber harvests in the areas where trails are to be constructed. Forest land will not be lost or converted to other uses as a result of the project. See discussion under B.3 above. In the San Vicente Redwoods Public Access Plan, the Public Access Manager is assigned the responsibility to “[c]lose trails and/or parking areas based on seasonal or extended closures, as necessary, to accommodate other property uses including timber harvest...”, and to “[u]tilize temporary re-routes and/or trail closures to minimize potential conflicts with timber

harvest activities.” The plan further states that “[p]ublic access must accommodate timber harvest and restoration forestry, and operations may necessitate re-routing or temporarily closing trails for visitor safety.” Impacts would be less than significant.

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| 5. <i>Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
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Discussion: As discussed in B.1, the project site and surrounding area does not contain any lands designated as Prime Farmland, Unique Farmland, Farmland of Statewide Importance or Farmland of Local Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide, or Farmland of Local Importance would be converted to a non-agricultural use.

While the project site contains land zoned for Timber Production, as well as land designated as forest according to the California Department of Forestry and Fire Protection, the project’s associated amenities would not prohibit the harvesting of timber. The proposed parking area and trails would be developed on limited portions of the project site and would not convert any of the forest land to any other use, as their primary purpose is for recreation within the forested areas. Pursuant to Santa Cruz County Code section 13.10.371 (Purposes of the Timber Production TP District) the purposes of the TP District include, but are not limited to, the protection and maintenance of the timberland of the County and the preservation of agriculture and other open space uses where compatible with timberland uses. Accordingly, no impact would occur from project implementation.

C. AIR QUALITY

The significance criteria established by the Monterey Bay Air Resources District (MBARD) has been relied upon to make the following determinations. Would the project:

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| 1. <i>Conflict with or obstruct implementation of the applicable air quality plan?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Discussion: The project would not conflict with or obstruct any long-range air quality plans of the MBARD.² Because general construction related emissions (i.e., temporary sources) are accounted for in the emission inventories included in the plans, impacts to air quality plan objectives are less than significant.

General estimated basin-wide construction-related emissions are included in the MBARD emission inventory (which, in part, form the basis for the air quality plans cited below) and are not expected to prevent long-term attainment or maintenance of the ozone and particulate matter standards within

² Please note that the MBARD recently changed its name from the Monterey Bay Unified Air Pollution Control District.

the North Central Coast Air Basin (NCCAB). Therefore, temporary construction impacts related to air quality plans for these pollutants from the project would be less than significant, and no mitigation would be required, since they are presently estimated and accounted for in the MBARD's emission inventory.

The MBARD has identified screening thresholds and thresholds of significance for criteria pollutant emissions and criteria air pollutant precursors, including reactive organic gases (ROG), oxides of nitrogen (NO_x), and coarse inhalable particulate matter (PM₁₀). Development projects below these significance thresholds are not expected to generate sufficient criteria pollutant emissions to violate any air quality standard or contribute substantially to an existing or projected air quality violation. The NCCAB does not meet state standards for ozone PM₁₀. Therefore, ozone precursors (ROG and NO_x) and PM₁₀ are regional pollutants of concern during construction. Additionally, during operation, the project would result in an increase in mobile sources of air pollutants (i.e., emissions associated with vehicular travel) although it would not consist of any new area or stationary sources of air pollutant emissions. Therefore, emissions associated with operation of the project were modeled by PlaceWorks using the California Emissions Estimator Model (CalEEMod) 2016.3.2 and compared to MBARD thresholds of significance for criteria pollutants of concern during operation. The results of this modeling are included as Attachment 4 of this Initial Study.

Ozone is the main pollutant of concern for the NCCAB. The primary sources of ROG within the air basin are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. The primary sources of NO_x are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes. In addition, the region is "NO_x sensitive," meaning that ozone formation due to local emissions is more limited by the availability of NO_x as opposed to the availability of ROGs. The other major pollutant of concern for the NCCAB is PM₁₀. In the NCCAB, the highest particulate levels and most frequent violations occur in the coastal corridor. In this area, fugitive dust from various geological and man-made sources combines to exceed the standard. The majority of all NCCAB exceedances occur at these coastal sites where sea salt is often the main factor causing exceedance.

Construction

Construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors and front-end loaders that temporarily emit precursors of ozone (i.e., volatile organic compounds (VOC) or oxides of nitrogen (NO_x), are accommodated in the emission inventories of state- and federally required air plans and would not have a significant impact on the attainment and maintenance of ozone ambient air quality standards (AAQS). Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Table 5 summarizes the screening thresholds for construction activities. Construction projects below the screening level thresholds shown below are assumed to be below the 82 pounds per day threshold of significance, while projects with activity levels higher than those above may have a significant impact on air quality. Additional mitigation and analysis of the project impact may be necessary for those construction activities.

Table 5: Construction Activity with Potentially Significant Impacts from Pollutant PM₁₀

Activity	Potential Threshold*
Construction site with minimal earthmoving	8.1 acres per day
Construction site with earthmoving (grading, excavation)	2.2 acres per day
*Based on Midwest Research Institute, <u>Improvement of Specific Emission Factors</u> (1995). Assumes 21.75 working weekdays per month and daily watering of site. Source: MBUAPCD, 2008.	

As required by the MBARD, construction activities (e.g., excavation, grading, on-site vehicles) that directly generate 82 pounds per day or more of PM₁₀ would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors. Construction projects below the screening level thresholds shown in Table 5 (above) are assumed to be below the 82 pounds per day threshold of significance, while projects with activity levels higher than those thresholds may have a significant impact on air quality. The project would require ground disturbance for the construction of the trails and parking area. Most trail construction would occur by hand with limited use of heavy machinery or vehicles. The proposed parking area would require grading on 0.88-acres of the 4.7-acre parking area. Thus, acreage disturbed by the project is below the MBARD's screening threshold of 2.2 acres per day for construction projects involving earthmoving. Because construction associated with the project would not exceed this screening threshold, quantification of construction emissions is not necessary and are assumed to be below this threshold.

Although the project would produce PM₁₀, because it would fall below the screening threshold of 2.2 acres per day, it would be far below the 82 pounds per day threshold. Thus, construction of the project would result in less-than-significant impacts on air quality.

Regardless, the proposed San Vicente Redwoods Public Access Plan includes the following Air Quality (AQ) construction protocol to ensure construction emission from PM₁₀ (fugitive dust) from construction of the parking area are reduced as much as possible:

Construction Protocol AQ 1.1. During construction of the parking area, construction emissions from fugitive dust shall be minimized to the fullest extent through implementation of the following Best Management Practices (BMPs) as applicable:

- Water all active construction areas as necessary and indicated by soil and air conditions.
- When materials are transported off site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, and cut & fill activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)
- Hydroseed or apply similarly effective soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1%.
- Replant vegetation in disturbed areas as quickly as possible.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 miles per hour.

Operation

The primary source of long-term criteria air pollutant emissions generated by the project would be emissions from project-generated vehicle trips. The project would generate approximately up to 420 average daily trips (weekend) upon buildout. The project would not generate substantial emissions from area sources (e.g., landscape fuel use, aerosols, and architectural coatings) or energy use (natural gas). Table 6 identifies the criteria air pollutant emissions associated with the project. As shown in Table 6, the net operational emissions generated by the project would not exceed the MBARD daily thresholds and no mitigation measures are required. Consequently, the project would not cumulatively contribute to the nonattainment designations of the NCCAB, and regional operational phase air quality impacts would be less than significant.

Table 6: Regional Operation-Phase Criteria Air Pollutant Emissions					
	Criteria Air Pollutants (lbs/day)				
	ROG	NO _x	CO	SO ₂	PM ₁₀
Area Sources	<1	<1	<1	<1	<1
Mobile Sources	1	1	7	<1	2
Total	1	1	7	<1	2
MBARD Threshold	137	137	550	150	82
Exceeds Threshold?	No	No	No	No	No
Source: CalEEMod Version 2016.3.2. Based on year 2025 emission rates. Emissions may not total to 100% due to rounding. Notes: lbs/day = pounds per day					

Carbon Monoxide

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the State one-hour standard of 20 parts per million (ppm) or the eight-

hour standard of 9.0 ppm. Because CO is produced in the greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds.

MBARD provides a list of scenarios that could result in a potentially significant impact from increased concentrations of CO on roadway intersections or segments. According to the MBARD CEQA Guidelines, the following would represent a potentially significant impact from CO:

- Intersections or road segments that operate at (Level of Service) LOS D or better that would operate at LOS E or F with the project's traffic;
- Intersections or road segments that operate at LOS E or F where the volume-to capacity (V/C) ratio would increase 0.05 or more with the project's traffic;
- Intersections or road segments that operate at LOS E or F where delay would increase by 10 seconds or more with the project's traffic;
- Un-signalized intersections which operate at LOS E or F where the reserve capacity would decrease by 50 or more with the project's traffic (this criterion is based on the turning movement with the worst reserve capacity); or
- The project would generate substantial heavy-duty truck traffic, substantial traffic along urban street canyons, or substantial traffic near a major stationary source of CO.

Given that in all scenarios the level of service in the area would be at LOS C or better, the scenarios described above would not occur. Additionally, the project would not generate substantial heavy-duty truck traffic and would not generate substantial traffic near a major stationary source of CO. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

2. *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?*
- | | | | |
|--------------------------|--------------------------|-------------------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: This section analyzes potential impacts related to air quality that could occur from a combination of the project with other past, present, and reasonably foreseeable projects within the NCCAB. The NCCAB does not meet state standards for ozone and particulate matter (PM₁₀). Any project that produces a significant project-level regional air quality impact in an area that is in nonattainment adds to the cumulative impact. Project construction would have a limited and temporary potential to contribute to existing violations of California air quality standards for ozone and PM₁₀ primarily through diesel engine exhaust and fugitive dust. The project would not have a significant long-term operational phase impact. Therefore, the project would not result in a cumulatively considerable net increase in criteria pollutants. The impact on ambient air quality would be less than significant.

3. *Expose sensitive receptors to substantial pollutant concentrations?*

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: Diesel exhaust contains substances (diesel particulate matter [DPM], toxic air contaminants [TACs], and mobile source air toxics [MSATs]) that are suspected carcinogens, along with pulmonary irritants and hazardous compounds, which may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease. Where construction activity occurs in proximity to long-term sensitive receptors, a potential could exist for unhealthful exposure of those receptors to diesel exhaust, including residential receptors.

The project is located in the Santa Cruz Mountains and the nearest sensitive receptors include approximately 50 single-family homes with the closest being approximately 950 feet across Empire Grade to the east of the proposed parking area. MBARD currently does not require health risk assessments to be conducted for short-term emissions from construction equipment. The Office of Environmental Health Hazard Assessment adopted new guidance for the preparation of health risk assessments in March 2015. Emissions from construction equipment primarily consist of DPM, and the Office of Environmental Health Hazard Assessment has developed a cancer risk factor and noncancer chronic reference exposure level for DPM. These factors are based on continuous exposure for over a 30-year time frame, and because the project is anticipated to be developed over three phases, each spanning 1 to 3 years, exposure of offsite receptors to DPM would be limited. Likewise, because construction is anticipated to occur intermittently over multiple one-to three-year phases, the sensitive receptors would be affected for a fraction of the 70-year maximum exposed individual criteria used for assessing public health risk due to emissions of certain air pollutants. For these reasons, it is anticipated that construction emissions would not pose a threat to offsite receptors near the project site.

Due to the intermittent and short-term temporary nature of construction activities, emissions of DPM, TACs, or MSATs would not be sufficient to pose a significant risk to sensitive receptors from construction equipment operations during the course of the project. The project would not be expected to expose sensitive receptors to substantial pollutant concentrations and impacts would be less than significant.

Carbon Monoxide

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the State one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9.0 ppm. Because CO is produced in the greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds.

MBARD provides a list of scenarios that could result in a potentially significant impact from increased concentrations of CO on roadway intersections or segments. According to the MBARD CEQA Guidelines, the following would represent a potentially significant impact from CO:

- Intersections or road segments that operate at (Level of Service) LOS D or better that would operate at LOS E or F with the project's traffic;
- Intersections or road segments that operate at LOS E or F where the volume-to capacity (V/C) ratio would increase 0.05 or more with the project's traffic;
- Intersections or road segments that operate at LOS E or F where delay would increase by 10 seconds or more with the project's traffic;
- Un-signalized intersections which operate at LOS E or F where the reserve capacity would decrease by 50 or more with the project's traffic (this criterion is based on the turning movement with the worst reserve capacity); or
- The project would generate substantial heavy-duty truck traffic, substantial traffic along urban street canyons, or substantial traffic near a major stationary source of CO.

Given that in all scenarios the level of service in the area would be at LOS C or better, the scenarios described above would not occur. Additionally, the project would not generate substantial heavy-duty truck traffic and would not generate substantial traffic near a major stationary source of CO. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

4. *Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?)* ☐ ☐ ☒ ☐

Discussion: California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight would be used in all diesel-powered equipment during construction, which minimizes emissions of sulfurous gases (sulfur dioxide, hydrogen sulfide, carbon disulfide, and carbonyl sulfide). Therefore, a minimal amount of objectionable odors associated with other emissions are anticipated from construction activities associated with the proposed Project, and no mitigation measures would be required. Once constructed, the project would not create other emissions resulting in objectionable odors affecting a substantial number of people; therefore, impacts are expected to be less than significant.

D. BIOLOGICAL RESOURCES

Would the project:

1. *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service?* ☐ ☒ ☐ ☐

Discussion: A Biological Resources Assessment was prepared for this project by WRA Inc. dated June 2018 (Attachment 5). In a letter dated July 16, 2018, County staff accepted the Biological

Resources Assessment and found the study's recommendations to be complete with some modifications, which are represented in this Initial Study.

Although the project site covers a large amount of land (approximately 8,500 acres), the proposed parking area and trails would be limited in their extent and location, thereby providing ample untouched lands for plant and wildlife conservation. The location of proposed parking area and preliminary trail alignments were selected based on input from professional biologists, amongst other experts, to minimize impacts on the land and sensitive resources. Likewise, the proposed San Vicente Redwoods Public Access Plan includes goals, policies, and implementation strategies, as well as design and maintenance guidelines, and construction protocol to protect natural resources. Biological Resources (BR) construction protocols required by the San Vicente Redwoods Public Access Plan were specifically prepared by WRA to reduce the potential for long-term adverse impacts related to special-status species, sensitive habitat, erosion, sedimentation, and other issues that can arise from improper trail design. Moreover, the low-impact recreational uses of the project as well as the educational and research activities that would be allowed on the site are by their very nature compatible with wildland conservation. The following discussion summarizes the potential impacts identified in the Biological Resources Assessment and the proposed San Vicente Redwoods Public Access Plan's required BR construction protocols. The draft protocols from the San Vicente Redwoods Public Access Plan have been reviewed and edited by County staff and the resulting protocols are discussed below and incorporated as Mitigation Measures BIO-1 through BIO-7 in this Initial Study.

Based on the results of the Biological Resources Assessment, it was determined that the project site contains sensitive resources that could potentially be adversely impacted by construction and operation of the proposed parking area and trail improvements. Elements of at least eight sensitive terrestrial biological communities and three sensitive aquatic biological communities were observed within the areas where the construction and operation of trails would occur. One special-status plant, Anderson's manzanita (*Arctostaphylos andersonii*), was determined to be present. Based on a lack of observations during seasonally-timed surveys, it was determined that other special-status plants are unlikely to occur within the areas where the proposed parking area would occur and the location of the preliminary trail alignments. The project site contains designated critical habitat for the California Red Legged Frog (*Rana aurora*). Two special-status wildlife species were also determined to be present, the San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) and oak titmouse (*Baeolophus inornatus*). Another 13 special-status wildlife species were determined to have moderate to high potential to occur on the property, including the following:

Bats. Townsend's big-eared bat (*Corynorhinus townsendii*) hoary bat (*Lasiurus cinereus*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), silver-haired bat (*Lasionycteris noctivagans*), fringed myotis (*Myotis thysanodes*)

Birds and other Avian Species. Vaux's swift (*Chaetura vauxi*), Nuttall's woodpecker (*Picoides nuttallii*), Allen's hummingbird (*Selasphorus sasin*), olive-sided flycatcher (*Contopus cooperi*), purple martin (*Progne subis*), and marbled murrelet (*Brachyramphus marmoratus*)

Mammals: mountain lion (*Felis concolor*)

Given the presence of the species noted above, the project could result in a potentially significant impact to special-status species if the project is not properly mitigated to prevent impacts to biotic resources.

Mitigation Measure BIO-1

In addition to implementing construction protocols BR-1.1 through BR-1.15 pursuant to Mitigation Measure BIO-4 below, the following construction protocols are required to ensure the protection of special-status plant species.

Construction Protocol BR-2.1. All occurrences of special-status plants within 50 feet of any work areas shall be flagged by a qualified, County-approved biologist prior to construction. Where work will occur within 10 feet of a special-status plant to be preserved, orange construction fencing (or similar) shall be installed at the edge of the work area and no work shall occur beyond the fence. If there are occurrences of special-status plants downslope from the work area, silt fencing shall be installed at the edge of the work area to prevent soil or other materials from being transported downslope where they may impact special-status plants.

Construction Protocol BR-2.2. Occurrences of special-status plants shall be avoided by re-routing the trail alignment to the extent feasible and practicable. Where this is not possible, impacts to special-status plants shall be minimized by reducing the trail width and associated vegetation removal to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal) should avoid the dripline of any special-status shrubs and should avoid special-status herbs by a minimum of 10 feet. If trails are re-routed, they should be re-routed downslope, where feasible, of any special-status plants to avoid causing erosion or sedimentation issues which could be detrimental to special-status plants. If not feasible then re-route the drainage away from the special-status plants. If other considerations such as slope or soil stability make it impossible to avoid special-status plants, a qualified, County-approved biologist shall apply a combination of propagation from local seed and habitat enhancement to repair, rehabilitate, or restore the impacted environment.

Mitigation Measure BIO-2

In addition to implementing Construction Protocol BR 1.1 through 1.15 pursuant to Mitigation Measure BIO-4 below, the following construction protocols are required to ensure the protection of special-status wildlife species.

Construction Protocol BR-3.1. Tree removal and trimming, regardless of size, shall take place outside of both the maternity and hibernation period for special-status bats (between September and October) and avoid the breeding bird window per Protocols BR 3.4 and BR 3.5. Tree removal can take place during this period without a breeding bird or bat roost survey.

Construction Protocol BR-3.2. If removal of large trees (e.g., the DBH is greater than 12 inches) occurs during the bat roosting season (November through August), these trees shall be inspected by a qualified, County-approved biologist for the presence of bat roosts. If a maternity roost is detected, up to a 200-foot buffer shall be placed around the maternity site until the bats are no longer utilizing the site. Non-maternity roost sites can be removed under the direction of a qualified, County-approved biologist. Any large tree that will be removed shall be left on the ground for 24 hours before being

taken offsite or being chipped. This period will allow any day-roosting bats the opportunity to leave before the tree is either removed from the area or is chipped.

Construction Protocol BR-3.3. Consultation with the CDFW shall be initiated to determine appropriate conservation measures if active roosting bat sites are disturbed.

Construction Protocol BR-3.4. Conduct pre-construction breeding bird surveys if construction, vegetation removal, or ground disturbance activities occur during the breeding season (February 1 to August 31). Pre-construction surveys shall be conducted by a qualified individual within 14 days of the start of these activities to avoid disturbance of active nests, eggs, and/or young. If these activities stop or lapse for a period of 14 days or more during the breeding season, a follow-up breeding bird survey shall be conducted to ensure no new breeding activity has occurred within the anticipated work area. Outside of the breeding season, no pre-construction breeding bird survey would be required for construction, vegetation removal, or ground disturbance activities.

Construction Protocol BR-3.5. If nesting birds are identified, an exclusion zone in which no construction activities would be allowed shall be established around any active nests of any avian species protected by the Migratory Bird Treaty Act and California Fish and Game Code until a qualified, County-approved biologist has determined that all young have fledged. Suggested exclusion zone distances differ depending on species, location, and placement of nest, and shall be at the discretion of the biologist based on the species in question, the proximity of the nest to the work area, and the type of work being conducted (e.g., use of hand tools versus gas-operated machinery).

Construction Protocol BR-3.6. During construction, all workers shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the construction area is deposited in covered or closed trash containers. The trash containers shall not be left open and unattended overnight.

Construction Protocol BR-3.7. A pre-construction survey of the parking area shall be conducted by a qualified, County-approved biologist to flag and delineate any woodrat middens within the planned disturbance footprint. During construction of the parking area, a biological monitor shall be onsite to ensure vegetation and ground disturbance with heavy equipment shall not impact those delineated resources. When avoidance of woodrat middens is not possible, the qualified, County-approved biologist shall dismantle the nest in accordance with Construction Protocol BR 3.9.

Construction Protocol BR-3.8. During construction and trail installation, a qualified, County-approved biologist or trained designee from the contractor's crew shall identify woodrat middens located along the trail alignment. If the latter, a qualified, County-approved biologist shall provide the training prior to the start of each construction phase. To the extent feasible and practicable, the trail alignment shall avoid woodrat middens by re-routing the trail alignment. Where this is not possible, implementation of Construction Protocol BR-3.9 would be required.

Construction Protocol BR-3.9. When construction of the trail alignment or the parking area would result in a direct impact to a woodrat midden, a qualified, County-approved biologist shall dismantle the nest and scatter the nest material a minimum of 10 feet outside of the trail alignment or the footprint of the parking area. If woodrat middens with young are encountered during the dismantling process, the material shall be placed back on the nest and the nest shall remain unmolested for three

weeks in order to give the young enough time to mature and leave on their own accord. After three weeks, the nest dismantling process may resume. In the event that a nest must be relocated, the following procedures shall be adhered to:

- a) Prior to nest disturbance, the biologist shall obtain from CDFW a scientific collection permit for the trapping of the dusky-footed wood rats.
- b) Nests shall be disturbed or dismantled only during the non-breeding season, between October 1 and December 31.
- c) At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the wood rat nest location and locate any other nests that may have been built in the project vicinity that may be affected by the proposed development.
- d) Prior to nest disturbance, woodrats shall be trapped at dusk of the night set for relocation of the nest(s).
- e) Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).
- f) In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection, and skin protection should all be used.
- g) Dismantling shall be done by hand, allowing any animals not trapped to scape either along existing wood rat trails or toward other available habitat.
- h) If a litter of young is found or suspected, nest materials shall be replaced, and the nest left along for 2-3 weeks before recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
- i) Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.
- j) Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.
- k) Once construction is complete, the biologist shall survey the nest area to note whether the new nests are in use, the wood rats have built new nests, or the nest area has been completely abandoned. This information shall be reported in a letter report to the Environmental Planning Section of the Planning Department, and the local CDFW biologist.

Construction Protocol BR-3.10. A qualified, County-approved biologist shall conduct a pre-construction survey immediately prior to the start of any ground-disturbing activities for stream crossings and areas within 100 feet of wetted features. If California red-legged frog (CLRF) are found

within the work area, all work shall cease within the immediate vicinity (approximately 25 feet around the work area) until the individual(s) have been allowed to leave the work area on their own. If CRLF cannot passively leave the work area, work shall cease and the USFWS shall be contacted by the qualified, County-approved biologist to determine the appropriate course of action. The qualified, County-approved biologist shall then implement the appropriate course of action as determined by the USFWS.

Construction Protocol BR-3.11. Because dusk and dawn are often the times when CRLF are most active and likely to disperse, all construction activities shall cease one half hour before sunset and shall not begin prior to one half hour after sunrise. Furthermore, no mechanized work shall occur during significant rain events, defined here as 0.25 inch or greater within a 24-hour period, when CRLF are more likely to disperse and occur within the work area.

Mitigation Measure BIO-3

Educational signage should be placed within the parking lot and at picnic areas informing the public to remove trash and food waste. Signage should provide information on the marbled murrelet and the impact that corvid and avian predators can have on nest sites. This education signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

Level of Impact after Implementation of Mitigation Measures

The above Mitigation Measures BIO-1, BIO-2, and BIO-3 in conjunction with Mitigation Measure BIO-4 below, would reduce potential impacts special-status plants and wildlife to a less-than-significant level.

In addition, the proposed San Vicente Redwoods Public Access Plan's adaptive management approach would further ensure the biological resources on the project site are preserved and protected in perpetuity. The following specific strategies relate to biodiversity on the project site:

- Locate the public access area and the closed area to provide large areas of core habitat
- Monitor and enforce closed areas for unauthorized access; adjust patrol and enforcement effort; impose use restrictions
- Locate the public access area to minimize activity in identified corridors, especially at night
- Monitor and enforce night time and area closures; adjust patrol and enforcement effort
- Zone public access and closed areas to retain large contiguous closed blocks of habitat
- Monitor closed areas for unauthorized access; adjust education and enforcement effort
- Provide a nature-based recreation opportunity with a skyline-to-the-sea type transect of Ben Lomond Mountain
- Provide large closed areas around mountain lion denning areas
- Patrol for unauthorized trail construction; prosecute and/or sue violators; decommission unauthorized trails; impose use restrictions
- Manage waste with education and wildlife-proof trash receptacles
- Track food waste; adjust visitor engagement and waste management effort

- Require that contractors clean vehicles of dirt and organic material
- Monitor and manage invasive plants in the public access area

- | | | | | |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 2. <i>Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|

Discussion: A range of sensitive terrestrial and aquatic biological communities occur within the project site, including: madrone forest, tanoak forest, coast live oak woodland, canyon live oak forest, redwood forest, California bay forest, Anderson's manzanita chaparral, brittle leaf manzanita chaparral, seasonal wetlands, shrub-scrub wetlands, and streams (including limited riparian vegetation). The conceptual trail network has the potential to impact these communities through both initial trail construction and subsequent use and maintenance. Impacts would be effectively mitigated by incorporating the following mitigation measures, as specified in the San Vicente Redwoods Public Access Plan.

Mitigation Measure BIO-4

Implement the following Biological Resources (BR) construction protocols from the San Vicente Redwoods Public Access Plan:

Construction Protocol BR-1.1. The construction work area including the parking area shall be minimized to the fullest extent feasible and trails shall be limited to the minimum width necessary to support the proposed use (i.e., hiking, cycling, and horse riding) as detailed in Table 3 (Trail Dimensions by Use Type).

Construction Protocol BR-1.2. Prior to the start of construction, all construction personnel shall be educated on the sensitivity of the biological communities and species at the site by a qualified, County-approved biologist. Environmental awareness training shall include measures to avoid or reduce impacts to the community, reporting and follow-up actions if sensitive biological communities are impacted, and the worker's responsibility under the applicable environmental regulation(s). A designated staff member from the contractor's crew shall provide follow-up training to any employees who begin work after the initial pre-construction training.

Construction Protocol BR-1.3. Trails should be routed around sensitive vegetation to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal and ground disturbance during construction) should avoid the dripline of sensitive vegetation, with greater separation between the trail and sensitive vegetation being preferred. If trails are re-routed, they should be re-routed downslope of any sensitive vegetation to avoid causing erosion or sedimentation issues which could be detrimental to sensitive vegetation.

Construction Protocol BR-1.4. Tree and shrub removal in sensitive biological communities shall be minimized to the fullest extent feasible. Where necessary, obtaining a tree removal permit may be required per Santa Cruz County Code Chapter 16.34, Significant Trees Protection. Tree removal should be conducted by a licensed arborist or registered professional forester using industry-standard BMPs to prevent the spread of invasive weeds or plant pathogens and avoid damage to vegetation to be retained.

Construction Protocol BR-1.5. Trail construction shall incorporate the best available technology and industry-standard BMPs to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance.

Construction Protocol BR-1.6. Any restoration or landscape plantings (e.g., plantings around the proposed parking/parking area) shall use native species appropriate for plant communities found at the site. To the extent feasible, plant material shall be salvaged from trail construction activities at the site. If not possible, plant material shall be propagated by a reputable nursery with protocols in place for minimizing the potential spread of plant diseases (sudden oak death or other *Phytophthora*-related diseases). Any propagated plant material shall be sourced from as close to the site as possible, ideally from within the site itself to avoid genetic variation.

Construction Protocol BR-1.7. Stream crossings should ideally be designed and constructed to freespan the channel and be anchored above the top of bank. Crossings of regulated streams that avoid work below the ordinary high-water mark do not require a permit from the United States Army Corps of Engineers (USACE). When required, notify the CDFW and the Central Coast Regional Water Quality Control Board (RWQCB) of the crossing, even if located above the top of bank. If the CDFW and/or RWQCB issue authorizations for such work, the measures included in any such authorizations shall be incorporated into the design.

Construction Protocol BR-1.8. Where wetlands or streams cannot be avoided, appropriate approvals from the USACE (for impacts to regulated wetlands or areas below the ordinary high water mark of regulated streams) and/or the RWQCB and the CDFW (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) shall be secured prior to initiating work in these areas. The measures included in any such authorizations shall be incorporated into the design.

Construction Protocol BR-1.9. Trails constructed near wetlands or streams shall be designed to minimize changes to pre-project hydrology. Avoid erosion or sedimentation by installing BMPs (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) around wetlands and streams. All materials shall be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs shall be determined by the contractor based on specific site conditions and the type of work being conducted. BMPs shall remain in place until all disturbed ground has been stabilized either through compaction or re-vegetation.

Construction Protocol BR-1.10. Equipment used for building new trails should generally have tread width of 48 inches or less and mass less than 10,000 pounds.

Construction Protocol BR-1.11. To avoid the introduction and prevent the spread of invasive weeds or plant pathogens, prior to arriving on the site, all construction equipment and vehicles shall be inspected to ensure they are clean.

Construction Protocol BR-1.12. Any equipment or vehicles that have been used in areas with known sudden oak death or other *Phytophthora*-related plant diseases shall be sterilized before being used and inspected by a qualified, County-approved biologist prior to entering the job site.

Construction Protocol BR-1.13. All disturbed ground shall be stabilized concurrent with or immediately following construction. Stabilization methods may include: compacting the soil (for trail surfaces only), covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat shall be used per Construction Protocol BR-1.6. If other erosion control materials are to be used, they shall be certified weed-free and as otherwise specified in Construction Protocol BR-1.9.

Construction Protocol BR-1.14. The importation of soils for construction of the parking area or other parts of the site shall be minimized to the fullest extent feasible. To the extent feasible, soils shall be salvaged from onsite before being imported from offsite. If it is necessary to import soils, they shall be certified weed-free and from a qualified, County-approved source with protocols in place for minimizing the potential spread of plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases).

Construction Protocol BR-1.15. Equipment and vehicle fueling and maintenance parking areas shall be at least 100 feet from any wetland or stream. A spill containment kit shall be provided at the work site and located within 50 feet of the fueling or maintenance area. All spills shall be cleaned immediately (i.e., within 5 minutes of the spill) and all resulting materials shall be disposed of properly. All construction vehicles shall be inspected daily for leaks of oil, hydraulic fluid, or other potentially hazardous materials by a qualified construction crew member and drip pans shall be placed under parked vehicles during prolonged periods of disuse (e.g., during evenings and weekends).

Mitigation Measure BIO-5

To minimize the introduction of invasive plants or plant pathogens that could threaten sensitive vegetation, parking and parking areas should include signage or other materials aimed at instructing the general public on the potential threats associated with invasive plants, plant pathogens, and other pests of concern. These materials should include basic prevention methods that the general public can implement such as inspecting shoes and pet fur for weed seeds or avoiding the movement of plant material or soil from one area to another. This education signage should be in place prior to opening the trails for public access and should be maintained annually by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

Mitigation Measure BIO-6

To minimize impacts to sensitive vegetation from use of the trail network, the trail maintenance system should be implemented as described in Chapter 6 of the San Vicente Redwoods Public Access Plan. The trail maintenance system includes an annual monitoring program aimed at identifying

maintenance issues (e.g., erosion) and other problems (e.g., nuisance trash areas or other impacts from trail users). The trail maintenance system should include specific methods for routinely documenting and implementing the necessary maintenance by the Public Access Manager.

Mitigation Measure BIO-7

All picnic locations shall be located outside of old-growth stands.

Level of Impact after Implementation of Mitigation Measures

The above listed Mitigation Measures would reduce potential impacts sensitive biological communities on the project site to a less-than-significant level. In addition, the adaptive management strategies of the proposed San Vicente Redwoods Public Access Plan would further ensure that impacts would be less than significant.

- | | | | | |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 3. <i>Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|

Discussion: The project has the potential to directly affect sensitive aquatic communities that may be protected by the Clean Water Act or other Federal, State, or local laws through removal of vegetation, placement of fill, or other grading activities that could impact wetlands, the bed and bank of streams, or riparian vegetation. The project also has potential to indirectly impact sensitive aquatic communities through increased rates of erosion and sedimentation, the introduction of invasive weeds, and other disturbances from trail construction, trail users, or trail maintenance. The trail network may also entail minor impacts to vegetation within the buffers of Sensitive Habitats and Environmentally Sensitive Habitats protected under the County of Santa Cruz General Plan and Local Coastal Program; however, passive recreational trails are an allowed use within riparian corridors and buffer areas.

The proposed San Vicente Redwoods Public Access Plan includes trail design guidelines for new trails and for trails to be developed from existing timber harvest roads, which represent approximately 30% or 12 miles of the proposed 38 miles of trails. New trails have specific guidelines for layout, orientation, switchbacks and climbing turns, and drainage. The proposed San Vicente Redwoods Public Access Plan also includes construction protocols and maintenance guidelines that would ensure that all trail construction and maintenance would prevent erosion to the degree feasible. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed. Detailed guidelines and construction protocols are provided the San Vicente Redwoods Public Access Plan.

The implementation of the proposed San Vicente Redwoods Public Access Plan requirements in conjunction with the recommendations of the Biological Resources Assessment and the Mitigation Measures as discussed in D.2 above, the project would not have a significant adverse impact to any wetlands, streams, or their buffers/riparian corridor. Impacts to sensitive aquatic communities that may be protected by the Clean Water Act or other Federal, State, or local laws from implementation

of the project would be less than significant with mitigation incorporated. In addition, the proposed San Vicente Redwoods Public Access Plan's adaptive management approach would further ensure the sensitive habitats on the project site are preserved and protected in perpetuity. A complete list of the adaptive management strategies is provided in the proposed San Vicente Redwoods Public Access Plan. However, the following specific strategies relate to surface water and watershed protection on the project site:

- Maintain trails so they don't widen or erode; adjust effort if problems arise
- Route trails away from municipal water intakes with large buffers
- Monitor closed areas for unauthorized access; educate and enforce closures
- Design and maintain trails to frequently shed water and minimize erosion and close the property following significant rain events until soils dry
- Monitor trails for sediment delivery to streams or wetlands; remediate problems promptly and monitor and enforce closures; adjust staffing as needed
- Span streams with bridges and route trails around wetlands unless that results in greater overall impacts
- Track and remediate horse and dog waste near streams and wetlands; impose use restrictions

4. *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: The project site is located within the western portion of an important wildlife corridor identified by the CDFW. Wildlife corridors and essential connectivity areas have been mapped by the CDFW to include the project site and continuing through to the north, east, and southeast. The proposed parking area and conceptual trail network have the potential to impact wildlife migration, including mountain lion, through the introduction of new human disturbance and increased noise. New scents would also occur as multi-use trails allow horses and dogs to access the area. The project would not, however, result in the development of any physical structures or barriers that would restrict or prevent wildlife migration (i.e., no new roads, large fences, urban development, etc.). The property will be closed at night, providing wildlife an opportunity to move through public access areas. Mountain lion and other native species often utilize human-use trail networks, and the development of a parking area and multi-use trails within the project site is not anticipated to adversely affect wildlife corridors or movement. In addition, the adaptive management strategies of the proposed San Vicente Redwoods Public Access Plan, as discussed in D.1 above, would further ensure impacts would be less than significant. Specifically, the location of the public access areas and the closed areas would provide large areas of core habitat and provide large closed areas around mountain lion denning areas that would minimize impacts to mountain lion breeding and connectivity to adjacent habitat areas.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. <i>Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: The trail network and parking area have the potential to directly impact trees protected under the Santa Cruz County Code Chapter 16.34 (Significant Trees Protection). Protected trees include larger trees in the Coastal Zone and trees within sensitive habitats as defined by Santa Cruz County Code Chapter 16.32 (Sensitive Habitat Protection). Per Chapter 16.34, a permit may be needed for tree removals within the Coastal Zone and Sensitive Habitat that meet certain definitions. Note that the project site includes an active Timber Harvest Plan and tree removals related to an approved Timber Harvest Plan are exempt from the requirements of Chapter 16.34.

The proposed parking area and conceptual trail alignment would avoid the removal of trees larger than 12 inches in DBH. The proposed San Vicente Redwoods Public Access Plan includes construction protocols BR-1.3 and BR-1.4 (as discussed in B.2 above). BR-1.3 requires trails to be routed around sensitive vegetation to the fullest extent feasible, and BR-1.4 requires that tree and shrub removal in sensitive biological communities be minimized to the fullest extent feasible. Where necessary, a tree removal permit may be required per County Code Chapter 16.34 (Significant Trees Protection).

See discussions and Mitigation Measures specified under D.1 and D.2 above. No wetlands would be impacted by the project, and riparian areas would be protected through the Riparian Exception permitting process. Impacts from project implementation would be less than significant with mitigation incorporated.

6. <i>Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The project would not conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

7. <i>Produce nighttime lighting that would substantially illuminate wildlife habitats?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: All construction would be completed during daylight hours. All use and activities are proposed to occur during daylight hours. No nighttime lighting is proposed, and no impacts from project implementation would occur.

E. CULTURAL RESOURCES

Would the project:

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: There are no existing structures on the parcels where the proposed parking area and trails would occur. The project site does not contain any designated historic resource as identified on any federal, state, or local inventory.

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|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|

Discussion: A *Cultural Resources Study* was prepared by Tom Origer & Associates in October 2017 for the project. In a letter dated July 16, 2018 (Attachment 6), County staff accepted the *Cultural Resources Study* and found the study's recommendations to be complete with some modifications, which are represented in this Initial Study. The cultural resources study includes confidential information regarding the locations of archaeological resources that is protected by law and is not available to the general public. This confidential information will be kept on file with the County of Santa Cruz Planning Department.

The location of proposed parking area and preliminary trail alignments were selected in part based on input from professional archaeologists at Tom Origer & Associates, amongst other experts, to minimize impacts on the land and sensitive resources. Likewise, the proposed San Vicente Redwoods Public Access Plan includes goals, policies, and implementation strategies, as well as design and maintenance guidelines, and construction protocol to protect resources. Specifically, Cultural Resources (CR) construction protocols required by the San Vicente Redwoods Public Access Plan were strategically prepared by Tom Origer & Associates to reduce the potential for adverse impacts related to both known and unknown cultural resources. The following discussion summarizes the impacts of the *Cultural Resources Study* and the proposed San Vicente Redwoods Public Access Plan's required CR construction protocols. The draft protocols from the San Vicente Redwoods Public Access Plan have been reviewed and edited by County staff and the resulting protocols are discussed below and incorporated as Mitigation Measures CUL-1 through CUL-4 in this Initial Study.

Records Search and History Map Review

Archival research included examination of the library and project files at Tom Origer & Associates. A review was also completed of the archaeological site base maps and records, survey reports, and other materials on file at the Northwest Information Center (NWIC File No. 12-0751), Sonoma State University, Rohnert Park. Sources of information included, but were not limited to, the current listings of properties on the National Register of Historic Places (NRHP), California Historical Landmarks, California Register of Historical Resources (CRHR), and California Points of Historical Interest as listed in the Office of Historic Preservation's *Historic Property Directory*. In addition,

previous survey base maps and survey reports were reviewed at the California Department of Forestry and Fire Protection (CAL FIRE) Archaeological Program in Santa Rosa, California. Maps ranged from hand-drawn maps of the 1800s (e.g., General Land Office) to topographic quadrangles issued by the United States Geological Survey. In addition, ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were reviewed.

The result of the above research yielded that 22 cultural resources surveys were conducted within portions of the main tract and Laguna Tract, and resulted in the findings of 25 cultural resources on the sites. These studies revealed the presence of prehistoric archaeological sites and isolated artifacts.

Tribal Consultation

The State of California's Native American Heritage Commission (NAHC), members of the Amah Mutsun Tribal Band, members of the Costanoan Ohlone Rumsen-Mutsen Tribe, members of the Indian Canyon Mutsun Band of Costanoan, members of the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area, members of the Trina Marine Ruano Family, Jakki Kehl, and Linda Yimane were contacted in writing. The NAHC responded via email on December 15, 2015 and provided a list of contacts and their information. Patrick Orozco (from the Pajaro Valley Ohlone Indian Council) responded in late December via telephone and suggested that Mark Hylkema (an archaeologist for California State Parks) be consulted about possible resources that have been found but not recorded. No other responses have been received as of the date of the *Cultural Resources Report*. In addition, Bryan Largay of the Land Trust of Santa Cruz County has discussed the project with the Amah Mutsun Tribal Band, which oversees long term research plots on the property.

Field Survey

Field surveys were completed between February 23, 2016 and July 18, 2017. Survey coverage of each proposed trail route was completed by walking transects within a swath 100 feet wide when feasible. Trail routes located within existing roads were completed by walking transects within a swath 50 feet wide. The parking area was inspected by walking transects spaced no greater than 15 meters apart.

Of the 25 previously recorded sites, five sites that were within or in close proximity to the vicinity where the parking area and trails would occur were revisited by Tom Origer & Associates to confirm the findings of the previous studies. No archaeological specimens were observed on four of these sites (P-44-000069, P-44-000070, P-44-000071, and P-44-000123). Various findings included cooking utensils, remnants of a stove, bricks, metal tools (i.e., axes, files), portions of pipelines, and glass fragments that are likely associated with the San Vicente Lumber Company and their operations at site P-44-000596 (Camp 3). The majority of the findings were observed in poor, rusted condition. A segment of the San Vicente Lumber Company Railroad grade was found that extends directly through Camp 3. This segment of the San Vicente Lumber Company Railroad grade is approximately 1 mile in length. Portions of the grade have eroded and some are marked by newly growing trees, bush, and vines. It's probable that the grade was used by motor vehicles after removal of the railroad tracts.

A new site, Camp ZZZ, was observed during the field studies. Historic-era specimens (i.e., glass fragments, ceramic fragments, metal cooking pots, pipe fragments, bed frame, and possible fence posts) were sparsely scattered throughout the Camp ZZZ site. The bed frame was in a poor, rusted condition and was found mangled among three trees. Some of the cooking utensils were observed in poor, rusted

condition. Other isolated artifacts (a probable vehicle fender, two fairly rusted historic era beer cans) were also observed as being previously found and piled together, as well as a historic era bottle fragment. These artifacts were documented, but none met the met criteria for inclusion on the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP). Therefore, implementation of the project would not affect a known archaeological resource.

Because multiple cultural resources have been identified within 0.5 miles of the project area and because the precise location of each trail has not yet been determined, there remains a possibility that unrecorded cultural resources are present, including the potential for those buried beneath the ground surface. Such resources could be exposed during project construction. Therefore, implementation of the project could result in a potentially significant impact to undocumented archaeological resources.

Mitigation Measure CUL-1

The following text shall be clearly identified on all grading plans and construction drawings: *Pursuant to sections 16.40.040 (Site Discovered During Excavation or Development) of the Santa Cruz County Code, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040.*

Mitigation Measure CUL-2

Implement the following CR construction protocols from the San Vicente Redwoods Public Access Plan:

Construction Protocol CR-1.1. Prior to the start of construction, all construction personnel shall be educated on the identification and treatment of prehistoric and/or historic artifacts that may be discovered by a qualified, County-approved archaeologist who meets the Secretary of Interior standards or a registered, County-approved forester who has successfully completed the CAL FIRE archaeology program.

Construction Protocol CR-1.2. If ground disturbing activity takes place and possible artifacts are discovered, then all construction activities within a 50-foot radius of the find shall be halted immediately and a qualified, County-approved archaeologist who meets the Secretary of Interior standards (including CAL FIRE archaeologists) shall be consulted to determine whether the resource requires further study. (Note, it is CAL FIRE policy that registered professional “foresters” do not perform significance evaluations of cultural resources). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps). Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance in terms of the CEQA criteria by a qualified archaeologist. If the resource is determined significant under CEQA, the qualified archaeologist shall prepare and

implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. The archaeologist shall also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources. The report shall be submitted to the County of Santa Cruz, Northwest Information Center, and State Historic Preservation Office, if required.

Construction Protocol CR-1.3. When trail building in the vicinity of sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596 as identified in the *Cultural Resources Study* dated October 2017 and on file with the County, a County-approved, qualified archaeologist who meets the Secretary of the Interior standards or a County-approved, registered forester who has successfully completed the CAL FIRE archaeology program shall be present during the initial ground-disturbing phase of construction. Selected portions of trail routes may be in close proximity to sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596, and monitoring at locations shown on Figure 3 and Figure 4 of the *Cultural Resources Study* is required. If archaeological specimens are discovered, a qualified archaeologist who meets the Secretary of the Interior standards should evaluate their significance.

Construction Protocol CR-1.4. For sites P-44-000596 and Camp ZZZ, a signage program at all entrances shall be developed by the applicant prior to final inspection at the entrances to the property. Signs shall include a brief description of the history of San Vicente Railroad, including various camps throughout the area, a discussion of the historic value of the sites, and the citation of the regulatory codes that protect artifacts. The signage shall also include the requirement to stay on trails.

Construction Protocol CR-1.5. If a trail is planned at site P-44-000596, the trail shall be constructed within the old railroad grade wherever possible because no trace of the railroad line, other than the grade is evident. If the trail is planned to be built outside the railroad grade where past land uses have disturbed the ground surface, construction of the trail is acceptable with the provision that any surface artifacts are avoided and ground disturbance is kept to a minimum. Portions of known railroad grade segments are depicted in Figures 5a and 5b of the *Cultural Resources Study*.

Construction Protocol CR-1.6. If a trail is planned at the Camp ZZZ site to follow the alignment of the existing gravel road, it is acceptable for the trail to follow within the road route because there is no trace of historic-period specimens evident within this alignment.

Level of Impact after Implementation of Mitigation Measures

The above mitigation measures require that trails be aligned to avoid known historic sites and for work to cease immediately if any artifact is found and that the proper authorities be notified. Implementation of these measures would reduce potential impacts to cultural resources to a less-than-significant level.

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|---|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 3. Disturb any human remains, including those interred outside of dedicated cemeteries? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|-------------------------------------|--------------------------|--------------------------|

Discussion: Similar to the discussion under E.2 above, although records search and field survey did not identify the presence of human remains within the project area, because other prehistoric resources have been identified within 0.5 miles of the project area, project construction has the potential to uncover previously undocumented human remains. Mitigation measures CUL-3 and CUL-4 address the finding of human remains.

Mitigation Measure CUL-3

The following text shall be clearly identified on all grading plans and construction drawings: *Pursuant to sections 16.40.040 (Site Discovered During Excavation or Development) of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible person shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archaeological report shall be prepared and representatives of the local Native California Indian groups shall be contacted.* If it is determined that the remains are Native American, the Native American Heritage Commission will be notified as required by law. The Commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. Pursuant to Public Resources Code section 5097, the descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. *Disturbance shall not resume until the significance of the archaeological resource is determined and appropriate mitigations to preserve the resource on the site are established.*

Mitigation Measure CUL-4

Implement the following Cultural Resources (CR) construction protocol from the San Vicente Public Access Plan:

Construction Protocol CR-1.7. The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5 and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be “most likely descended” from the deceased Native American. The most likely descendent would then make recommendations regarding the treatment of the remains with appropriate dignity.

Level of Impact after Implementation of Mitigation Measures

The above mitigation measures require work to cease immediately if any artifact or human remains are found and that the proper authorities be notified. Implementation of these measures would reduce potential impacts to cultural resources to a less-than-significant level.

F. ENERGY

Would the project:

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: The project, like all development, would be responsible for an incremental increase in the consumption of energy resources during site grading and construction due to onsite construction equipment, materials processing, and potential traffic delays. These impacts would occur at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, all project construction equipment would be required to comply with the California Air Resources Board (CARB) emissions requirements for construction equipment, which includes measures to reduce fuel-consumption, such as imposing limits on idling and requiring older engines and equipment to be retired, replaced, or repowered. As a result, impacts associated with the small temporary increase in consumption of fuel during construction are expected to be less than significant.

Once constructed, consumption of energy will be minimal, as the project involves a passive trail system. Energy use will be minimal, and no impacts are expected from project implementation. Therefore, the project will not result in wasteful, inefficient, or unnecessary consumption of energy resources, and impacts will be less than significant.

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The Association of Monterey Bay Area Governments (AMBAG) 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) recommends policies that achieve statewide goals established by CARB, the California Transportation Plan 2040, and other transportation-related policies and state senate bills. The SCS element of the MTP targets transportation-related GHG emissions in particular, which can also serve to address energy use by coordinating land use and transportation planning decisions to create a more energy efficient transportation system.

The Santa Cruz County Regional Transportation Commission (SCCRTC) prepares a County-specific regional transportation plan (RTP) in conformance with the latest AMBAG MTP/SCS. The 2040 RTP establishes targets to implement statewide policies at the local level, such as reducing vehicle miles traveled and improving speed consistency to reduce fuel consumption.

In 2013, Santa Cruz County adopted a Climate Action Strategy (CAS) is focused on reducing the emission of greenhouse gases, which is dependent on increasing energy efficiency and the use of renewable energy. The strategy intends to reduce energy consumption and greenhouse gas emissions by implementing a number of measures such as reducing vehicle miles traveled through County and regional long-range planning efforts, increasing energy efficiency in new and existing buildings and facilities, increasing local renewable energy generation, improving the Green Building Program by exceeding minimum state standards, reducing energy use for water supply through water conservation strategies, and providing infrastructure to support zero and low emission vehicles that reduce gasoline and diesel consumption, such as plug in electric and hybrid plug in vehicles that reduce.

In addition, the Santa Cruz County General Plan has historically placed a priority on “smart growth” by focusing growth in the urban areas through the creation and maintenance of an urban services line. Objective 2.1 directs most residential development to the urban areas, limits growth, supports compact development, and helps reduce sprawl. The Circulation Element of the General Plan further establishes a more efficient transportation system through goals that promote the wise use of energy resources, reduce vehicle miles traveled, and enhance transit and active transportation options.

The project will be consistent with the AMBAG 2040 MTP/SCS and the SCCRTC 2040 RTP. The project would also be required to comply with the Santa Cruz County General Plan and any implemented policies and programs established through the CAS. Therefore, the project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency.

G. GEOLOGY AND SOILS

Would the project:

1. *Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:*

A. <i>Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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B. <i>Strong seismic ground shaking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
C. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion (A through D): The project site is located outside of the limits of the State Alquist-Priolo Special Studies Zone (County of Santa Cruz GIS Mapping, California Division of Mines and Geology, 2001). However, due to the large nature of the project site (main tract: 8,160 acres and Laguna Tract: 373 acres) portions of the project site are within varying distances to nearby faults. For context, the distances to the nearby faults are described in relationship to the parking area. In general, the parking area is located approximately 9 miles southwest of the San Andreas fault zone, approximately 3 miles southwest of the Butano fault zone, approximately 1.5 miles south of the Zayante-Vergeles fault zone, and 7 miles northeast of the San Gregorio fault zone. While the San Andreas fault is larger and considered more active, each fault is capable of generating moderate to severe ground shaking from a major earthquake. Consequently, large earthquakes can be expected in the future. The October 17, 1989 Loma Prieta earthquake (magnitude 7.1) was the second largest earthquake in central California history.

A *Geotechnical Investigation* for the proposed parking area was prepared by Pacific Crest Engineering, Inc. in January 2018 (Attachment 7). Portions of the following discussion related to the proposed parking area are excerpted from or based upon the *Geotechnical Investigation*.

All of Santa Cruz County is subject to some hazard from earthquakes. However, the project site is not located within or adjacent to a County or state mapped fault zone, therefore the potential for ground surface rupture is low. Specifically, the *Geotechnical Investigation* concludes that the potential for ground rupture due to fault offset is low. The project site is likely to be subject to strong seismic shaking during the life of the improvements. The project includes the development of a parking area and trails for recreational use and would not include any habitable structures. The temporary construction trailer and prefabricated restroom building would be designed in accordance with the California Building Code, which would reduce the hazards of seismic shaking and liquefaction to a less-than-significant level. In addition, the *Geotechnical Investigation* (Attachment 7) includes additional recommendations to reduce the potential for structural damage to an acceptable risk.

Any trails developed on the project site would have a maximum sustained trail grade that would generally be less than 10% with a preference of 5% to 7% where feasible, and the trail grade would not exceed 15% for a distance of more than 50 feet unless otherwise approved by the trail design professional. Based on the Santa Cruz County GIS Hazards Maps, the parking area is not mapped within a liquefaction hazard zone. There is no indication that landsliding is a significant hazard at this site (Cooper-Clark, 1975) and all trails would be constructed to prevent conditions that could promote landslides as discussed further in section G.3 below.

2. *Result in substantial soil erosion or the loss of topsoil?*

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: Some potential for erosion exists during the construction phase of the project, however, this potential is minimal; as stated in discussion G.2, all trails would have a maximum sustained trail grade that is generally be less than 10%, preferably 5% to 7%, and the trail grade would not exceed 15% for a distance of more than 50 feet unless otherwise approved by the project design professional.

The proposed parking area location is situated on a northwest facing hillside with an average slope of 10%. Standard erosion controls are a required condition of the project. The soils at this location are well drained with moderate permeability. These soils are appropriate for storm water infiltration in vegetated basins. The runoff from the parking area location sheet flows from east to west in undeveloped forested areas to a swale downslope, which eventually feeds into Big Creek located approximately 1.5 miles downstream of the parking area location. There are two minor drainages that cross the parking area location with small drainage areas and poor definition. The proposed parking area would include seven vegetated basins to manage both concentrated storm water runoff from the proposed impervious areas and runoff from areas with existing drainage issues.

Onsite drainage improvements have been designed to infiltrate runoff from the proposed improvements. The drainage improvements have been designed to meet the requirements of the County of Santa Cruz Design Criteria (February 2017 edition). The post-development runoff rate would not exceed the pre-development site runoff rate, and therefore meets the requirements of the County of Santa Cruz and does not pose a risk of erosion of downstream drainage features. Prior to approval of a grading or building permit, the project must have an approved erosion control plan (per Santa Cruz County Code Section 16.22.060), which would specify detailed erosion and sedimentation control measures. The erosion control plan would include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion including erosion control blankets and straw wattles. Impacts from soil erosion or loss of topsoil would be considered less than significant. Furthermore, as listed in G.2, the proposed San Vicente Redwoods Public Access Plan includes detailed measures that would prevent accelerated erosion and ensure soil stability on the project site.

3. *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?*

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: Following a review of mapped information and a field visit to the site, there is no indication that the development site is subject to a significant potential for damage caused by any of these hazards. The *Geotechnical Investigation* (Attachment 7) confirmed that the parking area is located on a bedrock crest that is roughly parallel to Empire Grade.

In addition, the proposed San Vicente Redwoods Public Access Plan includes trail design guidelines for new trails and for trails to be developed from existing timber harvest roads, which represent approximately 30% or 12 miles of the conceptual 38-mile trail alignment. New trails have specific guidelines for layout, orientation, switchbacks and climbing turns, and drainage. The proposed San Vicente Redwoods Public Access Plan also includes construction protocols and maintenance guidelines that would ensure that all trails are stable and secure to the degree feasible through erosion prevention. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed. Detailed trail design guidelines and construction protocols are provided in Chapter 7, Design and Maintenance Guidelines, of the proposed San Vicente Redwoods Public Access Plan. The following are selections of guidelines and construction protocols that would ensure trail stability through erosion prevention:

Trail Design Guidelines

Roads to be Maintained for Vehicles and used as Trails.

- Where existing roads will be used as trails and also maintained for limited vehicular use for property operations and maintenance.
- Improvements to existing roads shall be designed to minimize erosion and extend the life of the trails while avoiding disturbance of the surrounding landscape. Any drainage features shall be built for longevity and require minimal maintenance.

Roads to be Decommissioned and Converted into Trails.

- An historic railroad grade, which also served as a road historically, will be converted to use as a trail. Most of this landform is stable and should not be regraded.
- Existing culverts that are in good condition and adequately sized will be retained. Existing culverts in poor condition may be improved or replaced with hardened crossings.

New Trails.

- New routes may be created when existing routes are not able to provide desired connectivity or have drainage issues or other problems that make trail sustainability infeasible.
- The trail should be laid out and construction overseen by a qualified design professional with experience in backcountry trail management.
- The trail shall be laid out to conform to the natural terrain to create a visually pleasing alignment and engineered for resilience to discourage the establishment of unauthorized trails. The trail should have a curvilinear alignment that avoids long straight reaches. The alignment should incorporate natural terrain features (e.g., trees, rocks) to form required grade reversals, while minimizing tree removal and impacts to roots.
- The trail should avoid active unstable and other hazardous areas, sensitive plant and animal habitats, archaeological resources, steep side-slopes, and unstable watercourse crossings.
- Trails shall avoid fall line orientations. A fall line trail is a trail that drops directly down the hillside following the same path that water flows, thereby focusing water down the length. These routes are difficult, if not impossible, to drain, and often experience higher rates of

ongoing erosion. Instead, trails on slopes should follow a contour alignment. Retaining walls may be required where additional support is needed to ensure trail sustainability on steep slopes.

- As a general rule, the trail should have a grade no steeper than half the grade of the native hillside. For example, a trail crossing a 10% gradient hillside shall have a grade no steeper than 5%. The maximum sustained trail grade should generally be less than 10%, preferably 5% to 7%, and the trail grade should not exceed 15% for a distance of more than 50 feet unless otherwise approved by the project design professional. Trails steeper than 15% tend to have greater erosion problems and require more maintenance than trails less than 15%.
- Switchbacks and climbing turns should be constructed to reverse the direction of travel on hillsides and to gain elevation in a limited distance.
- Trails should be designed, constructed, and upgraded to cause minimal disruption of natural drainage patterns. As a general rule, runoff should not be allowed to concentrate from one catchment to another.
- Trail shall be drained with grade reversals that are incorporated into the trail at the time of construction in order to avoid concentrated water flow by creating a drainage dip in the trail.
- Grade reversals shall be installed at minimum spacing of 150 feet. Grade reversal location should be identified and flagged in advance of trail construction by the project design professional.
- Trail routes should avoid watercourse crossings where channel gradient is steep, as well as at deeply entrenched streams with potential unstable streamside slopes. Routes preferably should be located such that drainage areas are crossed high in their watershed locations where streams are less defined in order to avoid stream disturbance.

Biological Resources (BR) Construction Protocols

Construction Protocol BR-1.5. Trail construction shall incorporate the best available technology and industry-standard BMPs to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance.

Construction Protocol BR-1.9. Trails constructed near wetlands or streams shall be designed to minimize changes to pre-project hydrology. Avoid erosion or sedimentation by installing BMPs (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) around wetlands and streams. All materials shall be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs shall be determined by the contractor based on specific site conditions and the type of work being conducted. BMPs shall remain in place until all disturbed ground has been stabilized either through compaction or re-vegetation.

Construction Protocol BR-1.10. Equipment used for building new trails should generally have tread width of 48 inches or less and mass less than 10,000 pounds.

Construction Protocol BR-1.13. All disturbed ground shall be stabilized concurrent with or immediately following construction. Stabilization methods may include: compacting the soil (for trail surfaces only), covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat shall be used per Construction Protocol BR-1.6. If other erosion control materials are to be used, they shall be certified weed-free and as otherwise specified in Construction Protocol BR-1.9.

Trail Maintenance Guidelines

The first step in trail maintenance and a key component of the required adaptive management approach to minimize impacts is to inspect all trails on a routine basis to identify and document current conditions, erosion and incision, evidence of sediment deposit in streams or wetlands, unauthorized trails, and any problem areas in need of improvement. Maintenance Guidelines would address typical problems such as infilled and nonfunctioning drainage features, wet and muddy trail segments, failed trail segments, plugged stream crossings, downed trees, informal social trails, rutted/rilled trail segments, and areas of trail widening.

- Work plans should be prepared to plan for and schedule any needed upgrades. It may be necessary to prioritize repairs based on available funding or severity of the problem. Upgrades should be completed prior to October 15th each year.
- Remove outside berms and out-slope tread to drain.
- Remove cut-bank slough from the trail tread.
- Remove accumulated debris from all trail drainage features.
- Enlarge grade reversals that appear undersized and at risk for failure.
- Install additional drainage grade reversals in areas where runoff is concentrated.
- Clean infilled ditches.
- Clean culverts of debris.
- Replace failing culverts with alternative improvements such as hardened crossings.
- Inspect and repair puncheons and bridges.

4. *Be located on expansive soil, as defined in section 1803.5.3 of the California Building Code (2016), creating substantial direct or indirect risks to life or property?*

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The effects of expansive soils can damage foundations of above-ground structures, paved roads and streets, and concrete slabs. However, since the project proposes trails and other trail features including associated amenities and not construction of habitable facilities, there would be no substantial risks to life or property, and there would be no impact.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. <i>Have soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems where sewers are not available for the disposal of waste water?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project includes a single restroom building with two vault toilets. Vault toilets are a common backcountry solution for sites with drivable road access, but without running water. Waste is held in an underground vault or tank and would not need a septic tank, connections to existing wastewater systems, or alternative systems. Waste is pumped out at regular intervals by a pump truck and removed from the project site for disposal at an approved facility. Therefore, there would be no impact.

6. <i>Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: As part of the *Cultural Resources Study* prepared for the project as discussed in E.2, a paleontological records search was requested from the University of California Museum of Paleontology at the University of California, Berkeley. The paleontological records search indicated that there are no significant localities within or adjacent to the project site. The nearest vertebrate locality is located more than three miles to the northeast of the study area.

H. GREENHOUSE GAS EMISSIONS

Would the project:

1. <i>Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas (GHG) emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact.

Construction

Construction-phase emissions would be nominal, as the project would not require intensive construction equipment. Furthermore, the project does not anticipate an intensive construction schedule. Most trail construction would occur by hand with limited use of heavy machinery or vehicles, and heavy machinery or vehicle use would be limited to areas with existing vehicular access (e.g., on former logging roads). Likewise, the construction of the parking area would entail the use of standard construction machinery and equipment. Overall, the project would result in a small temporary increase in GHG emissions during construction, and impacts would be less than significant.

Operation

The County Board of Supervisors approved the County of Santa Cruz CAS on February 26, 2013. No thresholds of significance for project generated GHG emissions were included in the CAS. Instead, the County is looking to the MBARD for guidance in this area. The MBARD has not yet adopted recommended thresholds of significance for land use projects within the NCCAB. However, on February 20, 2013, the MBUAPCD Board of Directors received an informational report on the status of developing GHG emissions thresholds for evaluating projects under CEQA. Although no action was taken, staff recommended further review of a GHG threshold of 2,000 metric tons of CO₂ equivalent (MTCO_{2e}) per year for land use projects or compliance with an adopted GHG reduction plan/climate action plan.

Operational emissions associated with the project include GHGs from mobile sources (emissions from vehicles), area sources (consumer products, painting), and waste generation. Because the project would increase vehicle trips to the project site by up to 420 average daily trips on the weekends and up to 90 average daily trips on the weekdays, operational GHG emissions were modeled using CalEEMod 2016.3.2. As shown in Table 7 below, the project would generate approximately 113 MTCO_{2e} per year. This is far below the suggested MBARD threshold of 2,000 metric tons per year. Impacts associated with the increase in operational greenhouse gas emissions are expected to be less than significant.

Table 7: Operation-Phase GHG Emissions	
Source	* Annual GHG (MTCO _{2e} /Year)
Area	<1
Mobile	113
Waste Generation	<1
Total	113
Notes: MTCO _{2e} = metric ton of carbon dioxide equivalent Source: CalEEMod, Version 2016.3.2.	

2. *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?* ☐ ☐ ☒ ☐

Discussion: Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan, AMBAG's MTP/SCS, and Santa Cruz County's CAS.

CARB Scoping Plan

In accordance with Assembly Bill (AB) 32, CARB developed the 2008 Scoping Plan to outline the state's strategy established by AB 32, which is to return the State's GHG emissions inventory to 1990 levels by year 2020. In September 2016, Senate Bill (SB) 32 was signed into law, requiring the State's GHG emissions to return to 40% below 1990 levels by 2030. Executive Order B-30-15 and SB 32 require CARB to prepare another update to the Scoping Plan to address the 2030 target for the State. On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan Update to address the

new interim GHG emissions target under SB 32. The CARB 2017 Scoping Plan is applicable to State agencies and is not directly applicable to cities/counties and individual projects. Nonetheless, the 2017 Scoping Plan has been the primary tool that is used to develop performance-based and efficiency-based CEQA criteria and GHG reduction targets for climate action planning efforts.

The project would be constructed to achieve the standards in effect at the time of development and would not conflict with Statewide programs adopted for the purpose of reducing GHG emissions. Therefore, impact would be less than significant.

Santa Cruz County's Metropolitan Transportation Plan

In addition to AB 32, the California legislature passed SB 375 to connect regional transportation planning to land use decisions made at a local level. SB 375 requires the metropolitan planning organizations to prepare an MTP/SCS in their regional transportation plans to achieve the per capita GHG reduction targets. AMBAG adopted the 2040 MTP/SCS on June 13, 2018. The project would provide recreational opportunities to the community. Therefore, the project would not interfere with AMBAG's ability to implement the regional strategies outlined in the MTP/SCS, and the impact is less than significant.

Santa Cruz County Climate Action Strategy Consistency

The CAS serves as a framework for the actions that the County of Santa Cruz and the unincorporated community can take to both lessen their contribution to climate change and prepare for the impacts when they do occur. In addition to guiding County government actions, the CAS is intended to inspire non-government community organizations in their efforts to address climate change, and to identify opportunities for partnerships with other government agencies and community groups. The project would align with the goals of the CAS. Namely, the project is not a major source of GHG emissions, and would generate nominal GHG emissions from energy use, transportation, waste generation, water use, and area sources.

In addition, the proposed San Vicente Redwoods Public Access Plan includes the following goals, policies and that are consistent with the main goals of the CAS:

Goal Recreation 1. Provide opportunities for non-motorized recreation.

- **Policy Recreation 1.1.** Open trails within San Vicente Redwoods for low impact recreation.
- **Policy Recreation 1.2.** Allow hiking on designated trails.
- **Policy Recreation 1.3.** Allow bicycle use on designated trails.
- **Policy Recreation 1.5.** Allow equestrian use on designated trails.

Goal Recreation 4. Promote regional trail connections.

- **Policy Recreation 4.1.** Designate a Skyline-to-Sea Trail corridor through San Vicente Redwoods, extending from Empire Grade to the Cotoni-Coast Dairies property.
- **Policy Recreation 4.2.** Coordinate with adjacent open space managers to facilitate regional trail connections.
- **Policy Recreation 4.3.** Provide additional trail connections to other public open space lands where feasible.

Goal Recreation 5. Provide amenities that support non-motorized recreation activities.

- **Policy Recreation 5.3.** Provide amenities at the parking area; amenities may include signage, benches, trash receptacles, restrooms, and bicycle parking.

Goal Education 2. Utilize research as a management tool.

- **Policy Education 2.1.** Encourage research projects that will inform management of public access, such as studies that monitor environmental impacts of visitors on the reserves.

In addition, of the proposed 38 miles of trails, approximately 30% or 12 miles would be on existing timber harvest roads; thus, reducing the amount of new construction. The proposed San Vicente Redwoods Public Access Plan includes trail design guidelines for layout, orientation, switchbacks and climbing turns, and drainage, that would ensure that the all trails are sustainable and stable to the degree feasible. The proposed San Vicente Redwoods Public Access Plan also includes construction protocols and maintenance guidelines to ensure sustainable trails. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed. Detailed guidelines (design and maintenance) and construction protocol are provided in the proposed San Vicente Redwoods Public Access Plan.

I. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

1. *Create a significant hazard to the public or the environment as a result of the routine transport, use, or disposal of hazardous materials?* ☐ ☐ ☒ ☐

Discussion: The project would not involve the route transport or disposal of hazardous materials. Small amounts of potentially hazardous materials associated with mechanical equipment would be used during construction of the parking area. However, these would not be a large enough quantity, due to the small scale of the project, to create a hazard to the public or the environment. Standard precautions and BMPs would be used to prevent spills and would minimize exposure of hazardous materials to people and to the environment. Project operation would involve the use of small amounts of hazardous materials for cleaning and maintenance purposes at the parking area. These potentially hazardous materials would not be of a type or be present in sufficient quantities to pose a significant hazard to public health and safety or the environment. Furthermore, such substances would be used, transported, stored, and disposed of in accordance with applicable federal, State, and local laws, policies, and regulations. Therefore, the project would not create a hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials and would not create a hazardous condition that would lead to the reasonably foreseeable upset that could release hazardous materials into the environment. The impact would be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. <i>Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: The project site does not contain any known hazardous materials spills or storage. As described above, the project would involve the routine usage of small amounts of hazardous materials during project construction and operation, but these materials would not be of a quantity or type to be susceptible to an accidental spill or release that would affect the environment or surrounding uses. In addition, the project would be required to comply with existing federal, State, and local regulations. The impact would be less than significant.

3. <i>Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: As discussed in I.2 and I.3, the project would not manage, transport, or release hazardous emissions. There are no existing or proposed schools within one-quarter mile of the project site. No impact would occur.

4. <i>Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The California State Department of Toxic-Substance Control (DTSC) EnviroStar database indicated that there are no cleanup sites on the project site. The closest facility is the Sunnyvale Niro, Santa Cruz Facility located on 16020 Empire Grade with a "No further action as of 12/10/2009" clean-up status. Therefore, development of the project would not create a significant hazard to the public or to the environment by virtue of its location in proximity to a known hazardous materials site and no impact would occur.

5. <i>For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The project is not located within an airport land use plan or within two miles of a public airport or public use airport. Additionally, the project would not result in any additional people

residing or working in close proximity to an airport. Therefore, the project would not expose people to safety hazards from airports. No impact would occur.

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 6. <i>Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: No new housing or facilities would be constructed such that the project would permanently impair implementation of or physically interfere with the County of Santa Cruz Local Hazard Mitigation Plan 2015-2020 (County of Santa Cruz, 2020). The project would include new gates and driveways that would facilitate emergency access to the site. CAL FIRE shall have access to the gates so that emergency personnel can respond to emergencies regardless of whether the gates are open or not. Therefore, no impacts to an adopted emergency response plan or evacuation plan would occur.

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|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 7. <i>Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: See discussion under Wildfire section T.2. Impacts would be less than significant.

J. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY

Would the project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. <i>Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: A *Drainage Analysis San Vicente Redwoods Staging Area* (Drainage Analysis) dated August 2018 was prepared for the project by Fall Creek Engineering, Inc. (Attachment 8).

Because the project would disturb one or more acres during construction, the project applicant would be required to comply with the National Pollutant Discharge Elimination System (NPDES) Permit and submit Permit Registration Documents to the State Water Resources Control Board (SWRCB) prior to the start of construction. The Permit Registration Documents include a Notice of Intent and a site-specific construction Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would describe the incorporation of BMPs to control sedimentation, erosion, and hazardous materials contamination of runoff during construction.

The proposed San Vicente Redwoods Public Access Plan includes construction protocols and maintenance guidelines that would ensure that the parking area and proposed trails are stable and secure to the degree feasible through erosion prevention. In addition, the adaptive management strategies related to watershed protection of the proposed San Vicente Redwoods Public Access Plan described in section D.3 above (Biological Resources), would further ensure impacts would be less than significant. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed. Detailed

guidelines and construction protocols are provided in the proposed San Vicente Redwoods Public Access Plan. With implementation of the guidelines and construction protocols in the San Vicente Redwoods Public Access Plan, as well as BMPs identified in the SWPPP, any water quality impacts during construction would be less than significant.

At buildout the proposed staging would accommodate up to 90 vehicular parking spaces. Contaminants from automobiles could potentially occur in the parking area. The proposed parking area is generally flat and has an average slope of 10%. Requirements by the SWRCB also require the project applicant to prepare a construction SWPPP that includes post construction treatment measures aimed at minimizing storm water runoff. The proposed parking area would include seven vegetated basins to manage both concentrated storm water runoff from the proposed impervious areas and runoff from areas with existing drainage issues. Onsite drainage improvements have been designed to infiltrate runoff from the proposed improvements, thereby protecting groundwater quality. The drainage improvements have been designed to meet the requirements of the County of Santa Cruz Design Criteria. The post-development runoff rate would not exceed the pre-development site runoff rate, and therefore meets the requirements of the County of Santa Cruz and does not pose a risk of erosion of downstream drainage features.

The conceptual trail alignment would include crossings of ephemeral drainages and intermittent to perennial streams that may be considered jurisdictional by the USACE, RWQCB, and CDFW. As stated in section G.2 above (Geology and Soils), the proposed San Vicente Redwoods Public Access Plan includes trail design guidelines for new trails and for trails to be developed from existing timber harvest roads, which represent approximately 30% or 12 miles of the proposed 38 miles. New trails have specific guidelines for layout, orientation, switchbacks and climbing turns, and drainage to prevent accelerated erosion.

Potential siltation from the project would be addressed through implementation of these erosion control requirements, which comply with industry standard BMPs. No water quality standards or waste discharge requirements would be violated during construction or operation of the project. Impacts would be less than significant.

2. *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: The project would only use small amounts of water during construction for dust control and concrete work for the development of the parking area. During project operation, two 5,000-gallon fire storage water tanks filled from a water truck as required for fire protection services. No additional water use would be required for the project. The total impervious area created for the ODA-required parking and trail section and building pads for the restroom building and fire storage water tanks at the parking area would be 30,259 square feet (0.7 acres) as shown in Table 1 above (Background Information - Construction and Phasing). Therefore, implementation of the proposed San Vicente Redwoods Public Access Plan and construction and operation of the parking area to serve

trails on the project site would not place any substantial demands on groundwater. Impacts would be less than significant.

3. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| A. <i>result in substantial erosion or siltation on- or off-site;</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| B. <i>substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| C. <i>create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or;</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| D. <i>impede or redirect flood flows?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Discussion:

Erosion

The proposed parking area would include seven vegetated basins to manage both concentrated storm water runoff from the proposed impervious areas and runoff from areas with existing drainage issues. Trails would include crossings of ephemeral drainages and intermittent to perennial streams that could be considered jurisdictional by the USACE, RWQCB, and CDFW. All proposed trails would be constructed to the standards outlined in the proposed San Vicente Redwoods Public Access Plan and would not substantially alter the existing drainage patterns in the area. The proposed San Vicente Redwoods Public Access Plan includes construction protocols Biological Resource (BR) BR-1.7 and BR-1.8.

Construction Protocol BR-1.7. Stream crossings should ideally be designed and constructed to fre-span the channel and be anchored above the top of bank. Crossings of regulated streams that avoid work below the ordinary high-water mark do not require a permit from the USACE. When required, notify the CDFW and the Central Coast RWQCB of the crossing, even if located above the top of bank. If

the CDFW and/or RWQCB issue authorizations for such work, the measures included in any such authorizations shall be incorporated into the design.

Construction Protocol BR-1.8. Where wetlands or streams cannot be avoided, appropriate approvals from the USACE (for impacts to regulated wetlands or areas below the ordinary high-water mark of regulated streams) and/or the RWQCB and the CDFW (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) shall be secured prior to initiating work in these areas. The measures included in any such authorizations shall be incorporated into the design.

Accordingly, the project would be consistent with Santa Cruz County Code section 7.79.070 (Storm Drain System and Channel Modification Prohibited), which states, “No person shall make any unpermitted alterations to drainage patterns or modifications to the storm drain system or any channel that is part of receiving waters of the county. No person shall deposit fill, debris, or other material in the storm drain system, a drainage channel, or on the banks of a drainage channel where it might enter the storm drain system or receiving waters and divert or impede flow.”

An erosion control plan would also be required per section 16.22.060 (Erosion Control Plan) of the County Code.

The proposed San Vicente Redwoods Public Access Plan includes construction protocols and maintenance guidelines that would ensure that all proposed trails are stable and secure to the degree feasible through erosion prevention. Trails that do not meet these standards or comply with the protocols may be closed for public use until maintenance that brings the trail into compliance can be completed. Detailed guidelines and construction protocols are provided in the proposed San Vicente Redwoods Public Access Plan. Implementation of the proposed San Vicente Redwoods Public Access Plan would ensure that water quality impacts to the ephemeral drainages and intermittent to perennial streams would be less than significant.

Surface Water Runoff

The project would not substantially alter any existing drainage patterns on the site including the alteration of the course of a stream or river. All storm water drainage as a result of the project would be managed on site. Onsite drainage improvements have been designed to infiltrate runoff from the proposed improvements. The drainage improvements have been designed to meet the requirements of the County of Santa Cruz Design Criteria. The Drainage Analysis (Attachment 8) evaluated the stormwater runoff for retention of a 2-year, 2-hour storm, and detention of a 10-year, 15-minute storm event. For sizing of the proposed vegetated basins at the parking area, the Drainage Analysis applied the Runoff Retention by the Storage Percolation Method, as provided by the County. Each vegetated basin proposed at the site was sized for retention of a 2-year, 2-hour storm, and detention of a 10-year, 15-minute storm event. Furthermore, the site as a whole was reviewed to ensure that site runoff does not exceed the pre-development condition for a minimum 10-year, 15-minute storm event. Finally, the seven proposed vegetated basins at the parking area have all been over-sized and would accommodate larger storms than required by the County Design Criteria. Any overflow from the vegetated basins will sheetflow to natural, landscaped areas. This overflow conveyance via sheetflow will accommodate the 25-year storm as required by the County Design Criteria. The post-

development runoff rate would not exceed the pre-development site runoff rate, and therefore meets the requirements of the County of Santa Cruz and does not pose a risk of on-site or off-site flooding. Impacts would be less than significant. In addition, the adaptive management strategies related to watershed protection of the proposed San Vicente Redwoods Public Access Plan would further ensure impacts would be less than significant.

Capacity of Drainage Systems

All storm water drainage as a result of the project would be managed on site and would not exceed the capacity of any storm water drainage system. No impact would occur.

Flood Flows

The only structures that would be introduced at the proposed parking area include the restroom building on a 15-foot by 15-foot pad, a temporary construction trailer, and two 5,000-gallon fire storage water tanks. According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated May 16, 2012, no portion of the parking area lies within a 100-year flood hazard area. Therefore, the project would not impede or redirect flood flows. No impact would occur.

4. *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: There are two primary types of tsunami vulnerability in Santa Cruz County. The first is a tsunami or distant source tsunami from elsewhere in the Pacific Ocean. This type of tsunami is capable of causing significant destruction in Santa Cruz County. However, this type of tsunami would usually allow time for the Tsunami Warning System for the Pacific Ocean to warn threatened coastal areas in time for evacuation (County of Santa Cruz 2015).

The more vulnerable risk to the County of Santa Cruz is a tsunami generated as the result of an earthquake along one of the many earthquake faults in the region. Even a moderate earthquake could cause a local source tsunami from submarine landsliding in Monterey Bay. A local source tsunami generated by an earthquake on any of the faults affecting Santa Cruz County would arrive just minutes after the initial shock. The lack of warning time from such a nearby event would result in higher casualties than if it were a distant tsunami (County of Santa Cruz 2015).

The only structures that would be introduced at the proposed parking area include the restroom building, a temporary construction trailer, and two 5,000-gallon fire storage water tanks. The proposed parking area is located in the Santa Cruz Mountains at approximately 2,600 feet in elevation with no large bodies of water in the vicinity. Given this, a tsunami or seiche would not affect this area of the project site. The project geotechnical engineer did not identify mudflows as a risk for development in this area. The proposed improvements at the parking area would be located on an average slope of 10% and are, therefore, unlikely to become saturated in heavy rainfall.

The conceptual location of the proposed trail alignments are located approximately 1 mile inland at its closest point and 7 miles at its furthest point beyond the effects of a tsunami. The soil conditions

vary over the approximately 38 miles of trails, but due to the nature of multi-purpose trails they are unlikely to become saturated in heavy rainfall. In addition, no impact from a seiche or mudflow is anticipated. No impact would occur.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 5. <i>Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: All County water agencies are experiencing a lack of sustainable water supply due to groundwater overdraft and diminished availability of streamflow. Because of this, coordinated water resource management has been of primary concern to the County and to the various water agencies. As required by state law, each of the County's water agencies serving more than 3,000 connections must update their Urban Water Management Plans (UWMPs) every five years, with the most recent updates completed in 2016.

County staff are working with the water agencies on various integrated regional water management programs to provide for sustainable water supply and protection of the environment. Effective water conservation programs have reduced overall water demand in the past 15 years, despite continuing growth. In August 2014, the Board of Supervisors and other agencies adopted the Santa Cruz Integrated Regional Water Management (IRWM) Plan Update 2014, which identifies various strategies and projects to address the current water resource challenges of the region. Other efforts underway or under consideration are stormwater management, groundwater recharge enhancement, increased wastewater reuse, and transfer of water among agencies to provide for more efficient and reliable use.

The County is also working closely with water agencies to implement the Sustainable Groundwater Management Act of 2014. By January 2020, Groundwater Sustainability Plans will be developed for two basins in Santa Cruz County that are designated as critically overdrafted—Santa Cruz Mid-County and Corralitos - Pajaro Valley. These plans will require management actions by all users of each basin to reduce pumping, develop supplemental supplies, and take management actions to achieve groundwater sustainability by 2040. A management plan for the Santa Margarita Basin will be completed by 2022, with sustainability to be achieved by 2042. However, since the project is a trail system and water runoff for the parking area will be treated on site, there will be no impact.

K. LAND USE AND PLANNING

Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. <i>Physically divide an established community?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project does not include any element that would physically divide an established community. No impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: The project does not conflict with any regulations or policies adopted for the purpose of avoiding or mitigating an environmental effect. While the project requires an exception to the County's riparian corridor standards for locations where the trail system crosses through riparian areas, General Plan/Local Coastal Program Policy 5.2.3 (Activities Within Riparian Corridors and Wetlands) states: "Development activities, land alterations and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception is granted per the Riparian Corridor and Wetlands Protection ordinance." Santa Cruz County Code Chapter 16.30 (Riparian Corridor and Wetlands Protection ordinance) allows the granting of riparian exceptions for projects located adjacent to, or within, a riparian corridor. The project is expected to be consistent with all other regulations in Santa Cruz County Code Title 16, Environmental and Resource Protection. In addition, the design and construction of the proposed stream crossings would utilize construction protocols and trail design guidelines as indicated in the San Vicente Redwoods Public Access Plan as well as BMPs to ensure that riparian resources would be protected and impacts to riparian areas would be minimized. Impacts would be considered less than significant.

L. MINERAL RESOURCES

Would the project:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: Four parcels (APNs 058-011-10, 058-022-04, 063-031-02 & 063-071-07) at the southeast corner of the main tract are designated as a mineral resource due to the former use of the area as the San Vicente quarry for the Davenport cement plant. The San Vicente quarry was the former quarrying site for the cement plant prior to use of the Bonny Doon quarry for limestone and shale in the production of cement. The San Vicente quarry was closed decades ago and is no longer in operation. No plans are in place for future use of the site for extraction of mineral resources.

The proposed trail system is located to the west of the parcels with the mineral resource designation and would not affect any existing or proposed quarrying operations. The location of the trail system would also not preclude future quarrying of the parcels designated as a mineral resource. For these reasons, the project will not result in the loss of a known mineral resource of value to the region and residents of the state. No impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. <i>Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: Please see discussion in L.1 above.

M. NOISE

Would the project result in:

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. <i>Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: Per Santa Cruz County General Plan Policy 6.9.1 (Land Use Compatibility Guidelines), development projects must conform to the land use compatibility guidelines specified in the General Plan. Projects that raise interior noise levels in the residential structures beyond 45 dB Ldn or exterior levels beyond 60 dB Ldn are not permitted.

Traffic Related Noise Impacts

The Transportation Study (Attachment 11) prepared for the project identified the existing, existing plus project, and net change in anticipated average daily vehicle trips along Empire Grade and Felton Empire Road. The traffic volumes of the project would result in a minimal increase in traffic noise levels along Empire Grade and Felton Empire Road. Project-related traffic noise impacts would be less than significant.

Parking Area

The proposed parking area would include up to 90 parking spaces at full buildout with public access limited to daylight hours only. Typical noise generated within a parking area could include occasional vehicle idling, car alarms, car beeps, car doors slamming, and conversation. As discussed in section Q.1 (Transportation and Traffic) below, the proposed parking area is anticipated to be most active on weekends (with up to 120 vehicles per day) and minimally active on weekdays (with up to 15 vehicles per day).

The parking area could generate noise levels up to 35 dBA L_{eq} , which would not exceed the County's noise standard. Therefore, overall, noise impacts from use of the proposed parking area would be less than significant, and no mitigation measures are necessary.

Multiple-Use Trail System

The multiple-use trail system would be for non-motorized recreational use during daytime hours. The location of the trails would be in the interior of the subject property and would be well separated from surrounding properties and sensitive receptors. Due to the non-motorized nature of the proposed use and the distance to surrounding properties, impacts would be less than significant.

Short Term Construction Impacts

Under the project, approximately 38 miles of trails would be constructed, as well as a parking area with associated amenities. Development of the project would occur over multiple phases as described in Table 4 (Construction and Operation Phasing). The parking area would be built out by the second phase, and construction of the trails would span all phases.

Noise generated during construction is based on the type of equipment used, the location of the equipment relative to sensitive receptors, and the timing and duration of the noise-generating activities. Each construction activity/phase involves the use of different kinds of construction equipment and, therefore, has its own distinct noise characteristics. However, noise levels from construction activities are dominated by the loudest piece of construction equipment.

The construction of the parking area would occur over 500 feet from the closest residence, and trail construction would occur in remote areas of main tract and Laguna Tract, where there are no sensitive receptors identified. Most trail construction would occur by hand with limited use of heavy machinery or vehicles. The use of heavy machinery or vehicles would be limited to areas with existing vehicular access (e.g., on former logging roads), with the exception of the parking area, which would require the use of standard construction machinery and equipment.

The highest potential noise exposure would be from grading operations for the parking area. While the magnitude of the average noise levels may at times be slightly higher compared to the ambient noise environment, construction activities would fluctuate throughout the workday because equipment would not be in use at one location for an extended period of time.

Although construction activities would occur only during daytime hours, noise may be audible to nearby residents. However, noise exposure would be temporary. Noise from construction activity may also vary substantially on a day-to-day basis. Santa Cruz County Code Chapter 8.30 further limits any offensive noise (defined as over 75 dB at the boundary of the property generating the noise) to the hours between 8 AM to 10 PM. Noise is not expected to exceed this level, and impacts would be less than significant.

2. *Generation of excessive groundborne vibration or groundborne noise levels?* ☐ ☐ ☒ ☐

Discussion: During construction, the use of grading equipment would potentially generate vibration in the project area. This impact would be temporary and intermittent during construction, with the closest residence being located at substantial distance from construction activities at over 500 feet from the property line at the proposed parking area. Project operations associated with the parking area and trails would not generate substantial levels of vibration since there are no significant vibration-generating sources as part of the project, which would be limited to passive recreation activities including hiking, walking, and horseback riding. Impacts would be less than significant.

3. *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public* ☐ ☐ ☒ ☐

airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Discussion: The project is not located within an airport land use plan or within 2 miles of a public airport or public use airport. Additionally, the project would not result in any additional people residing or working in close proximity to any airport. Therefore, the project would not expose people to excessive noise levels from airports. No impact would occur.

The project is not within two miles of a private airstrip. The closest private airstrip is located approximately 3.5 miles southeast of the subject property at 8647 Empire Grade. Additionally, the project would not result in any additional people residing or working in close proximity to a private airstrip. Therefore, the project would not expose residents or workers to excessive noise levels. Impacts would be less than significant.

N. POPULATION AND HOUSING

Would the project:

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|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. <i>Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project would not induce substantial unplanned population growth in an area because the project does not propose any new homes or business. The project includes the development and implementation of the San Vicente Redwoods Public Access Plan and would not induce population growth. No impact would occur as a result of project implementation.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 2. <i>Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project site does not contain any existing housing; thus, no people or housing would be displaced. Therefore, implementation of the project would result in no impact related to displacement of existing population or housing units.

O. PUBLIC SERVICES

Would the project:

1. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:*

a. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Other public facilities; including the maintenance of roads?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion (a through e): The primary purpose of a public impact analysis is to examine the impacts associated with physical improvements to public service facilities required to maintain acceptable service ratios, response times or other performance objectives. Generally, public service facilities need improvements (i.e., construction, renovation, or expansion) as demand for services increase. Increased demand is typically driven by increases in population. A project could have a significant environmental impact if it would exceed the ability of public service providers to adequately serve residents, thereby requiring construction of new facilities or modification of existing facilities. As discussed in section N, Population and Housing, above, the project would not result in a net increase of residents at the project site or elsewhere in the region because it does not propose housing and is not a major regional employer. Accordingly, the project would not warrant new construction of or expansion of an existing fire or police services, schools, or parks. While the project could represent an incremental contribution to the increase in services and road maintenance, the increase would be minimal and impacts associated with public services would be less than significant.

In addition, the proposed San Vicente Redwoods Public Access Plan includes the following goals and policies that are required to help reduce the demand to emergency service providers:

Goal Access 2. Manage Risk and Safety.

Policy Access 2.1. Provide patrol, monitoring, security, and signage for public safety and protection of resources.

Policy Access 2.2. Provide trail etiquette coaching to users and safety monitoring.

Policy Access 2.3. Work with partners to ensure adequate provision of emergency services.

Policy Access 2.4. Collect and maintain incident and accident reports and respond accordingly to reduce hazards.

Goal Access 4. Minimize the impact on the security, privacy, and rural character of the neighborhoods near the property, while achieving the other goals of the Plan.

Policy Access 4.2. Utilize signage and surveillance to minimize impacts to neighboring properties caused by trespassing or other activities.

In addition, the proposed San Vicente Redwoods Public Access Plan's adaptive management approach would further ensure the safety of users on the project site. A complete list of the adaptive management strategies is provided in the proposed San Vicente Redwoods Public Access Plan. However, the following specific strategies relate to wildland fires on the project site:

- Monitor and enforce rule violations; adjust engagement and enforcement effort
- Monitor closed areas for unauthorized access; adjust education and enforcement effort
- Route trails around large blocks of the Restoration Reserves and Working Forest
- Track the satisfaction of working forest and restoration project managers; increase collaboration effort with partners as needed
- Close the property on 'red flag' days of exceptionally high fire risk and maintain a network of fire-fighting water tanks
- Track unauthorized visitors on 'red flag day' fire hazard days; adjust patrol effort, engagement and enforcement and monitor and maintain tanks to ensure they are full and in good condition

Impacts would be considered less than significant.

P. RECREATION

Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. <i>Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: The project is a recreational project that includes the development of multi-use trails and a parking area with associated amenities that support recreational uses. The project would increase the quality of recreational options in the area, and thus would not result in the physical deterioration of or require the expansion of an existing park or recreational facility nor would it require the addition of new parks in Santa Cruz County or the surrounding area. No impacts would occur from project implementation.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 2. <i>Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: As described in P.1, the project is a recreational project that includes the development of multi-use trails and a parking area with associated amenities that support recreational uses. There

would be no new employment opportunities or residential land uses that would increase demand for recreational facilities. The construction of recreational facilities and improvements has been evaluated through this Initial Study. Impacts to recreational facilities would be less than significant.

Q. TRANSPORTATION

Would the project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: A traffic analysis was prepared for the project by Mott MacDonald, dated September 20, 2017 (Attachment 11). Due to the remoteness of the parking area and the limited street network in the vicinity of the parking area, the traffic analysis evaluated conditions at two study roadway segments (Empire Grade north of Pine Flat Road and Felton Empire Road east of Empire Grade). The traffic analysis describes the level of service (LOS), which is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. General Plan Policy 3.12.1 (Level of Service [LOS] Policy) uses this ranking system. Generally, LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the level of service designation. The traffic analysis is based on the *2010 Highway Capacity Manual* methodologies, which is the calculation method identified in General Plan Policy 3.12.2 (Level of Service [LOS] Policy). However, to be conservative, the level of service threshold volumes have been reduced 50% (Empire Grade) and 75% (Felton Empire Road) to better reflect the mountainous terrain traversed by both roadways.

The traffic volumes on Empire Grade used in this analysis were collected in June 2016 (described below), presumably a high-volume month for project traffic due to the consistently good weather during that time of the year. However, the parking area is located opposite the Crest Ranch Christmas Tree Farm, which has its driveway approximately 800 feet north of the exit driveway for the parking area. Visitor activity at Crest Ranch Christmas Tree Farm causes traffic volumes on Empire Grade to increase between roughly Thanksgiving Day and Christmas Day. However, activity levels at the parking areas would be lower during this period, due to colder weather and possible rain. Therefore, the application of the June traffic counts is appropriate.

The traffic analysis included an evaluation of the following scenarios, which are summarized below:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative without Project Conditions
- Cumulative with Project Conditions

Existing Conditions:

New roadway segment counts were collected for seven consecutive days on Empire Grade near the parking area driveways in June 2016 (Monday, June 20 through Sunday, June 26, 2016) and on Felton

Empire Road just east of Empire Grade in July and August 2017 (Thursday, July 27 through Wednesday, August 2, 2017) – these counts can be found in Appendix B of the traffic analysis included as Attachment 11 of this Initial Study. These volumes were averaged together to derive an average daily traffic (ADT) for Empire Grade and Felton Empire Road in the project area as follows:

- ADT volumes on Empire Grade are 550 vehicles per day, which corresponds with LOS A. On Saturdays, ADT volumes are 630 vehicles per day, also LOS A.
- ADT volumes on Felton Empire Road are 2,350 vehicles per day, or LOS C. On Saturdays, ADT volumes are 2,340 vehicles per day, also LOS C.

Existing Plus Project Conditions:

Trip Generation. The trip generation and hourly traffic levels for the trailhead estimates are based on *Projected Visitor Counts and Parking Needs*, prepared by PlaceWorks dated January 12, 2016 (Attachment 10). In addition, Mott MacDonald also compared visitation estimates with existing visitation at the Twin Gates trailhead (Appendix B of Attachment 11). The project is estimated to attract approximately eight vehicles/day (initial) and 30 vehicles/day (future) on an average weekday during the year. Higher activity levels are anticipated on weekends during the spring, summer and fall months with as many as 36 vehicles/day (initial) and 140 vehicles/day (future). These vehicle rates assume that a planned future connection of the future trail system on the site to the Cotoni-Coast Dairies properties near Davenport would reduce the overall percentage of visitors that use the Empire Grade staging to access the overall trailhead site in the future.

Trip Distribution. The traffic analysis estimated that 10% of the project traffic would travel to/from the north of the site and 90% would travel to/from the south. The Existing Plus Project condition volumes are as follows:

- The ADT on Empire Grade is 566 (initial) and 610 (future) vehicles per day, which corresponds with LOS A. On Saturdays, ADT volumes are to 694 (initial) and 910 (future) vehicles per day, also LOS A.
- The ADT on Felton Empire Road is 2,358 (initial) and 2,380 (future) vehicles per day, which corresponds with LOS C. On Saturdays, ADT volumes are to 2,372 (initial) and 2,480 (future) vehicles per day, also LOS C.

The level of service at both study roadways remains the same as Existing Conditions and Existing Plus Project Conditions. As the Santa Cruz County level of service standard is LOS C, operations on Empire Grade and Felton Empire Road would continue to be acceptable.

Cumulative without Project and Cumulative Plus Project Conditions:

Derivation of Cumulative Traffic Volumes. Due to a lack of future traffic volume projections for Empire Grade near the parking area and insufficient historical traffic volumes to derive a historical growth rate, an assumed growth rate of 0.5% per year for 20 years – an overall growth rate of 10% – was applied to the existing volumes on Empire Grade and Felton Empire Road to approximate Cumulative without Project condition volumes. This level of growth is reflective of the rural nature of the surrounding area and the anticipated very low level of potential future development in the

study area. It is also slightly higher than the projected yearly population growth projection (0.42% per year between 2010 and 2035) for unincorporated Santa Cruz County forecasted by AMBAG in its *2014 Regional Growth Forecast*, which was adopted on June 11, 2014. AMBAG adopted an updated *Regional Growth Forecast* in 2018 with a slower rate of projected population growth than the 2014 population growth forecast. Due to a lower rate of population growth in the updated 2018 AMBAG *Regional Growth Forecast*, the cumulative traffic volumes in the traffic analysis (which were based on the higher 2014 AMBAG growth rates) are adequate for traffic analysis purposes through 2040, as noted in a traffic update memo prepared on January 18, 2019 (Attachment 11).

Trip Distribution. The traffic analysis estimated that 10% of the project traffic would travel to/from the north of the site and 90% would travel to/from the south.

The Cumulative without Project condition volumes are as follows:

- The ADT on Empire Grade is 605 vehicles per day, which corresponds with LOS A. On Saturdays, ADT volumes are to 693 vehicles per day, also LOS A.
- The ADT on Felton Empire Road is 2,585 vehicles per day, which corresponds with LOS C. On Saturdays, ADT volumes are to 2,574 vehicles per day, also LOS C.

The Cumulative Plus Project condition volumes are as follows:

- The ADT on Empire Grade is 621 (initial) and 665 (future) vehicles per day, which corresponds with LOS A. On Saturdays, ADT volumes are to 757 (initial) and 973 (future) vehicles per day, also LOS A.
- The ADT on Felton Empire Road is 2,593 (initial) and 2,615 (future) vehicles per day, which corresponds with LOS C. On Saturdays, ADT volumes are to 2,610 (initial) and 2,714 (future) vehicles per day, also LOS C.

The LOS at both study roadways remains the same as Existing Conditions and Cumulative without Project Conditions and Cumulative Plus Project Conditions. As the Santa Cruz County LOS standard objective is LOS C, operations on Empire Grade and Felton Empire Road would continue to be acceptable.

Construction Trips

Temporary construction trips would be significantly less than those of the project, which would not exceed the County level of standards as described above under existing and future conditions.

Alternative Modes of Transportation

Due to the rural setting of the project and the relative remoteness of the area from major population centers, few pedestrians are anticipated to walk to and from the parking area along the county roadway network. Pedestrians that visit the trailhead are likely to be residents that live in the area. Additionally, few bicyclists are anticipated to travel on the county road network to the parking area. The Santa Cruz Metropolitan Transit District does not provide services to the project site. Therefore, the project would not impede or conflict with any plan, ordinance or policy establishing measures of

effectiveness for the performance of the pedestrian and bicycle circulation systems in Santa Cruz County, and impacts would be less than significant.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 2. <i>Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1) (Vehicle Miles Traveled [VMT])?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: In response to the passage of Senate Bill 743 in 2013 and other climate change strategies, the Governor's Office of Planning and Research amended the CEQA Guidelines to replace LOS with VMT as the measurement for traffic impacts. New Section 15064.3 – Determining the Significance of Transportation Impacts was added to the Guidelines. Subsection (c) Applicability allows jurisdictions until July 1, 2020 to implement the VMT provisions. Santa Cruz County is currently evaluating methodologies for implementing a VMT methodology prior to that date. See discussion under question Q-1 for an evaluation of traffic impacts.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 3. <i>Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion:

Driveways

The project would include a one-way vehicle entry point and a one-way vehicle exit point off Empire Grade where there is already an access point to the project site. The parking area entry and exit are a minimum of 14 feet wide – more than adequate for one-way driveways. The two driveways are located on a continuously straight segment of Empire Grade. There is a short vertical curve as one travels north on Empire Grade between the driveways, such that the elevation of the exit driveway is below that of the entry driveway. The entry and exit driveway approaches are flared out at their intersections with Empire Grade, which will allow for left and right turning vehicles out of the exit driveway to turn onto Empire Grade independently of each other. They also allow vehicles pulling trailers (such as horse trailers) to turn onto Empire Grade without the trailers driving off of the pavement.

Sight Distance

Santa Cruz County standards require a minimum of 250 feet of sight distance on either side of a driveway.

Exit Driveway. Field measurements in June 2016 found that the amount of sight distance available at the exit driveway exceeds the county sight distance requirement in both directions of Empire Grade. Trees and utility poles would not obstruct sight lines at the exit driveway. No improvements are required.

The County standard (250 feet of sight distance) is based on a speed limit of 35 mph. However, as the speed limit on Empire Grade is 40 mph, the sight distance was also compared to the California Department of Transportation (Caltrans) sight distance requirements. For 40 mph, Caltrans requires

a sight distance for private driveways of 300 feet. Field measurements in June 2016 found available sight distance to/from the north of over 500 feet, and available sight distance to/from the south of 440 feet. As both these measurements exceed 300 feet, there is adequate sight distance at the exit driveway.

Entry Driveway. At the entry driveway, no traffic would be exiting the driveway. Instead, vehicles would be turning off Empire Grade itself, either slowing as they are turning off of the roadway or stopping while awaiting an adequate gap in traffic to make their turn. Therefore, the critical sight distance is the view of slowing, stopped or turning downstream vehicles on Empire Grade at the entry driveway.

Field measurements in June 2016 found that the amount of sight distance at the entry driveway exceeds the county sight distance requirements in both directions of Empire Grade. Available sight distance is 385 feet to/from the north and over 400 feet to/from the south; therefore, available sight distance also exceeds Caltrans requirements. No improvements are required.

Internal Circulation

The internal driveways widen to 24 feet in the parking areas where two-way travel is allowed, which meets standards for parking lot aisles. As the entry roadway, exit roadway, and some of the parking aisles only allow one-way traffic, appropriate signs that direct the one-way flow of traffic and clearly state do-not-enter signs would be placed throughout the parking area. Similar signs would also be located at the entry and exit driveways, in locations that would not obstruct the available sight distance from Empire Grade. Signs directing visitors with horse trailers to the designated horse trailer parking area would be posted to help prevent visitors with horse trailers from mistakenly parking in either the general parking aisles or along the edge of the access roadway. Clear pathways from the parking area to the trails would be posted to channel trail users to a centralized access point, concentrating foot/bicycle/equestrian traffic in certain areas.

Furthermore, as stated in Q.1 above, the project would not create unacceptable levels of congestion that would impede the existing traffic on the roadway. For the reasons discussed above, the project would not include any on-site or off-site hazardous design feature such as sharp curves, nor would it increase incompatible uses on local roads (such as slow-moving farm equipment) to result in hazards. Accordingly, no impact would occur.

4. Result in inadequate emergency access? ☐ ☐ ☒ ☐

Discussion: The project exceeds the Santa Cruz County standard of 250 feet of sight distance standards on either side of a driveway and would not introduce any hazards that would impede emergency vehicles. The parking area would be designed and constructed to meet all emergency vehicle turning standards and clear signage would mark these locations. The parking area and parking spaces would be surfaced with compacted aggregate base that would support emergency vehicles and facilitate ingress and egress. Existing access roads throughout the property are currently being maintained as part of the timber harvesting operations and overall management of the property, ensuring that emergency vehicles will be able to continue to access the property in case of an emergency. Therefore, impacts would be less than significant.

R. TRIBAL CULTURAL RESOURCES

1. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

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|---|--------------------------|-------------------------------------|--------------------------|--------------------------|
| A. <i>Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources Code section 5020.1(k), or</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| B. <i>A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</i> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Discussion: AB 52 requires the CEQA lead agency to begin consultation with a California Native American Tribe that is traditionally and culturally affiliated with the geographic area of the project if the Tribe requests in writing, to be informed by the lead agency through formal notification of the projects in the area. Such consultation would be required before the determination of whether a negative declaration, mitigated negative declaration, or EIR is required. In addition, AB 52 includes time limits for certain responses regarding consultation. AB 52 also adds “tribal cultural resources” (TCR) to the specific cultural resources protected under CEQA. CEQA section 21084.3 has been added, which states that “public agencies shall, when feasible, avoid damaging effects to any tribal cultural resources.” Information shared by tribes as a result of AB 52 consultation shall be documented in a confidential file, as necessary, and made part of a lead agencies administrative record. No California Native American tribes traditionally and culturally affiliated with the area of Santa Cruz County have requested consultation pursuant to Public Resources Code section 21080.3.1.

A TCR is defined under AB 52 as a site, feature, place, cultural landscape that is geographically defined in terms of size and scope, sacred place, and object with cultural value to a California Native American tribe that are either included or eligible for inclusion in the CRHR or included a local register of historical resources, or if the County of Santa Cruz, acting as the lead agency, supported by substantial evidence, chooses at its discretion to treat the resource as a TCR.

As discussed in section E, Cultural Resources, in discussion E.2, as part of the *Cultural Resources Study*, the NAHC, members of the Amah Mutsun Tribal Band, members of the Costanoan Ohlone Rumsen-

Mutsen Tribe, members of the Indian Canyon Mutsun Band of Costanoan, members of the Muwekma Ohlone Indian Tribe of the SF Bay Area, members of the Trina Marine Ruano Family, Jakki Kehl, and Linda Yimane were contacted in writing. These letters serve as notification that work is being performed in the project area they may be interested in; however, they were not designed to comply with CEQA's requirements stemming from the passage of AB 52. The NAHC responded via email on December 15, 2015 and provided a list of contacts and their information. Patrick Orozco (from the Pajaro Valley Ohlone Indian Council) responded in late December via telephone and suggested that Mark Hylkema (an archaeologist for California State Parks) be consulted about possible resources that have been found but not recorded. No other responses have been received as of the date of the *Cultural Resources Report*.

As discussed under discussion E.2 and E.3, no known archaeological resources meeting the AB 52 definition of a TCR were observed on the project site. Implementation of Mitigation Measures CUL-1 and CUL-2 would reduce impacts to unknown archaeological resources and Mitigation Measures CUL-3 and CUL-4 would reduce impacts to unknown Native American remains (both of which could qualify as TCRs) to a less-than-significant level.

S. UTILITIES AND SERVICE SYSTEMS

Would the project:

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|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. <i>Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion:

Water

The implementation of the proposed San Vicente Redwoods Public Access Plan and development of the proposed parking area with associated amenities including a restroom building with vault toilets that would be adequate to accommodate the project. No potable water is proposed, and there would be no water features other than two 5,000-gallon fire storage water tanks filled from a water truck. Impacts would be less than significant.

Wastewater

The project would not generate wastewater. All sewage produced on site would be pumped from the vault toilets by a licensed sewage disposal company and disposed of at an approved facility. Impacts would be less than significant.

Stormwater

All storm water drainage as a result of the project would be managed on site. The proposed parking area would include seven vegetated basins to manage and treat both concentrated storm water runoff from the proposed impervious areas and other surface runoff from the immediate area. The

implementation of the proposed trail system would not introduce any new impervious surfaces and drainage would flow to the vegetated areas adjacent to the trails on the project site. Therefore, implementation of the proposed San Vicente Redwoods Public Access Plan and construction and operation of the parking area to serve trails on the project site would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities that could cause significant environmental effects. Impacts would be less than significant.

Electric Power

Pacific Gas and Electric Company (PG&E) provides power to existing and new developments in the Santa Cruz County area. During construction, electricity would be wired to a construction trailer within the proposed parking area. Impacts are expected to be minimal.

Natural Gas

PG&E serves the urbanized portions of Santa Cruz County with natural gas. Permanent use of natural gas is not proposed for the project. No impacts are anticipated.

Telecommunications

The site would not be served by any permanent telecommunications facilities, and there would be no impact.

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|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| 2. <i>Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: The project would only use a limited amount of water for dust control and concrete work during construction of the parking area. During project operation, two 5,000-gallon fire storage water tanks would remain filled from a water truck as required for fire protection services. No additional water use would be required or utilized for the project. Therefore, implementation of the proposed San Vicente Redwoods Public Access Plan and construction and operation of the parking area to serve trails on the project site would not place any substantial demands on the water supply that serves the region. Impacts would be less than significant.

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| 3. <i>Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: See discussion in S.1, above. All sewage produced on site would be pumped from the vault toilets by a licensed sewage disposal company and disposed of at an approved facility. Impacts would be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. <i>Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: As a rural recreational use project would generate small amounts of waste. The project proposes up to four trash and recycling receptacles with an approximate 110-gallon capacity to hold two standard 55 gallon recycle-type bags to be located at the parking area. Trash and recycling would be routinely removed by the property manager. Any excavation needed for trail construction would be used on site and would not be disposed of in a landfill. Therefore, implementation of the proposed San Vicente Redwoods Public Access Plan and construction and operation of the parking area to serve trails on the project site would not generate an amount of solid waste that would cause landfills or transfer stations to exceed permitting capacity. Impacts would be less than significant.

5. <i>Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The project would comply with all federal, state, and local statutes and regulations related to solid waste disposal. No impact would occur.

T. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

1. <i>Substantially impair an adopted emergency response plan or emergency evacuation plan?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Discussion: The project is located within a high fire hazard area as mapped by the California Department of Forestry and Fire Prevention. However, the project would not conflict with implementation of the County of Santa Cruz Local Hazard Mitigation Plan 2015-2020 (County of Santa Cruz, 2020). Therefore, no impacts to an adopted emergency response plan or evacuation Plan would occur from project implementation.

2. <i>Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Discussion: The project is the development of a trail system and would not provide housing or facilities that would be occupied, and therefore there would be no exposure of occupants to pollutants. The trail system would be used by the public; however, daytime users of the parking area or trails would not be exposed to higher risks of fire than currently exist at the site. These recreational users would be present for a limited period of time during the day and would therefore be less susceptible

to loss or injury from fire. Regardless, several protections are incorporated into the project as described in the Detailed Project Description. The proposed parking area includes all required all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency. Two 5,000-gallon water storage tanks filled from a water truck and a 4-inch wharf hydrant would be installed for fire protection. The fire hydrant would be located a minimum 50 feet and a maximum 150 feet from the restroom building. The water tanks would be mounted on an 8-inch prepared and compacted subgrade. The parking area would be designed and constructed to meet all emergency vehicle turning standards and clear signage would mark these locations. Cameras and a standard emergency call box would be installed and routinely monitored. Cameras would be installed at various locations and the emergency call box would be mounted on the restroom building. The single-speaker emergency call box would have a water tight enclosure and be vandal resistant.

The project site has historically been used for timber harvest and has an active Timber Harvest Plan (THP# 1-14-117 SCR) approved by CAL FIRE (2015). The proposed San Vicente Redwoods Public Access Plan includes integrating preservation, restoration, and sustainable timber harvesting with research, education, and recreation. Two areas of the project site were delineated as Preservation Reserves, totaling about 900 acres. These areas would be managed to preserve and maintain existing old forest and other rare plant communities. Three areas on the project site were delineated as Restoration Reserves, totaling about 4,000 acres. These areas would be managed to allow limited timber harvesting primarily for the restoration and enhancement of native ecosystem values. Two areas were delineated as Working Forest, totaling about 3,700 acres that are areas to be managed to emphasize Sustainable Forest Management. Public access would be permitted on approximately 460 acres of the site. Most of the property (approximately 94%) would be closed to public access.

The existing uses at the site involve some potential ignition sources (timber harvest equipment), which would continue under the project. The project would also introduce increased public access, which can increase ignition potential. Primary ignition sources related to public access include vehicles, open fire, and smoking. The project does not include camp sites or barbeque pits. Smoking would be prohibited. In addition, the proposed parking areas would be overlain with a pervious rock base that minimized ignition potential from vehicles. The only structures that would be introduced at the proposed parking area include the restroom building on a 15-foot by 15-foot pad, a temporary construction trailer, and two 5,000-gallon fire storage water tanks.

Although these structures would be proposed in close proximity to wildland where the risk of fire is high, they are not habitable structures and adequate fire protection services would be available. Because adequate fire protection services would be available to the project site, and no permanent residents would be added as part of this project, people and structure would not be exposed to a significant risk from wildland fire. Therefore, impacts would be less than significant.

In addition, the proposed San Vicente Redwoods Public Access Plan includes the following goals and policies that are required to manage risk and safety for users of the site:

Goal Access 2. Manage Risk and Safety.

Policy Access 2.1. Provide patrol, monitoring, security, and signage for public safety and protection of resources.

Policy Access 2.2. Provide trail etiquette coaching to users and safety monitoring.

Policy Access 2.3. Work with partners to ensure adequate provision of emergency services.

Policy Access 2.4. Collect and maintain incident and accident reports and respond accordingly to reduce hazards.

Goal Access 4. Minimize the impact on the security, privacy, and rural character of the neighborhoods near the property, while achieving the other goals of the Plan.

Policy Access 4.2. Utilize signage and surveillance to minimize impacts to neighboring properties caused by trespassing or other activities.

In addition, the proposed San Vicente Redwoods Public Access Plan's adaptive management approach would further ensure the safety of users on the project site. A complete list of the adaptive management strategies is provided in the proposed San Vicente Redwoods Public Access Plan. However, the following specific strategies relate to wildland fires on the project site:

- Close the property on 'red flag' days of exceptionally high fire risk and maintain a network of fire-fighting water tanks
- Track unauthorized visitors on 'red flag day' fire hazard days; adjust patrol effort, engagement and enforcement and monitor and maintain tanks to ensure they are full and in good condition.

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| 3. <i>Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: New infrastructure that exacerbates fire risk is not proposed. New trails would be maintained, and the area would be operated as described in the San Vicente Redwoods Public Access Plan, and as described in T.2 above. Approximately 14 miles of shaded fuel breaks have been created on the property and would continue to be maintained. The trail network design is coordinated with these to facilitate maintenance. CAL FIRE is the emergency management partner, and would be involved in planning fire prevention, and emergency medical and fire response. A utility road for existing high-tension electric transmission lines (operated and maintained by PG&E) passes through the northern portion of the main tract (roughly parallel with Empire Grade). This utility line would continue to be maintained. Impacts would be less than significant.

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| 4. <i>Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Discussion: The project proposes re-use of existing roads for trails, the development of new trails, a 4.7-acre parking area, and the conservation/restoration of approximately 5,000 acres. The project includes Trail Design Guidelines, which are intended to facilitate the integrated design and construction of trails to avoid environmental impacts. New trails would conform to the natural terrain, minimize erosion and fall-line orientation, avoid the removal of trees larger than 12 inches in diameter at breast height (DBH) and damage to roots, and avoid active unstable and other hazardous areas, sensitive plant and animal habitats, archaeological resources, steep sideslopes, and unstable watercourse crossings. New trails would have a grade no steeper than half the grade of the native hillside and less than 15% except for sections shorter than 50 feet. New trails would avoid watercourse crossings where channel gradient is steep, as well as at deeply entrenched streams with potential unstable streamside slopes. Routes would generally be located such that drainage areas are crossed high in their watershed locations where streams are less defined in order to avoid stream disturbance.

The proposed San Vicente Redwoods Public Access Plan also includes construction protocols and maintenance guidelines that would ensure that all trail construction and maintenance would prevent erosion to the degree feasible. See further discussion under questions J.1 and J.3 for descriptions of erosion and run-off control. The limited development proposed, as well as the sensitivity to the existing landscape, will reduce instability, run-off, and landslides, and impacts will be less than significant.

U. MANDATORY FINDINGS OF SIGNIFICANCE

- Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal community or eliminate important examples of the major periods of California history or prehistory? ☐ ☒ ☐ ☐

Discussion: The potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory were considered in the response to each question in Section III (A through T) of this Initial Study.

Resources that have been evaluated as significant would be potentially impacted by the project, particularly biological resources, cultural resources, and tribal cultural resources. However, mitigation has been included that clearly reduces these effects to a level below significance. Mitigation measures BIO-1 through BIO-7 (discussed in section D above) and CUL-1 through CUL-4 (discussed in section

E above) were developed based on the presence of existing resources, site conditions observed in the field, and approved technical studies to adequately address any potential impacts from the project. In summary, these mitigations include: plant and wildlife surveys by qualified biologists to ensure that no protected species would be negatively affected; measures to protect nesting birds; and mitigation to cease construction and contact the appropriate agencies if archaeological resources or human remains are found. As a result of this evaluation, there is no substantial evidence that, after mitigation, significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

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| 2. Does the project have impacts that are individually limited, but cumulatively considerable? ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: In addition to project specific impacts, this evaluation considered the projects potential for incremental effects that are cumulatively considerable. As a result of this evaluation, there is no substantial evidence that there are cumulative effects associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

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|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 3. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Discussion: In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in section III, Environmental Review Checklist, sections A through R of this Initial Study. As noted above, mitigations have been included to address potential impacts to biological and archaeological impacts to reduce them to be less than significant. There were no impacts warranting mitigation for other issues which might cause substantial adverse effects on human beings. Traffic and noise were the most likely impacts to affect the adjacent neighbors. However, technical reports demonstrated that the impacts would be less than significant. As a result of this evaluation, there is no substantial evidence that, after mitigation, there are adverse effects to human beings associated with this project. Therefore, this project has been found not to meet this Mandatory Finding of Significance.

IV. REFERENCES USED IN THE COMPLETION OF THIS INITIAL STUDY

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WRA, Inc. 2018

Biological Resources Assessment, Draft San Vicente Redwoods Public Access Plan, June 2018.

V. ATTACHMENTS

1. Mitigation Monitoring and Reporting Program
2. Draft San Vicente Redwoods Public Access Plan, prepared by PlaceWorks, June 2018
3. Trails and Staging Area Plan
4. Air Quality/Greenhouse Gas Emissions Modeling Data, prepared by PlaceWorks, April 2018
5. Biological Resources Assessment, prepared by WRA, Inc., June 2018 & County of Santa Cruz acceptance letter dated July 16, 2018
6. Cultural Resources Study for the San Vicente Redwoods Public Access Plan Santa Cruz, Santa Cruz County, California, prepared by Tom Origer & Associates, October 2017 & County of Santa Cruz acceptance letter dated July 16, 2018 (*Note: The Cultural Resources Study includes confidential information regarding the locations of archaeological resources that is protected by law and is not available to the general public.*)
7. Geotechnical Investigation for San Vicente Redwoods Staging Area, prepared by Pacific Crest Engineering, Inc., January 2018
8. Drainage Analysis San Vicente Redwoods Staging Area, prepared by Fall Creek Engineering, Inc., August 2018
9. Noise Modeling Data, prepared by PlaceWorks, April 2018
10. Projected Visitor Counts and Parking Needs, prepared by PlaceWorks, January 2016
11. Traffic Impact Analysis, prepared by Mott MacDonald, September 2017



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Attachment 1

Mitigation and Monitoring Program



County of Santa Cruz

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

MITIGATION MONITORING AND REPORTING PROGRAM for Application No. 181146

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
Biological Resources				
BIO-1	<p>In addition to implementing construction protocols BR-1.1 through BR-1.15 pursuant to Mitigation Measure BIO-4 below, the following construction protocols are required to ensure the protection of special-status plant species.</p> <p>Construction Protocol BR-2.1. All occurrences of special-status plants within 50 feet of any work areas shall be flagged by a qualified, County-approved biologist prior to construction. Where work will occur within 10 feet of a special-status plant to be preserved, orange construction fencing (or similar) shall be installed at the edge of the work area and no work shall occur beyond the fence. If there are occurrences of special-status plants downslope from the work area, silt fencing shall be installed at the edge of the work area to prevent soil or other materials from being transported downslope where they may impact special-status plants.</p> <p>Construction Protocol BR-2.2. Occurrences of special-status plants shall be avoided by re-routing the trail alignment to the extent feasible and practicable. Where this is not possible, impacts to special-status plants shall be minimized by reducing the trail width and associated vegetation removal to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal) should avoid the dripline of any special-status shrubs and should avoid special-status herbs by a minimum of 10 feet. If trails are re-routed, they should be re-routed downslope, where feasible, of any special-status plants to avoid causing erosion or sedimentation issues which could be detrimental to special-status plants. If not feasible then re-route the drainage away from the special-status plants. If other considerations such as slope or soil stability make it impossible to avoid special-status plants, a qualified, County-approved biologist shall apply a combination of propagation from local seed and habitat enhancement to repair, rehabilitate, or restore the impacted environment.</p>	Applicant	Compliance monitored by the County Planning Department	During trail construction and site grading operations
BIO-2	<p>In addition to implementing Construction Protocol BR 1.1 through 1.15 pursuant to Mitigation Measure BIO-4 below, the following construction protocols are required to ensure the protection of special-status wildlife species.</p> <p>Construction Protocol BR-3.1. Tree removal and trimming, regardless of size, shall take place outside of both the maternity and hibernation period for special-status bats (between September and October) and avoid the breeding bird window per Protocols BR 3.4 and BR 3.5. Tree removal can take place during this period without a breeding bird or bat roost survey.</p> <p>Construction Protocol BR-3.2. If removal of large trees (e.g., the DBH is greater than 12 inches) occurs during the bat roosting season (November through August), these trees shall be inspected by a qualified, County-approved biologist for the presence of bat roosts. If a maternity roost is detected, up to a 200-foot buffer shall be placed around the maternity site until the bats are no longer utilizing the site. Non-maternity roost sites can be removed under the direction of a qualified, County-approved biologist. Any large tree that will be removed shall be left on the ground for 24 hours before being taken offsite or being chipped. This period will allow any day-roosting bats the opportunity to leave before the tree is either removed from the area or is chipped.</p>	Applicant	Compliance monitored by the County Planning Department	During trail construction and site grading operations

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	<p>Construction Protocol BR-3.3. Consultation with the CDFW shall be initiated to determine appropriate conservation measures if active roosting bat sites are disturbed.</p> <p>Construction Protocol BR-3.4. Conduct pre-construction breeding bird surveys if construction, vegetation removal, or ground disturbance activities occur during the breeding season (February 1 to August 31). Pre-construction surveys shall be conducted by a qualified individual within 14 days of the start of these activities to avoid disturbance of active nests, eggs, and/or young. If these activities stop or lapse for a period of 14 days or more during the breeding season, a follow-up breeding bird survey shall be conducted to ensure no new breeding activity has occurred within the anticipated work area. Outside of the breeding season, no pre-construction breeding bird survey would be required for construction, vegetation removal, or ground disturbance activities.</p> <p>Construction Protocol BR-3.5. If nesting birds are identified, an exclusion zone in which no construction activities would be allowed shall be established around any active nests of any avian species protected by the Migratory Bird Treaty Act and California Fish and Game Code until a qualified, County-approved biologist has determined that all young have fledged. Suggested exclusion zone distances differ depending on species, location, and placement of nest, and shall be at the discretion of the biologist based on the species in question, the proximity of the nest to the work area, and the type of work being conducted (e.g., use of hand tools versus gas-operated machinery).</p> <p>Construction Protocol BR-3.6. During construction, all workers shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the construction area is deposited in covered or closed trash containers. The trash containers shall not be left open and unattended overnight.</p> <p>Construction Protocol BR-3.7. A pre-construction survey of the parking area shall be conducted by a qualified, County-approved biologist to flag and delineate any woodrat middens within the planned disturbance footprint. During construction of the parking area, a biological monitor shall be onsite to ensure vegetation and ground disturbance with heavy equipment shall not impact those delineated resources. When avoidance of woodrat middens is not possible, the qualified, County-approved biologist shall dismantle the nest in accordance with Construction Protocol BR 3.9.</p> <p>Construction Protocol BR-3.8. During construction and trail installation, a qualified, County-approved biologist or trained designee from the contractor's crew shall identify woodrat middens located along the trail alignment. If the latter, a qualified, County-approved biologist shall provide the training prior to the start of each construction phase. To the extent feasible and practicable, the trail alignment shall avoid woodrat middens by re-routing the trail alignment. Where this is not possible, implementation of Construction Protocol BR-3.9 would be required.</p> <p>Construction Protocol BR-3.9. When construction of the trail alignment or the parking area would result in a direct impact to a woodrat midden, a qualified, County-approved biologist shall dismantle the nest and scatter the nest material a minimum of 10 feet outside of the trail alignment or the footprint of the parking area. If woodrat middens with young are encountered during the dismantling process, the material shall be placed back on the nest and the nest shall remain unmolested for three weeks in order to give the young enough time to mature and leave on their own accord. After three weeks, the nest dismantling process may resume. In the event that a nest must be relocated, the following procedures shall be adhered to:</p> <ol style="list-style-type: none"> Prior to nest disturbance, the biologist shall obtain from CDFW a scientific collection permit for the trapping of the dusky-footed wood rats. Nests shall be disturbed or dismantled only during the non-breeding season, between October 1 and December 31. At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the wood rat nest location and locate any other nests that may have been built in the project 			

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	<p>vicinity that may be affected by the proposed development.</p> <p>d) Prior to nest disturbance, woodrats shall be trapped at dusk of the night set for relocation of the nest(s).</p> <p>e) Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).</p> <p>f) In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection, and skin protection should all be used.</p> <p>g) Dismantling shall be done by hand, allowing any animals not trapped to scape either along existing wood rat trails or toward other available habitat.</p> <p>h) If a litter of young is found or suspected, nest materials shall be replaced, and the nest left along for 2-3 weeks before recheck to verify that young are capable of independent survival before proceeding with nest dismantling.</p> <p>i) Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.</p> <p>j) Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.</p> <p>k) Once construction is complete, the biologist shall survey the nest area to note whether the new nests are in use, the wood rats have built new nests, or the nest area has been completely abandoned. This information shall be reported in a letter report to the Environmental Planning Section of the Planning Department, and the local CDFW biologist.</p> <p>Construction Protocol BR-3.10. A qualified, County-approved biologist shall conduct a pre-construction survey immediately prior to the start of any ground-disturbing activities for stream crossings and areas within 100 feet of wetted features. If California red-legged frog (CLRF) are found within the work area, all work shall cease within the immediate vicinity (approximately 25 feet around the work area) until the individual(s) have been allowed to leave the work area on their own. If CLRF cannot passively leave the work area, work shall cease and the USFWS shall be contacted by the qualified, County-approved biologist to determine the appropriate course of action. The qualified, County-approved biologist shall then implement the appropriate course of action as determined by the USFWS.</p> <p>Construction Protocol BR-3.11. Because dusk and dawn are often the times when CLRF are most active and likely to disperse, all construction activities shall cease one half hour before sunset and shall not begin prior to one half hour after sunrise. Furthermore, no mechanized work shall occur during significant rain events, defined here as 0.25 inch or greater within a 24-hour period, when CLRF are more likely to disperse and occur within the work area.</p>			
BIO-3	<p>Educational signage should be placed within the parking lot and at picnic areas informing the public to remove trash and food waste. Signage should provide information on the marbled murrelet and the impact that corvid and avian predators can have on nest sites. This education signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.</p>	Applicant	Compliance monitored by the County Planning Department	Prior to opening parking area and trail system for use
BIO-4	<p>Implement the following Biological Resources (BR) construction protocols from the San Vicente Redwoods Public Access Plan:</p> <p>Construction Protocol BR-1.1. The construction work area including the parking area shall be minimized to</p>	Applicant	Compliance monitored by the County Planning	During trail construction and site

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	<p>the fullest extent feasible and trails shall be limited to the minimum width necessary to support the proposed use (i.e., hiking, cycling, and horse riding) as detailed in Table 3 (Trail Dimensions by Use Type).</p> <p>Construction Protocol BR-1.2. Prior to the start of construction, all construction personnel shall be educated on the sensitivity of the biological communities and species at the site by a qualified, County-approved biologist. Environmental awareness training shall include measures to avoid or reduce impacts to the community, reporting and follow-up actions if sensitive biological communities are impacted, and the worker's responsibility under the applicable environmental regulation(s). A designated staff member from the contractor's crew shall provide follow-up training to any employees who begin work after the initial pre-construction training.</p> <p>Construction Protocol BR-1.3. Trails should be routed around sensitive vegetation to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal and ground disturbance during construction) should avoid the dripline of sensitive vegetation, with greater separation between the trail and sensitive vegetation being preferred. If trails are re-routed, they should be re-routed downslope of any sensitive vegetation to avoid causing erosion or sedimentation issues which could be detrimental to sensitive vegetation.</p> <p>Construction Protocol BR-1.4. Tree and shrub removal in sensitive biological communities shall be minimized to the fullest extent feasible. Where necessary, obtaining a tree removal permit may be required per Santa Cruz County Code Chapter 16.34, Significant Trees Protection. Tree removal should be conducted by a licensed arborist or registered professional forester using industry-standard BMPs to prevent the spread of invasive weeds or plant pathogens and avoid damage to vegetation to be retained.</p> <p>Construction Protocol BR-1.5. Trail construction shall incorporate the best available technology and industry-standard BMPs to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance.</p> <p>Construction Protocol BR-1.6. Any restoration or landscape plantings (e.g., plantings around the proposed parking/parking area) shall use native species appropriate for plant communities found at the site. To the extent feasible, plant material shall be salvaged from trail construction activities at the site. If not possible, plant material shall be propagated by a reputable nursery with protocols in place for minimizing the potential spread of plant diseases (sudden oak death or other <i>Phytophthora</i>-related diseases). Any propagated plant material shall be sourced from as close to the site as possible, ideally from within the site itself to avoid genetic variation.</p> <p>Construction Protocol BR-1.7. Stream crossings should ideally be designed and constructed to freespan the channel and be anchored above the top of bank. Crossings of regulated streams that avoid work below the ordinary high-water mark do not require a permit from the United States Army Corps of Engineers (USACE). When required, notify the CDFW and the Central Coast Regional Water Quality Control Board (RWQCB) of the crossing, even if located above the top of bank. If the CDFW and/or RWQCB issue authorizations for such work, the measures included in any such authorizations shall be incorporated into the design.</p> <p>Construction Protocol BR-1.8. Where wetlands or streams cannot be avoided, appropriate approvals from the USACE (for impacts to regulated wetlands or areas below the ordinary high water mark of regulated streams) and/or the RWQCB and the CDFW (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) shall be secured prior to initiating work in these areas. The measures included in any such authorizations shall be incorporated into the design.</p> <p>Construction Protocol BR-1.9. Trails constructed near wetlands or streams shall be designed to minimize changes to pre-project hydrology. Avoid erosion or sedimentation by installing BMPs (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) around wetlands and streams. All materials shall be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs shall</p>		Department	grading operations

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	<p>be determined by the contractor based on specific site conditions and the type of work being conducted. BMPs shall remain in place until all disturbed ground has been stabilized either through compaction or re-vegetation.</p> <p>Construction Protocol BR-1.10. Equipment used for building new trails should generally have tread width of 48 inches or less and mass less than 10,000 pounds.</p> <p>Construction Protocol BR-1.11. To avoid the introduction and prevent the spread of invasive weeds or plant pathogens, prior to arriving on the site, all construction equipment and vehicles shall be inspected to ensure they are clean.</p> <p>Construction Protocol BR-1.12. Any equipment or vehicles that have been used in areas with known sudden oak death or other <i>Phytophthora</i>-related plant diseases shall be sterilized before being used and inspected by a qualified, County-approved biologist prior to entering the job site.</p> <p>Construction Protocol BR-1.13. All disturbed ground shall be stabilized concurrent with or immediately following construction. Stabilization methods may include: compacting the soil (for trail surfaces only), covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat shall be used per Construction Protocol BR-1.6. If other erosion control materials are to be used, they shall be certified weed-free and as otherwise specified in Construction Protocol BR-1.9.</p> <p>Construction Protocol BR-1.14. The importation of soils for construction of the parking area or other parts of the site shall be minimized to the fullest extent feasible. To the extent feasible, soils shall be salvaged from onsite before being imported from offsite. If it is necessary to import soils, they shall be certified weed-free and from a qualified, County-approved source with protocols in place for minimizing the potential spread of plant diseases (e.g., sudden oak death or other <i>Phytophthora</i>-related diseases).</p> <p>Construction Protocol BR-1.15. Equipment and vehicle fueling and maintenance parking areas shall be at least 100 feet from any wetland or stream. A spill containment kit shall be provided at the work site and located within 50 feet of the fueling or maintenance area. All spills shall be cleaned immediately (i.e., within 5 minutes of the spill) and all resulting materials shall be disposed of properly. All construction vehicles shall be inspected daily for leaks of oil, hydraulic fluid, or other potentially hazardous materials by a qualified construction crew member and drip pans shall be placed under parked vehicles during prolonged periods of disuse (e.g., during evenings and weekends).</p>			
BIO-5	<p>To minimize the introduction of invasive plants or plant pathogens that could threaten sensitive vegetation, parking and parking areas should include signage or other materials aimed at instructing the general public on the potential threats associated with invasive plants, plant pathogens, and other pests of concern. These materials should include basic prevention methods that the general public can implement such as inspecting shoes and pet fur for weed seeds or avoiding the movement of plant material or soil from one area to another. This education signage should be in place prior to opening the trails for public access and should be maintained annually by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.</p>	Applicant	Initial compliance monitored by the County Planning Department; Annual compliance monitored by the Public Access Manager	Prior to opening parking area and trail system for use
BIO-6	<p>To minimize impacts to sensitive vegetation from use of the trail network, the trail maintenance system should be implemented as described in Chapter 6 of the San Vicente Redwoods Public Access Plan. The trail maintenance system includes an annual monitoring program aimed at identifying maintenance issues (e.g., erosion) and other problems (e.g., nuisance trash areas or other impacts from trail users). The trail maintenance system should include specific methods for routinely documenting and implementing the</p>	Applicant	Compliance monitored by the Public Access Manager	Annual monitoring after parking area and trail system is open for use

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	necessary maintenance by the Public Access Manager.			
BIO-7	All picnic locations shall be located outside of old-growth stands.	Applicant	Compliance monitored by the County Planning Department	At submittal for construction and grading permits
Cultural Resources				
CUL-1	The following text shall be clearly identified on all grading plans and construction drawings: <i>Pursuant to sections 16.40.040 (Site Discovered During Excavation or Development) of the Santa Cruz County Code, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040.</i>	Applicant	Compliance monitored by the County Planning Department	At submittal for construction and grading permits
CUL-2	<p>Implement the following CR construction protocols from the San Vicente Redwoods Public Access Plan:</p> <p>Construction Protocol CR-1.1. Prior to the start of construction, all construction personnel shall be educated on the identification and treatment of prehistoric and/or historic artifacts that may be discovered by a qualified, County-approved archaeologist who meets the Secretary of Interior standards or a registered, County-approved forester who has successfully completed the CAL FIRE archeology program.</p> <p>Construction Protocol CR-1.2. If ground disturbing activity takes place and possible artifacts are discovered, then all construction activities within a 50-foot radius of the find shall be halted immediately and a qualified, County-approved archaeologist who meets the Secretary of Interior standards (including CAL FIRE archaeologists) shall be consulted to determine whether the resource requires further study. (Note, it is CAL FIRE policy that registered professional “foresters” do not perform significance evaluations of cultural resources). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps). Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance in terms of the CEQA criteria by a qualified archaeologist. If the resource is determined significant under CEQA, the qualified archaeologist shall prepare and implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. The archaeologist shall also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources. The report shall be submitted to the County of Santa Cruz, Northwest Information Center, and State Historic Preservation Office, if required.</p> <p>Construction Protocol CR-1.3. When trail building in the vicinity of sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596 as identified in the <i>Cultural Resources Study</i> dated October 2017 and on file with the County, a County-approved, qualified archaeologist who meets the Secretary of the Interior standards or a County-approved, registered forester who has successfully completed the CAL FIRE archaeology program shall be present during the initial ground-disturbing phase of construction. Selected portions of trail routes may be in close proximity to sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596, and monitoring at locations shown on Figure 3 and Figure 4 of the <i>Cultural Resources Study</i> is required. If archaeological specimens are discovered, a qualified archaeologist who meets</p>	Applicant	Compliance monitored by the County Planning Department	During trail construction and site grading operations

No.	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
	<p>the Secretary of the Interior standards should evaluate their significance.</p> <p>Construction Protocol CR-1.4. For sites P-44-000596 and Camp ZZZ, a signage program at all entrances shall be developed by the applicant prior to final inspection at the entrances to the property. Signs shall include a brief description of the history of San Vicente Railroad, including various camps throughout the area, a discussion of the historic value of the sites, and the citation of the regulatory codes that protect artifacts. The signage shall also include the requirement to stay on trails.</p> <p>Construction Protocol CR-1.5. If a trail is planned at site P-44-000596, the trail shall be constructed within the old railroad grade wherever possible because no trace of the railroad line, other than the grade is evident. If the trail is planned to be built outside the railroad grade where past land uses have disturbed the ground surface, construction of the trail is acceptable with the provision that any surface artifacts are avoided and ground disturbance is kept to a minimum. Portions of known railroad grade segments are depicted in Figures 5a and 5b of the <i>Cultural Resources Study</i>.</p> <p>Construction Protocol CR-1.6. If a trail is planned at the Camp ZZZ site to follow the alignment of the existing gravel road, it is acceptable for the trail to follow within the road route because there is no trace of historic-period specimens evident within this alignment.</p>			
CUL-3	<p>The following text shall be clearly identified on all grading plans and construction drawings: <i>Pursuant to sections 16.40.040 (Site Discovered During Excavation or Development) of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible person shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representative of the local Native California Indian group shall be contacted. If it is determined that the remains are Native American, the Native American Heritage Commission will be notified as required by law. The Commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. Pursuant to Public Resources Code section 5097, the descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established.</i></p>	Applicant	Compliance monitored by the County Planning Department	At submittal for construction and grading permits
CUL-4	<p>Implement the following Cultural Resources (CR) construction protocol from the San Vicente Redwoods Public Access Plan:</p> <p>Construction Protocol CR-1.7. The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5, and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be "most likely descended" from the deceased Native American. The most likely descendent would then make recommendations regarding the treatment of the remains with appropriate dignity.</p>	Applicant	Compliance monitored by the County Planning Department	During trail construction and site grading operations

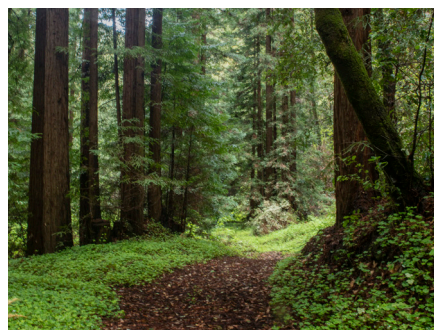
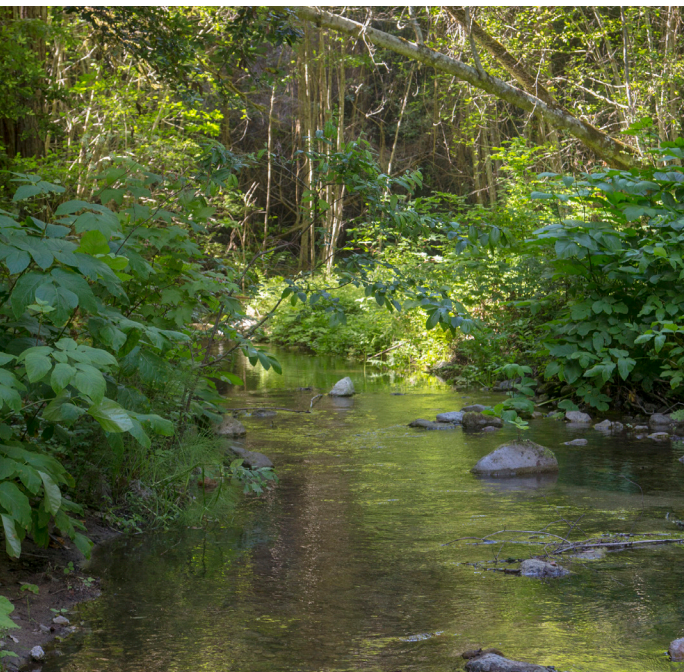
Attachment 2

San Vicente Redwoods Public Access Plan



SAN VICENTE REDWOODS PUBLIC ACCESS PLAN

PUBLIC REVIEW DRAFT
JUNE 2018



SAN VICENTE REDWOODS PUBLIC ACCESS PLAN

PUBLIC REVIEW DRAFT

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TABLE OF CONTENTS

1	INTRODUCTION	1-1
2	SAN VICENTE REDWOODS OVERVIEW	2-1
3.	GOALS AND POLICIES.....	3-1
4.	RECREATION ACCESS PLAN	4-1
5.	EDUCATION ACCESS PLAN	5-1
6	IMPLEMENTING THE PLAN	6-1
7	DESIGN AND MAINTENANCE GUIDELINES	7-1
8	ACKNOWLEDGEMENTS	8-1

Appendices

Appendix 1: Conservation Values

Appendix 2: Adaptive Management Overview

Appendix 3: Questionnaire Summary

Appendix 4: Biological Resources Assessment

Figures

Figure 1-1	Regional Context.....	1-2
Figure 2-1	Existing Conditions.....	2-2
Figure 4-1	Access at Buildout.....	4-3
Figure 4-2	Phase 1: Trail Phasing	4-4
Figure 6-1	Initial Access Organizational Structure.....	6-6

Tables

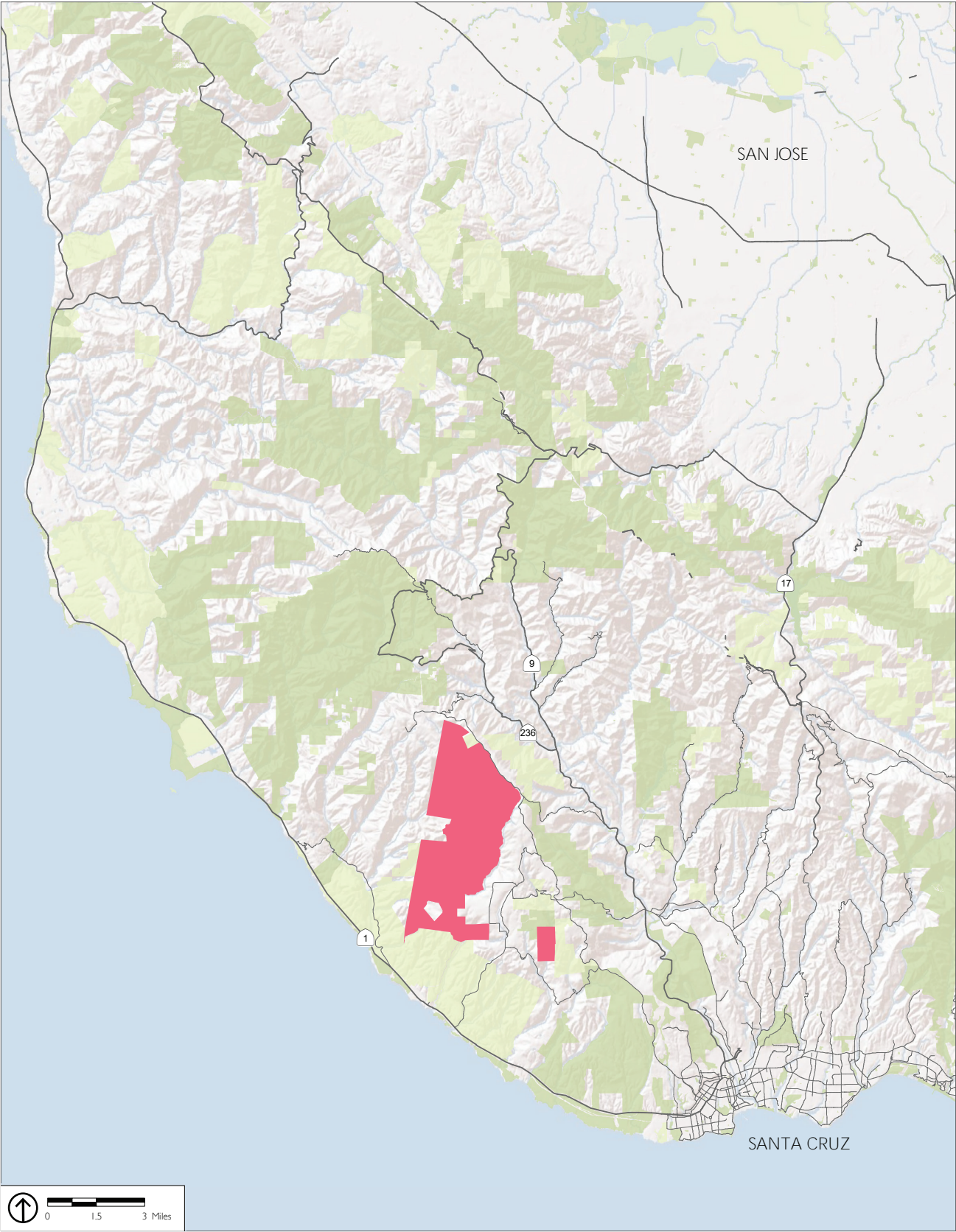
Table 4-1	Trail Network Summary (Buildout).....	4-8
Table 4-2	Trail Phasing.....	4-10
Table 6-1	Phasing Strategy	6-9
Table 6-2	Implementation Plan	6-11
Table 6.3	Emergency Prevention and Response Strategies.....	6-17
Table 6-4	Overview of Adaptive Management Strategies	6-22
Table 6-5	Summary of Financial Analysis	6-25
Table 7-1	Trail Dimensions by Use Type.....	7-3

1 INTRODUCTION



The San Vicente Redwoods is generally located in the Santa Cruz Mountains between the Davenport and Bonny Doon communities. As shown in Figure 1-1, San Vicente Redwoods is a contiguous 8,160-acre property with the exception of the 373-acre area located to the southeast of the main property that is referred to as San Vicente Redwoods: Laguna Tract. Combined, the main property and the Laguna Tract total 8,533 acres.

The purchase of the property by the Peninsula Open Space Trust (POST), Sempervirens Fund, Save the Redwoods League (SRL), and the Land Trust of Santa Cruz County (Land Trust) in December 2011 resulted in the creation of approximately 27,500 acres of contiguous protected land, as it fills a long standing gap between the numerous protected lands that surround it. Although San Vicente Redwoods is currently owned by POST and Sempervirens Fund, the ongoing protection of the San Vicente Redwoods is due to the successful collaboration between these organizations and the Land Trust and SRL, with additional financial assistance from other organizations. The two owners are currently responsible for the protection and management of the property, the Land Trust is responsible for implementing the San Vicente Public Access Plan as the Public Access Manager, and the SRL will provide Conservation Easement monitoring and enforcement. These four organizations are collectively referred to as the Conservation Partners, and their roles and responsibilities are further described in Chapter 6, Implementing the Plan.



- SV Redwoods Boundary
- Public Lands - Open Access
- Public Lands - Restricted Access
- State Highways
- Major Roads

FIGURE 1-1
REGIONAL CONTEXT

The land uses and activities envisioned for the San Vicente Redwoods property are both as complementary and diverse as the stakeholders that have come together towards the property's protection. The Conservation Vision (completed in 2011) for the property envisions integration of preservation, restoration, and sustainable timber harvesting with research, education, and recreation. Recreation, education, and research activities at the property provide unique opportunities to further the property's Conservation Values, which contribute to the property's on-going protection. Recreation and education increases public exposure to and therefore understanding of these unique ecosystems and natural processes, and research can inform successful management of San Vicente Redwoods and other properties. Together, such uses have the potential to make a substantial impact towards the conservation goals for San Vicente Redwoods.

PURPOSE OF THE PUBLIC ACCESS PLAN

The provision of access for the purposes of recreation, research, and education is a core component of the Conservation Vision, and allowing for public access is a requirement of the Conservation Easement that protects the property. The San Vicente Redwoods Public Access Plan defines the vision for providing this access as well as the tools that will be necessary to establish initial access and maintain appropriate access into the future.

The Public Access Plan includes a Recreational Access Plan and a Research and Education Access Plan, though the focus of the Public Access Plan is recreational access and regional trail connections. While all research and educational activities are not necessarily open to the public, they are included as part of the Public Access Plan because of the education potential and because research and education will be supported by the same trails and access features required for recreational access. Research access will be managed by the owners, while educational and special use will be managed by the Land Trust.

This Public Access Plan will be used by the Conservation Partners and any other partners to guide the management of public access on the property. Members of the organized groups and/or general public with an interest in public access at San Vicente Redwoods may use the Public Access Plan to understand opportunities for use and identify avenues for participation. The Public Access Plan is intended to guide the provision of access for at least 10 years, at which



point it may be revisited and updated as necessary, in accordance with the Conservation Easement. The Plan may also be revised if another entity assumes public access management responsibilities, as further discussed in Chapter 6. This Plan will remain the active plan until revised.

THE PLANNING PROCESS

The development of the Public Access Plan included background and on-site research, coordination with related planning efforts, consultation with experts and Regulatory agencies, and extensive public outreach.

The Conservation Partners provided guidance throughout the planning process, with designated representatives of each Partner participating in the ‘Working Group.’ Working Group meetings were held almost every week from 2013 to 2017, and members engaged Conservation Partner leadership at quarterly meetings of the Living Landscape Initiative.

The outcomes of background research and field reconnaissance are summarized in Chapter 2, San Vicente Redwoods Overview. A summary of related planning efforts, consultation with experts and regulatory agencies, and the community engagement conducted as part of the planning process are provided below.



RELATED PLANNING EFFORTS

Prior to the development of this Public Access Plan, substantial planning work was conducted for the San Vicente Redwoods property, including existing conditions analysis and the development of an strategy to conservation, the preparation of the Conservation Vision (2011), Conservation Easement (2014), and the first Timber Harvest Plan (2015). Timber harvest activities on the property are governed by Timber Harvest Plans, which further inform the development of the Public Access Plan and are summarized below as they pertain to public access.

SAN VICENTE REDWOODS ANALYSIS AND CONSERVATION STRATEGY

The Conservation Partners have mapped and analyzed various features of the site, including aquatic, marbled murrelet, and mountain lion habitat; climate resilience based on stream buffers and topographic shading; vegetation communities; geology, soils, and erosion sensitivity; and road density, usage, steepness, and hydrologic connectivity. Relative Conservation Values were then

applied for each feature type to the 21 “Planning Watershed” units that were identified on the property. Based on the cumulative analysis, the “Planning Watersheds” were further grouped and delineated as two Preservation Reserves, three Restoration Reserves, and two Working Forest Reserves of various acreages. These management areas are the basis for the conservation strategies that the Conservation Partners will incorporate into all planning and management efforts. The management areas are described below.

- **Preservation Preserve.** Two areas were delineated as Preservation Reserves. These areas are to be managed to preserve and maintain existing old forest and other rare plant communities.
- **Restoration Reserve.** Three areas were delineated as Restoration Reserves. These areas are to be managed to allow limited timber harvesting primarily for the restoration and enhancement of native ecosystem values.
- **Working Forest.** Two areas were delineated as Working Forest. Working forests are areas to be managed to emphasize Sustainable Forest Management.

SAN VICENTE REDWOODS CONSERVATION EASEMENT

The general purpose of the Conservation Easement, executed December 2014, is to preserve and protect in perpetuity the natural, ecological, habitat, scenic, open space, and forestry resources located on the property, including management and maintenance by the Grantor (POST and Sempervirens Fund) and the Grantor’s successors. The Conservation Easement gives the SRL the right to allow public access. The Conservation Easement identifies seven Conservation Values and explains the role San Vicente Redwoods plays in providing each value. These are summarized in Chapter 2. The full text of the Conservation Values is provided in Appendix 1 (Conservation Values).

TIMBER HARVEST PLAN

Timber harvesting activities are governed by the California Forest Practice Rules and other relevant statutes, and Timber Harvest Plans describe individual harvest projects. The Timber Harvest Plan (THP# 1-14-117 SCR) for the first harvest at San Vicente Redwoods was approved by CAL FIRE in 2015. Subsequent timber harvest plans are anticipated for the property.



CONSULTATION WITH EXPERTS AND REGULATORY AGENCIES

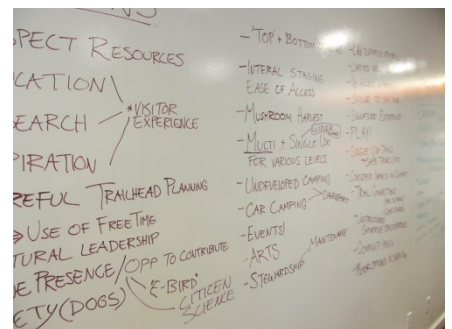
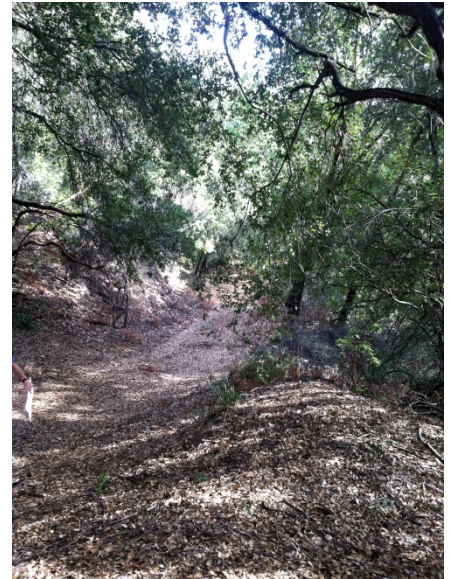
The Land Trust and the Conservation Partners solicited guidance from experts in the fields of conservation science, public access management, biological resources, cultural resources, and engineering. In addition, Regulatory Agency staff was consulted in an effort to minimize potential resource impacts through proactive planning and design. These efforts include but are not limited to:

- The Working Group consulted the University of California Santa Cruz Puma Project to understand the areas of the property that support mountain lion denning, movement and foraging, and supplemented their data with game camera data managed by the San Vicente Property Manager.
- Potential trail corridors and staging area were flagged on site by professional trail designers and builders; evaluated by the civil and environmental engineers for stability related to erosion and geotechnical considerations; and surveyed by biological and cultural resource experts. Through close coordination with technical experts, trail alignments were refined to minimize potential impacts to resources.
- Site visits were conducted with representatives from the County of Santa Cruz and the California Department of Fish and Wildlife (CDFW). In addition, the proposed project was presented to California Coastal Commission.

PUBLIC OUTREACH AND ENGAGEMENT

Public outreach for the project consisted of interviews with key stakeholders, including the owners, partners, and potential buyers/leasers; two facilitated meetings, one with recreation stakeholders and the other with research/education stakeholders; a community meeting in March 2014, which built upon the initial public meeting held in May 2012; an online questionnaire open to the public; and additional neighborhood outreach. The public was notified of the opportunity to participate through extensive media coverage of the topic, including newspaper articles (five in the Santa Cruz Sentinel, one in the Contra Costa Times), television stories (one on KSBW, two on KION), and news websites (three stories on Hilltromper.com). Adjacent property owners and several government agencies were contacted by phone or email. Outreach efforts are summarized below.

- **Interviews.** A series of interviews and small meetings with interested parties was conducted by the Land Trust between October 2013 and July 2014. This effort focused on people and organizations that could be substantially affected by the project, such as: owners of adjacent lands, emergency service providers, water purveyors, utilities, law enforcement, and local community groups. Local experts and agencies were also consulted from the following fields: biology, geology, forestry, cultural resources, recreation, and education. Approximately 150 individuals and groups were identified and contacted. In total, such meetings were held with approximately 190 people. The meetings covered a range of topics typically set by the interviewee. Additional interviews were conducted between 2014 and 2017 as part of ongoing outreach by the Land Trust.
- **Stakeholder Meetings.** In addition to interviews, two small group meetings were held, one for education and research interests, and one for representatives of recreational user groups. Both meetings were facilitated by PlaceWorks and involved a short overview of the project, followed by a roundtable discussion about opportunities and constraints. Attendees of the education meeting included representatives from Swanton Pacific Ranch and University of California Santa Cruz. Attendees of the recreational meeting included hikers, mountain bikers, equestrians, dog-walkers, nature interpreters, representatives from the Sierra Club, the Mountain Bikers of Santa Cruz County, Bureau of Land Management, the Santa Cruz Bird Club, the 8 Shields Institute, and the Fungus Federation.
- **Questionnaire.** To gain a broad understanding of public concerns and interest in public access, an online questionnaire was hosted from November 2013 through April 2014 to seek public input from neighbors, residents, agency staff and others. Survey participants were asked to express their hopes and concerns for the project by indicating their preferences for various recreational activities, by selecting their top concerns, and by judging proposed access points. The survey also allowed participants the opportunity to provide public and private feedback. To reach individuals without computer access, hard-copies of the survey were distributed by request. Additionally, in May 2014, questionnaires were also shared with a local non-profit to interface with the local Spanish speaking community. In total 2,326 people filled out the questionnaire. In June 2014, questionnaire responses were downloaded and summarized. Public



comments were also organized. The results and public comments are posted and accessible on the Land Trust's website, and provided in Appendix 3 (Questionnaire Summary).

- **Community Meetings.** A community meeting was hosted in March 2014 by the Land Trust. Over 300 people attended the meeting to share their views on public access. At the meeting, the draft access map was presented, and attendees were asked to form small groups to discuss opportunities and constraints. Each group was given the opportunity to share their views and conclusions in front of all the attendees as well as the planners. An additional community meeting was held in September 2014 to present the Draft Public Access Plan (2014) and hear from the community regarding preferences, priorities and concerns. Approximately 150 people attended this meeting, and the Public Access Plan has been revised to reflect feedback received from the public.
- **Neighborhood Outreach.** Neighborhood outreach included presentations at four meetings of the Rural Bonny Doon Association and more than 15 smaller meetings.

Throughout the planning process, the community was engaged through over 125 separate meetings and interviews with a cumulative attendance of over 1,500. The Land Trust, in collaboration with the other Conservation Partners, continues to engage and reach out to local stakeholders during the planning process.

ORGANIZATION OF THE PLAN

The Public Access Plan is organized as follows:

- Chapter 1 – Introduction
- Chapter 2 – San Vicente Redwoods Overview
- Chapter 3 – Goals and Policies
- Chapter 4 – Recreation Access Plan
- Chapter 5 – Education and Research Access Plan
- Chapter 6 – Implementing the Plan
- Chapter 7 – Design and Maintenance Guidelines

The first three chapters of the Public Access Plan provide an overview of the property and establish broad goals and objectives for the project. The Recreational Access Plan and the Research and Educational Access Plan are provided as Chapters 4 and 5, respectively. Chapters 6 and 7 provide further detail to guide the development and management of public access.

LAND TRUST OF SANTA CRUZ COUNTY
SAN VICENTE REDWOODS PUBLIC ACCESS PLAN
INTRODUCTION

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2 SAN VICENTE REDWOODS OVERVIEW



This chapter provides a brief overview of the 8,532-acre San Vicente Redwood property with respect to the biological resources, cultural resources, existing access and circulation system, views, and adjacencies, as well as opportunities for regional connectivity, as they pertain to access opportunities and constraints. An overview of the property is provided in Figure 2-1. The Conservation Easement defines the Conservation Values for which the property was protected. These seven Conservation Values are: (1) statewide and regional conservation significance, (2) forests, (3) biodiversity, (4) watershed protection, (5) viewshed protection, (6) landscape and habitat connections, and (7) public recreation, education, and scientific study.

BIOLOGICAL RESOURCES

San Vicente Redwoods is comprised of a range of habitat types, including, but not limited to, redwood forest, chaparral and riparian habitats, which together have the potential to support a wide range of plant and animal species. An existing conditions review and biological sensitivity analysis were conducted by professional biologists with the purpose of identifying potential biological constraints in relation to the implementation of the Public Access Plan.

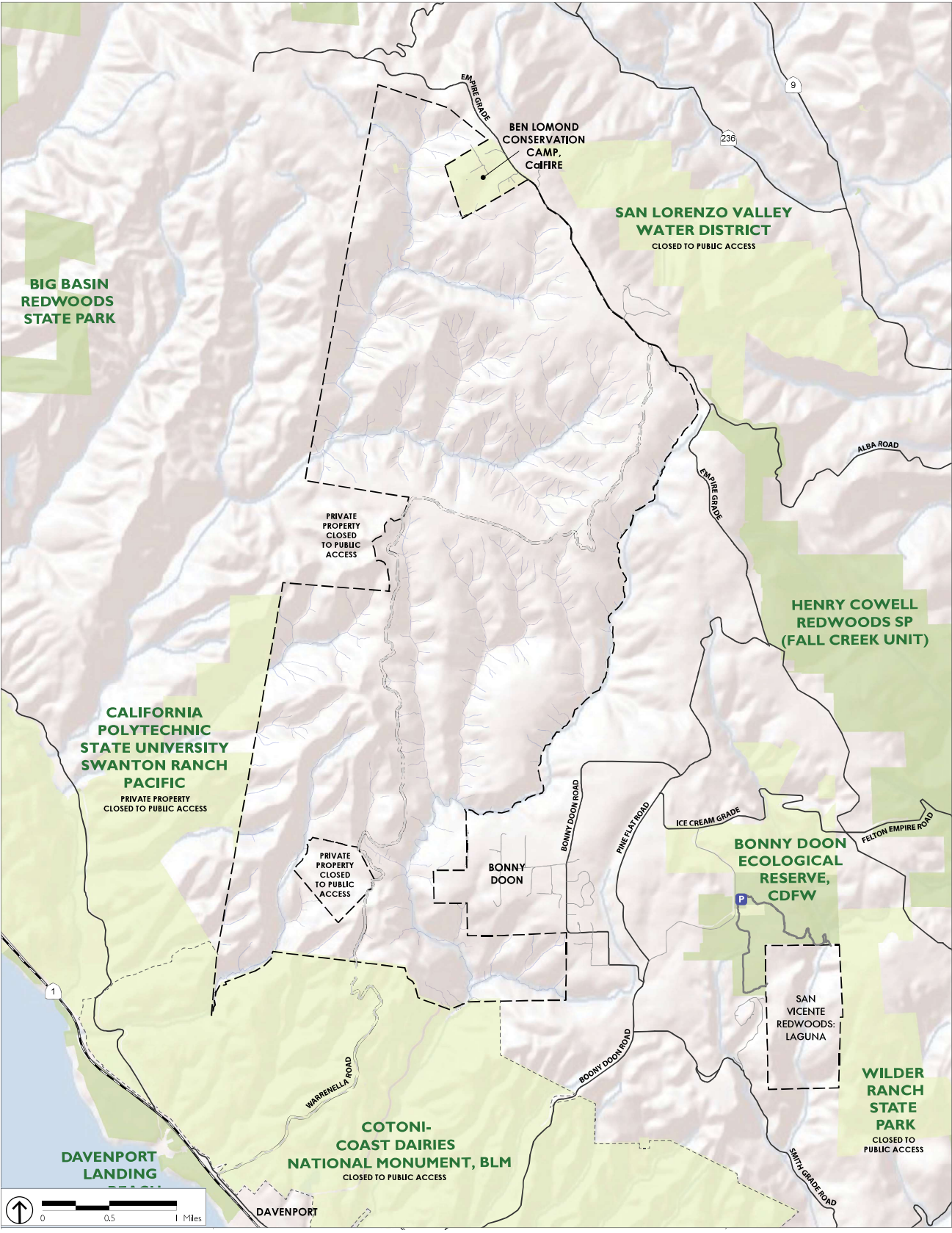


FIGURE 2-1
EXISTING CONDITIONS

The review and analysis was based on review of existing plans and data, including, but not limited to, the Conservation Blueprint for Santa Cruz County (2011), a California Department of Fish and Wildlife (CDFW) California Native Diversity Database (CNDDDB) search (2016), the United States Fish and Wildlife Service (USFWS) Santa Cruz County quadrangle list of listed species (2016), the California Native Plant Society (CNPS) rare plant list (2016), and review of the University of California Santa Cruz Puma Project.

Based on this review and analysis, it has been determined that the property either has or has the potential to support onsite and offsite sensitive biological resources, including, but not limited to, the following:

- Special-status wildlife species such as the San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), the Oak titmouse (*Baeolophus inornatus*), the anadromous steelhead (*Oncorhynchus mykiss*), the coho salmon (*Oncorhynchus kisutch*), the Townsend's big-eared bat, (*Corynorhinus townsendii townsendii*), the California red-legged frog (*Rana draytonii*), as well as the Marbled murrelet (*Brachyramphus marmoratus*).
- Special-status plant species such as the Anderson's manzanita (*Arctostaphylos andersonii*), Point Reyes horkelia (*Horkelia marinensis*), Santa Cruz Mountains pussypaws (*Calyptridium parryi* var. *hesseae*), Dudley's lousewort (*Pedicularis dudleyi*), Santa Cruz Mountains beard tongue (*Penstemon rattanii* var. *kleei*), white-flowered rein orchid (*Piperia candida*), Brewer's red maids (*Calandrinia breweri*), bristly sedge (*Carex comosa*), deceiving sedge (*Carex saliniformis*), robust spineflower (*Chorizanthe robusta* var. *robusta*), and the mountain lady's-slipper (*Cypripedium montanum*).
- Movement corridors for mountain lions (*Puma concolor*) along gentle slopes and broad ridge top lands, as well as denning sites in other areas.
- Unique and sensitive terrestrial and aquatic habitat types such as maritime chaparral, coastal scrub, coast live oak woodland, redwood forests, the endangered Anderson's manzanita (*Arctostaphylos andersonii*) habitat, seeps and seasonal wetlands, shrub-scrub wetlands, and the Zayante sandhills habitat.



CULTURAL RESOURCES

During the time of European settlement, the land that is now the San Vicente Redwoods property was inhabited by the Awaswas division of Ohlone, who were hunter-gatherers that lived in large settlements, often near fresh water sources and surrounded by diverse and abundant plant and animal life. Through the second half of the 19th century, the majority of the property was part of the San Vicente (Escamilla) Land Grant and homesteading occurred on portions of the property. Logging activities began in the early 20th century on the northern portion of the property by the San Vicente Lumber Company. Ocean Shore Railroad built a rail line that connected the property down to the coast, which was then sold to San Vicente Lumber Company in 1920 and abandoned when the logging company went out of business in 1923. The Santa Cruz Portland Cement Company also constructed a rail line from their cement plant on the coast to a limestone quarry on the property, following San Vicente Creek. This quarry supported the small community of Bella Vista, which was destroyed in a 1962 landslide.

Based on the available historical and archeological data from the Northwest Information Center (NWIC), as well as additional sources including the office at the CAL FIRE Archaeology Program in Santa Rosa, examination of the library and files of Tom Origer & Associates, field inspection of the project location, meeting with Santa Cruz Forester Nadia Hamey, and contact with the Native American community, there are approximately 25 known cultural resource sites located on the property. However, the property has not been subjected to a survey that covers the entirety of the property and there is the potential for more unknown resources to exist. The areas where development is planned as part of the Public Access Plan (see Chapter 4, Recreation Access Plan) have been surveyed by professional archeologists (2016 and 2017). As part of these surveys, it was determined that five of the identified sites appear to be within or in close proximity to the where development is proposed. These sites are avoided by the trail network layout, and measures will be taken to detect additional sites during construction as further described in Chapter 7.

EXISTING ACCESS AND CIRCULATION

Existing access points, internal roads and trails, and the potential for regional trail connectivity are discussed below.

EXISTING ACCESS POINTS

Perimeter and internal gates restrict access on the San Vicente Redwoods roads. However, due to vulnerability to trespass, the perimeter of the property is intensively managed to successfully minimize trespassing through use of frequent patrol as well as fencing, signage, and gates. These efforts will be emphasized in areas where trails approach neighboring private property, and will be coordinated with neighboring property owners. Limited perimeter access points are located along the northern edge of Empire Grade and along the southern edge that borders the Cotoni-Coast Dairies property.

EXISTING ROADS AND TRAILS

There are a variety of existing roads and trails on the San Vicente Redwoods property, including over 80 miles of double lane and single lane roads, the railroad line, tractor roads used for timber harvest operations, and narrow trails. Many of the roads were developed for historic timber and quarry operations, and some continue to provide access for ongoing timber operations, fire, utility access, private easements, and general property management. The primary road that extends from the north to the south of the property is the private Warrenella Road. This road is used for timber harvest activities and also serves as the sole access road for several private properties. While the Warrenella Road and many other existing roads are currently used and maintained, others are not passable due to overgrowth of vegetation and maintenance needs. The road assessment conducted as part of the planning process determined that some of the existing roads are suitable for use as recreational trails. The assessment was based on numerous factors, including trail grade and alignment and the viability of water crossings.

REGIONAL TRAIL CONNECTIVITY

San Vicente Redwoods is well situated to increase connectivity between inland and coastal open space, and between open space to the east and west of the property. Adjacent and nearby open space includes, but is not limited to, Big Basin Redwoods State Park (including Little Basin), Henry Cowell Redwoods State Park (Fall Creek Unit), San Lorenzo Valley Water District property (closed to the public), the Bonny Doon Ecological Reserve, and the Bureau of Land Management's Cotoni-Coast Dairies, which is part of the California Coastal National Monument property.



A future opportunity is to create a trail connection through San Vicente Redwoods from the Fall Creek Unit to Cotoni-Coast Dairies, which would require bridging the gap between the Fall Creek Unit and the San Vicente Redwoods property.

Potential connectivity between CDFW's Bonny Doon Ecological Reserve and San Vicente Redwoods: Laguna is relatively unconstrained as existing, informal trail connections are already present between these properties. Given that formalization of this trail connection is a component of this Plan, coordination with CDFW will still be necessary to address access and management concerns.

Other trails could connect San Vicente Redwoods to nearby State Parks and other recreational sites, such as Henry Cowell Redwoods State Park and Wilder Ranch State Park to the west, and Big Basin Redwoods State Park to the east.



EXISTING VIEWS AND ADJACENCIES

SCENIC VIEWS

San Vicente Redwoods offers breathtaking views over Cotoni-Coast Dairies to the Pacific Ocean coastline.

NEIGHBOR VIEWS AND ADJACENCIES

San Vicente Redwoods is surrounded by a variety of neighbors, including single-family residential, institutional, and recreational uses. The following properties border San Vicente Redwoods:

- Ben Lomond Conservation Camp, a California Department of Corrections and Rehabilitation facility, to the north, on the same side of Empire Grade Road.
- The Bonny Doon community.
- Bureau of Land Management Cotoni-Coast Dairies to the south.
- Cal Poly Swanton Pacific Ranch, owned by the Cal Poly Corporation, a private non-profit.
- Private residential property inholding.
- Private timber land.

- Other private properties, including the private residences in the town of Davenport and the Swanton Road area.

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3 GOALS AND POLICIES



The Public Access Plan identifies goals and policies that will guide the development of public access at San Vicente Redwoods which are identified below. Each goal is listed in bold and followed by a list of respective policies that support it. Policies are also referenced in Table 6-2 of Chapter 6, Implementing the Plan, showing how the policies guide implementation. Policies include both general and focused direction that the Public Access Manager and Conservation Partners shall adhere to as part of Public Access Plan implementation.

GENERAL ACCESS GOALS AND POLICIES

- | | |
|------------|---|
| ACCESS 1 | PROVIDE SUSTAINABLE ACCESS CONSISTENT WITH THE CONSERVATION VALUES OF THE PROPERTY. |
| ACCESS 1.1 | Follow appropriate steps to minimize impacts to sensitive resources when opening any areas, roads, or trails for public or management and maintenance access. |
| ACCESS 1.2 | Open designated trails to the public and ensure baseline level of public access. |
| ACCESS 1.3 | Develop framework/strategies to ensure financial sustainability of public access. |

Sustainability means meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.

—The Bruntland Commission of the United Nations, March 20, 1987

- ACCESS 1.4 Implement Visitor Registration System and Special Use Permit System to control and monitor access.
- ACCESS 1.5 Coordinate public access with other property uses, including timber harvest, restoration, and conservation.
- ACCESS 1.6 Monitor the condition of access features, including staging area, trails, to assess condition of features and impacts to resources; utilize findings for adaptive management.
- ACCESS 1.7 Abide by the requirements of the Conservation Easement.
- ACCESS 1.8 Patrol and monitor closed areas for the protection of natural resources.
- ACCESS 1.9 Provide robust education and management policies to prevent nuisance trash that attracts corvids.



- ACCESS 2 MANAGE RISK AND SAFETY.
- ACCESS 2.1 Provide patrol, monitoring, security, and signage for public safety and protection of resources.
- ACCESS 2.2 Provide trail etiquette coaching to users and safety monitoring.
- ACCESS 2.3 Work with partners to ensure adequate provision of emergency services.
- ACCESS 2.4 Collect and maintain incident and accident reports and respond accordingly to reduce hazards.
- ACCESS 3 ENGAGE A VARIETY OF PARTNERS IN PUBLIC ACCESS MANAGEMENT.
- ACCESS 3.1 Establish user-agreements with organized user groups that identify responsibilities of user groups
- ACCESS 3.2 Engage organized groups and individuals in stewardship activities, such as volunteer patrols, interpretation, and trail construction and maintenance, where appropriate.

- ACCESS 4 MINIMIZE THE IMPACT ON THE SECURITY, PRIVACY, AND RURAL CHARACTER OF THE NEIGHBORHOODS NEAR THE PROPERTY, WHILE ACHIEVING THE OTHER GOALS OF THE PLAN.
- ACCESS 4.1 Provide buffers between public access features and neighboring properties where feasible.
- ACCESS 4.2 Utilize signage and surveillance to minimize impacts to neighboring properties caused by trespassing or other activities.
- ACCESS 4.3 Design access features to complement the natural character of the San Vicente Redwoods property and the Santa Cruz Mountains, as well as adjacent rural neighborhoods.

RECREATIONAL ACCESS GOALS AND POLICIES

RECREATION 1 PROVIDE OPPORTUNITIES FOR NON-MOTORIZED RECREATION.

- RECREATION 1.1 Open trails within San Vicente Redwoods for low impact recreation.
- RECREATION 1.2 Allow hiking on designated trails.
- RECREATION 1.3 Allow bicycle use on designated trails.
- RECREATION 1.4 Allow dogs on leash on designated trails.
- RECREATION 1.5 Allow equestrian use on designated trails.
- RECREATION 1.6 Allow for quiet enjoyment of nature.

RECREATION 2 PROVIDE FOR PUBLIC STAGING/PARKING.

- RECREATION 2.1 Provide a staging area off of Empire Grade.

RECREATION 3 PROVIDE A TRAIL NETWORK THAT SUPPORTS MULTIPLE USES WHILE MINIMIZING CONFLICTS.

- RECREATION 3.1 Provide trail opportunities that offer a variety of experiences through different habitats, different trail lengths, and difficulty levels.

RECREATION 3.2 Follow appropriate steps to ensure that trail routes avoid the following, to the extent possible: neighbor views, safety hazards, impacts to sensitive resources, and interference with timber harvest operations, other natural resource management, and ongoing general operations.

RECREATION 3.3 Provide multi-use access on designated existing roads.

RECREATION 3.4 Construct new trails that allow for bicycle and equestrian uses to be separated or improve sustainability of multi-use trails.

RECREATION 3.5 Provide loop trails, especially in the northern part of the property where they can be accessed from the Empire Grade staging area.

RECREATION 3.6 Provide through-trails that connect from the Empire Grade staging area to the Cotoni-Coast Dairies property.

RECREATION 3.7 Collaborate with the Bureau of Land Management on potential loop trails accessible from the Cotoni-Coast Dairies property.

RECREATION 4 PROMOTE REGIONAL TRAIL CONNECTIONS.

RECREATION 4.1 Designate a Skyline-to-Sea Trail corridor through San Vicente Redwoods, extending from Empire Grade to the Cotoni-Coast Dairies property.

RECREATION 4.2 Coordinate with adjacent open space managers to facilitate regional trail connections.

RECREATION 4.3 Provide additional trail connections to other public open space lands where feasible.

RECREATION 5 PROVIDE AMENITIES THAT SUPPORT NON-MOTORIZED RECREATION ACTIVITIES.

RECREATION 5.1 Provide trail-related amenities, such as signage and benches.

RECREATION 5.2 Provide amenities at the staging area; amenities may include signage, benches, trash receptacles, restrooms, and bicycle parking.

RECREATION 5.3 Provide picnic facilities and allow for informal gathering in designated areas.

EDUCATION AND RESEARCH ACCESS GOALS AND POLICIES

All of the recreation goals listed above also apply to education and research, but additional goals include the following.

EDUCATION 1 PROVIDE THE OPPORTUNITY FOR PARTNERS TO CONDUCT RESEARCH AND EDUCATION ABOUT THE RESOURCES AND ACTIVITIES AT SAN VICENTE REDWOODS.

EDUCATION 1.1 Allow partners to interpret the natural and cultural resources of San Vicente Redwoods, as well as active uses of the property (sustainable timber harvest and restoration activities).

EDUCATION 1.2 Allow for use of property by school groups, tours, and other educational groups.

EDUCATION 2 UTILIZE RESEARCH AS A MANAGEMENT TOOL.

EDUCATION 2.1 Encourage research projects that will inform management of public access, such as studies that monitor environmental impacts of visitors on the reserves.

EDUCATION 2.2 Consider research outcomes in management decisions and any updates to the Public Access Plan.

LAND TRUST OF SANTA CRUZ COUNTY
SAN VICENTE REDWOODS PUBLIC ACCESS PLAN
GOALS AND POLICIES

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4 RECREATION ACCESS PLAN



Photo courtesy of Ian Bornarth.

The Recreation Access Plan is intended to guide the development of high-quality non-motorized recreation opportunities that meet the goals for access defined in Chapter 3, Goals and Policies, as well as the conservation goals for the property. Non-motorized recreation activities appropriate for San Vicente Redwoods are defined as allowable uses, below.

The types of recreational use that are allowable at San Vicente Redwoods, as well as concepts for providing baseline (minimum) and maximum levels of trails and other access features to support recreational use, are identified in this Plan. The Plan aims to provide immediate and long-term recreational access for the local and regional communities, and to build regional connectivity. In order to successfully monitor the impacts of recreational use, public access will be phased by gradually opening more trails and visitor activities. Phase 1 will open a limited network of trails for a variety of recreational uses, and later phases will include more visitor access as management success is demonstrated. Strategies for gauging successful management are identified in Chapter 6, Implementing the Plan. Additional guidance for implementing this Plan is provided in Chapters 6, Implementing the Plan, and Chapter 7, Design and Maintenance Guidelines. All components of the Plan must be in compliance with the California

Environmental Quality Act (CEQA), the purpose of which is to identify and reduce environmental impacts.

ACCESS OVERVIEW AND ALLOWABLE USES

The Conservation Easement for San Vicente Redwoods gives Save the Redwoods League (SRL) the right to provide public access. With the exception of trails that are designated for public access and posted as open, all areas of the property will be closed to public access. The Conservation Partners will collaboratively provide opportunities for non-motorized recreation activities at San Vicente Redwoods as identified in this section. Figure 4-1 shows the Recreation Access Plan at buildout, and Figure 4-2 shows the phased approach to trail network implementation.

The first portion of this chapter applies to the main San Vicente Redwoods property. The Laguna Tract is described in a separate section at the end of this chapter.

ALLOWED RECREATIONAL USES

Allowable recreational uses are dependent on project phasing and will differ for different access features and geographic areas. For instance, each trail will have designated allowable uses that may change over time. The following recreational uses may be allowed at the staging area and on designated trails:

- Hiking
- Biking
- Horse-riding
- Dog-walking (on-leash)
- Picnicking and small group gatherings
- Nature observation

Recreational uses for the main property and the Laguna Tract will be limited to daylight hours, with public access facilities generally opening a half hour after sunrise and closing a half hour before sunset.

Other non-motorized recreational activities that require limited infrastructure and are not identified as a prohibited use (refer to page 4-5) may be allowed as determined appropriate by the Public Access Manager, defined in Chapter 6,

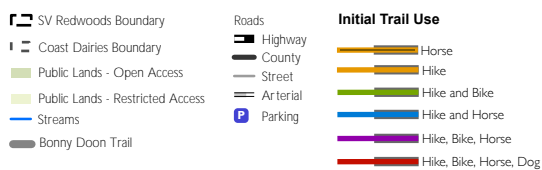
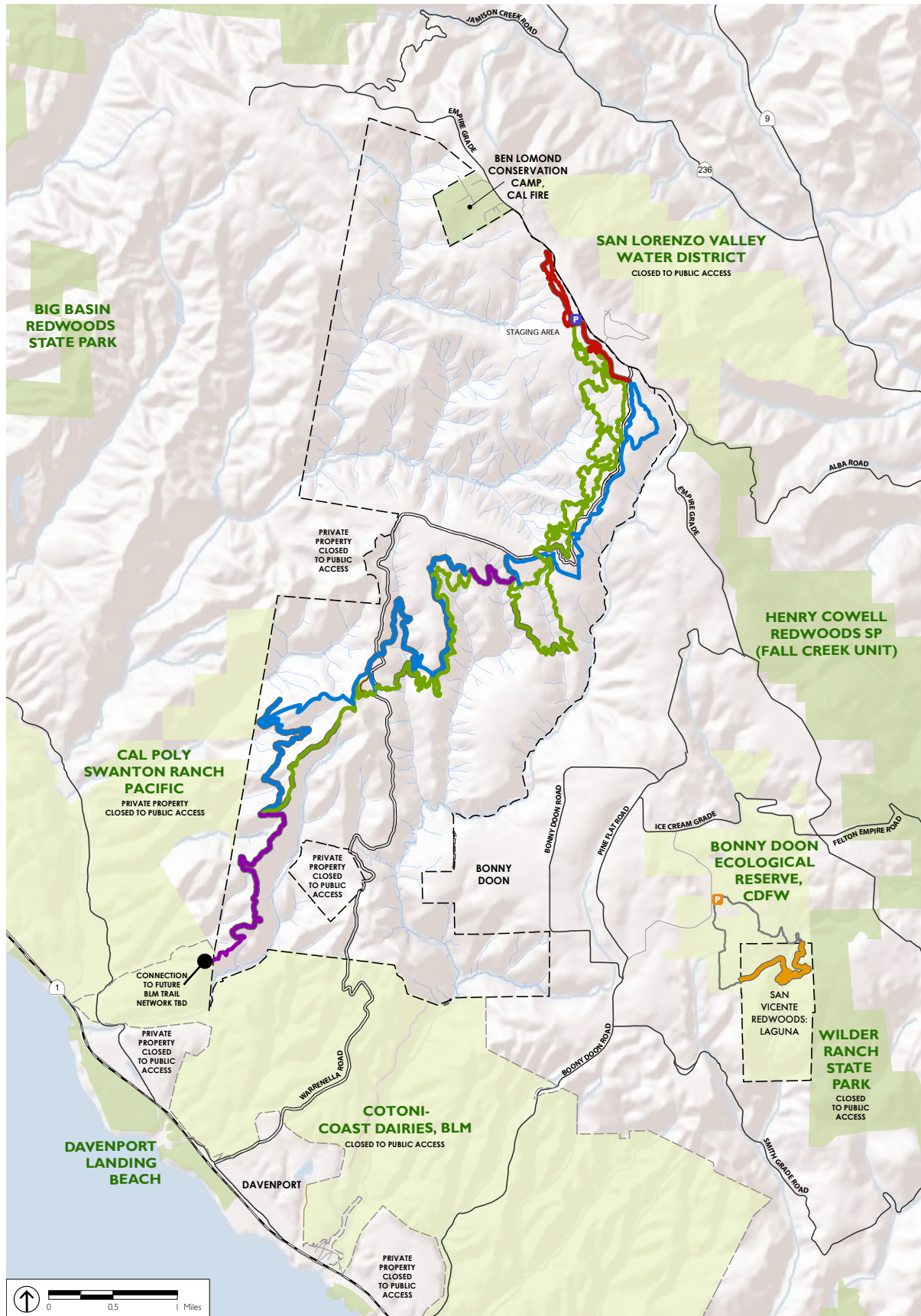


FIGURE 4-I
ACCESS AT BUILDOUT

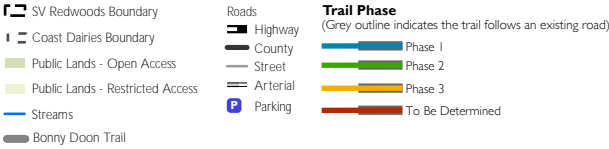
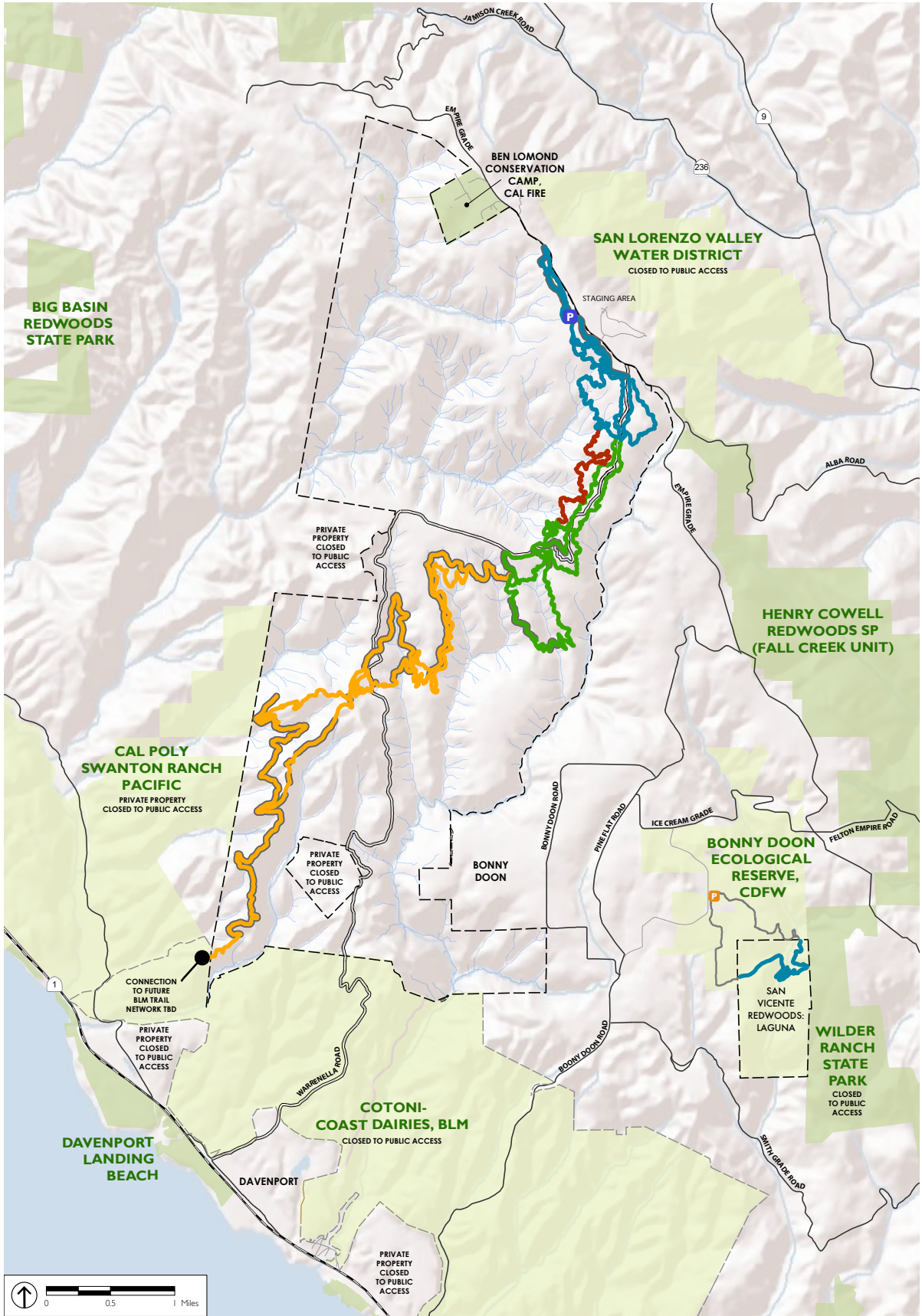


FIGURE 4-2
PHASE I: TRAIL PLANNING

and its partners. Uses that are identified as prohibited in this Plan or that are determined by the Public Access Manager and its Partners to have the potential to contribute additional impacts to resources will not be allowed under any condition.

VISITOR REGISTRATION

All recreational visitors will be expected to register using the free Visitor Registration System prior to use of public access. To register, individuals must provide contact information to the Public Access Manager to be used in case of an emergency and also sign up to receive updates on site conditions and status. Once registered, visitors must sign-in upon arrival to the property. The Public Access Manager will reduce potential barriers to registration by providing both electronic and paper (hard copy) options for registration. Following registration, visitors will be issued a pass (or permit).

Permits may also be required for parking at the designated staging area and/or for certain on-trail recreational use at the discretion of the Public Access Manager, Owner(s), and Conservation Easement Holder.

Visitors will be required to carry their permits on their person, and display a copy on the dashboard of their car when parked at the staging area. Failure to comply with rules may result in the revocation of access permits, as well as citation as further discussed in Chapter 6, Implementing the Plan.

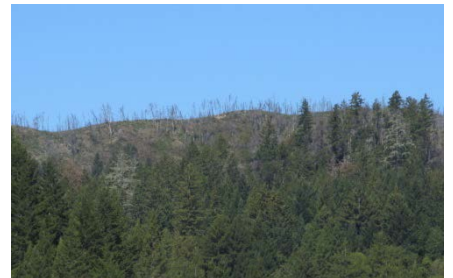
SPECIAL USE PERMITS

Recreational activities will require a special use permit if they are either (1) not identified as an allowed use, (2) would take place outside of daylight hours, or (3) would not be limited to designated public access trails and use areas. Permits will also be required for groups with more than 20 individuals, any special events (such as organized trail runs), or any off-trail activities.

Implementation of a permit program, including permit application review, is further discussed in Chapter 6, Implementing the Plan.

PROHIBITED USES

Activities and recreational uses that will not be allowed on the property through special use permits or under any circumstance include, but are not limited to,



fire making, collecting, hunting, fishing, off-leash dogs, off-road vehicles or motorized dirt biking (including electric bikes), trail building and rock climbing, and rappelling. Camping was considered as a use, but ultimately not included due to fire management concerns. Commercial uses, defined as activities where a fee is charged for a good or service with the intention of making a profit, are prohibited under the Conservation Easement and will not be allowed on the property under any circumstances. The designated Closed Area will be managed to receive minimal visitor activity. Smoking and unpermitted alcohol use will not be allowed on the property under any circumstance.



STAGING AREA

Staging for recreational use on the San Vicente Redwoods property will be limited to one staging area located off Empire Grade. Prior to opening the staging area, 'No Parking' signs will be posted along Empire Grade frontage near the property and pullouts on the property. The staging area lot will be opened in Phase 1 with capacity for 25 to 40 vehicles, including two spaces for horse trailers and two accessible parking spaces. The staging area may be expanded and improved to accommodate up to 90 parking spaces as needed to ensure sufficient parking is provided to prevent parking along the road shoulder in order to protect viewsheds. The staging area will be designed to meet the accessibility requirements of the United States Access Board's Final Guidelines for Outdoor Developed Areas (ODA). See Chapter 7 for additional details and design guidance.

Access features associated with the staging area may include entry gates, signage, informational kiosks or bulletin boards, benches, picnic area/gathering area, wildlife-proof trash and recycling receptacles, dog-courtesy stations, restrooms (composting or pump-out toilet), and water tanks with combined capacity of 9,800 gallons for fire protection purposes.

Where trail connections are established between San Vicente Redwoods and adjacent open space, the adjacent open space may provide additional staging opportunities for San Vicente Redwoods trail users. This is anticipated at the Cotoni-Coast Dairies property and Bonny Doon Ecological Reserve, and will require coordination with managing entities.

TRAIL NETWORK

At full build-out, the network of public access trails on the San Vicente Redwoods property will include multi-use and separate-use trails, as well as loop and through trails. Trail alignments shown in Figure 4-1 include existing roads that will be converted to trails, as well as alignments for newly constructed trails. The trail network will be constructed and opened for public uses in gradual phases, as described below and in Chapter 6, Implementing the Plan.

Key design goals that guided the development of the trail network shown in Figure 4-1 are listed below. Chapter 7, Design and Maintenance Guidelines, provides greater detail regarding requirements for trail design and maintenance.

- Provide for a variety of experiences through different habitats.
- Concentrate loop trails in the northern part of the property, where they can be accessed from the Empire Grade staging area(s).
- Establish through trails connecting the Empire Grade staging area down to the Cotoni-Coast Dairies property.
- Provide buffers around private property.
- Accommodate other property uses, including but not limited to habitat restoration, timber harvest, and research uses.
- Avoid, to the extent possible: neighbor views, safety hazards, and impacts to sensitive resources including but not limited to water sources, forest restoration and management areas, habitat areas, specifically mountain lion communication centers and dens, and cultural resources.

TRAIL NETWORK AT FULL BUILDOUT

Complete implementation of the Public Access Management Plan would result in approximately 38 miles of recreational trails, with over 30 percent of the trails located on existing roads. Through-trails connect from Empire Grade to Cotoni-Coast Dairies property, providing continuous connections for hiking, biking, and equestrian use. Numerous loop trails connect to the through-trail, providing unique recreational experiences and allowing for the separation of use types to reduce user conflicts and improve trail experience. Trail mileage at buildout is summarized in Table 4-1 according to potential designated uses.

TABLE 4-1 TRAIL NETWORK SUMMARY (BUILDOUT)

Initial Trail Use*	Located on Existing Road/Trails (Miles)	New Construction (Miles)	Total Trails at Buildout (Miles)
Main Property			
Horse	0	0.2	0.2
Hike and Horse	5.0	6.8	11.8
Hike and Bike	2	17.1	19.1
Hike, Bike, Horse	2.4	0.5	2.9
Hike, Bike, Horse, Dog	1.3	1.2	2.5
<i>Subtotal (Main Property)</i>	<i>10.7</i>	<i>25.8</i>	<i>36.5</i>
Laguna Tract			
Hike	1.3	0.2	1.5
<i>Subtotal (Laguna Tract)</i>	<i>1.3</i>	<i>0.2</i>	<i>1.5</i>
Total			~38 miles

* Trail use may be strategically adjusted as part of adaptive management.

While this summary of trails assumes that most trails are dual- or multi-use at full implementation, trail use designations may be revised through the adaptive management process discussed in Chapter 6. It is possible that certain areas could remain as single use trails. Trail mileage estimates for trails located on existing roads are estimated based on GIS analysis of existing road length. Trail mileage estimates for newly constructed trails is measured based on 100-foot corridor study areas using GIS and increased by 13 percent to allow for sinuosity, grade changes, and other anticipated variations in trail alignment.

Trails are described below according to initial trail use as illustrated in Figure 4-1. As discussed above, use designations may be revised through the adaptive management process.

SINGLE-USE TRAILS

Trail use designations are subject to change in response to trail conditions and feedback on visitor experiences. Single-use trails are limited to the 1.5-mile hiking-only trail within the Laguna Tract, and a short 0.2-mile trail horse-only connection on the main property. The latter trail connection is a steep trail that is not suited for other uses.

DUAL-USE TRAILS

Dual-use trails are trails that allow hiking and either biking or equestrian uses. There are 19.1 miles of dual use trails that allow hiking and biking, with connections from the Empire Grade to the multi-use trail in the southern portion of the property. Loop hiking and biking trails are concentrated in the northern portion of the property.

The 11.9 miles of dual-use trails that allow hiking and equestrian comprise most of the through-trail experience for equestrian uses, with connections to multi-use trails at the northern and southern ends of the property.

MULTI-USE TRAILS

Multi-use trails are trails that allow more than two uses. There are 2.9 miles of multi-use trails that allow hiking, biking, and equestrian use. These trail segments are located in constrained areas where separate use trails are less feasible, including the southern end of the through-trail and a short segment in the central are of the through-trail.

Approximately 2.5 miles of multi-use trail allows hiking, biking, and equestrian uses as well as on-leash dogs. These trails are located primarily along an existing frontage road that parallels Empire Grade, and is the only trail where dogs are allowed on the property.

PHASED IMPLEMENTATION OF TRAIL NETWORK

The trail network will be constructed and implemented in phases as shown in Figure 4-2 and described in Table 4-2 and below.

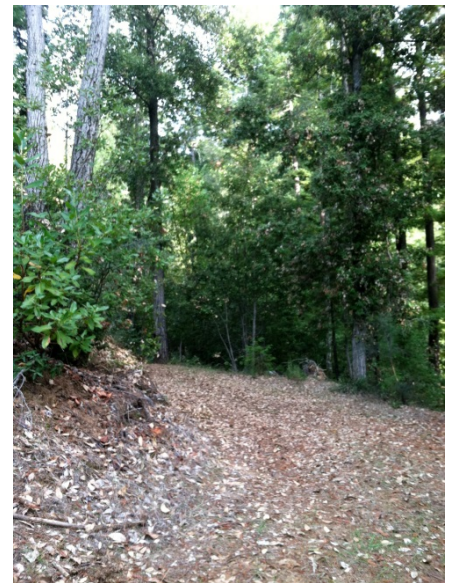


TABLE 4-2 TRAIL PHASING

Trail Phasing*	Located on Existing Road/Trails (Miles)	New Construction (Miles)	Total Trails (Miles)
Main Property			
Phase 1	1.3	7.1	8.4
Phase 2 (additional trails)	1	8.3	9.3
Phase 3 (additional trails)	8.4	8.1	16.5
TBD (additional trails)	0	2.3	2.3
Laguna Tract			
Phase 1	1.3	0.2	1.5
<i>Total Trails at Buildout</i>	<i>12</i>	<i>26</i>	<i>~38 miles</i>



Phase 1 includes approximately 8.4 miles of trails located in the northern area in proximity to the staging area, as well as the 1.5-mile Laguna Tract trail segment to the south. The network of loops in the north offers a range of trail experiences, with initial allowable uses shown in Figure 4-1. Phase 2 will add an additional 9.3 miles of trails, extending the network of new loops south towards the middle of the property. Phase 3 will consist of up to 16.5 miles of trails and complete the through-trail experience from Phase 2 trails to Cotoni-Coast Dairies. Phasing of approximately 2.3 miles of additional trails that would offer hiking and biking loops in the northern area of the main property will be determined based on adaptive management strategies discussed in Chapter 6.

OTHER ACCESS FEATURES

Other access features may include overlooks and gathering areas, signage, limited site furnishings, and gates and fencing for security and safety. Signage should be used to communicate regulatory, directional, hazard, and interpretive information to the public. Limited site furnishings may include benches along the trail network and at scenic vistas or other destinations, as well as picnic

tables in designated areas. See Chapter 7, Design and Maintenance Guidelines, for additional information on access features.

LAGUNA TRACT

The Laguna Tract trail is an existing trail that is to be improved with minor reroutes to reduce potential for erosion. This trail will be accessible only through existing trails on the California Department of Fish and Wildlife's (CDFW) Bonny Doon Ecological Reserve. Trail planning for the Laguna Tract has been conducted in coordination with CDFW. The Laguna Tract is located east of the main property, as shown in Figure 4-1. Management of trails, visitor activities and parking will be coordinated with CDFW to be consistent with management of the Bonny Doon Ecological Reserve. Allowable uses at the Laguna Tract are limited to hiking and nature observation from designated trails. The Conservation Partners will allocate resources to assist with patrol, maintenance and volunteer coordination, as discussed in Chapter 6 below.

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5 EDUCATION AND RESEARCH ACCESS PLAN



Research and educational uses are similar in that they share the goal of increasing knowledge and understanding. While research uses strive to generate new information and understanding, education is focused on sharing experiences, concepts, and information.

Activities associated with primary and secondary education, or community education conducted by organized community or non-profit groups, are unique types of public access. While such uses are complimentary to recreational access, the requirements and implications of successful educational access programs are unique and therefore addressed independently in this chapter.

This chapter identifies potential education uses that are allowable types of public access, as well as the facilities and management framework necessary for successful programs. While research is not considered a type of public access, public access features may support research uses and therefore an overview of potential research uses is provided in this chapter. Goals and policies for education and research are provided in Chapter 3, Goals and Policies.

ACCESS OVERVIEW AND ALLOWABLE USES

There are endless opportunities for educational activities and research at San Vicente Redwoods. However, permits will be required for all research projects and for educational uses, except where such uses are indistinguishable from recreational uses and will only occur on publicly accessible trails and staging area(s). Potential educational and research uses are discussed below.

PRIMARY, SECONDARY, AND COMMUNITY EDUCATION USES

Education uses considered as public access uses may include but are not limited to interpretive tours, field classes, eco-tourism, and restoration-based education and stewardship activities. San Vicente Redwoods is well situated to provide rich experiences for students of all ages, although group size may be limited depending on the intended location and duration of the activity.

Educational programs may be organized by primary or secondary schools, non-profit organizations, or other partners. Educational themes may include the ecological, historical, and social aspects of the property. In addition, San Vicente Redwoods may become an ideal location to showcase the synergist relationship between public access, resource protection, and resource management (timber harvest).



HIGHER EDUCATION AND RESEARCH USES

As discussed above, research is not considered a type of public access but is discussed in this chapter because public access features have the potential to support research uses. Research uses may include a variety of project types ranging from short- to long-term projects; private projects to student or class projects; and site-based to landscape scale studies. San Vicente Redwoods provides ample opportunities for both natural and social science studies, as well as for research that extends across multiple protected open space areas. Research may be conducted within restoration, conservation reserves, or the working forest, pending a permit as discussed under Permit System, below, and in Chapter 6, Implementing the Plan. Research and higher education uses are not considered public access.

Universities and others interested in conducting research on the property should coordinate directly with the Save the Redwoods League (SRL) as the SRL will hold the conservation easement for the property. The Public Access Manager can facilitate appropriate introductions on request.

PHYSICAL REQUIREMENTS

The physical and spatial requirements for research and education projects will vary according to the project and/or activity. However, the following physical requirements generally satisfy the key demands of uses appropriate for the properties:

On-Road Access. Given that research and education may be permitted at various areas throughout the property, use of access points and roads beyond those identified for public access may be required in many situations. Such use will need to be carefully coordinated with other property uses, including restoration and timber harvest.

Off-Road Access. In addition to utilizing existing roads, research and education uses may require off-road access throughout the property, including but not limited to, watercourses, sensitive habitats, and active areas of the working forest. During the permit review process, areas affected by proposed projects and/or programs and their potential impacts will need to be assessed.

Gathering Spaces. Gathering spaces may be necessary for certain education projects and programs, depending on the specific project and the number of individuals involved. Gathering spaces can be informal, and should be located in areas where tree removal and/or vegetation clearing will not be required. The intent of establishing such areas is to concentrate impacts in specified areas while creating desirable places to gather in terms of meaningful views, physical comfort and unique experiences. Chapter 7, Design and Maintenance Guidelines, provides additional guidance for the development of informal gathering spaces.

CONTROLLING AND MONITORING ACCESS

Special use permits are the primary tool for controlling and monitoring access by primary and secondary education. Special use permits will be required for all





primary and secondary educational uses, except where such uses are indistinguishable from recreational uses that will only occur on publicly accessible trails and staging area(s) and are allowed through the visitor registration system. Implementation of the visitor registration system and special use permit program is discussed in Chapter 6, Implementing the Plan.

6 IMPLEMENTING THE PLAN



This chapter is intended to guide implementation of the Public Access Plan (Plan), including development of public access features and management of recreational uses. Key components of this chapter include the identification of an appropriate management framework under the Initial and Future ownership scenarios; a phasing plan that also defines the baseline and maximum level of access to be provided; implementation strategies; financial considerations; and a discussion of future planning and environmental review. Implementation of the Public Access Plan is dependent upon adequate funding for capital improvements and ongoing operations and maintenance, and adherence to the adaptive management approach described in this Chapter. Specific design and maintenance guidelines are provided in Chapter 7, Design and Maintenance Guidelines.

MANAGEMENT FRAMEWORK

Although Save the Redwoods League (SRL) holds the right to provide and responsibility to allow for public access under the terms of the Conservation Easement with the owners, it is anticipated that other entities will take on management responsibilities under contracted agreements with the SRL or the owners. This section describes the key parties responsible for providing, or supporting provision of, public access at San Vicente Redwoods; identifies the legal agreements that will define relationships and responsibilities; and

describes potential organizational structure under the Initial and Future access scenarios. The purpose of this framework is to (1) support coordination between responsible parties, and (2) ensure the protection of the seven conservation values through proactive adaptive management. As discussed in Chapter 2, the Conservation Values include: (1) statewide and regional conservation significance, (2) forests, (3) biodiversity, (4) watershed protection, (5) viewshed protection, (6) landscape and habitat connections, and (7) public recreation, education, and scientific study. Phased implementation and adaptive management will allow for managers to balance visitor experience and protection of the Conservation Values. The distribution of management responsibilities amongst key parties will depend on potential changes in ownership of the property. In order to provide clear guidance as well as flexibility given the unknown future ownership of the property, management structure under current ownership and under potential future ownership scenarios are discussed in this Plan. The Laguna Tract, as it is accessible only through the CDFW's Bonny Doon Ecological Reserve, will be subject to certain differences in management as indicated below.



Photo courtesy of Nadia Hamey.

RESPONSIBLE PARTIES

Key parties with responsibility to provide management, or support the provision of public access at San Vicente Redwoods, are identified below. Responsibilities of each party are detailed in the Implementation Plan, and relationships between these parties are described below under Organizational Structure. The Conservation Easement Holder, property owners, and Public Access Manager comprise the four Conservation Partners..

- **Conservation Easement Holder.** The SRL will hold the Conservation Easement, and therefore has the right to provide and responsibility to allow for public access consistent with the Public Access Plan.
- **Landowner.** Peninsula Open Space Trust (POST) and Sempervirens Fund are the Landowners. The owners are the entities holding title to the land. The owners will provide broad management and steer stewardship of the entire property.
- **Public Access Manager.** The Land Trust of Santa Cruz County (Land Trust) is responsible for implementing the Plan as the Public Access Manager. The Public Access Manager does not need to conduct all of the tasks identified

in the Implementation Plan, but will be responsible for ensuring that they are carried out through coordination with and oversight of the Conservation Partners and other entities. The Public Access Manager will be responsible for financial management, marketing, and fundraising for public access, and managing maintenance and security of parts of the property opened for or affected by public access. In addition, the Public Access Manager will monitor access demand and impacts, and update management and maintenance plans pertaining to public access as necessary to ensure that the Public Access Goals identified in this Plan are met.

- **Property Manager:** The Property Manager is a contractor to the property owners with expertise in forestry, ecology, and land management. The Property Manager will oversee stewardship activities that are outside the scope of the Public Access Manager, but that are essential to upholding the Conservation Values.
- **Law Enforcement:** The Santa Cruz County Sheriff's Office (County Sheriff) will provide law enforcement to ensure compliance with state laws, and provide for public safety and protection of the Conservation Values. If Santa Cruz County Parks Department (County Parks) acquires the capacity to provide peace officers, the role of law enforcement may be transferred from County Sheriff to County Parks.
- **Steward:** County Parks will provide stewardship, interpretation, and maintenance services for the first three years of implementation. After that time, financial considerations may change this role.
- **Emergency Response:** CAL FIRE will provide emergency medical and firefighting services, consistent with delivery of services in the Santa Cruz County Fire Department.
- **California Department of Fish and Wildlife (CDFW):** CDFW owns the Bonny Doon Ecological Preserve, through which access to the Laguna Tract trails are provided. The Public Access Manager will coordinate with CDFW and provide appropriate signage, maps and patrols on the Bonny Doon Ecological Preserve and the Laguna Tract, and to assist in the maintenance of the parking area.

ADDITIONAL PARTNERS

Partnerships with user groups, institutions, and others will be important to successful implementation. Potential partners include but are not limited to recreational user groups, such as Mountain Bikers of Santa Cruz and the Santa Cruz County Horsemen's Association; local schools and school districts; and other groups with interest and capacity to help realize the conservation vision for the properties. Tasks that partners may assist with may include trail development and maintenance, trail etiquette and safety patrol, monitoring, and provision of educational programming and interpretation. Written agreements will need to be developed where the use of the property is contingent upon fulfillment of specified responsibilities.

DOCENTS AND VOLUNTEERS

Volunteers are significant in building a community of regular visitors with a strong stewardship ethic, which will become the culture of the property and influence the behavior of other visitors. Multiple roles for volunteers are envisioned, which will cater to different personalities and capacities: patrol, maintenance, interpretation, and trail construction. Hikers, horseback riders, and bike riders have all expressed enthusiasm for helping make the trail construction and management process successful.

LEGAL FRAMEWORK/AGREEMENTS AND LIABILITY



- **Conservation Easement.** The Conservation Easement is the legal agreement between the Landowners (POST and Sempervirens Fund) and the Easement Holder (the SRL) that identifies specific terms for conservation and potential uses of the property. As the holder of the Conservation Easement, the SRL has the right to provide and the responsibility to provide for public access.
- **Access Management Agreement.** An Access Management Agreement will be established between the Conservation Partners, giving right and responsibility for management responsibilities identified in the Implementation Plan to the Public Access Manager.
- **Use Agreements.** Use Agreements may be established between the Public Access Manager and organized user groups. Such agreements may be used to establish conditions under which user groups may access the property,

and specify the type of access allowed. An example of a use agreement would be for an organized trail run.

It is important that all responsible parties, including the Landowners, Conservation Easement Holder, and Public Access Manager, maintain appropriate liability protection insurance. However, successful control and monitoring of access will minimize liability concerns for all responsible parties, as well as potential for conflicts between the various uses of the property (including recreational, research, educational, conservation, restoration, and timber harvest, and other). For instance, liability can be reduced by ensuring that all the users are aware of allowed activities, appropriate behavior and trail etiquette, hazards, and any other access limitations (including boundaries). Strategies for ensuring that users understand and agree to conditions include implementing a registration and permit program; providing on-site signage identifying regulations, allowed uses, and user responsibilities; and conducting orientation programs for user groups.

ORGANIZATIONAL STRUCTURE

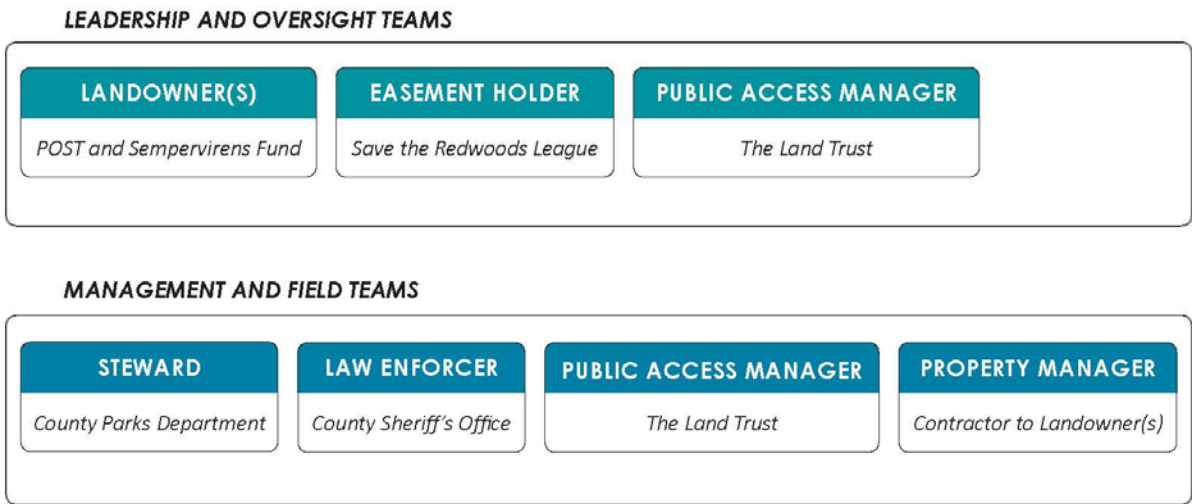
Organizational structure under the Initial access and Future access scenarios is described below and illustrated in Figure 6-1. Within the figures, solid arrows indicate decision making authority and coordination between entities. As discussed above, the SRL has the right to provide and responsibility to allow for public access regardless of property owner or management structure.

INITIAL ACCESS

The management structure for providing initial access is applicable as long as POST and Sempervirens Fund retain ownership of the property. Under this management structure, the Landowners and the Easement Holder (the SRL) would provide oversight and leadership but would not be responsible for managing public access. The Public Access Manager will be the Land Trust, and would manage access under an agreement with the Landowners and Easement Holder. To facilitate long-term and ongoing management, the responsible parties described above will work in Public Access Coordination Teams as described below and in Figure 6-1. This structure will ensure that all responsible parties are aware of conditions and activities on the property.

- Leadership and Oversight Teams.** Representatives from the landowners, Easement Holder, and Public Access Manager will comprise both the Leadership Team and Oversight Team. The Leadership Team will be tasked with fundraising and communications policy, as well as conflict resolution, with the landowners and easement holder having ultimate decision-making authority. The Oversight Team will also manage access related to higher education and research.
- Management and Field Teams.** The Public Access Manager, County Sheriff's Office, and County Parks Department will comprise the Management Team and Field Team. The Management Team, which will also include the Property Manager, will be responsible for collaborating on week-to-week decisions, and the Field Team will manage day-to-day operations related to public access including recreation and primary, secondary and community education. The Field Team will collaborate with Public Access Volunteers.

Figure 6-1 Initial Access Organizational Structure



FUTURE ACCESS

Public access on San Vicente Redwoods is governed by this Plan until replaced by another Public Access Plan. That plan will be subject to review and approval by the Conservation Easement holder, per the conservation easement. In the event of an ownership change, where POST and Sempervirens Fund transfer fee title for the property to another entity, the parties to that transfer will reexamine the Public Access Plan and amend as appropriate. If that future landowner is not in a position to manage public access, key parties would determine the appropriate approach for continued management of public access. Under that scenario, the Land Trust anticipates continuing to manage public access. If amendments to the Public Access Plan are significant, they will be subject to additional environmental review.

MANAGEMENT ZONES

Three unique management zones will guide public access management activities at San Vicente Redwoods. These zones and the implications to management, maintenance and operations are identified below.

- Staging Area (4.7 acres). This zone is limited to the staging area vicinity and will receive the highest level of concentrated use, and will require regular management and maintenance.
- Public Access Area (460 acres). This zone includes a 100-foot-wide corridor centered on the trail, with 50 feet on either side. Ongoing maintenance and management will be required in this area, including management and monitoring to ensure that use is limited to designated trail alignments.
- Closed Area. Most of the property (approximately 94 percent) is closed to routine public access. As part of the research and education component of the proposed Public Access Plan, these uses would be permitted throughout the property on a case-by-case basis. The Management Team will focus management efforts in this zone on approving appropriate research and education uses and preventing access and addressing any trespass.

RULES AND REGULATIONS

Extensive rules and regulations will protect the seven Conservation Values. Rules and regulations will include but not be limited to:

- Access is restricted to designated trails and the staging area (Public Access Area and Staging Area Zones).
- Trail users must comply with designated allowable trail uses.
- Dogs are allowed on-leash only on designated trails and the staging area.
- Public access is limited to daylight hours.
- Uses that will not be allowed on the property under any circumstance include, but are not limited to:
 - smoking
 - unauthorized alcohol use
 - fire making
 - hunting
 - camping
 - mushroom harvesting
 - firewood gathering
 - fishing
 - building log or rock pile dams
 - off-leash dogs
 - off-road vehicles or motorized dirt biking (including electric bikes)
 - unauthorized trail building
 - rock climbing and rappelling

PHASING PLAN

The Public Access Plan provides a guide for implementation sequencing. However, adjustments may be required based on future unknown conditions such as available funding, contributions of partner organizations, opportunities for creating regional connections, and changes in ownership and management. As a first step, implementation of the Public Access Plan will also be informed by the adaptive management strategies discussed below under Implementation Plan, including routine monitoring, clear metrics for success, and regular review, which allow for adjustments to phasing. Successful achievement of adaptive

management indicators will be used to guide advancement from one phase to the next as well as to inform any changes to trail use designations.

Three phases of implementation are identified for San Vicente Redwoods, as summarized in Table 6-1 and further described below. With each phase, opportunities for recreational use would be expanded pending successful implementation for the previous phase. Impacts that result from public access will be monitored during each phase, and if successful management is demonstrated, implementation of the next phase would be appropriate. Similarly, the number of parking spaces in the staging area will be expanded based on implementation phase as well as adaptive monitoring and management. For instance, if the parking area is regularly filled to capacity, the Oversight Team may decide to expand the parking area to avoid visitor parking on the shoulder of Empire Grade. The staging area will provide 25 to 40 parking spaces in Phase 1 and can be expanded to 98 spaces as needed. Phasing is further described below, and trail alignments are described in Chapter 4.

TABLE 6-1 PHASING STRATEGY

Phase	Visitor Activities	Total Cumulative Trail Miles	Estimated Timeline for Phase Initiation
Phase 1	Hike (all trails) bike, horseback ride, dog walk (on select trails)	9.9	Year 1 (staging area and trails available at opening)
Phase 2	Hike (all trails) bike, horseback ride, dog walk (on select trails)	19.2	Year 3, 4 or 5, assuming success in Phase 1
Phase 3	Hike (all trails) bike, horseback ride, dog walk (on select trails)	35.7	Year 5, 6 or 7, assuming success in Phase 2 and completion of connecting trails at the Cotoni-Coast Dairies property
To Be Determined	Additional trails near Phase 2 trails	38	To be determined



PHASE 1

The focus of the first phase of implementation is to provide the baseline level of public access. This includes establishing the staging area with 25 to 40 parking

spaces, opening of 8.4 miles of trails within the main property, and providing necessary signage and security measures. This trail network and the staging area is intended to be complete prior to the opening of the property for public access, and is envisioned to provide visitors the opportunity to recreate on the property for at least two hours if bicycling and four hours if hiking. If monitoring of visitor impacts demonstrates successful management of Phase 1, it will be appropriate to advance to Phase 2. Phase 1 also includes the opening of a 1.5-mile trail within the Laguna Tract that will be for hiking-only use. The opening of this trail would be independent of the 8.4 miles of Phase 1 trails for the main property, but is anticipated to occur prior to the initiation of Phase 2.

PHASE 2

Phase 2 of the Plan will focus on providing loop trail opportunities. Additional trails opened to the public in Phase 2 will include up to 8.3 miles of new construction and 1 mile of improved existing road, bringing the total network to 19.2 miles. To accommodate additional visitors, the staging area may be expanded to up to 98 spaces.

PHASE 3

Phase 3 of the Plan will focus on extending the trail network and establishing regional trail connections. Up to 16.5 miles of trail will be added, with trail connections from the San Vicente Redwoods staging area through the property to Cotoni-Coast Dairies property, creating opportunities for ridgeline to the shoreline experiences. Implementation of this phase is dependent on establishment of connecting trails at the Cotoni-Coast Dairies property.

ADDITIONAL TRAILS: PHASING TO BE DETERMINED

Approximately 2.3 additional miles of trail may be established if adaptive management monitoring determines that management of public access in previous phases has successfully protected Conservation Values. These additional trails include three segments, each of which would offer a unique loop experience that connects to Phase 1 or Phase 2 trails. Implementation of these trails would be independent of Phase 3 implementation, but would not be established until successful implementation of Phase 2 trails has been established.

IMPLEMENTATION PLAN

The Implementation Plan identifies tasks and responsible parties for implementation under the initial organizational structure described under Management Framework, above. The Implementation Plan utilizes all five overarching management strategies utilized by the National Park Service to manage visitor impacts, including site management, rationing (capping use), regulations, deterrence and enforcement, and visitor education. The Implementation Plan, shown in Table 6-2, presents the implementation tasks and related policies, which are defined in Chapter 3, Goals and Policies. Table 6-2 also identifies in which management zone each task will be implemented.

TABLE 6-2 IMPLEMENTATION PLAN

Task	Management Zone	Related Policies
Capital Improvements Implementation Tasks		
Improve existing roads for use as trails.	Staging and Public Access Areas	ACC.1.2 REC.3.3
Design and construct new trails.	Staging and Public Access Areas	REC.3.1 REC.3.2 REC.3.4
Construct/install other access features (staging, signage, benches, restrooms, wildlife-proof trash receptacles, etc.).	Staging and Public Access Areas	ACC.2.1 ACC.4.3 REC.2.1 REC.5.1 REC.5.2
Construct/install security features	All	ACC.2.1 ACC.4.2
Safety, Security and Maintenance Tasks		
Open and close trail access as necessary.	Staging and Public Access Areas	ACC.1.5 REC.3.2
Remove litter and waste.	All	ACC.1.6
Maintain public access features.	Staging and Public Access Areas	ACC.1.6
Provide professional security and safety patrol.	All	ACC.1.6 ACC.2.1

TABLE 6-2 IMPLEMENTATION PLAN

Task	Management Zone	Related Policies
Provide emergency services.	All	ACC.2.3
Provide trail etiquette and safety monitoring.	Staging and Public Access Areas	ACC.2.2
Visitor Education and Use Management Tasks		
Provide visitor education.	Staging and Public Access Areas	ACC.2.2
Establish and manage a visitor registration system.		ACC.1.4
Establish and manage a permit system and fee system.		ACC.3.1 RES.1.2
Manage Parking.	Staging Area	
Manage Mountain Bike Use	All	ACC.1.1, 1.2, 1.4, 1.6, 2.1 and 2.2
Other Management and Administrative Tasks		
Coordinate with responsible parties and management teams		ACC.1.5
Coordinate with adjacent open space managers and other neighbors.		REC.2.2
Develop and implement the financial management strategies; update as needed.		ACC.1.3
Develop and implement a trail maintenance system; update as needed.		ACC.1.1 RES.2.3
Develop and implement adaptive management strategies.		ACC.1.7

Three broad categories of tasks are identified in the Implementation Plan: Implement Capital Improvements; Provide Ongoing Maintenance and Security; and Manage Public Access. All tasks will need to be conducted in all phases, with the possible exception of construction of new trails. Implementation tasks and recommended strategies for completing the tasks are discussed below according to category.

CAPITAL IMPROVEMENTS

The design and construction of capital improvements should adhere to the guidelines provided in Chapter 7, Design and Maintenance Guidelines, as well as any permit requirements.

Access features may include staging, signage, informational kiosks or bulletin boards, benches, picnic tables, restrooms, trash receptacles, dog courtesy stations, and other site furnishings. No visitor centers, amphitheaters or other large built elements are planned. Security features installed on-site are anticipated to include gates, fencing, signage, and cameras. Up to two portable staff offices sized for a parking space may be located in the staging area for use as staff offices and equipment storage. The portable offices may be shipping containers with appropriate upgrades and aesthetic treatments. The Land Trust will collaborate with the CDFW to support improvements they make to their Martin Road staging area.

SAFETY, SECURITY, AND MAINTENANCE AND OPERATIONS

Recommended strategies for implementing safety, security, maintenance and operations tasks are provided below. The Management and Field Teams will be responsible for these efforts, with the Public Access Manager leading efforts and County Sheriff's Office and County Parks providing support. The County Sheriff's office will provide law enforcement to ensure compliance with State laws and County ordinances, provide for public safety, and protect the Conservation Values. County Parks Department will provide maintenance and patrol services for trails and access roads, as well as visitor engagement and education. The level and type of effort required will vary for each management zone as described above. The Sheriff's Office and County Parks Department have committed to provide these services. The Conservation Partners will offset costs of the Sheriff's Office and County Parks Department's participation, as described below under Implementation Costs.

OPEN AND CLOSED TRAIL ACCESS

The Public Access Manager will be responsible for opening and closing staging area(s) and trails using gates and/or signage as described below:

- Open and close gates daily for Empire Grade staging area. Public access will be limited to daylight hours. Staging Area gates shall be opened

approximately 30 minutes after sunrise and closed 30 minutes before sunset. Close trails and/or staging areas based on seasonal or extended closures, as necessary to accommodate other property uses including timber harvest, conservation, restoration, and extreme fire danger (including National Weather Service 'red flag' days). The property should also be closed if wet weather conditions limit the ability of emergency vehicles to access the property.

- Utilize temporary re-routes and/or trail closures to minimize potential conflicts with timber harvest activities.
- Close trails that do not meet the maintenance criteria identified in Chapter 7, Design and Maintenance Guidelines, until the trails are improved to meet criteria.
- Close property to mountain bikes and/or other user groups if unauthorized use cannot be effectively managed.
- The Public Access Manager will collaborate with the CDFW to support management of the CDFW's Martin Road staging area.

LITTER AND WASTE MANAGEMENT

Trash shall be removed at least weekly, and at a frequency sufficient to prevent trash overflow at the receptacles and to minimize wildlife-attracting odors. All trash and recycling receptacles will be wildlife-proof. Signage and visitor education should instruct visitors to pack out and/or properly dispose of all waste. Litter, food scraps, and dog waste should be picked up and disposed of as part of regular monitoring and patrol activities.

MONITOR AND MAINTAIN PUBLIC ACCESS FEATURES

The staging area, trails, and other public access features (such as water tanks, signage, furnishings, and monitoring equipment) should be monitored and maintained by the Management and Field Teams to meet guidelines and criteria provided in Chapter 7. Features that do not meet conditions specified in Chapter 7 should be improved or closed to public use until improvements can be completed. Monitoring and maintenance should address drainage, vegetation, and graffiti or damage to the property. Specific guidelines for trail maintenance are provided in Chapter 7. Monitoring and maintenance activities should include but not be limited to:

- Inspect restrooms three times a week and maintain restrooms at least weekly and more frequently when necessary.
- Clean graffiti and fix vandalism within 48 hours of discovery to demonstrate evidence of stewardship and resistance to vandalism.
- Ensure maps and educational materials are stocked.
- Monitor trail conditions and maintain trails to encourage visitors to stay on trails by rapidly clearing down trees that fall onto or affect access along the trail, and maintaining brush, drainage, signs, gates, and barriers. Respond with increased effort and/or a more rapid response if off-trail use takes place due to trail maintenance issues. Conduct cross country scouting (contour patrols) to locate unauthorized trails, decommission as quickly as possible, and respond with increased patrol, engagement, and enforcement including prosecution.
- Monitor the Public Access Area for occurrences of California Invasive Plant Council high and medium priority 'Red List' species, and manage those populations for eradication, if feasible, and containment, if infeasible.
- Track the availability of parking, and whether the parking area is regularly filled to capacity.
- Monitor water tanks quarterly to ensure tanks are at least 80 percent full and showing structural integrity.
- Provide separate maps for the main property and the Laguna Tract to clearly distinguish between these two distinct recreational opportunities, and collaborate with the CDFW to show the closed areas of the Bonny Doon Ecological Reserve on maps.

PROVIDE PROFESSIONAL SECURITY AND SAFETY PATROL

Public access features, including staging area(s) and trails, will be patrolled on a regular basis by the Management and Field Teams, including the County Sheriff's office. The County Sheriff will ensure a rapid response and a credible deterrent to those who would violate laws and regulations (see rules and regulations, above).

In addition to patrol, trails may be monitored using photographic monitoring in the Closed Area and for nighttime monitoring of the Staging Area and Public

Access Area. Patrol and enforcement activities should be initiated when construction activities begin. For instance, on discovery of an unauthorized trail, the trail should be dismantled as rapidly and completely as possible, and tools or equipment should be confiscated. County Sheriff should attempt to identify builders and users and engage them, with enforcement as necessary, to motivate compliance with rules. If necessary, the Public Access Manager will prosecute and make civil court claims where appropriate.

The Management and Field Teams should track visitor compliance with Closed Area, nighttime, and weather related closures, and increase management effort as needed to ensure compliance. Estimated labor cost for provision of patrol is identified under Financial Considerations, below.

PROVIDE EMERGENCY SERVICES

Emergency services include police, fire, and medical services. Emergency services will be provided by the Santa Cruz County Fire Department, which is managed by CAL FIRE. The Land Trust will develop a safety and emergency management plan in collaboration with CAL FIRE and the Santa Cruz County Sheriff's Office that identifies specific roles and responsibilities. The plan will include but not be limited to the response strategies identified in Table 6-3.

PROVIDE TRAIL ETIQUETTE AND SAFETY MONITORING

Patrol activities should demonstrate a stewardship presence, and foster a culture of responsibility among visitors to increase user compliance with closed area designations, and rules regarding litter, food scraps and dog waste. Patrol should also provide education on safe trail use, including educating visitors on trail options for their selected use. Bike bells, which jingle to alert visitors of approaching cyclists, may be provided to users to further reduce potential use conflicts. Specific tasks for providing visitor education include but are not limited to:

- Engage and educate horseback riders and other visitors about actions they should take to avoid the introduction of non-native plants and animals.
- Educate horse and dog owners in the actions they must take to protect water quality by cleaning up their animal waste, especially in proximity to streams. Provide bags and trash receptacles in convenient locations.

TABLE 6.3 EMERGENCY PREVENTION AND RESPONSE STRATEGIES

Threat	Prevention	Response
Injury or Health Emergency	<ul style="list-style-type: none"> ▪ Use restrictions ▪ Education and signage ▪ Areas closures ▪ Trail design and maintenance ▪ Hazard tree inspections and removal 	<ul style="list-style-type: none"> ▪ Signage and maps to locate victims and emergency response meeting locations ▪ Call box at staging area ▪ Emergency response meeting locations along trail network
Lost or Missing Persons	<ul style="list-style-type: none"> ▪ Good trail maps and wayfinding signs along trails ▪ Closed area signs and wayfinding signs in closed areas ▪ Visitor registration system 	<ul style="list-style-type: none"> ▪ Search and rescue training ▪ Routine patrols
Wildfire	<ul style="list-style-type: none"> ▪ Use restrictions ▪ Coordination of trail network design with shaded fuel breaks 	<ul style="list-style-type: none"> ▪ Response planning with CAL FIRE ▪ Incident training with CAL FIRE ▪ Frequent patrols for early identification ▪ Firefighting tanks at staging area, along trail network, and in closed areas

- Educate mountain bike riders and other visitors about the gradual approach to phasing, with observed success being necessary for the implementation of future phases.
- Work with members of the bike community to exert peer pressure on their fellow riders to comply with all rules and regulations.
- Educate mountain bike riders on trail courtesy and etiquette in order to minimized potential conflicts with other trail users.
- Engage hikers, mountain bike riders, dog walkers and horseback riders to ensure they appreciate the privilege of visiting the property and that they contribute to the culture of stewardship.

Patrol requirements may be offset by volunteer patrol efforts provided by docents or by organized user groups under a formal Use Agreement. Volunteer patrols should be prioritized for high-use times and days. Other strategies for

ensuring user safety and reducing liability of owners and managers include conducting orientations for user groups, as well as use of visitor registration system to ensure users are aware of and agree to conditions of use.

VISITOR AND USE MANAGEMENT TASKS

Recommended strategies for providing visitor education and managing level of use are provided below. These tasks, unless specified, will not apply to the Laguna Tract.

PROVIDE VISITOR EDUCATION

Visitor education is an opportunity to inspire the conservationists of tomorrow (and today), as well as to educate users about rules and regulations. Fostering a stewardship culture that deters visitor impacts (such as unauthorized trail construction) is a primary strategy for minimizing visitor impact. In addition to the tasks described under trail etiquette and safety monitoring, above, visitor education strategies include providing educational and interpretive signage, providing staff and volunteer training, and supporting educational efforts. This task will apply to the Laguna Tract.

ESTABLISH AND MANAGE A VISITOR REGISTRATION SYSTEM

This large property has poor cellular coverage, dense vegetation, rugged terrain, and roads in closed areas, which may contribute to visitors becoming lost. Furthermore, the property is subject to forest management operations, including tree falling and log hauling, for restoration and commercial purposes. The Public Access Manager will establish a visitor registration system for the main San Vicente Redwoods property to facilitate visitor awareness of site conditions, notify regular visitors of closures, and facilitate the identification and prosecution of abusive visitors, including revoking access privileges. The registration system will include both electronic and paper (hard copy) options. Following registration, a visitor will be issued a visitor use permit that they will be required to carry on their person and to display a copy on the dashboard of their car while parked at the staging area. Permits are further discussed below.

ESTABLISH AND MANAGE PERMIT PROGRAMS/FEE PROGRAMS

Permit programs are an effective way to ensure that all users agree to conditions of use and to monitor and document use. While commercial use of the property is prohibited, certain permits may or may not have associated fees

to cover some of the costs of management, as described below. Different permits will require different levels of review by the Public Access Manager and the Conservation Partners, as well as other advisors that they deem appropriate. Permits for approved uses such as parking at dedicated staging areas should be obtainable through an on-site and/or on-line permit system. Other permits may require direct coordination with the Public Access Manager and the Conservation Partners. Permits would be revoked if conditions of use are not met.

All permitted uses must be in compliance with the Conservation Easement and consistent with requirements for 501(c)(3) status. Permit requests that are likely to conflict with protection of the Conservation Values or the intent of the Conservation Easement, including activities that leave materials behind or manipulate the environment, will require a greater level of review and may not be permitted. No activities identified as prohibited in Chapter 4 will be permitted. Permit approval will be limited to minimize the potential for visitation on days with special use permits to exceed that of typical (days without special events) high-visitation days and to ensure that staging area capacity is not exceeded.

Permits which may be required for public access include:

- **Visitor Use Permits.** A visitor use permit would demonstrate that a visitor has completed the visitor registration system.
- **Parking Permits.** If utilized, parking permits for use of the staging area(s) would allow for monitoring of daily use, and provide a framework by which each visitor agrees to the conditions of use for public access.
- **Special Use Permits.** As discussed in Chapters 4 and 5, special use permits would be required for any use that does not take place on dedicated public access trail or at a staging area requires a special use permit, for groups larger than 20, for special events (such as organized trail run), and for primary, secondary and community education groups. Special use permits are intended for use on a limited basis only, and will be managed so that all use, enjoyment, and conservation values will be maintained. In addition to the considerations for permit approval discussed above, special use permit review should consider duration and timing of the activity, the number of individuals involved, proposed location(s), potential conflicts with other property uses and activities, and potential impacts to the property's

resources. Special Use Permits will require that facilities for special uses would be limited to the staging area, trails, gathering areas, and benches, with no vegetation clearing beyond the guidelines described in Chapter 7, Design and Maintenance Guidelines.

Fees may be charged for parking and special use permits at the discretion of the Public Access Manager and the Conservation Partners. A fee schedule should be developed by the Public Access Manager. Fees would be nominal so as not to create a deterrent to visiting the property or participating in the permit system. Fees would be structured to, at most, offset some of the costs of managing public access.

As discussed in Chapter 5 and under Organizational Structure, above, research and higher education are not considered public access. Requests for research and higher education uses will be reviewed, authorized, and managed by the Landowners and the Conservation Easement Holder, and other advisors as they deem necessary.

MANAGE PARKING

Use of the staging area should be monitored and tracked as described above, and expanded to full capacity as necessary to ensure adequate capacity. The Public Access Manager will collaborate with the Santa Cruz County Department of Public Works to ensure that road shoulder parking does not become an established pattern, through the use of strategies such as no-parking zones and towing.

MANAGE MOUNTAIN BIKE USE

Managing visitor impact to protect the Conservation Values involves special considerations with mountain biking as an allowed use. Open space in the Santa Cruz Mountains hosts various examples of non-sustainable and environmentally damaging trails primarily used by mountain bikes. The damage is primarily caused by erosion, trail widening, and unauthorized trail use and/or construction.

Several examples also exist in the region of high quality trail stewardship led by responsible members of the mountain bike community.

The Public Access Manager will implement prevention-based strategies to mountain bike use that includes visitor education, monitoring, and enforcement (described above), as well as engagement of users in trail building and other activities. As discussed above, the property will be closed to mountain bikes if unauthorized use cannot be effectively managed. The Laguna Tract will be managed as closed to mountain bike use.

OTHER MANAGEMENT AND ADMINISTRATIVE TASKS

Recommended strategies for conducting other management and administrative tasks are provided below.

COORDINATE WITH RESPONSIBLE PARTIES AND MANAGEMENT TEAMS

The Public Access Manager will be responsible for conducting routine meetings and providing ongoing coordination with the Leadership, Oversight, Management, and Fields Teams to determine when actions are needed to ensure protection of the seven Conservation Values. Public access must accommodate timber harvest and restoration forestry, and operations may necessitate re-routing or temporarily closing trails for visitor safety. Although most potential conflicts and opportunities will be identified in advance, there is potential for unforeseen conflicts (such as those requiring trail closures) or opportunities (new discoveries or research needs) to arise.

COORDINATE WITH ADJACENT OPEN SPACE MANAGERS AND OTHER NEIGHBORS

Ongoing coordination will also be necessary with adjacent open space managers and neighboring residents and property owners. It is recommended that a system for recording and responding to neighbor input be established. The level of coordination required with adjacent open space managers will depend upon the status of trail connection projects and unforeseen opportunities. Given the anticipated connection to the Cotoni-Coast Dairies property and the Bonny Doon Ecological Reserve, coordination with the Bureau of Land Management and CDFW is of high importance.

DEVELOP AND IMPLEMENT ADAPTIVE MANAGEMENT STRATEGIES

The Public Access Manager will implement adaptive management strategies to ensure protection of the seven Conservation Values. In addition to phased implementation of the staging area and trail network, adaptive management

strategies should include monitoring and tracking of use and site conditions, followed by proactive management actions. The following will be monitored and tracked to inform management decisions: visitor compliance with regulations; development of unauthorized trails; trail and drainage feature conditions; signage and furnishings conditions; occurrence of food waste, dog waste, and horse waste; available capacity of the staging area; perspectives of the Property Manager and restoration project managers; and visitor satisfaction. The Public Access Manager will monitor and respond to a variety of indicators, as described below.

Monitoring and tracking should be conducted as part of patrol activities discussed above, as well as trail assessments discussed in Chapter 7. Response to visitor impacts may include increased patrol, increased communication, increased enforcement, and additional use restrictions, including potentially banning particular uses from the property. Specific adaptive management strategies for ensuring protection of each of the seven Conservation Values are identified in Table 6-4. Additional context for these strategies, including the specific constraints addressed and related preventative strategies, is provided in Appendix 2 (Adaptive Management Overview).

TABLE 6-4 OVERVIEW OF ADAPTIVE MANAGEMENT STRATEGIES

Conservation Value	Adaptive Management Strategy
Statewide and Regional Significance	<ul style="list-style-type: none"> Monitor and enforce rule violations; adjust engagement and enforcement effort.
	<ul style="list-style-type: none"> Monitor closed areas for unauthorized access; adjust education and enforcement effort.
	<ul style="list-style-type: none"> Track visitor satisfaction; respond to meet expectations to the extent feasible.
Forests	<ul style="list-style-type: none"> Maintain trails so they don't widen or erode; adjust effort if problems arise.
	<ul style="list-style-type: none"> Track the satisfaction of working forest and restoration project managers; increase collaboration effort with partners as needed.
	<ul style="list-style-type: none"> Track unauthorized visitors on 'red flag' fire hazard days; adjust patrol effort, engagement and enforcement
	<ul style="list-style-type: none"> Monitor and maintain tanks to ensure they are full and in good condition.

TABLE 6-4 OVERVIEW OF ADAPTIVE MANAGEMENT STRATEGIES

Conservation Value	Adaptive Management Strategy
Biodiversity	<ul style="list-style-type: none"> ▪ Patrol for unauthorized trail construction; prosecute and/or sue violators; decommission unauthorized trails; impose use restrictions.
	<ul style="list-style-type: none"> ▪ Track food waste; adjust visitor engagement and waste management effort.
	<ul style="list-style-type: none"> ▪ Monitor and manage invasive plants in the public access area.
Watershed Protection	<ul style="list-style-type: none"> ▪ Monitor trails for sediment delivery to streams or wetlands; remediate problems promptly.
	<ul style="list-style-type: none"> ▪ Monitor and enforce closures; adjust staffing as needed.
Viewshed Protection	<ul style="list-style-type: none"> ▪ Track and remediate horse and dog waste near streams and wetlands; adjust engagement; impose use restrictions.
	<ul style="list-style-type: none"> ▪ Inspect trails routinely for widening and erosion; adjust maintenance effort; adjust alignments and grade.
	<ul style="list-style-type: none"> ▪ Track the availability of parking and expand the parking area only as needed.
Landscape and Habitat Connections	<ul style="list-style-type: none"> ▪ Monitor and enforce closed areas for unauthorized access; adjust patrol and enforcement effort; impose use restrictions.
	<ul style="list-style-type: none"> ▪ Review and revise strategies for protecting core habitat in response to research.
	<ul style="list-style-type: none"> ▪ Monitor and enforce night time and area closures; adjust patrol and enforcement effort.
Conservation Value: Public Recreation, Education, and Research	<ul style="list-style-type: none"> ▪ Survey visitor satisfaction; respond to the extent feasible with changes to trails, including use designations.
	<ul style="list-style-type: none"> ▪ Track and evaluate incidents and accidents; identify and implement corrective measures.

DEVELOP AND IMPLEMENT THE FINANCIAL MANAGEMENT STRATEGIES

The Public Access Manager will be responsible for developing financial management strategies for the provision of public access. Strategies will be informed by the financial considerations and preliminary cost estimates provided in this chapter, and will be updated as needed. Strategies should be designed to ensure long-term financial sustainability.

DEVELOP AND IMPLEMENT A TRAIL MAINTENANCE PLAN

A trail maintenance system will be developed by the Management Team and reviewed by the Leadership and Oversight Teams. The maintenance guidelines provided in Chapter 7 are intended to guide the system, including the requirement that trails be inspected every spring and fall.

ESTABLISH AND MANAGE A VOLUNTEER PROGRAM

The San Vicente Access Manager will manage the volunteer program and collaborate with County Parks and County Sheriff's Office staff to ensure their programs receive volunteer support. The San Vicente Access Manager will ensure that each volunteer benefits from education and training in the natural history of the property, and will collaborate with the Oversight Team to confirm the content of that educational material. Volunteer roles may include the following:

- The most experienced and trusted docents will patrol the property. Patrol volunteers will be eyes on the property, but all enforcement activities will be handled by Land Trust, County, or Sheriff staff.
- Interpretive docents will engage visitors with educational experiences about the cultural and natural history of the property and its context in the Santa Cruz Mountains.
- Maintenance docents will help with the upkeep of facilities such as roads, trails and picnic tables, and collect rubbish.

The San Vicente Access Manager will be responsible for ensuring this training occurs, and that all volunteer work is managed such that the activities and products are consistent with design guidelines and construction protocols provided in Chapter 7, and all permits and regulatory authorizations. Specific constraints addressed and related preventative strategies, is provided in Appendix 2 (Adaptive Management Overview).

FINANCIAL CONSIDERATIONS

This section provides an overview of projected capital improvement costs, annual operations and maintenance costs, potential revenue, including

donations, generated by the implementation of the Plan, as well as secured and pledged funding. Table 6-5 summarizes the financial analysis conducted.

TABLE 6-5 SUMMARY OF FINANCIAL ANALYSIS

Description	Phase 1	Buildout
Capital Improvements	\$800,000– \$1,200,000	\$3-5 million ^b
Projected Annual Operations Costs ^a	\$250,00–\$500,000	
Potential Annual Revenue ^c	\$10,000– \$50,000	\$100,000– \$400,000
Funding Secured for Capital Improvements and Initial Operating Costs ^d	\$2.25 million	
Contribution by Non-Profit and Agency Partners ^e	\$1.25 million	

^a Annual cost based on average cost of first ten years of implementation.

^b These costs would be partially offset by volunteer trail construction (equestrian and mountain bike).

^c Revenue is projected to be generated by the Land Trust through donations, grants, contributions from volunteers, partner non-profits and agencies, and fees.

^d Funds were raised through Land Trust of Santa Cruz County Capital Program.

^e Pledged financial contributions by Sempervirens Fund, Save the Redwoods League, and in-kind contributions by the Santa Cruz County Sheriff's Office and the Santa Cruz County Parks Department.

IMPLEMENTATION COSTS

Providing public access at San Vicente Redwoods, including construction and management activities, is estimated to cost \$5 to \$10 million during the first ten years of implementation. Financial elements include:

- Oversight Team and Management Team staffing.
- Administrative, legal and planning costs.
- Access management staffing.
- Maintenance (Roads and Trails).
- Construction.
- Payments for services to the County Sheriff's Office, County Parks Department, and the Santa Cruz County Fire Department.

The annual cost of providing public access will increase as the number of trails increases; however, the maintenance cost per mile of trail will decrease due to economies of scale.

POTENTIAL REVENUE

The Land Trust has secured donations and commitments valued in excess of \$3.5 million to initiate the project. The Land Trust is responsible for securing adequate funding for operations and maintenance of public access through donations, grants, financial and in-kind contributions from non-profit, agency partners, and volunteers, and through permit fees, among other sources. If adequate operating funds cannot be secured in the future, the Land Trust will have to close the property to public access. If financial planning indicates that closure of the property will be necessary, a reserve of funds will be retained by the Land Trust to finance the closure, including patrols and enforcement, to protect natural resources on the property and nearby communities. As discussed above, advancing from one phase to the next will also be dependent on available funding.

Donations and permit fees could generate up to \$50,000 in Phase 1 and \$400,000 at buildout. Given the limited revenue anticipated from fees, it is anticipated that donations and contributions will be the primary revenue source, and will directly affect the level of access provided.

FUNDING SOURCES

Funding sources are anticipated to include the following:

- **Donations and Contributions.** Donations and contributions from individuals and organizations are anticipated to be the primary source of funding. Fees may supplement these amounts. Secured donations and commitments are described above under Potential Revenue.
- **Coastal Conservancy.** The California Coastal Conservancy made a generous grant in support of the development of this plan, and may be a source of additional funding for implementation. The Coastal Conservancy Grant programs fund projects that are consistent with the Agency's goals to "protect, restore, and enhance coastal resources, and to provide access to the shore." Proposals for funding from the Conservancy are accepted on a

continuous basis, and there are no established grant minimum or maximum amounts.

- **Wildlife Conservation Board.** The Wildlife Conservation Board (WCB) provides public access funding and can enter into cooperative project agreements with local agencies or nonprofit organizations for the development of facilities for “public access for hunting, fishing, or other wildlife-oriented recreation,” such as wildlife viewing and bird watching. The WCB may fund the construction of project elements such as trails, boardwalks, interpretive facilities. Applications are accepted on a continuous basis.
- **Federal Land and Water Conservation Fund (LWCF).** This fund can be used to reimburse development costs for outdoor recreation areas and facilities. The funds provide matching grants to cities and counties seeking funds covering up to 50 percent of project costs.
- **Other Grants.** The Public Access Manager should identify other grants for public access and pursue in partnership with other entities, as appropriate given grant requirements. Resources for identifying grant opportunities include American Trails, which maintains a list of federal grant programs at <http://www.americantrails.org/resources/funding/index.html>; and the International Mountain Bicycling Association maintains a similar list at <https://www.imba.com/resources/grants>.

FUTURE PLANNING AND ENVIRONMENTAL REVIEW

This Plan was developed based on an understanding of current environmental, economic, and financial conditions, as well as assumptions regarding recreational demand and other uses of the properties. The Public Access Plan is intended to guide the provision of access for 10 years, at which point it may be revisited and updated as necessary, in accordance with the Conservation Easement. This will remain the active plan until revised. In addition, further planning may be necessary in order to address future conditions. Future planning efforts may expand upon the information put forward in this Plan, and all efforts should also be consistent with the vision, goals, and guidelines described in this Plan.

LAND TRUST OF SANTA CRUZ COUNTY
SAN VICENTE REDWOODS PUBLIC ACCESS PLAN
IMPLEMENTING THE PLAN

Preparation of environmental review documents will be coordinated with Santa Cruz County, who will serve as the lead agency for CEQA review of the Public Access Plan.

7 DESIGN AND MAINTENANCE GUIDELINES



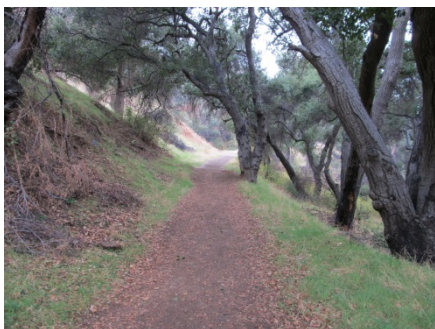
This chapter provides guidance for the design and construction of the features outlined in the Public Access Plan, as well as for the maintenance of the trails. All development of public access features must comply with requirements of the California Environmental Quality Act (CEQA) to identify and mitigate potential environmental impacts, and must meet the standards and protocols identified in this chapter.

The development of Public Access Features must also comply with any permits or regulatory authorizations issued by the agencies listed below.

- Santa Cruz County
- California Department of Fish and Wildlife (CDFW)
- United States Fish and Wildlife Service (USFWS)
- U.S. Army Corps of Engineers (USACE)
- National Marine Fisheries Service (NMFS)
- Central Coast Regional Water Quality Control Board (RWQCB)

TRAIL DESIGN GUIDELINES

Trail design guidelines are intended to facilitate the design and construction of trails as identified in Chapter 4. Trails that do not meet these standards or



comply with the protocols may be closed for public use until maintenance can be completed.

Conceptual trail alignments identified in Chapter 4 indicate appropriate trail corridors where trails should be located; exact alignment may vary as necessary to address field conditions and meet design guidelines provided in this chapter.

Given the existing conditions and planned uses at San Vicente Redwoods, trail design guidelines are organized based on construction-type rather than trail type: (1) roads to be maintained for vehicles and used as trails, (2) roads to be decommissioned and converted into trails, and (3) trails to be built along completely new alignments. Trail characteristics according to planned use that apply to all types of construction are provided below, followed by design guidelines based on construction type. Standard Details providing construction detail relevant to all trail types are provided at the end of this chapter.

TRAIL GUIDELINES ACCORDING TO PLANNED USE

Regardless of planned use, all trail routes should be designed to provide for a variety of experiences through different habitats, and should be coordinated with other property uses, including timber harvest and research uses. In

addition, trail routes should avoid the following, to the extent possible: neighbor views, safety hazards, impacts to sensitive resources, and interference with timber harvest operations. Where feasible, buffers should be provided around private property, and views of neighboring houses should be obstructed by vegetation where necessary.

Table 7-1 provides general trail dimensions for each trail type envisioned at San Vicente Redwoods, including multi-use, hiking and equestrian, and mountain bike and hiking trails. Accessible trails are further discussed below.

TABLE 7-1 TRAIL DIMENSIONS BY USE TYPE*

Trail Type	Tread Width	Vegetation Clearance	Maximum Grade
Accessible Trails	Constructed Width: 5 feet +	2 feet horizontal; 10 feet vertical	<5% (ADA)** 10% (ODA)***
	Maintained Width: 5 feet +		
Multi-Use Trails	Constructed Width: 5 feet+	1-foot horizontal; 10 feet vertical	15% for any extended section
	Maintained Width: 2 to 5 feet +		
Equestrian Hiking Trails	Constructed Width: 2 to 5 feet	1-foot horizontal; 10 feet vertical	15% for any extended section
	Maintained Width: 2 to 5 feet		
Mountain Biking Hiking Trails	Constructed Width: 2 to 4 feet	1-foot horizontal; 10 feet vertical	15% for any extended section
	Maintained Width: 2 to 4 feet		

*Where trails utilize roads that are to be maintained for vehicle use, dimensions will be dictated by vehicular requirements.

**Americans with Disabilities Act (ADA).

*** United States Access Board Final Guidelines for Outdoor Developed Areas (ODA)

ACCESSIBILITY

Americans with Disabilities Act (ADA) Accessibility guidelines address accessible routes between facilities, but currently do not address trails. The United States (U.S.) Access Board is currently reviewing guidelines for shared use paths and public right-of-way that will include trails, but there is no schedule for their anticipated release. The Final Guidelines for Outdoor Developed Areas¹ (ODA) are considered best management practices and standards for pedestrian trails and it is recommended that they are used until updated ADA Accessibility

¹ U.S. Access Board, 2013. *Final Guidelines for Outdoor Developed Areas*. <https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/final-guidelines-for-outdoor-developed-areas>.

guidelines are released.² The ODA guidelines provide detailed accessibility recommendations for pedestrian/hiker designated trails. Due to constraints related to the natural terrain, most of San Vicente Redwoods trails will not meet ADA or ODA requirements. However, efforts should be made to meet guidelines to the extent that is practical. The northern frontage trail can be designed as an accessible trail. The ODA guidelines for trail surface, slope, and signage are as follows:

- **Surface.** The ODA guidelines do not provide a list of specific surface materials that are accessible. Instead, the guidelines require that “surface of trails, passing spaces, and resting intervals to be firm and stable. A firm trail surface resists deformation by indentations. A stable trail surface is not permanently affected by expected weather conditions and can sustain normal wear and tear from the expected uses between planned maintenance.” The ODA guidelines also require that openings in trail surfaces, such as grates, be no more than 0.25-inch-wide and that 2-inch vertical obstacles are allowed on surfaces other than asphalt and concrete. The ODA guidelines are clear that surfaces are required to be firm and stable and that materials other than concrete or asphalt are allowed.
- **Slopes.** The ODA guidelines include requirements that running slopes for trails must be less than 10 percent and where slope is steeper than 5 percent resting intervals are included per the ODA guidelines. Cross slope and clear ground spaces of trails must be 2 percent maximum with 5 percent allowed on surfaces other than asphalt, concrete or boards when necessary for drainage.
- **Signage.** Trailhead signage must include length, surface type, typical and minimum trail width, and typical and minimum running and cross slopes.



ROADS TO BE MAINTAINED FOR VEHICLES AND USED AS TRAILS

Where existing roads will be used as trails and also maintained for limited vehicular use for property operations and maintenance. Upgrades should be based on the trail maintenance system, discussed in Chapter 6, and proposed

² January 9, 2014. Webinar. “Trails and the New Federal Accessibility Guidelines” from American Trails (A National Trails Training Partnership).

use type. Signage and design will depend on whether the road will be used for regular, intermittent, or emergencies only.

Improvements to existing roads shall be designed to minimize erosion and extend the life of the trails while avoiding disturbance of the surrounding landscape. Any drainage features shall be built for longevity and require minimal maintenance.

ROADS TO BE DECOMMISSIONED AND CONVERTED INTO TRAILS

An historic railroad grade, which also served as a road historically, will be converted to use as a trail. Most of this landform is stable and should not be regraded. In these segments, the trail should be installed on the inboard edge of the road as shown in Standard Detail 1, *Trail Installation- Road to Trail Conversion*. Existing stream crossings should be fully excavated during road-to-trail conversions, and may be narrowed and upgraded for trail use. As the road approaches the crossing, the trail alignment is meandered toward the inboard edge of the road to intersect with the stream on contour. An appropriate crossing structure should be installed at stream crossing; refer to discussion of stream crossings for new trails (below) for preferred crossings. Existing culverts that are in good condition and adequately sized will be retained. Existing culverts in poor condition may be improved or replaced with hardened crossings. Refer to Standard Details 2, 3, and 4.

Many other roads were considered for decommissioning and use as trails, but were determined to be unsuitable for use as trails as a result of grade, location, or drainage.

NEW TRAILS

New routes may be created when existing routes are not able to provide desired connectivity or have drainage issues or other problems that make trail sustainability infeasible. For the construction of new trails on the San Vicente Redwoods property, the following design guidelines should be utilized.

LAYOUT

- The trail should be laid out and construction overseen by a qualified design professional with experience in backcountry trail management.



- The trail shall be laid out to conform to the natural terrain to create a visually pleasing alignment, engineered for resilience and to discourage the establishment of unauthorized trails. The trail should have a curvilinear alignment that avoids long straight reaches. The alignment should incorporate natural terrain features (e.g., trees, rocks) to form required grade reversals, while minimizing tree removal and impacts to roots. In addition to a curvilinear alignment, a narrow trail design will help maintain the aesthetic character of the surrounding viewsheds.
- The trail should avoid active unstable and other hazardous areas, sensitive plant and animal habitats, archaeological resources, steep sideslopes, and unstable watercourse crossings. Sensitive habitats include wetlands and non-wetland waters, riparian habitats, plant communities listed by the CDFW with a Global (G) or State (S) Rank of 1, 2, or 3, and occurrences of special-status plant and wildlife species. To ensure avoidance of sensitive habitats, trails corridors should be surveyed by a qualified biologist. The trail network shall leave large, intact habitat blocks undisturbed by recreational visitors, in particular disturbance of the mountain lion movement corridors.



TRAIL ORIENTATION

- **Trail Alignment:** Trails shall avoid fall line orientations. A fall line trail is a trail that drops directly down the hillside following the same path that water flows, thereby focusing water down the length. These routes are difficult, if not impossible, to drain, and often experience higher rates of ongoing erosion. Instead, trails on slopes should follow a contour alignment. Retaining walls may be required where additional support is needed to ensure trail sustainability on steep slopes. Refer to Standard Details 5, 6, 7 and 8, respectively.
- **Trail Grade:** As a general rule, the trail should have a grade no steeper than half the grade of the native hillside. For example, a trail crossing a 10 percent gradient hillside shall have a grade no steeper than 5 percent. The maximum sustained trail grade should generally be less than 10 percent, preferably 5 to 7 percent, and the trail grade should not exceed 15 percent for a distance of more than 50 feet unless otherwise approved by the project design professional. Trails steeper than 15 percent tend to have



greater erosion problems and require more maintenance than trails less than 15 percent.

SWITCHBACKS AND CLIMBING TURNS

Switchbacks and climbing turns should be constructed to reverse the direction of travel on hillsides and to gain elevation in a limited distance. A switchback is a sharp turn with a flat landing, whereas a climbing turn has a wider radius with a constant grade through the turn. The advantage of climbing turns are that they allow for better user flow, especially with mountain bikes which sometimes cannot easily navigate a switchback, are easier to construct, and generally require less maintenance. The climbing turns also discourage user created short-cuts when brush, ridgelines, and logs are strategically located to block short-cut options. However, climbing turns are restricted to moderate gradient slopes less than about 45 percent. To the extent feasible, the trail should be laid out to minimize switchbacks and where necessary avoid stacking.

NATURAL CHOKE POINTS

Trails for bicycles should be designed and constructed to be undulating. A 5 to 7 percent grade is ideal, with a 15 percent maximum for trails that allow bikes. Natural choke points, turns, and adequate line of sight are necessary design features to limit speeds downhill and to reduce visitor conflict.

TRAIL DRAINAGE

Trails should be designed, constructed, and upgraded to cause minimal disruption of natural drainage patterns. As a general rule, runoff should not be allowed to concentrate from one catchment to another. Other guidelines for trail drainage include the following:

- **Grade Reversals:** Trail shall be drained with grade reversals that are incorporated into the trail at the time of construction in order to avoid concentrated water flow by creating a drainage dip in the trail. Refer to Standard Detail 9.
- **Grade Reversal Spacing:** Grade reversals shall be installed at minimum spacing of 150 feet. Grade reversal location should be identified and flagged in advance of trail construction by the project design professional.

- **Decomposed Granitic Soils:** Tighter spacing and larger grade reversals are required in areas underlain by decomposed granitic soils, as applies to many areas of San Vicente Redwoods.
- **Wet Soils:** In excessively wet areas the road tread may need to be armored or the trail built up on a causeway or low puncheon (a small, low, elevated structure spanning the drainage). The locations of these areas are often known prior to construction and should be avoided to the extent possible during trail layout. Refer below to discussion of Stream Crossings.



GRADING AND EXCAVATION

Trails should be constructed at width not to exceed those specified in Table 7-1. Trails should be constructed on a full bench with fill spread downslope of the trail at a depth less than 6 inches. Refer to Standard Details 3, 4, and 5.

STREAM CROSSINGS

Trail routes should avoid watercourse crossings where channel gradient is steep, as well as at deeply entrenched streams with potential unstable streamside slopes. Routes preferably should be located such that drainage areas are crossed high in their watershed locations where streams are less defined in order to avoid stream disturbance. Site-specific field review will be needed to determine suitability of new stream crossings. Existing water crossings should be used where doing so would minimize environmental impacts and continue to allow for a desirable trail alignment in terms of sustainability and user experience. Guidelines for stream crossings include the following:

- **Design:** All stream crossings shall be designed to avoid impacts to streams, riparian areas, and wetlands. Stream crossings shall be properly designed by a qualified trail professional.
- **Type:** Appropriate crossings include bridges, armored crossings, puncheons, and existing culverts. Bridges and puncheons are the preferred crossing type for streams. Armored crossings are the preferred crossing type for swales that lack a defined channel. As discussed above, existing culverts that are in good condition and adequately sized will be retained. Existing culverts in poor condition may be replaced with hardened crossings. Refer to Standard Details 10, 11, 12, and 13.

- **Size:** All bridges shall be designed to accommodate 100-year flood flow, including sediment and debris. All drainage improvements shall be sized to convey flood overflows for the 25-year storm in compliance with Santa Cruz County Design Criteria.
- **Approach:** Avoid steep trail grades leading to stream crossings. The crossing should be as close to perpendicular to the stream as possible in order to shorten the span of crossing.

VEGETATION CLEARING

Guidelines for vegetation at trails include the following:

- Final trail alignment shall be determined with consideration to minimize impacts to trees larger than 12 inches in diameter at breast height (DBH).
- The trail bed and the area extending 1 foot to either side of the trail bed may be cleared of trees and logs less than 12 inches DBH. Trees greater than 12 inches DBH within the trail bed shall be removed only if indicated on the plans or with the authorization of the landowner representative.
- Vegetation should be maintained for views and seating at up to 10 overlooks. Maintenance may include removal of trees and shrubs less than 12 inches in DBH. An overlook may be up to 10 feet by 20 feet.
- All roots exposed during construction shall be clean cut to avoid tree damage.
- Branches that extend into the trail corridor may be trimmed to leave a minimum 10-foot-high vertical clearance.
- When pruning, prevent branches from damaging tree or stripping the bark when the branch falls to the ground.

ADDITIONAL DESIGN GUIDELINES

Specific guidelines are provided below to aid in the design and construction of other public access features, including the entrance gateway(s), security gates, the staging area, picnic areas, site furnishings, and signage.

The character of San Vicente Redwoods will be defined by its natural setting and the historic and ecological features that are located on the property. For this



reason, it is important that all public access components be designed and constructed to be consistent with the property's historic character and environmental setting. Where possible, access features should be constructed with natural and durable materials, such as concrete, metal, wood, or locally sourced stone. Guidelines for ensuring that the design of specific access features and elements reflect the natural beauty and unique history of the property, while allowing for flexibility and innovative design solutions, are provided below.

ENTRANCE GATEWAY(S) AND SIGNAGE

The entrance to the staging area(s) should be a threshold/gateway that will provide a strong sense of arrival and exemplify the character of the property. The gateway should be constructed with natural materials that are appropriate for the site, such as stone, concrete, metal, and/or wood. Signage at the entrance should be visible for approaching vehicles coming in both directions on Empire Grade, yet it should also complement the neighborhood and be subdued. Roadside parking should be discouraged through an inviting and easy-to-access staging area, as well as clear roadside signage.



SECURITY GATES AND FENCING

Gates and/or appropriate signage should be installed at certain roads and trails to allow for areas/trails to be closed off to the public when needed. Gates should be designed for utility and resistant to vandalism, to the extent feasible. All gates and bollards should be made of durable materials, such as metal, with a natural finish.

Fencing should be provided at entrances to the property and where necessary to restrict access. Three-strand wire, split-rail fencing, or other low, rustic fencing constructed of natural materials and designed to ensure permeability for local wildlife, is preferred when the purpose is to visually communicate restrictions where security concerns exist. However, chainlink fence and guardrails should be used when necessary to protect resources and ensure safety, but without impeding wildlife movement.



STAGING AREA

A staging area provides parking as well as visitor information, amenities, and trailhead access. Parking at the staging area should be designed for efficient

circulation, to maximize permeable surfaces and shade, minimize vegetation disturbance, and to meet ADA Accessibility Guidelines to the extent possible. The surface for parking areas should be unpaved with road base material, and the accessible parking spaces shall be surfaced with concrete. Sufficient parking should be provided to prevent accumulation of vehicles parked along road shoulders in order to protect surrounding viewsheds.

The staging area should include a kiosk with informational signage, restrooms, benches, and receptacles for trash and recycling. Trash receptacles must be wildlife-proof, particularly for corvids and raccoons. Water tanks for fire protection purposes, and dog and horse courtesy stations may be included, as needed.

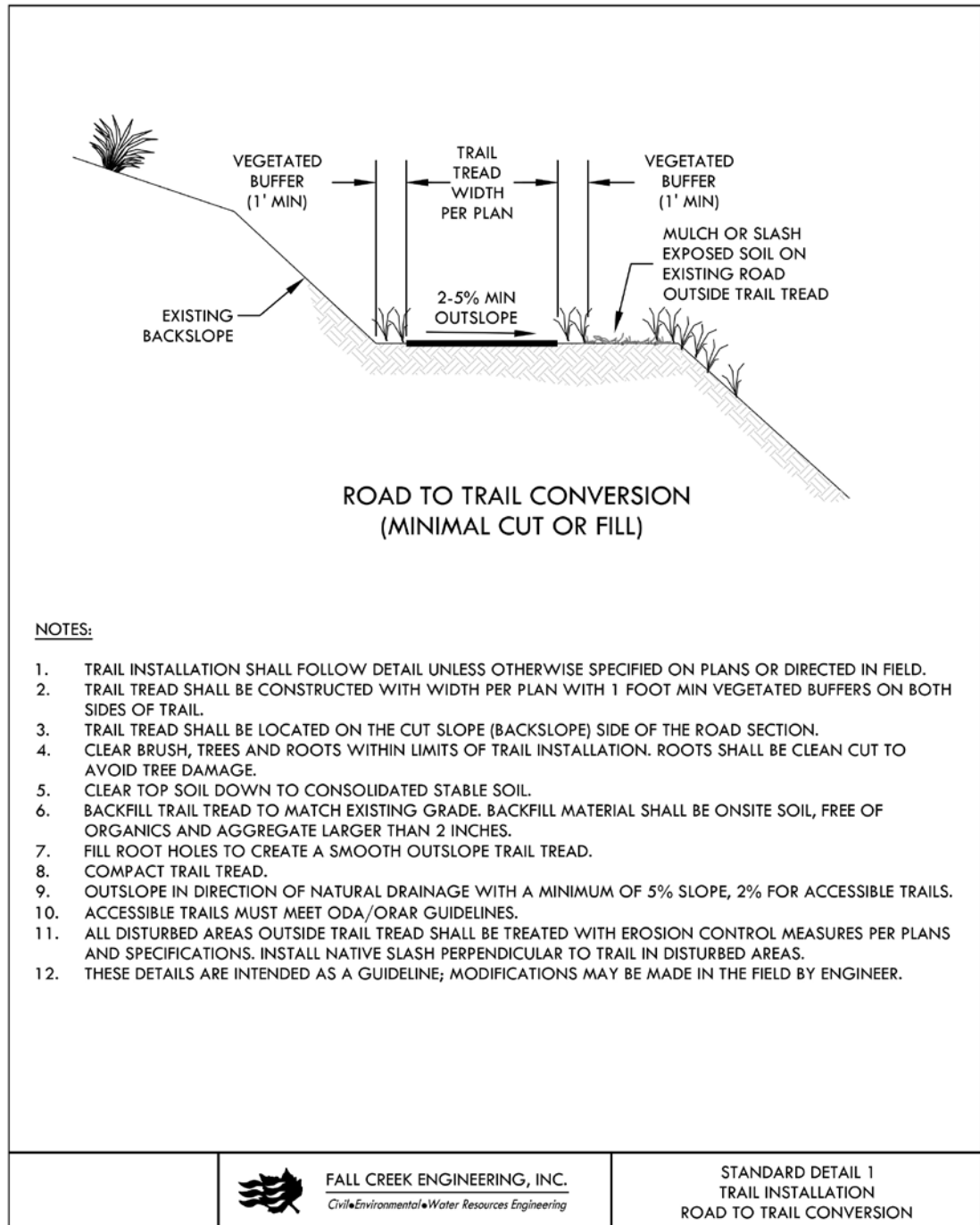
Bicycle parking should be provided at the staging area as well. Bicycle racks should be galvanized steel U-racks, looped-racks, or racks of a similar design, with a metal finish. If paint is necessary, racks should be painted with neutral tones.

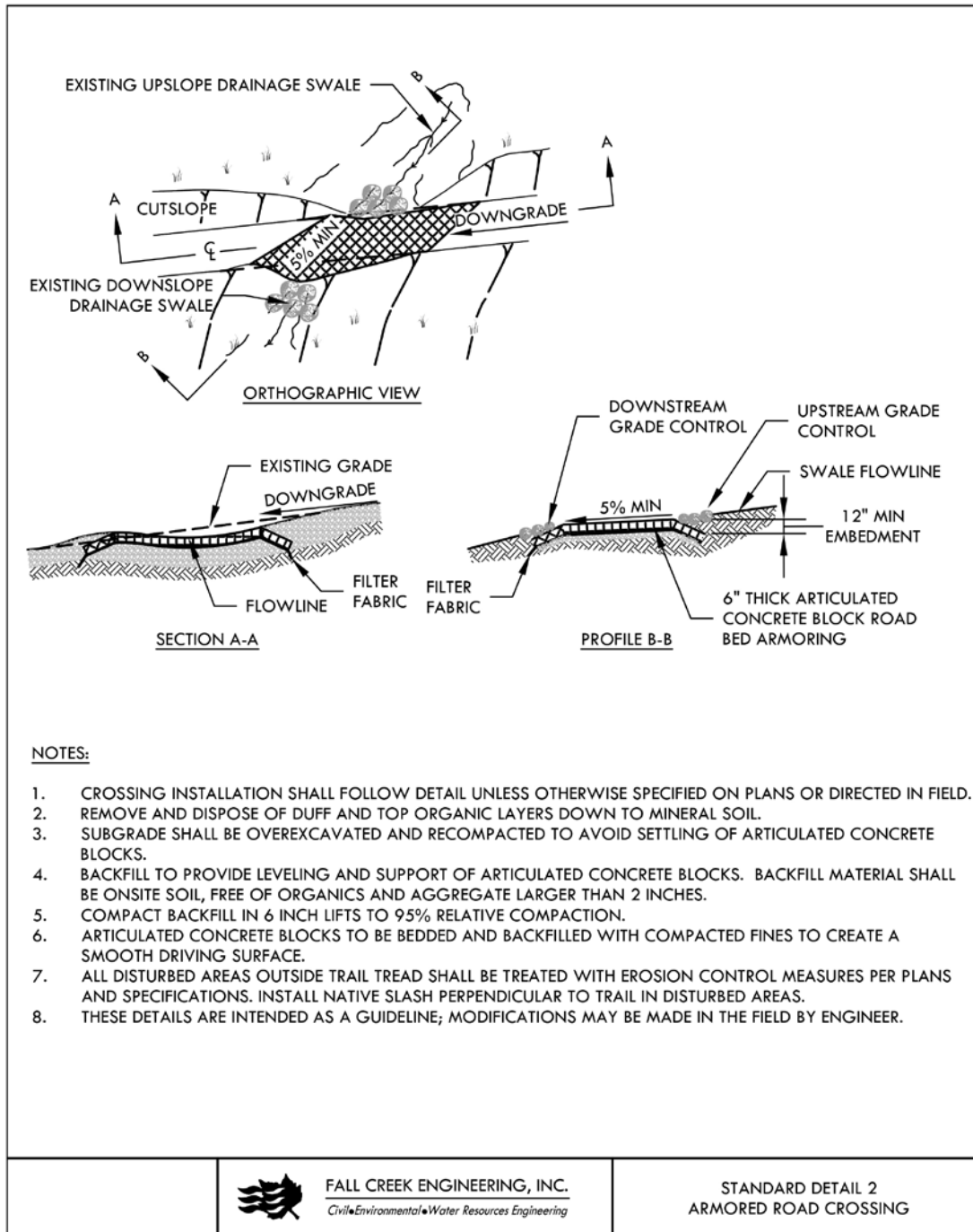
PICNIC AREAS AND GATHERING AREAS

Picnic areas should include one or two tables and be located near the staging area. Picnic areas should be easy to locate from staging areas, yet have some visual buffer for a pleasing appearance. Picnic tables and benches must be located outside of the dripline of redwood trees. Picnic areas should either include wildlife-proof trash receptacles or clear signage stating that trash must be packed out. See Site Furnishings below for additional guidance.

As discussed in Chapter 5, gathering spaces are informal areas that do not require tree removal and/or vegetation clearing. A gathering area may be up to 20 feet by 40 feet. Gathering spaces may be developed where regular and/or on-going use is anticipated and supported by the Public Access Manager and its partners. The intent of establishing such areas is to concentrate impacts in specified areas while creating desirable places to gather in terms of meaningful views, physical comfort, and unique experiences. Elements within semi-formal gathering areas should be limited to seating, preferably constructed with onsite materials such as fallen logs.

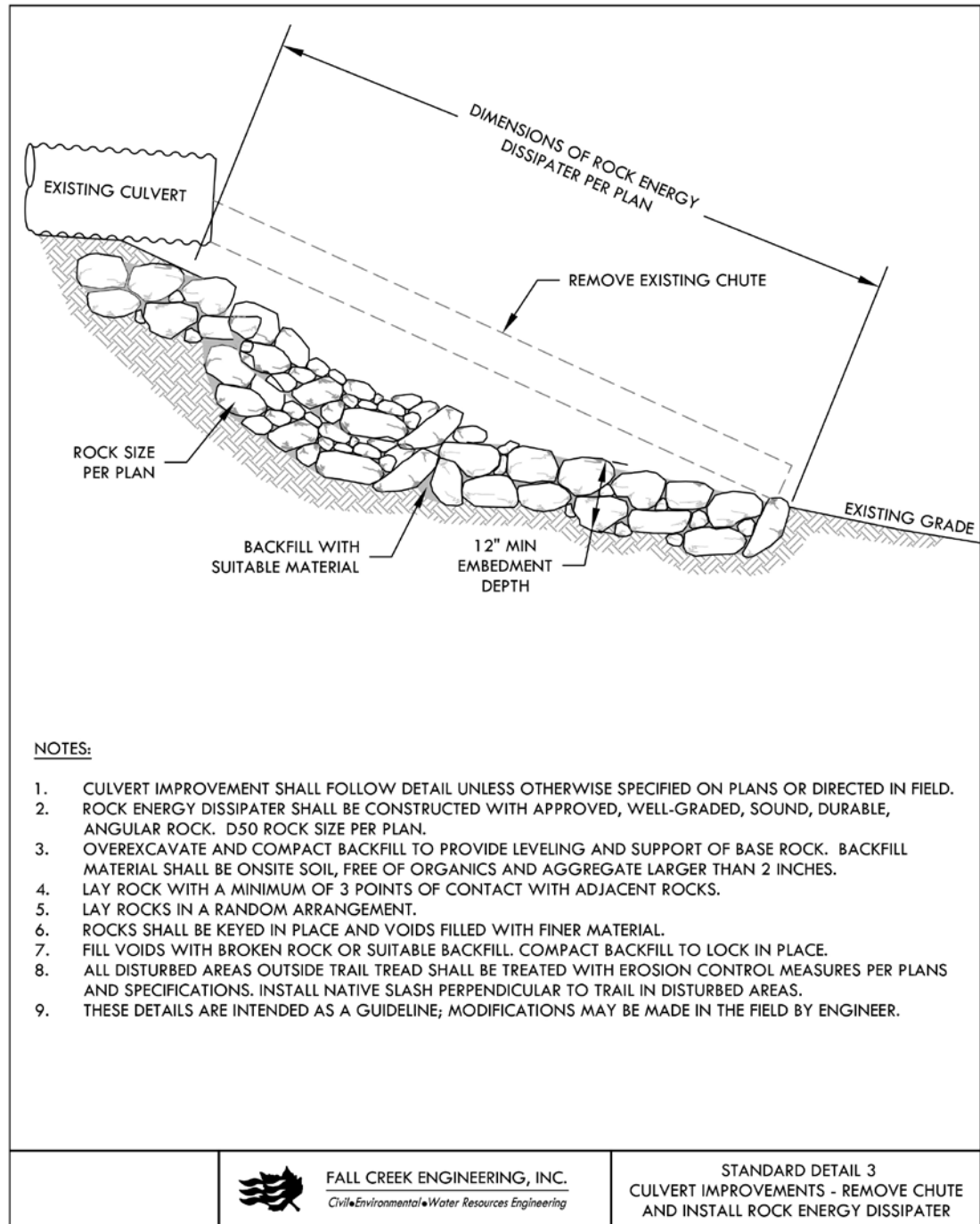


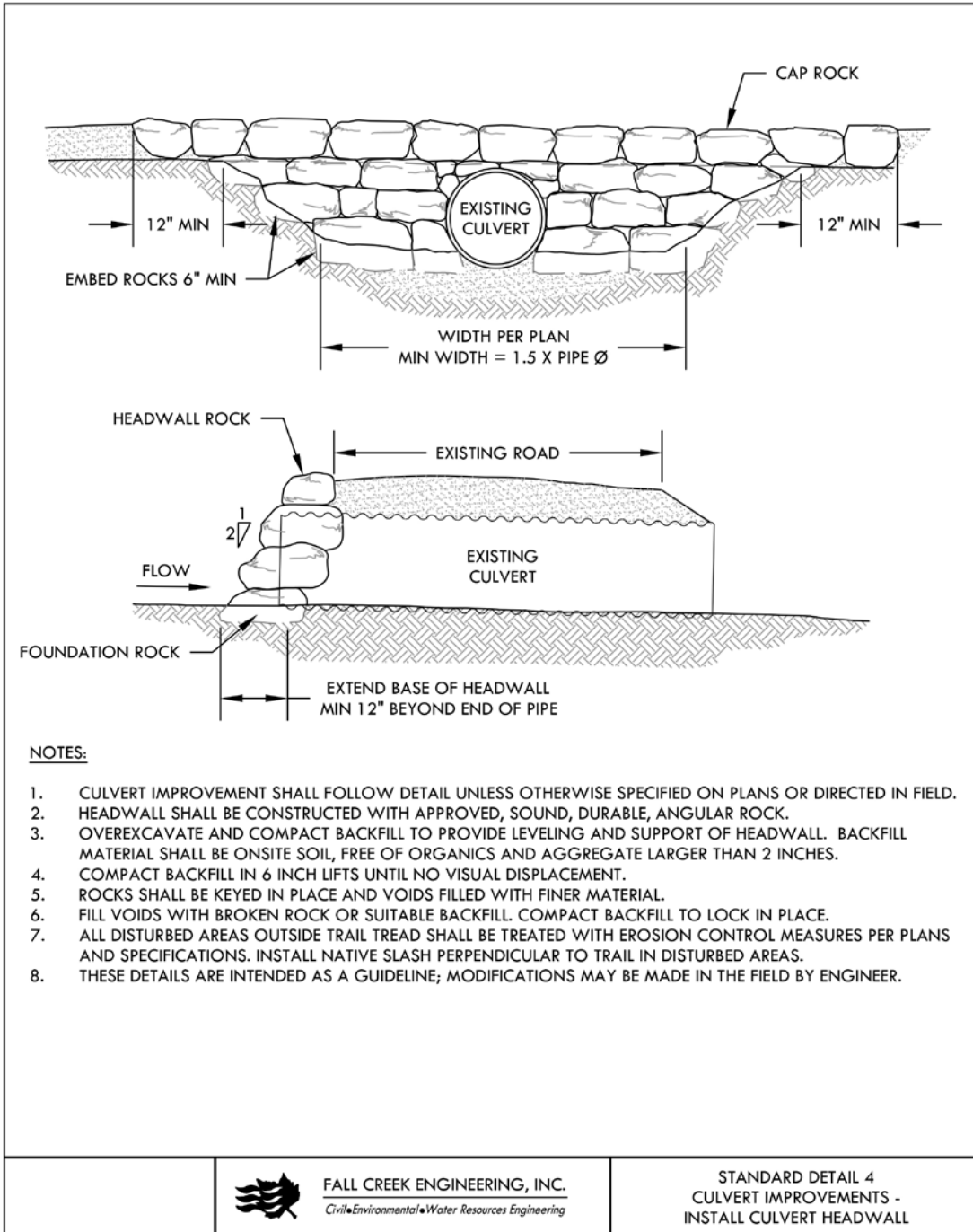


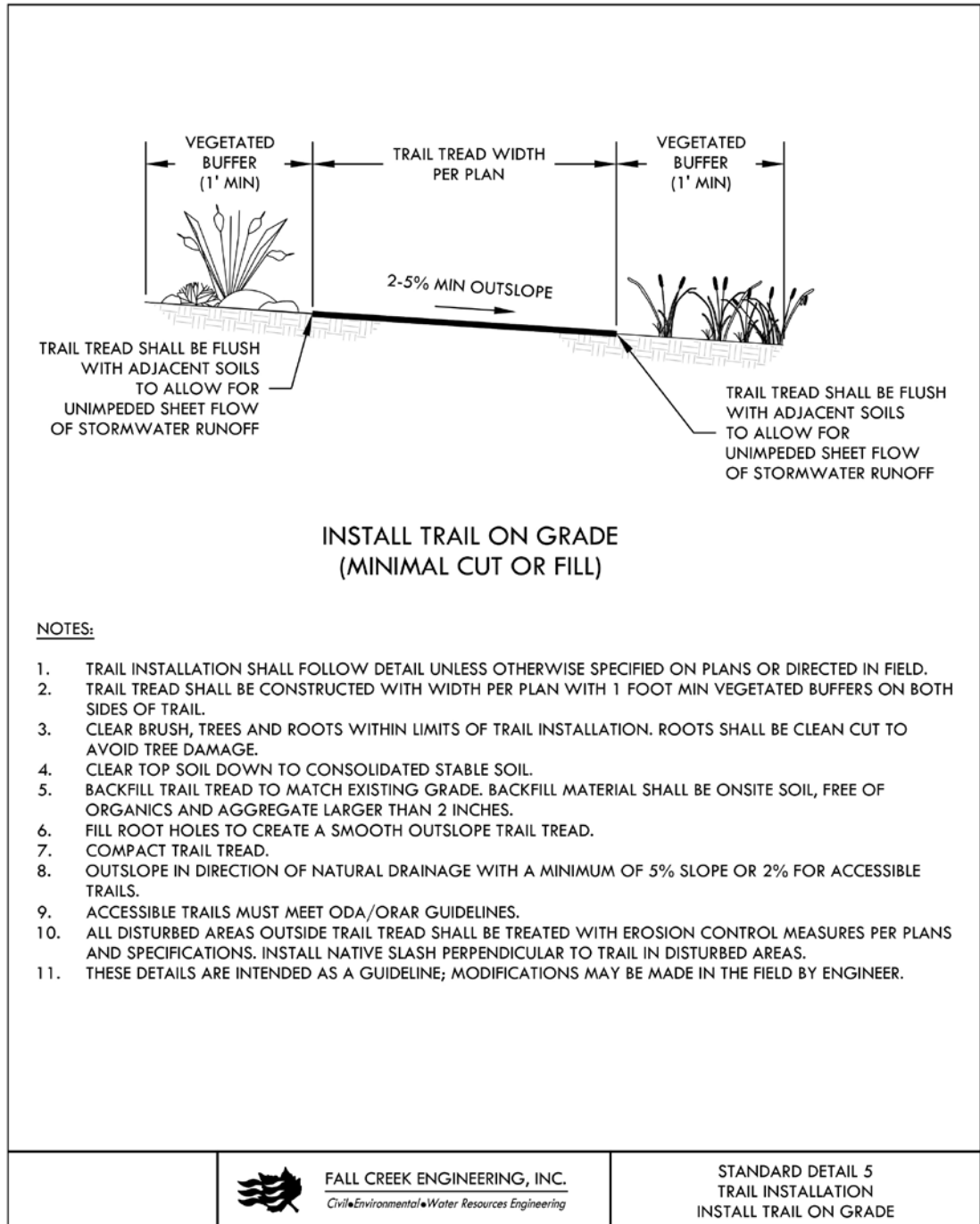


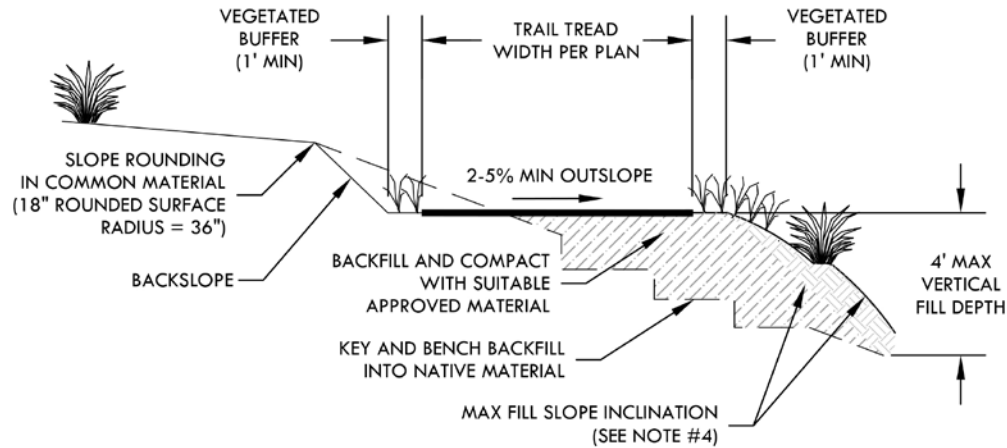
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STANDARD DETAIL 2
 ARMORED ROAD CROSSING









PARTIAL BENCH SECTION
 (CUT & FILL)

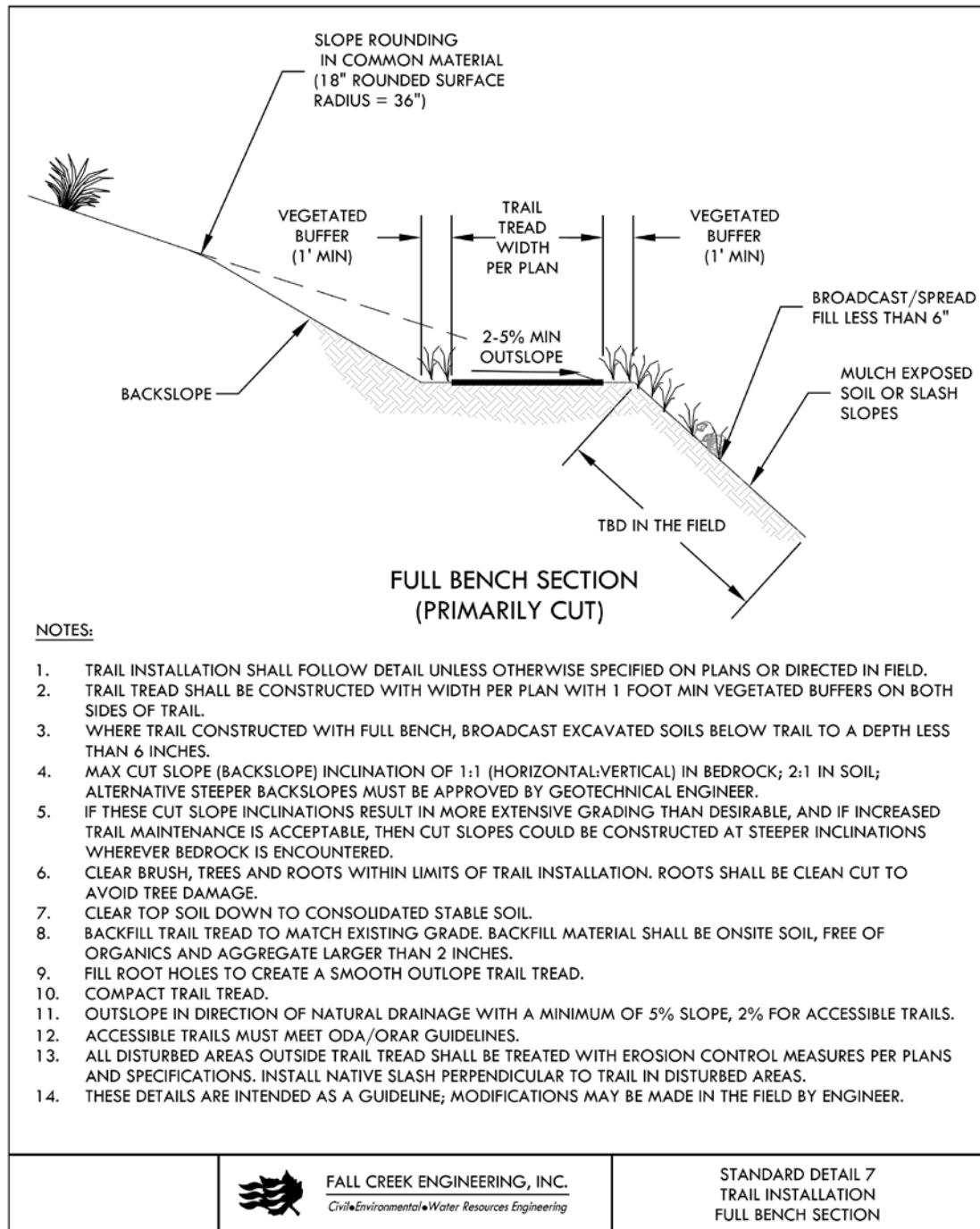
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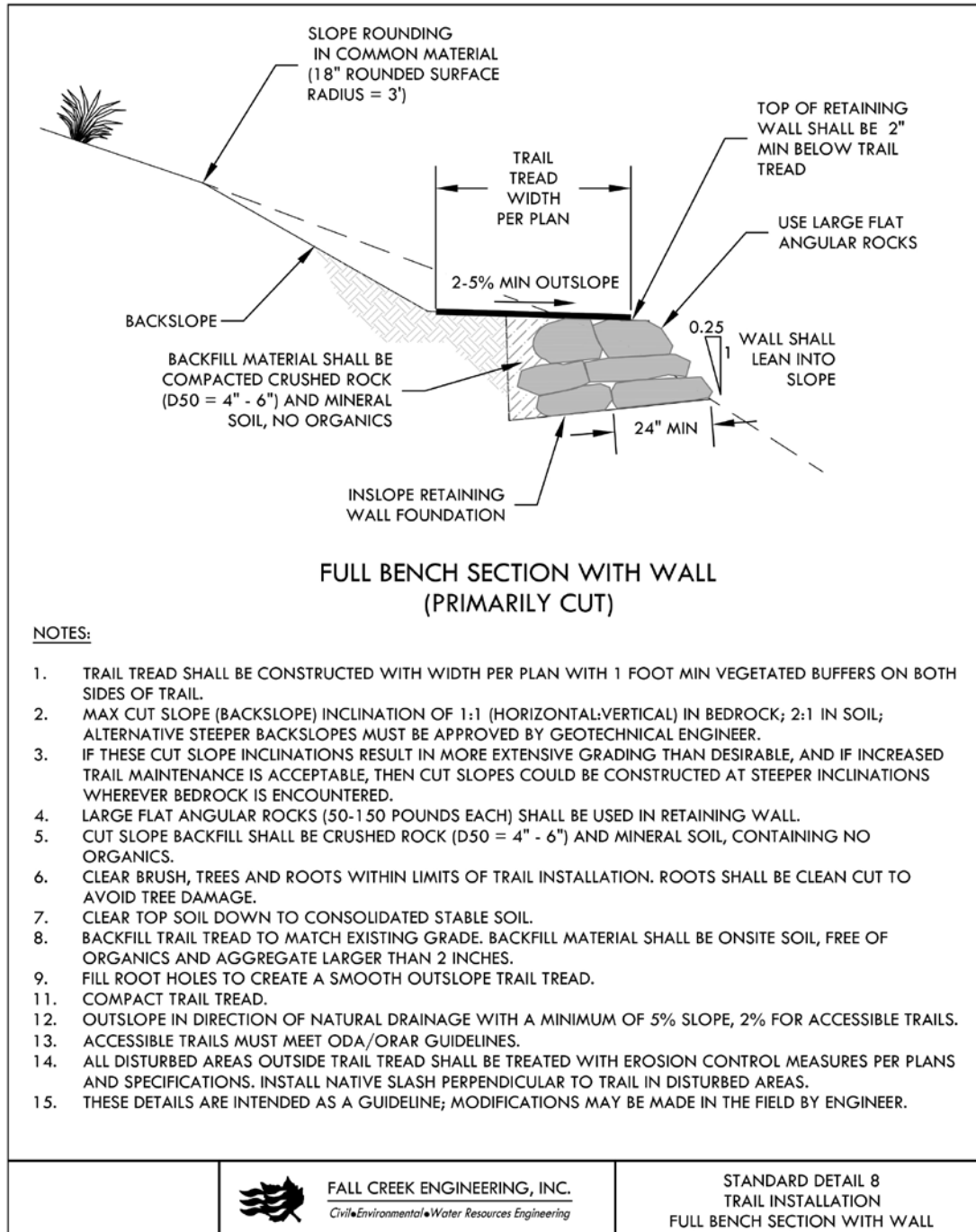
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
3. WHERE FILL IS TO BE PLACED ON EXISTING SLOPES STEEPER THAN 5:1 (HORIZONTAL:VERTICAL), KEY AND BENCH INTO EXISTING NATIVE MATERIAL.
4. MAX CUT SLOPE (BACKSLOPE) AND FILL SLOPE (FRONTSLOPE) INCLINATION OF 1:1 (HORIZONTAL:VERTICAL) IN BEDROCK; 2:1 IN SOIL; ALTERNATIVE STEEPER SLOPES MUST BE APPROVED BY GEOTECHNICAL ENGINEER.
5. IF THESE CUT SLOPE OR FILL SLOPE INCLINATIONS RESULT IN MORE EXTENSIVE GRADING THAN DESIRABLE, AND IF INCREASED TRAIL MAINTENANCE IS ACCEPTABLE, THEN SLOPES COULD BE CONSTRUCTED AT STEEPER INCLINATIONS WHEREVER BEDROCK IS ENCOUNTERED.
6. MINIMUM COMPACTION 85% FOR ALL FILL SLOPES.
7. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
8. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
9. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
10. FILL ROOT HOLES TO CREATE A SMOOTH OUTSLOPE TRAIL TREAD.
11. COMPACT TRAIL TREAD.
12. OUTSLOPE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE, 2% FOR ACCESSIBLE TRAILS.
13. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
14. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
15. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

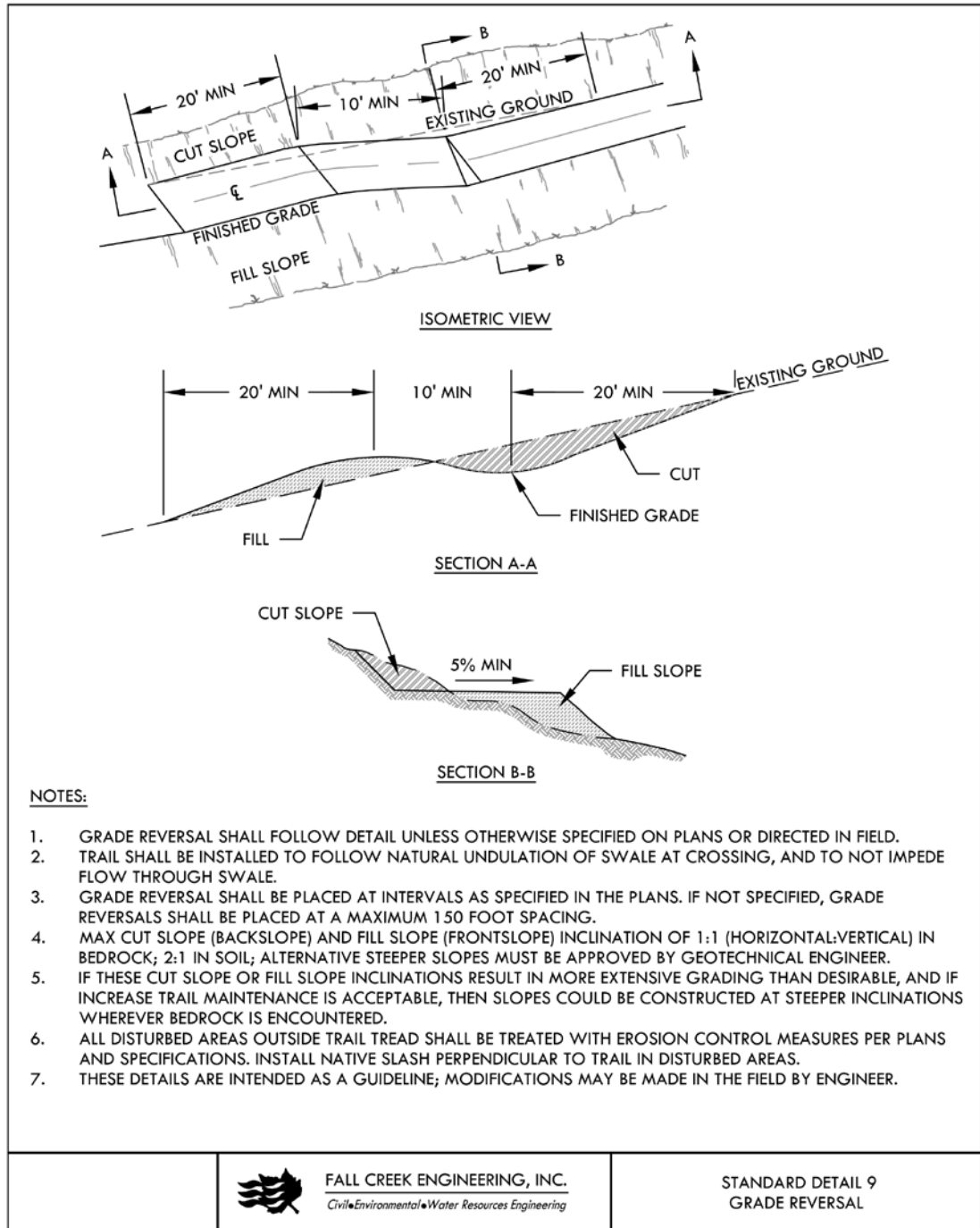


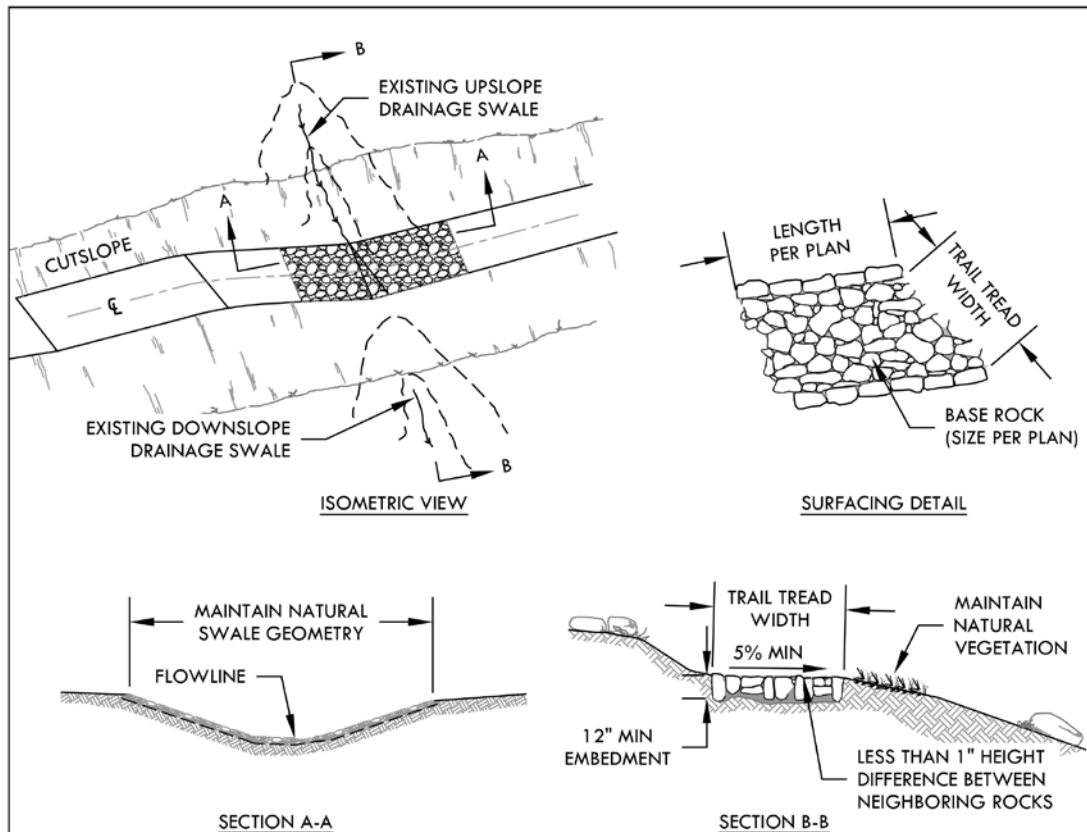
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STANDARD DETAIL 6
 TRAIL INSTALLATION
 PARTIAL BENCH SECTION









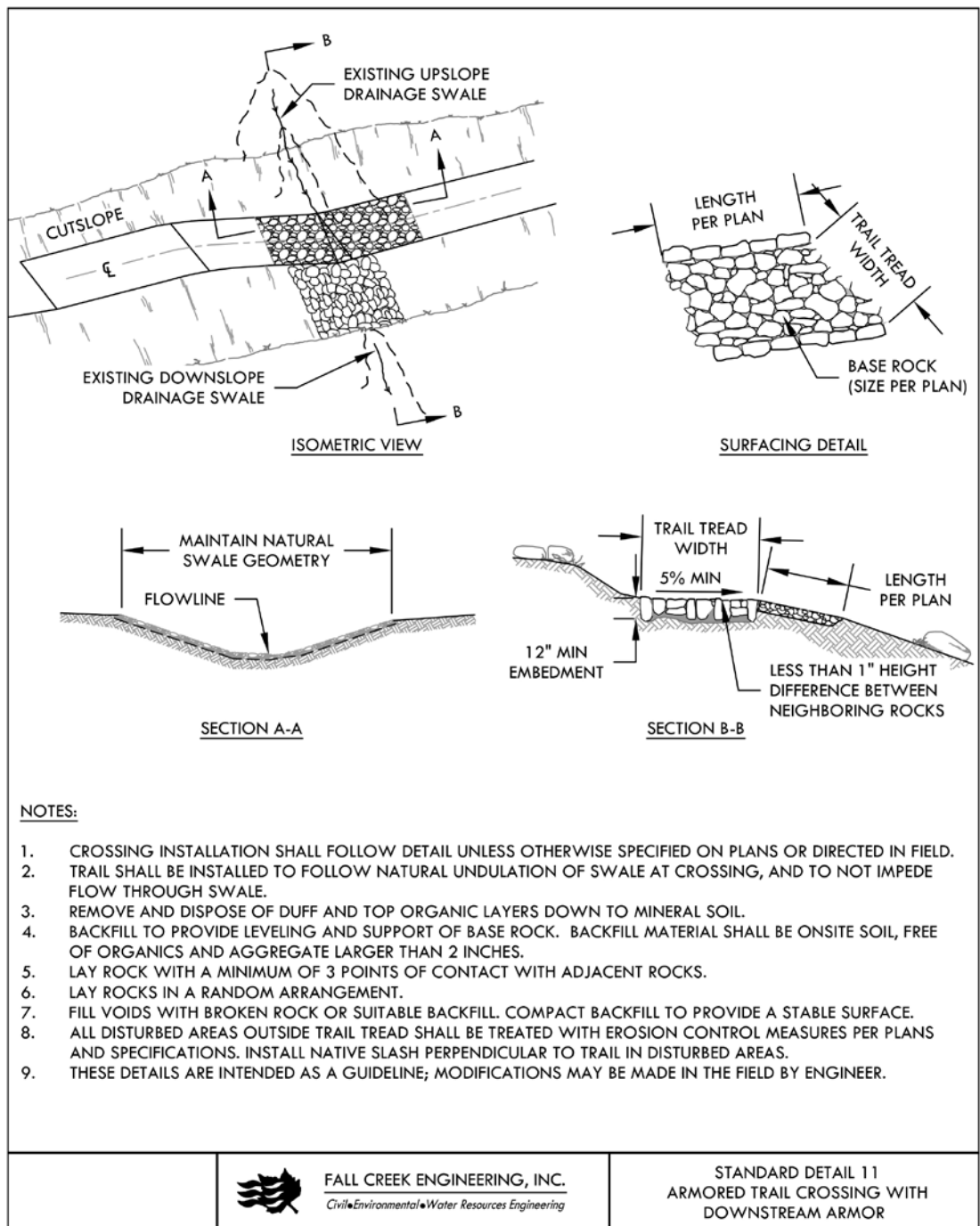
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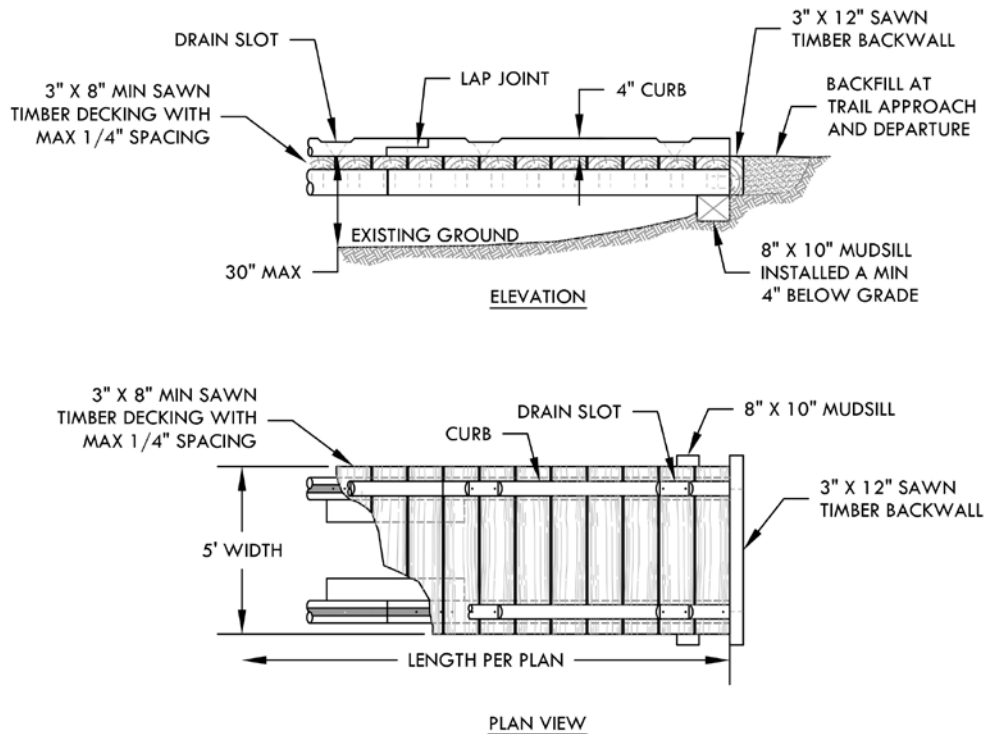
1. CROSSING INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
2. TRAIL SHALL BE INSTALLED TO FOLLOW NATURAL UNDULATION OF SWALE AT CROSSING, AND TO NOT IMPEDE FLOW THROUGH SWALE.
3. REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
4. BACKFILL TO PROVIDE LEVELING AND SUPPORT OF BASE ROCK. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
5. LAY ROCK WITH A MINIMUM OF 3 POINTS OF CONTACT WITH ADJACENT ROCKS.
6. LAY ROCKS IN A RANDOM ARRANGEMENT.
7. FILL VOIDS WITH BROKEN ROCK OR SUITABLE BACKFILL. COMPACT BACKFILL TO PROVIDE A STABLE SURFACE.
8. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
9. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.



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STANDARD DETAIL 10
 ARMORED TRAIL CROSSING





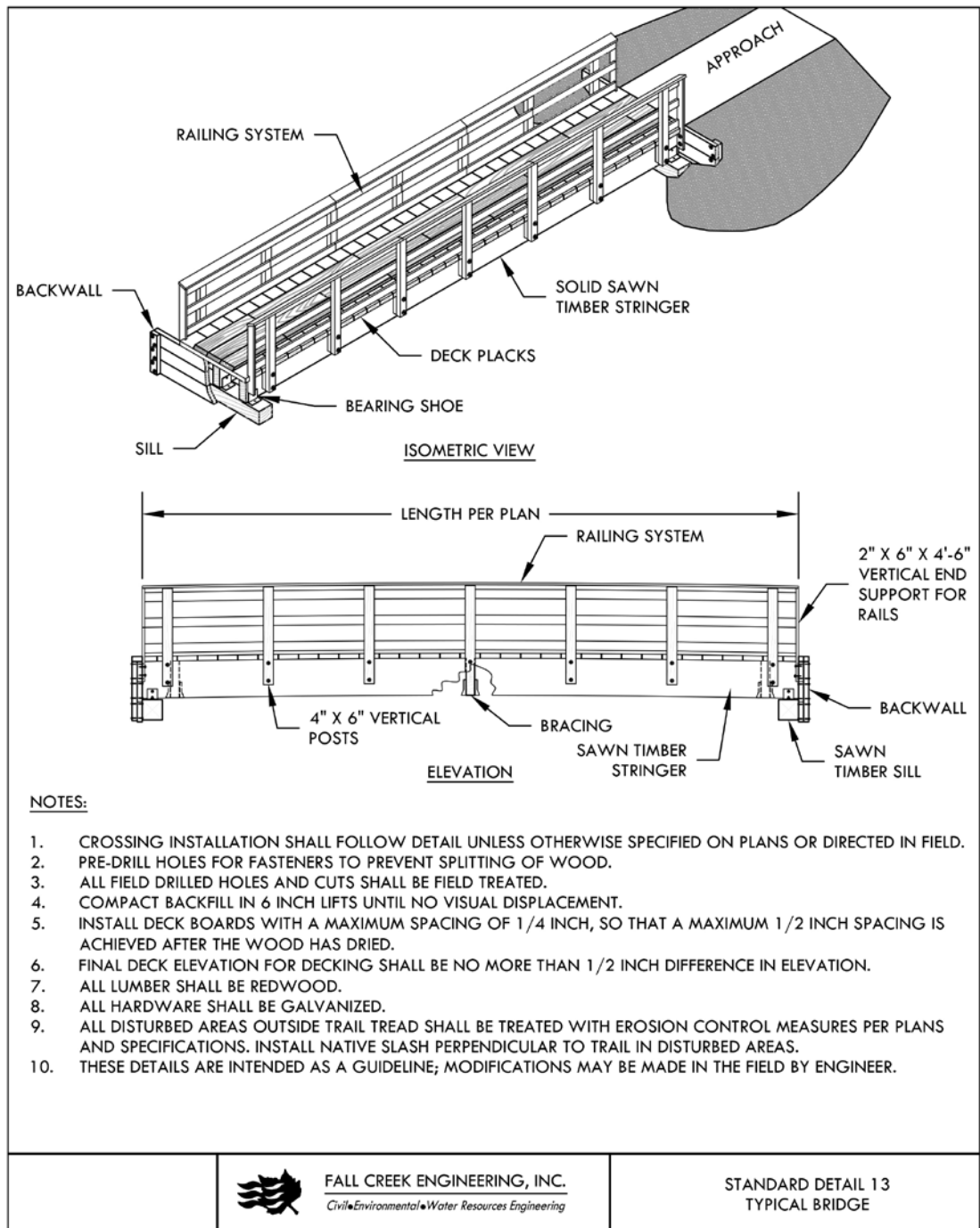
NOTES:

1. CROSSING INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
2. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF WOOD.
3. ALL FIELD DRILLED HOLES AND CUTS SHALL BE FIELD TREATED.
4. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
5. INSTALL DECK BOARDS WITH A MAXIMUM SPACING OF 1/4 INCH, SO THAT A MAXIMUM 1/2 INCH SPACING IS ACHIEVED AFTER THE WOOD HAS DRIED.
6. FINAL DECK ELEVATION FOR DECKING SHALL BE NO MORE THAN 1/2 INCH DIFFERENCE IN ELEVATION.
7. WHERE HEIGHT OF PUNCHEON EXCEEDS 30 INCHES, RAILINGS ARE REQUIRED (SEE TYPICAL BRIDGE DETAIL).
8. ALL LUMBER SHALL BE REDWOOD.
9. ALL HARDWARE SHALL BE GALVANIZED.
10. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
11. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.



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STANDARD DETAIL 12
TYPICAL PUNCHEON



PLANTING

All new planting on the property should be native, regionally appropriate, and consistent with any guidelines. Any cut surfaces or fill should be planted with native groundcovers.

SITE FURNISHINGS

In addition to the site furnishings located at the staging area(s), rest stops with benches should be strategically located along trails to emphasize scenic views, encourage a diversity of experiences, and provide shade and other pedestrian comforts. Site furnishings must be located outside of the dripline of redwood trees.

As true for all park features, site furnishings should be made of durable materials, such as concrete, metal, wood, or locally sourced stone, and should have natural or neutral colored finishes. For example, cut log stools for gathering areas.

SIGNAGE

Clear signage should be installed and maintained at the staging area(s), at property boundaries, and on all trails that includes allowable uses, proper trail etiquette, and wayfinding. Trailhead signage should include length, surface type, typical and minimum trail width, and typical and minimum running and cross slopes. Interpretative and educational signage should communicate rules while also fostering a stewardship ethic.

Trail closures must also be identified through clear onsite signage and gates, if warranted.

Signage should be durable and framing/support structures should be made of natural materials, where possible.

CONSTRUCTION PROTOCOLS

Construction protocols to further ensure the protection of biological and cultural resources, and water quality are listed under the corresponding topic.

BIOLOGICAL RESOURCES

A site-specific *Biological Resources Assessment* (BRA) was prepared for the areas with planned development under the Public Access Plan and is included in Appendix 4 (Biological Resources Assessment). Implementation of the following biological resources (BR) construction protocol is required to mitigate adverse impacts to biological resources and ensure the protection of sensitive biological communities:

BR 1 PROTECT SENSITIVE COMMUNITIES

- BR 1.1 The construction work area including the staging area shall be minimized to the fullest extent feasible and trails shall be limited to the minimum width necessary to support the proposed use (i.e., hiking, cycling, and horse riding) as defined in Table 7-1 (Trail Dimensions by Use Type).
- BR 1.2 Prior to the start of construction, all construction personnel shall be educated on the sensitivity of the biological communities and species at the site by a qualified, County-approved biologist. Environmental awareness training shall include measures to avoid or reduce impacts to the community, reporting and follow-up actions if sensitive biological communities are impacted, and the worker's responsibility under the applicable environmental regulation(s). A designated staff member from the contractor's crew shall provide follow-up training to any employees who begin work after the initial pre-construction training.
- BR 1.3 Trails should be routed around sensitive vegetation to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal and ground disturbance during construction) should avoid the dripline of sensitive vegetation, with greater separation between the trail and sensitive vegetation being preferred. If trails are re-routed, they should be re-routed downslope of any sensitive vegetation to avoid causing erosion or sedimentation issues which could be detrimental to sensitive vegetation.
- BR 1.4 Tree and shrub removal in sensitive biological communities shall be minimized to the fullest extent feasible. Where necessary, obtaining a

tree removal permit may be required per Santa Cruz County Municipal Code Chapter 16.34, Significant Trees Protection. Tree removal should be conducted by a licensed arborist or registered professional forester using industry-standard best management practices (BMPs) to prevent the spread of invasive weeds or plant pathogens and avoid damage to vegetation to be retained.

- BR 1.5 Trail construction shall incorporate the best available technology and industry-standard Best Management Practices (BMPs) to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance. See Standard Details 5 through 13.
- BR 1.6 Any restoration or landscape plantings (e.g., plantings around the proposed parking/staging area) shall use native species appropriate for plant communities found at the site. To the extent feasible, plant material shall be salvaged from trail construction activities at the site. If not possible, plant material shall be propagated by a reputable nursery with protocols in place for minimizing the potential spread of plant diseases (sudden oak death or other *Phytophthora*-related diseases). Any propagated plant material shall be sourced from as close to the site as possible, ideally from within the site itself to avoid genetic variation.
- BR 1.7 Stream crossings should ideally be designed and constructed to freespans the channel and be anchored above the top of bank. Crossings of regulated streams that avoid work below the ordinary high water mark do not require a permit from the USACE. When required, notify the CDFW and the Central Coast RWQCB of the crossing, even if located above the top of bank. If the CDFW and/or RWQCB issue authorizations for such work, the measures included in any such authorizations shall be incorporated into the design.
- BR 1.8 Where wetlands or streams cannot be avoided, appropriate approvals from the USACE (for impacts to regulated wetlands or areas below the ordinary high water mark of regulated streams) and/or the RWQCB and the CDFW (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) shall be secured

prior to initiating work in these areas. The measures included in any such authorizations shall be incorporated into the design.

- BR 1.9 Trails constructed near wetlands or streams shall be designed to minimize changes to pre-project hydrology. Avoid erosion or sedimentation by installing BMPs (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) around wetlands and streams. All materials shall be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs shall be determined by the contractor based on specific site conditions and the type of work being conducted. BMPs shall remain in place until all disturbed ground has been stabilized either through compaction or re-vegetation.
- BR 1.10 Equipment used for building new trails should generally have tread width of 48 inches or less and mass less than 10,000 pounds.
- BR 1.11 To avoid the introduction and prevent the spread of invasive weeds or plant pathogens, prior to arriving on the site, all construction equipment and vehicles shall be inspected to ensure they are clean..
- BR 1.12 Any equipment or vehicles that have been used in areas with known sudden oak death or other *Phytophthora*-related plant diseases shall be sterilized before being used and inspected by a qualified, County-approved biologist prior to entering the job site.
- BR 1.13 All disturbed ground shall be stabilized concurrent with or immediately following construction. Stabilization methods may include: compacting the soil (for trail surfaces only), covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat shall be used per Protocol BR 1.6. If other erosion control materials are to be used, they shall be certified weed-free and as otherwise specified in Protocol BR 1.9.

BR 1.14 The importation of soils for construction of the staging area or other parts of the site shall be minimized to the fullest extent feasible. To the extent feasible, soils shall be salvaged from onsite before being imported from offsite. If it is necessary to import soils, they shall be certified weed-free and from a qualified, County-approved source with protocols in place for minimizing the potential spread of plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases).

BR 1.15 Equipment and vehicle fueling and maintenance staging areas shall be at least 100 feet from any wetland or stream. A spill containment kit shall be provided at the work site and located within 50 feet of the fueling or maintenance area. All spills shall be cleaned immediately (i.e., within 5 minutes of the spill) and all resulting materials shall be disposed of properly. All construction vehicles shall be inspected daily for leaks of oil, hydraulic fluid, or other potentially hazardous materials by a qualified construction crew member and drip pans shall be placed under parked vehicles during prolonged periods of disuse (e.g., during evenings and weekends).

BR 2 PROTECT SPECIAL-STATUS PLANT SPECIES

In addition to implementing Protocol BR 1.1 through 1.15, the following construction protocols are required to ensure the protection of special-status plant species.

BR-2.1 All occurrences of special-status plants within 50 feet of any work areas shall be flagged by a qualified, County-approved biologist prior to construction. Where work will occur within 10 feet of a special-status plant to be preserved, orange construction fencing (or similar) shall be installed at the edge of the work area and no work shall occur beyond the fence. If there are occurrences of special-status plants downslope from the work area, silt fencing shall be installed at the edge of the work area to prevent soil or other materials from being transported downslope where they may impact special-status plants.

BR-2.2 Occurrences of special-status plants shall be avoided by re-routing the trail alignment to the extent feasible and practicable. Where this is not possible, impacts to special-status plants shall be minimized by

reducing the trail width and associated vegetation removal to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal) should avoid the dripline of any special-status shrubs and should avoid special-status herbs by a minimum of 10 feet. If trails are re-routed, they should be re-routed downslope, where feasible, of any special-status plants to avoid causing erosion or sedimentation issues which could be detrimental to special-status plants. If not feasible then re-route the drainage away from the special-status plants. If other considerations such as slope or soil stability make it impossible to avoid special-status plants, a qualified, County-approved biologist should develop appropriate mitigation measures based on the species in question, the size and type of the anticipated impact, and the likelihood of success with various minimization approaches approved by the CNPS (1998) including:

- a) Avoiding the impact altogether by not taking a certain action
- b) Minimizing impacts by limiting the degree or magnitude of the action
- c) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment
- d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the Project
- e) Compensating for the impact by replacing or providing substitute resources or environments (*for example Anderson's manzanita habitat enhancement could be used to offset impacts on-site near disturbance areas by the removal of overstory trees, including non-native trees*)

BR 3 PROTECT SPECIAL-STATUS WILDLIFE SPECIES

BR 3.1 Tree removal and trimming, regardless of size, shall take place outside of both the maternity and hibernation period for special-status bats (between September and October) and avoid the breeding bird window per Protocols BR 3.4 and BR 3.5. Tree removal can take place during this period without a breeding bird or bat roost survey.

- BR 3.2 If removal of large trees (e.g., the Diameter at Breast Height [DBH] is greater than 12 inches) occurs during the bat roosting season (November through August), these trees shall be inspected by a qualified, County-approved biologist for the presence of bat roosts. If a maternity roost is detected, up to a 200-foot buffer shall be placed around the maternity site until the bats are no longer utilizing the site. Non-maternity roost sites can be removed under the direction of a qualified, County-approved biologist. Any large tree that will be removed shall be left on the ground for 24 hours before being taken offsite or being chipped. This period will allow any day-roosting bats the opportunity to leave before the tree is either removed from the area or is chipped.
- BR 3.3 Consultation with the CDFW shall be initiated to determine appropriate conservation measures if active roosting bat sites are disturbed.
- BR 3.4 Conduct pre-construction breeding bird surveys if construction, vegetation removal, or ground disturbance activities occur during the breeding season (February 1 to August 31). Pre-construction surveys shall be conducted by a qualified individual within 14 days of the start of these activities to avoid disturbance of active nests, eggs, and/or young. If these activities stop or lapse for a period of 14 days or more during the breeding season, a follow-up breeding bird survey shall be conducted to ensure no new breeding activity has occurred within the anticipated work area. Outside of the breeding season, no pre-construction breeding bird survey would be required for construction, vegetation removal, or ground disturbance activities.
- BR 3.5 If nesting birds are identified, an exclusion zone in which no construction activities would be allowed shall be established around any active nests of any avian species protected by the Migratory Bird Treaty Act and California Fish and Game Code until a qualified, County-approved biologist has determined that all young have fledged. Suggested exclusion zone distances differ depending on species, location, and placement of nest, and shall be at the discretion of the biologist based on the species in question, the proximity of the nest to

the work area, and the type of work being conducted (e.g., use of hand tools versus gas-operated machinery).

- BR 3.6 During construction, all workers shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the construction area is deposited in covered or closed trash containers. The trash containers shall not be left open and unattended overnight.
- BR 3.7 A pre-construction survey of the staging area shall be conducted by a qualified, County-approved biologist to flag and delineate any woodrat middens within the planned disturbance footprint. During construction of the staging area, a biological monitor shall be onsite to ensure vegetation and ground disturbance with heavy equipment shall not impact those delineated resources. When avoidance of woodrat middens is not possible, the qualified, County-approved biologist shall dismantle the nest in accordance with Protocol BR 3.9.
- BR 3.8 During construction and trail installation, a qualified, County-approved biologist or trained designee from the contractor's crew shall identify woodrat middens located along the trail alignment. If the latter, a qualified, County-approved biologist shall provide the training prior to the start of each construction phase. To the extent feasible and practicable, the trail alignment shall avoid woodrat middens by re-routing the trail alignment. Where this is not possible, implementation of Protocol BR 3.9 would be required.
- BR 3.9 When construction of the trail alignment or the staging area would result in a direct impact to a woodrat midden, a qualified, County-approved biologist shall dismantle the nest and scatter the nest material a minimum of 10 feet outside of the trail alignment or the footprint of the staging area. If woodrat middens with young are encountered during the dismantling process, the material shall be placed back on the nest and the nest shall remain unmolested for three weeks in order to give the young enough time to mature and leave on their own accord. After three weeks, the nest dismantling process may resume.

BR 3.10 A qualified, County-approved biologist shall conduct a pre-construction survey immediately prior to the start of any ground-disturbing activities for stream crossings and areas within 100 feet of wetted features. If California red-legged frog (CLRF) are found within the work area, all work shall cease within the immediate vicinity (approximately 25 feet around the work area) until the individual(s) have been allowed to leave the work area on their own. If CLRF cannot passively leave the work area, work shall cease and the USFWS shall be contacted by the qualified, County-approved biologist to determine the appropriate course of action. The qualified, County-approved biologist shall then implement the appropriate course of action as determined by the USFWS.

BR 3.11 Because dusk and dawn are often the times when CLRF are most active and likely to disperse, all construction activities shall cease one half hour before sunset and shall not begin prior to one half hour before sunrise. Furthermore, no mechanized work shall occur during significant rain events, defined here as 0.25 inch or greater within a 24 hour period, when CLRF are more likely to disperse and occur within the work area.

CULTURAL RESOURCES

A site-specific *Cultural Resources Study* was prepared for areas with planned development under the Public Access Plan. The Study includes confidential information regarding the locations of archaeological resources that are protected by law and is therefore, not available to the general public. Implementation of the following cultural resources (CR) construction protocol is based on the findings of the *Cultural Resource Study* and is required to mitigate adverse impacts to cultural resources and ensure the protection of cultural resources:

CR 1 PROTECT ARCHEOLOGICAL RESOURCES

CR1.1 Prior to the start of construction, all construction personnel shall be educated on the identification and treatment of prehistoric and/or historic artifacts that may be discovered by a qualified, County-approved archaeologist who meets the Secretary of Interior standards

or a registered, County-approved forester who has successfully completed the California Department of Forestry and Fire Protection (CAL FIRE) archeology program.

- CR1.2 If ground disturbing activity takes place and possible artifacts are discovered, then all construction activities within a 50-foot radius of the find shall be halted immediately and a qualified, County-approved archaeologist who meets the Secretary of Interior standards (including CAL FIRE archeologists) shall be consulted to determine whether the resource requires further study. (Note, it is CAL FIRE policy that registered professional “foresters” do not perform significance evaluations of cultural resources). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps). Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance in terms of the California Environmental Quality Act (CEQA) criteria by a qualified archeologist. If the resource is determined significant under CEQA, the qualified archaeologist shall prepare and implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. The archaeologist shall also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources. The report shall be submitted to the County of Santa Cruz, Northwest Information Center (NWIC), and State Historic Preservation Office (SHPO), if required.

- CR1.3 When trail building in the vicinity of sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596 as identified in the Cultural Resources Study dated October 2017 and on file with the County, a County-approved, qualified archaeologist who meets the Secretary of the Interior standards or a County-approved, registered forester who has successfully completed the CAL FIRE archaeology program shall be present during the initial ground-disturbing phase of construction. Selected portions of proposed trail routes may be in close proximity to sites P-44-000069, P-44-000070, P-44-000071, P-44-000123, and P-44-000596, and monitoring at locations shown on Figure 3 and Figure 4 of the Cultural Resources Study is required. If archaeological specimens are discovered, a qualified archaeologist who meets the Secretary of the Interior standards should evaluate their significance.
- CR 1.4 For sites P-44-000596 and Camp ZZZ, a post construction monitoring program shall be implemented. This program would assess whether surface artifacts are being destroyed, moved, or removed. The monitoring program requires photographic documentation, sketch/plan maps, and written notes of the location of exposed surface artifacts. A County-approved, qualified archaeologist who meets the Secretary of the Interior standards or County-approved registered forester who has successfully completed the CAL FIRE archaeology program shall check the artifact locations semiannually after trails have been completed and are in use. If artifacts are moved, destroyed, or disappear, then a qualified archaeologist shall develop a treatment plan designed to protect the resources and mitigate impacts caused by hikers and other visitors. The treatment plan might include scientific collection of artifacts, their analysis, and written report preparation.
- CR 1.5 If a trail is planned at site P-44-000596, the trail shall be constructed within the old railroad grade wherever possible because no trace of the railroad line, other than the grade is evident. If the trail is planned to be built outside the railroad grade where past land uses have disturbed to ground surface, the construction of the trail is acceptable with the provision that any surface artifacts are avoided and ground disturbance is kept to a minimum (see Construction Protocol CR 1.4). Portions of

known railroad grade segments are depicted in Figures 5a and 5b of the Cultural Resources Study.

- CR 1.6 If a trail is planned at the Camp ZZZ site to follow the alignment of the existing gravel road it is acceptable for the trail to follow within the road route because there is no trace of historic-period specimens evident within this alignment.
- CR 1.7 The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5, and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be “most likely descended” from the deceased Native American. The most likely descendent would then make recommendations regarding the treatment of the remains with appropriate dignity.

AIR QUALITY

A site-specific air quality analysis was prepared for the areas with planned development under the Public Access Plan. While all impacts were determined to be well below the significance standards of the Monterey Bay Unified Air Pollution Control District, implementation of the following Air Quality (AQ) construction protocol would be implemented to further minimize emissions from fugitive dust:

AQ 1 CONSTRUCTION DUST EMISSIONS

- AQ 1.1 During the construction of the staging area, construction emissions from fugitive dust shall be minimized to the fullest extent through implementation of the following Best Management Practices (BMPs) as applicable.
- Water all active construction areas as necessary and indicated by soil and air conditions.

- When materials are transported off site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, and cut & fill activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)
- Hydroseed or apply similarly effective soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- Replant vegetation in disturbed areas as quickly as possible.



- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 miles per hour.

TRAIL MAINTENANCE GUIDELINES

All trails in San Vicente Redwoods will require routine maintenance to ensure the trails are functioning properly and to correct problems before they become significant. The goal is to maintain the trail for safe use, correct erosional problems that may impact natural resources, and preserve trail investment. Lack of such maintenance could increase long-term upkeep costs, adversely impact the environment, and result in potential offsite impacts. Effective trail maintenance incorporates trail assessments and work plans, trail maintenance and repairs, and scheduling.

TRAIL ASSESSMENT AND WORK PLAN

TRAIL ASSESSMENT

The first step in trail maintenance and a key component of adaptive management is to inspect all trails on a routine basis to identify and document current conditions, erosion and incision, evidence of sediment deposit into streams or wetlands, unauthorized trails, and any problem areas in need of improvement. Minor problems, such as clearing trail drainage features of debris, can often be corrected during the assessment whereas sites with heavy maintenance needs may require a trail crew to undertake the improvements. It is at these larger sites where documenting the problems is most useful for scheduling and prioritizing repairs.

During the assessment, sites requiring improvements are documented on a Trail Maintenance/Repair Form. This form takes the ambiguity out of the maintenance work and provides a means to identify problem areas and convey that information to crews who will be performing the maintenance. It also provides background information that could be used in a monitoring program. This form should include the following information:

- Trail and site number
- Location / Site map
- Problem description
- Recommended repair

- Priority of repair
- Materials/ Staff required
- Sketch map or photo

Typical problems include infilled and nonfunctioning drainage features, wet and muddy trail segments, failed trail segments, plugged stream crossings, downed trees, informal social trails, rutted/rilled trail segments, and areas of trail widening.

WORK PLAN

Work plans should be prepared to plan for and schedule any needed upgrades. It may be necessary to prioritize repairs based on available funding or severity of the problem. Upgrades should be completed prior to October 15th each year.

TRAIL MAINTENANCE AND REPAIRS

VEGETATION MAINTENANCE AT TRAILS

- Clear brush and trees from the trail corridor to conform to Standard Details.
- All side branches extending into the trail clearing should be cut flush with the parent branch or stem, leaving no stubs.
- Small trees and shrubs within the tread should be grubbed out to prevent tripping — holes should be filled and compacted.
- Fallen branches and trees should be removed from trail tread and placed outside the corridor.

TREAD MAINTENANCE

- Remove outside berms and out-slope tread to drain.
- Remove cut-bank slough from the trail tread.
- Remove loose rocks.
- Install appropriately sized, well-graded, angular rock aggregate at chronic wet/muddy segments of trail as needed.

DRAINAGE AND STREAM CROSSING MAINTENANCE

- Remove accumulated debris from all trail drainage features.
- Enlarge grade reversals that appear undersized and at risk for failure.
- Install additional drainage grade reversals in areas where runoff is concentrated.
- Clean infilled ditches.
- Clean culverts of debris.
- Replace failing culverts with alternative improvements such as hardened crossings.
- Inspect and repair puncheons and bridges.

SIGN MAINTENANCE

- Sign repair/replacement.

SCHEDULING

Inventory drainage features (grade reversal/rolling dip, bridge, waterbar, culvert, and swale) in April and September and perform major maintenance before summer and winter seasons.

- **Routine Inspection:** Inspect and maintain trails monthly, including vegetation, signs, gates, barriers, etc., to discourage shortcuts, trail widening, and erosion. Ensure that the width and surface of the trail designed for accessibility is appropriately maintained. Incision of the trail tread should be monitored and tracked to ensure erosion and root damage does not become a problem. Additional stormwater runoff management features should be installed where needed to address erosion, and failing trails should be re-routed if necessary.. Spring inspections are necessary to identify failed or poorly functioning drainage structures that may become less evident following summer trail use. Fall inspections are necessary to identify problems that may have arisen following summer trail use and to make a final check of the trail prior to the winter rainy seasons. Inventory drainage features (grade reversal/rolling dip, bridge, puncheons, waterbar, culvert, and swale) in April and September.

- **Winter Inspections:** Perform routine winter season inspections and maintenance monthly from October to April to minimize trail damage and the need to re-route trails in the future. It is also advisable to inspect portions of the trail network during or following major storm events. These inspections would generally focus on watercourse crossings, steep gradient trail reaches, and known problems areas. Assess each drainage feature for evidence of stormwater delivery of sediment to streams or wetlands every winter and remediate any problems
- **Upgrades:** Perform major maintenance before summer and winter seasons. Prescribed trail maintenance should occur prior to October 15th and the winter season. Minor trail maintenance, such as clearing dips and culverts using hand crews may occur at any time, including during routine inspections. Trails should generally be maintained to conform to the standard trail specifications.
- **Repairs.** Maintain high use trails within one week of identifying an issue, and maintain low use trails are maintained within two weeks of identifying an issue.

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8 ACKNOWLEDGEMENTS

We would like to acknowledge the State Coastal Conservancy for providing grant funding to support his planning project, and Land Trust donors who helped make this possible. We would also like to thank our Conservation Partners for the robust collaboration that resulted in this plan.

We would like to acknowledge and express gratitude to our agency partners, to the experts who reviewed drafts of the plan, and to experts consulted through interviews.

AGENCY PARTNER TEAM

The agency partner team is working with the Conservation Partners on emergency management, public safety, and visitor services and will continue to collaborate during the implementation phase.

Angela Bernheisel, CAL FIRE, Forester II – Soquel Demonstration Forest

Jake Hess, Deputy Chief, CAL FIRE San Mateo-Santa Cruz Unit

Jeff Gaffney, Parks Director, Santa Cruz County

Also Gonzalez, Battalion Chief, CAL FIRE San Mateo-Santa Cruz Unit

Rich Sampson, CAL FIRE, Forester II

Eric Strum, Park Superintendent, Santa Cruz County

Craig Wilson, Chief Deputy, Santa Cruz County Sheriff's Office

EXPERT REVIEW

We solicited review of the plan from experts in public access management and the protection of wildlife in the context of recreation management. Their insightful feedback strengthened our approach. Expert review included a conference call, field tour and review of a draft of the Public Access Plan and supporting materials. Each reviewer participated in some or all of these elements. We look forward to future collaboration to ensure implementation is a success.

Ramona Arechiga, San Mateo County Parks, Natural Resource Manager

Angela Bernheisel, CALFIRE, Forester II – Soquel Demonstration Forest

Sarah Birkeland, San Mateo County Parks, Assistant Director

Ben Blom, Bureau of Land Management, Central Coast Field Office Manager

Joe Connors, California State Parks, Supervising Ranger

Jeremy Dertien, Wildlife Conservation Society, Project Coordinator

Will Fourt, Santa Cruz County Parks, Park Planner
Jeff Gaffney, Santa Cruz County Parks, Director
Joanne Kerbavaz, California State Parks, Senior Environmental Scientist
Courtney Larson, Colorado State University Fort Collins, Graduate Research Assistant
Brian Malone, Midpeninsula Regional Open Space District, Land Facilities Manager
Lee Otter, California Coastal Commission, Planner (Retired)
Mike Powers, Bureau of Land Management, Natural Resource Specialist
Juliana Rebagliati, City of Santa Cruz, Planning Director (Retired)
Sarah Reed, Wildlife Conservation Society, Director of Applied Conservation Science for the Americas Program, and Colorado State University Fort Collins, Affiliate Faculty Member
Michelle Reilly, Northern Arizona University, PhD (now Wildlife Biologist and Strategic Habitat Conservation Coordinator at the U.S. Fish and Wildlife Service)
Chris Spohrer, California State Parks, District Superintendent
Chris Wilmers, UC Santa Cruz, Professor and Santa Cruz Puma Project Director
Bill Wolcott, California State Parks, Public Safety Superintendent

INTERVIEWS

To guide development of this plan, we interviewed staff from agencies and organizations with relevant expertise. Interviewees, in addition expert reviewers, included:

Ezekiel Bean, Water Resources Supervisor, City of Santa Cruz Water Department
Rick Bisaccia, Stewardship Director, Ojai Land Conservancy
Rick Cooper, Field Manager, Bureau of Land Management (Retired)
Scott Couture, Lead Resource Specialist III, The Land Conservancy of San Luis Obispo County
Joe Christy, Bonny Doon Fire Safe Council
Joe Clarke, Sargent, Santa Cruz Sheriff Coroner
Paul Houghtaling, wildlife tracker, University of California at Santa Cruz
Terris Kasteen, Wildlife Biologist, California Department of Fish and Wildlife
Ian Larkin, Chief, CalFIRE San Mateo-Santa Cruz Unit
Randy Lavasseur, Chief of Visitor and Resource Protection, Golden Gate National Recreation Area

Brian Martin, Chief Ranger, Bureau of Land Management Hollister Office
David Moore, Outdoor Recreation Planner, Bureau of Land Management
Sky Painter Murphy, Planning & Environmental Coordinator, Bureau of Land
Management
Michael Newburn, Visitor Services Manager, Midpeninsula Regional Open Space
District
John Ricker, Director, Santa Cruz County Water Resources Division
Justine Smith, PhD Candidate, University of California at Santa Cruz
John Svahn, Stewardship Director, Tahoe Donner Land Trust

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SAN VICENTE REDWOODS PUBLIC ACCESS PLAN
ACKNOWLEDGEMENTS

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A P P E N D I X 1

C O N S E R V A T I O N V A L U E S

Overview of Conservation Values

The 2014 Grant Deed of Conservation Easement by Peninsula Open Space Trust and Sempervirens Fund to Save The Redwoods League for the San Vicente Redwoods property identifies the following values as providing a significant public benefit and are worthy of conservation. These values are referred to as the Conservation Values.

1. **Statewide and Regional Conservation Significance.** The Property is identified as a conservation priority in several regional planning efforts, including the Bay Area Open Space Council's *Conservation Lands Network, 2011*, Save the Redwood League's *Master Plan for the Coast Redwoods, 2007*, Land Trust of Santa Cruz County's *Conservation Blueprint, 2011* ("Conservation Blueprint"), The Nature Conservancy's *Central California Coast Ecoregional Plan, 2006*, and the Living Landscape Initiative's *Redwood Focal Area, 2011*.
2. **Forests.** The Property includes substantial native forest ecosystems in their natural or relatively natural condition, including second-growth mixed redwood and Douglas-fir forest and live oak forest. The Property's forests are naturally diverse, consisting of a range of age classes and forest structures, including old-growth forest and large individual and contiguous stands of younger trees. The Property contains numerous forest resource values, including but not limited to its capacity to provide raw material for wood, timber and other forest products.
3. **Biodiversity.** The Property encompasses at least eight distinct vegetation types, ranging from vast stands of redwood forest to smaller pockets of the endemic Sandhills community. Populations of locally rare and unique plants such as Santa Cruz manzanita, oracle oak, and Shreve oak occur on the Property. The pockets of Sandhills habitat located on the Property are dominated by sparse stands of the rare maritime form of ponderosa pine forest and by maritime chaparral, and may support at least four federally-endangered plant species found only in the Sandhills, including Ben Lomond spineflower, Santa Cruz wallflower, Ben Lomond buckwheat, and Bonny Doon (silver leaf) manzanita. The Property provides habitat for a wide variety of rare and sensitive animal species, including California red-legged frog, mountain lion, peregrine falcon, steelhead trout, coho salmon and marbled murrelet. The Sandhills are also home to two insects found nowhere else on earth, the Mount Hermon June beetle and the Zayante band-winged grasshopper, as well as the Santa Cruz kangaroo rat and coast horned lizard.
4. **Watershed Protection.** Conservation of the Property is very important for watershed protection. San Vicente Creek originates on the Property and is the sole supply of domestic water to the residents of the town of Davenport. Laguna Creek, which bisects the Laguna parcels, is a critical source of domestic water for the City of Santa Cruz, especially during drought years. Most of the Property is underlain by pervious soils and underground karst formations, which provide for critical groundwater recharge. This recharge helps maintain vital year-round stream flows, which in turn supports aquatic habitat and domestic water supplies. The Property's streams are also a very important conservation priority to sustain populations of steelhead trout, red-legged frog, and other aquatic species, and its

two principal streams - Big Creek (tributary to Scott Creek) and San Vicente Creek - were designated as core coho salmon recovery priorities in the 2010 Draft Coho Recovery Plan prepared by the National Oceanic and Atmospheric Administration, Department of Fisheries, Office of Protected Resources. Mill Creek has both coho salmon and steelhead presence, and is therefore a high priority for conservation. Laguna Creek has a strong steelhead population and historically supported coho salmon, and is a very important conservation priority to sustain populations of steelhead, red-legged frog, and other aquatic species. Together with their tributaries, there are over 19.5 kilometers of critical stream targets on the Property, and 19.7 kilometers of very important streams as designated in the Conservation Blueprint. Conservation and watershed-based management of the Property represents an outstanding opportunity to protect and restore water supply and water quality.

5. **Viewshed Protection.** Much of the Property is visible from Highway 1, Empire Grade Road, Smith Grade Road, County-designated scenic routes, and from public viewpoints in parks and protected lands along the coast and in the Santa Cruz Mountains. Views from Highway 1 in particular reveal the abundant natural resources of the Property, including the extensive native tree cover. The view of these undisturbed natural resources contributes to the scenic panorama and character of the Santa Cruz Mountain range.
6. **Landscape and Habitat Connections.** The Property is located within a nearly 70,000-acre complex of mostly contiguous habitat, including Big Basin Redwoods State Park, the private forestlands just to the west of the Property, and several large adjoining properties comprising approximately 20,000 acres, including Cal Poly Swanton Pacific Ranch, Coast Dairies Property, Bonny Doon Ecological Reserve, Wilder Ranch State Park and the University of California Santa Cruz Campus Natural Reserve. Conservation of the Property will secure the southern portion of this large habitat block and will help maintain connectivity to nearby contiguous habitats, including Ben Lomond Mountain, the Upper San Lorenzo River watershed, and Loch Lomond Reservoir and its headwaters. Protecting the Property through this Conservation Easement will result in over 27,500 acres of contiguous, protected lands.
7. **Public Recreation, Education and Scientific Study.** With over 70 miles of unpaved roads, the Property has outstanding potential for public recreational access, including regional trail connections to Big Basin Redwoods State Park, the Fall Creek Unit of Henry Cowell Redwoods State Park, and the Coast Dairies Property, including the possibility for a new Skyline to the Sea Trail that would connect the California Coastal Trail in Davenport to the main crest of the Santa Cruz Mountains along Empire Grade. Given its proximity to Cal Poly Swanton Pacific Ranch and the university's focus on resource management-related research, the Property provides unparalleled opportunities for scientific research related to restoration forestry, as well as environmental education and interpretation for the public at large. The Property may also present opportunities related to the University of California Natural Reserve Program's system of living laboratories and outdoor classrooms in which a variety of disciplines could pursue fieldwork and educational efforts.

A P P E N D I X 2

A D A P T I V E M A N A G E M E N T O V E R V I E W

Overview of Constraints, Preventative Strategies, and Adaptive Management Strategies by Conservation Value

<i>Constraints</i>	<i>Preventative Strategies</i>	<i>Adaptive Management Strategies</i>
Conservation Value 1: Statewide and Regional Conservation Significance		
Preserve the regionally significant conservation values of the property	Perform an extensive planning process and a well-organized and funded implementation	Monitor and enforce rule violations; adjust engagement and enforcement effort
Leave undisturbed large blocks of habitat	Zone public access and closed areas to retain large contiguous closed blocks of habitat	Monitor closed areas for unauthorized access; adjust education and enforcement effort
Provide regionally significant public access	Provide a nature-based recreation opportunity with a skyline-to-the-sea type transect of Ben Lomond Mountain	Track visitor satisfaction; respond to meet expectations to the extent feasible
Conservation Value 2: Forests		
Minimize native tree removal and damage	Preserve large native trees when locating trails Locate the staging area in an area dominated by non-native trees	Maintain trails so they don't widen or erode; adjust effort if problems arise
Do not interfere with forest restoration and timber production	Route trails around large blocks of the Restoration Reserves and Working Forest	Track the satisfaction of working forest and restoration project managers; increase collaboration effort with partners as needed
Do not increase wildfire risk or damage	Close the property on 'red flag' days of exceptionally high fire risk. Maintain a network of fire-fighting water tanks	Track unauthorized visitors on 'red flag day' fire hazard days; adjust patrol effort, engagement and enforcement Monitor and maintain tanks to ensure they are full and in good condition

<i>Constraints</i>	<i>Preventative Strategies</i>	<i>Adaptive Management Strategies</i>
Conservation Value 3: Biodiversity		
Minimize impacts to mountain lion breeding	Provide large closed areas around mountain lion denning areas	Patrol for unauthorized trail construction; prosecute and/or sue violators; decommission unauthorized trails; impose use restrictions
Avoid increasing populations of predators of marbled murrelets	Manage waste with education and wildlife-proof trash receptacles	Track food waste; adjust visitor engagement and waste management effort
Avoid the introduction of invasive species	Require that contractors clean vehicles of dirt and organic material	Monitor and manage invasive plants in the public access area
Conservation Value 4: Watershed Protection		
Protect municipal water supplies	Route trails away from municipal water intakes with large buffers	Monitor closed areas for unauthorized access; educate and enforce closures
Protect stream water quality	Design and maintain trails to frequently shed water and minimize erosion	Monitor trails for sediment delivery to streams or wetlands; remediate problems promptly
	Close the property following significant rain events until soils dry	Monitor and enforce closures; adjust staffing as needed
Protect aquatic habitat and wetlands	Span streams with bridges and route trails around wetlands unless that results in greater overall impacts	Track and remediate horse and dog waste near streams and wetlands; adjust engagement; impose use restrictions
Conservation Value 5: Viewshed Protection		
Preserve native forest canopy	Design new trails with a narrow tread to retain full canopy cover	Inspect trails routinely for widening and erosion; adjust maintenance effort; adjust alignments and grade
Minimize impacts to roadside aesthetics	Design the parking area to expand to accommodate demand, minimizing road shoulder and neighborhood parking	Track the availability of parking and expand the parking area only as needed

<i>Constraints</i>	<i>Preventative Strategies</i>	<i>Adaptive Management Strategies</i>
Conservation Value 6: Landscape and Habitat Connections		
Preserve core wildlife habitat	Locate the public access area and the closed area to provide large areas of core habitat	Monitor and enforce closed areas for unauthorized access; adjust patrol and enforcement effort ; impose use restrictions
Preserve corridors for wildlife movement	Locate the public access area to minimize activity in identified corridors, especially at night	Monitor and enforce night time and area closures; adjust patrol and enforcement effort
Conservation Value 7: Public Recreation, Education and Scientific Study		
Manage conflicts between visitor groups	Provide trail use designations that allow visitors to enjoy and avoid specific uses	Survey visitor satisfaction; respond to the extent feasible with changes to trails, including use designations
Manage safety and risk	Maintain trails and facilities; Educate visitors; Patrol, enforce and create a stewardship presence; Maintain incident report system	Track and evaluate incidents and accidents; identify and implement mitigation measures

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A P P E N D I X 3

QUESTIONNAIRE SUMMARY

San Vicente Redwoods Public Access Plan

Opportunities and Constraints

Expressed by Interview and Questionnaire Participants

Bryan Largay and Jessica Missaghian

Land Trust of Santa Cruz County

July 24, 2014

Purpose

This document summarizes the opportunities and constraints related to public access of the San Vicente Redwoods property as expressed by community members through questionnaires and interviews.

Overview of Opportunities for Participation by the Community

The Land Trust and our conservation partners, the Peninsula Open Space Trust, Sempervirens Fund and Save the Redwoods League, are developing the San Vicente Redwoods Public Access Plan over the next year. We invite community participation throughout the planning process.

Phase 1. Questionnaire and Interviews

During this phase anyone interested in the plan may complete a questionnaire. We will also interview certain affected parties, such as owners of adjacent lands, emergency services, and others. Two small group meetings will be held, one for education and research interests, and one for representatives of recreational user groups. During this period various technical assessments will also be conducted.

Questionnaires are available online at www.LandTrustSantaCruz.org. Paper versions are available on request from the Land Trust of Santa Cruz County, Attn. San Vicente Access, 617 Water Street, Santa Cruz CA 95060. Questionnaires will be accepted until April 30.

Phase 2. Opportunities and constraints summary

The findings from Phase 1 will be combined into a summary of the opportunities and constraints on the property. These will be presented in map format at a Community

Meeting in early spring. Public input will be welcome at that meeting and during the following month.

Phase 3. Draft plan

Public input will be combined with feasibility analysis to develop a draft plan. This will be presented at a Community Meeting planned for September 10, 2014. Public input will be welcome at that meeting and for a few weeks afterwards.

Phase 4. Final plan and implementation

Input from the public, follow-up analysis and decision making by partners will lead to the Final Plan. Components to be implemented will be submitted to Santa Cruz County for regulatory compliance, which is anticipated to take about a year.

Interview and Questionnaire Approach

This document provides a summary of the results of preliminary public and stakeholder engagement conducted in the process of planning for public access on the San Vicente Redwoods property.

In order to understand how people could be affected by the project, the Land Trust of Santa Cruz County conducted a series of interviews and hosted an online questionnaire to provide an opportunity for neighbors, residents, agency staff and others to express their hopes and concerns.

Between October 2013 and June 2014 we interviewed and held small group meetings with 115 people. The online questionnaire was launched in mid-November, and on June 24, 2014, we downloaded the data summarized here. The questionnaire was closed May 1, 2014, but was reopened on request for individuals who were unable to participate previously. We organized feedback into concerns and opportunities, and summarize those here.

The future work of developing the management plan will include addressing concerns expressed and making the most of those opportunities identified by the community.

Results

Overall, the community expressed strong support for access. Of the 2326 valid questionnaires, 97% supported some form of public access, while only 20 respondents (1%) indicated that they did not want to see any recreational access to the property. (The difference consisted of people who either did not respond to the question or who responded 'maybe' to the question).

<i>Affiliations of questionnaire respondents (percent of respondents who indicated each affiliation)</i>	
Resident of Adjacent Property	5%
Resident of Bonny Doon or Davenport	12%
Resident of Santa Cruz County	41%
Hiker	46%
Mountain Biker	33%
Equestrian	41%
Agency Staff	1%
Educator/Researcher	5%
Business Representative	2%
Other Interested Party (please specify)	10%

Common responses to 'Other Interested Party' can be grouped into these categories: dog owner, disc golfer, birder, trail runner, off-road vehicle rider, mushroom gatherer and 'nature lover' or similar.

Concerns

A variety of interviewees and respondents expressed concerns.

<i>Concerns expressed by questionnaire respondents (percent of respondents who expressed each concern)</i>	
Illegal Uses	48%
Trail Conflicts (horses, bikers, hikers, dogs, etc.)	48%
Fire Risks (i.e. campfires)	43%
Wildlife Impacts	35%
Parking	26%
Impacts to Water Quality and/or Supply	21%
Invasive Species	20%
Too Many Users	19%
Private Land Trespassing	14%
Roadway Congestion	14%
Other (please specify)	15%
Cost of Management	12%
Quarry Hazards	8%
Loss of Productive Timberland	7%

Most responses to 'Other' consisted of additional detail on one of the other topics, expressed concerns about the planning process, particularly that one group of users would be unfairly advantaged at the expense of others.

Management Responsibility and Approach

Overarching all other concerns were questions about responsibility for management, including provision of public safety services. Interview participants almost always had numerous questions about how management would be provided, including consideration of costs. Only one in eight questionnaire respondents expressed concern related to the cost of management.

Many process participants expressed the opinion that adverse impacts would occur unless a robust approach was adopted for the implementation phase. Many expressed interest in who was going to be in charge of daily operations and what level of resources would be allocated to managing the property. Many expressed that additional resources would be required for people to use the property safely and for neighbors to not be adversely impacted.

Many residents of Davenport and Bonny Doon we talked to expressed the opinion that local emergency services are under strain. They said that there are relatively few Sheriffs Deputies on patrol, relatively few volunteers available for fire protection, and long response times in emergencies. We heard that private landowners in the area were under pressure from trespass and illegal activities.

Many residents wanted to know how the approach to management of public access would prevent illegal activities from occurring.

Many interviewees provided suggestions to address these management challenges included:

- high investment (dollars, skills and hours)
- on-site presence
- frequent patrols
- modest infrastructure and extent of trail network
- gradual roll-out of facilities
- investment in relationships with both users and neighbors
- monitoring technology.

Health and safety of users and nearby residents

Health and safety of neighbors was far and away the most consistent concern expressed during interviews. Embedded within this concern were several interrelated themes.

Illegal Activities

Illegal activities that were identified as concerns included a variety of criminal and trespass related activities such as:

- trespass
- vandalism
- theft and storage of stolen goods
- marijuana cultivation
- camping
- dumping
- off-road vehicle operation
- mountain bike trail construction
- commercial mushroom harvesting
- commercial firewood harvesting
- commercial landscape materials collection

Nearby residents expressed concern that illegal activities could spread to their property. Business property owners in the area described typically spending thousands to tens of thousands of dollars annually preventing such unauthorized activities. We heard from a variety of people who thought that existing public lands in the area were inadequately

managed with regard to these issues. They provided examples that such lands have been the origin of wildfires, location of extensive unauthorized encampments, and the sites of illegal drug production and consumption.

Many concerned individuals wanted to know the approach to manage these potential impacts.

Fire

Fire was the single greatest and most consistent concern. Two large scale wildfires – and dozens of smaller ones – have burned in the vicinity of the property in the past six years. Arson and carelessness are the primary causes. Numerous people expressed concern that providing access would result in a much greater likelihood of fire. Recreational user activities they identified as related to wildfires included:

- unauthorized camping and cooking,
- camp fires,
- tobacco and marijuana smoking,
- improper use of cook stoves,
- vehicle use in parking lots, and
- arson

While Cal Fire maintains a strong presence in the area, a blaze can cover hundreds of acres very quickly. The communities of Bonny Doon and Davenport have active community-agency partnerships to reduce fire risk and provide, but these are often strained in terms of financing and volunteer hours.

Parking and Roadway Congestion

Parking was of great concern to neighbors. Some neighbors indicated that the provision of a parking lot close to their homes would bring noise, trash and undesirable people who might commit crimes. They also said that the increase in activity would change the character of their neighborhoods. Some recreational users also expressed concern about parking, indicating that many recreational areas in Santa Cruz have road shoulder parking which is unsafe. Many participants indicated that Empire Grade is unsafe for road shoulder parking. Many participants indicated that the residential streets in Davenport and Bonny Doon Road would be inappropriate for road shoulder parking.

A few participants expressed the expectation that traffic associated with opening the property to public access would substantially change the noise levels and safety of roads in the vicinity, including Highway 1, Empire Grade and Bonny Doon Road.

Quarry Hazards

Participants familiar with the quarry expressed considerable concern about the safety hazards posed by quarry and related infrastructure and earthworks. Sinkholes, cliffs, tunnels, aging infrastructure and other features were identified as areas of concern.

User Experience

Trail Conflicts

Numerous participants expressed concern that hikers, bikers, equestrians and dog walkers could not share the same trails without diminishment of the enjoyment. Contributing factors included:

- differences in the speed of the biker and hikers,
- rude behavior by cyclists
- rude behavior by hikers
- the potential for bikes to startle horses
- people not cleaning up after their dogs
- flies and odors associated with horses
- hikers feeling unsafe without their dogs
- dogs behaving aggressively towards other users and wildlife

Numerous suggestions were made to mitigate these impacts, including:

- separate trails for different user groups
- alternating days of use for different user groups
- uni-directional trails for biking, with the uphill direction aligned with
- requirements for leashes on dogs
- trail stewards to educate users and mediate conflict

Natural Resources

Wildlife, Water and Water Quality, and Too Many Users

Many participants expressed concerns related to natural resources and the impact of too many users on those resources. Comments along these lines expressed the importance of leaving parts of the property in a wild state for the benefit of wildlife and preservation of ecologic integrity. A number of Davenport residents expressed concern about the impact of access on the quality of drinking water, which is sourced on the property. Water resource agency staff expressed concerns related potential impacts to the City of Santa Cruz water supply, which is located downstream from the Laguna Parcel.

Participants recommended strategies to reduce impacts to salmonids (manage erosion), mountain lions (avoid denning and migration corridors), and peregrine falcons (manage access to the quarry using fencing).

Access Points

Trailheads and Parking Lots

Many participants expressed concern about how the public would access the property: where they would park and where the trailheads would be located. Most of the concern centered around parking lots, as described above. Participants generally did not want parking lots to be

located in their neighborhoods. Many participants were also concerned about trailheads, again preferring for them to be located in neighborhoods other than theirs. The least favored site for either trailheads or parking was in Bonny Doon. Parking and trailheads at the Coast Dairies property in Davenport were generally preferred, except for by the residents of Davenport. Parking and trailheads at Empire Grade received the broadest – but not strongest – support.

<i>Support for trailheads and parking lots from different areas (percent of respondents who expressed support for the activity in the specified area)</i>		
Area A (Empire Grade) Parking	Bonny Doon	53%
	Davenport	59%
	Santa Cruz	68%
Area A (Empire Grade) Trailhead	Bonny Doon	72%
	Davenport	65%
	Santa Cruz	81%
Area B (Bonny Doon Road) Parking	Bonny Doon	26%
	Davenport	34%
	Santa Cruz	43%
Area B (Bonny Doon Road) Trailhead	Bonny Doon	51%
	Davenport	48%
	Santa Cruz	67%
Area C (Coast Dairies) Parking	Bonny Doon	76%
	Davenport	27%
	Santa Cruz	72%
Area C (Coast Dairies) Trailhead	Bonny Doon	76%
	Davenport	42%
	Santa Cruz	82%

Opportunities

Numerous participants described various opportunities for the property. Participants described preferences for various recreational uses of the property.

<i>Opportunities expressed by questionnaire respondents (percent of respondents who answered 'Yes' to the question of whether the activity should be provided)</i>	
Hiking	85%
Loop Trail	84%
Ridgeline to Ocean Trail	85%
Biking	46%
Horseback Riding	58%
Hike-In Camping	43%
On-Leash Dogs	57%
Off-Leash Dogs	27%

In addition to options offered by the questionnaire, various participants identified:

- a disc golf course
- collecting mushrooms and edible plants
- hosting gatherings and events

- providing a place of quite nature reflection
- providing a place for building communities in concert with nature

Summary

The interviews and questionnaire provided an invaluable window into the hopes and concerns of the community.

Below is a word cloud consisting of the 50 most common words expressed in responses to an open ended question in the questionnaire. The size of each word is proportionate to its frequency in the responses.



A P P E N D I X 4

BIOLOGICAL RESOURCES ASSESSMENT

Biological Resources Assessment Draft San Vicente Redwoods Public Access Plan

SANTA CRUZ COUNTY, CALIFORNIA

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	v
1.0 INTRODUCTION.....	1
2.0 REGULATORY BACKGROUND	1
2.1 Sensitive Biological Communities	1
2.1.1 Clean Water Act Section 404	2
2.1.2 Clean Water Act Section 401 and Porter-Cologne Water Quality Control Act	2
2.1.3 California Fish and Game Code Section 1600	2
2.1.4 Essential Fish Habitat	3
2.1.5 CDFW Sensitive Terrestrial Communities	3
2.1.6 Sensitive Communities Identified by Santa Cruz County Code	3
2.1.7 Environmentally Sensitive Habitats Identified by the Santa Cruz County Local Coastal Program	5
2.2 Special-Status Species.....	5
2.2.1 Special-Status Plants and Wildlife	5
2.2.2 Critical Habitat	6
2.3 Protected Trees	7
3.0 METHODS	7
3.1 Biological Communities	8
3.1.1 Non-Sensitive Biological Communities	8
3.1.2 Sensitive Biological Communities	8
3.2 Special-Status Species.....	10
3.2.1 Literature Review	10
3.2.2 Site Assessment	10
3.2.3 Special-Status Species Surveys	11
3.2.4 Critical Habitat	13
3.4 Protected Trees	13
4.0 ENVIRONMENTAL SETTING	13
5.0 RESULTS	14
5.1 Biological Communities	14
5.1.1 Non-Sensitive Biological Communities	17
5.1.2 Sensitive Biological Communities	17
5.2 Special-Status Species.....	21
5.2.1 Special-Status Plants	21
5.2.2 Special-Status Wildlife	25
5.2.3 Critical Habitat	33
5.3 Protected Trees	33
6.0 PROJECT DESCRIPTION	33
7.0 POTENTIAL IMPACTS, MINIMIZATION, AND AVOIDANCE MEASURES	35
7.1 Sensitive Biological Communities	36
7.1.1 Sensitive Terrestrial Communities	36
7.1.2 Sensitive Aquatic Communities	38
7.2 Special-Status Plant and Wildlife Species.....	40
7.2.1 Special-Status Plants	40
7.2.2 Special-Status Wildlife	41
7.3 Protected Trees	47

8.0 CONCLUSION	47
9.0 REFERENCES	48

LIST OF TABLES

Table 1. Description of California Rare Plant Ranks and Threat Codes.....	6
Table 2. Coarse-Scale Biological Communities Mapped within the Larger San Vicente Redwoods Property by ESA (2012)	15
Table 3. Biological Communities Observed by WRA within the Project Area.....	16
Table 4. Trail Dimensions by Type	35

LIST OF APPENDICES

Appendix A – Project Figures

- Figure 1. Location Map
- Figure 2. Project Area Overview
- Figure 3. Biological Communities Documented within the Greater San Vicente Property
- Figure 4. Wetlands Documented within the Project Area
- Figure 5. Regulated Stream Crossings within the Project Area
- Figure 6. Special-Status Plants Documented within a 5-Mile Radius of the Project Area
- Figure 7. Special-Status Plants Documented within the Project Area
- Figure 8. Special-Status Wildlife Documented within a 5-Mile Radius of the Project Area
- Figure 9. Special-Status Wildlife Documented within the Project Area

Appendix B – List of Observed Plant and Wildlife Species

Appendix C – Potential for Special-Status Species to Occur in the Project Area

Appendix D – Site Photographs

LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CCA	California Coastal Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game (currently the CDFW)
CDFW	California Department of Fish and Wildlife (formerly the CDFG)
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFG	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California Red-Legged Frog
CSRL	California Soil Resource Lab
DBH	Diameter at Breast Height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
ESU	Ecologically Significant Unit
Inventory	CNPS Inventory of Rare and Endangered Plants
LCP	Local Coastal Program
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
OWHM	Ordinary High Water Mark
PCE	Primary Constituent Element
PFCM	Pacific Fisheries Management Council
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
USFWS	U.S. Fish and Wildlife Service
WBWG	Western Bat Working Group
WRA	WRA, Inc.

EXECUTIVE SUMMARY

This report provides an analysis of natural community and special-status species issues for the proposed trail alignment associated with the Draft San Vicente Redwoods Public Access Plan (Draft Public Access Plan; PlaceWorks 2018) located in unincorporated Santa Cruz County, California. In December 2015, January, February, June, August, and October 2016, and May, June, and August 2017 WRA, Inc. (WRA) conducted a biological resources assessment within the Project Area for the proposed trail network. WRA observed 13 biological communities, 242 plant taxa and 18 wildlife taxa. Eleven sensitive biological communities were identified, including three sensitive aquatic communities. One special-status plant species and three special-status wildlife were determined to be present based on direct observations made by WRA or documented historical occurrences from the site. An additional 18 special-status plant species known from the region were originally determined to have potential to occur within the trail alignment. However, these plants were not observed within the trail alignment during seasonally timed rare plant surveys in 2016 and 2017, and it was subsequently determined that these species have low potential to occur within the proposed trail alignment, although they may have potential occur elsewhere on the property. An additional 13 special-status wildlife species known from the region were determined to have a moderate to high potential to occur within the proposed trail alignment or the immediate vicinity based on the presence of suitable habitat conditions and the proximity of known occurrences within the vicinity of the Project Area.

Although the proposed Project covers a large amount of land, the proposed Project itself is relatively minimal in nature. As a result of the intensive conservation and planning analyses conducted by the Project team, the proposed trail alignment and staging area have been designed to minimize impacts on the land and the sensitive resources found there. The proposed trail design has incorporated the best available design practices for trail construction and maintenance, reducing the potential for long-term adverse impacts related to erosion, sedimentation, and other issues that can arise from poor trail design. The trail network was designed to occupy only a small fraction of the land within the larger San Vicente Redwoods property, thereby providing ample untouched lands for plant and wildlife conservation. Moreover, the minimal nature of the proposed trail network and the activities that will be allowed there are by their very nature compatible with wildland conservation. With the implementation of the avoidance and minimization measures built into the project, WRA believes that all potential adverse impacts associated with the proposed Project can be reduced to a less-than-significant level.

1.0 INTRODUCTION

On multiple dates in December 2015, January, February, June, August, and October 2016, and May, June, and August 2017, WRA, Inc. (WRA) performed an assessment of biological resources for a proposed trail network within the approximately 8,532-acre San Vicente Redwoods property. The trail network is described in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018). The site is composed of two properties located in unincorporated Santa Cruz County, California (Figure 1). For the purpose of this report, the “main parcel” refers to the approximately 8,159-acre property located off of Empire Grade Road, and the “Laguna parcel” refers to the approximately 373-acre property located adjacent to the Bonny Doon Ecological Reserve. The “Project Area” refers to the alignment for the proposed trail network on both properties and an associated parking and staging area on the main parcel, adjacent to Empire Grade Road. The Project Area includes an approximately 50-foot buffer on either side of the trail alignment and around the parking and staging area (Figure 2).

The purpose of the assessment was to gather information necessary to complete a review of biological resources under the California Environmental Quality Act (CEQA) for the proposed trail network. This report describes the results of the site visit, which assessed the Project Area for the (1) potential to support special-status species and (2) presence of other sensitive biological resources protected by local, state, and federal laws and regulations. Special-status species observed during the site visit were documented and are discussed herein. Specific findings on the habitat suitability or presence of special-status species or sensitive habitats may require that protocol-level surveys be conducted. This report also contains an evaluation of potential impacts to special-status species and sensitive biological communities that may occur as a result of the proposed Project, including potential mitigation measures to compensate for any such impacts.

A biological resources assessment provides general information on the potential presence of sensitive species and habitats. The biological resources assessment is not an official protocol-level survey for listed species which may be required for Project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on site conditions that were observed on the dates of the site visits.

Note to the Reader: All Figures referenced in the text are included in Appendix A.

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological assessment, including applicable laws and regulations that were applied to the field investigations and analysis of potential Project impacts.

2.1 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, riparian habitat, and sensitive terrestrial communities. These habitats are protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, the California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game [CDFG]) Streambed Alteration Program, and the CEQA; and/or local ordinances or policies such as Special Habitat Management Areas or General Plan Elements. Where these communities occur within the Coastal Zone, they may also be regulated under the California Coastal Act (CCA), as administered by the Santa Cruz County Local Coastal Program (LCP).

2.1.1 Clean Water Act Section 404

The U.S. Army Corps of Engineers (Corps) regulates “Waters of the United States” under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “other waters” and are often characterized by an ordinary high water mark (OHWM). Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the U.S. generally requires an individual or nationwide permit from the Corps under Section 404 of the Clean Water Act. The Project Area is within the jurisdiction of the Corps’ San Francisco District.

2.1.2 Clean Water Act Section 401 and Porter-Cologne Water Quality Control Act

The term “Waters of the State” is defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes “isolated” wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements. The Project Area is within the jurisdiction of the Central Coast RWQCB.

2.1.3 California Fish and Game Code Section 1600

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of California Fish and Game Code (CFG). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW. The Project Area is within the jurisdiction of the CDFW’s Bay Delta Region.

2.1.4 Essential Fish Habitat

Essential Fish Habitat (EFH) is regulated through the National Marine Fisheries Service (NMFS), a division of the National Oceanic and Atmospheric Administration. Protection of EFH is mandated through changes implemented in 1996 to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to protect the loss of habitat necessary to maintain sustainable fisheries in the United States. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" [16 USC 1802(10)]. The NMFS further defines Pacific coast salmon fishery essential fish habitat as "waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem" (Pacific Fisheries Management Council [PFMC] 1999). California salmonid species covered by this Fisheries Management Plan include Chinook salmon (*Oncorhynchus tshawytscha*) and Coho salmon (*O. kisutch*), and the EFH "must include all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon" in California (PFMC 1999). Under regulatory guidelines issued by the NMFS, any federal agency that authorizes, funds, or undertakes action that may affect EFH is required to consult with the NMFS (50 CFR 600.920).

The Project Area is located outside of viable areas to Chinook salmon and Coho salmon (as described in more detail in Section 4.2.2) and Project activities will be minimized to prevent downstream impacts to EFH (as described in Section 6.1.2). Therefore, while EFH was evaluated for the regulatory context of this Project; no further discussion of EFH is warranted.

2.1.5 CDFW Sensitive Terrestrial Communities

Sensitive terrestrial biological communities include terrestrial habitats that fulfill special functions or have special values. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2016a). Sensitive plant communities are also identified by CDFW (CNPS 2016a, CDFW 2016b). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G; referred to herein as the "Global Rank") or statewide (S; referred to herein as the "State Rank") as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified by the CDFW must be considered and evaluated under the CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances (see sections 2.1.6 and 2.1.7).

2.1.6 Sensitive Communities Identified by Santa Cruz County Code

Chapter 16 of the Santa Cruz County Code pertains to the protection of natural resources, and includes sections relating to topics such as grading regulations, erosion control, and water quality control, among others. The sections of Chapter 16 which are relevant to the Project are summarized as follows:

Riparian Corridor and Wetlands Protection

County approval is required for projects that may result in impacts to "riparian corridors." In Chapter 16.30, a riparian corridor is defined as:

- (1) *Lands within a stream channel, including the stream and the area between the mean rainy season (bankfull) flowlines;*

- (2) *Lands extending 50 feet (measured horizontally) out from each side of a perennial stream. Distance shall be measured from the mean rainy season (bankfull) flowline;*
- (3) *Lands extending 30 feet (measured horizontally) out from each side of an intermittent stream. Distance shall be measured from the mean rainy season (bankfull) flowline;*
- (4) *Lands extending 100 feet (measured horizontally) from the high water mark of a lake, wetland, estuary, lagoon or natural body of standing water;*
- (5) *Lands within an arroyo located within the urban services line, or the rural services line;*
- (6) *Lands containing a riparian woodland.*

Sensitive Habitat Protection

County approval is required for projects that may result in impacts to “sensitive habitat.” Chapter 16.32 includes the following definition of a “sensitive habitat”:

- (1) *Areas of special biological significance as identified by the State Water Resources Control Board.*
- (2) *Areas which provide habitat for locally unique biotic species/communities including but not limited to: oak woodlands, coastal scrub, maritime chaparral, native rhododendrons and associated Elkgrass, indigenous Ponderosa Pine, indigenous Monterey Pine, mapped grassland in the Coastal Zone and sand parkland; and special forests including San Andreas Oak Woodlands, indigenous Ponderosa Pine, indigenous Monterey Pine and ancient forests.*
- (3) *Areas adjacent to essential habitats of rare, endangered or threatened species as defined in subsections (5) and (6) of this definition.*
- (4) *Areas which provide habitat for species of special concern as listed by the California Department of Fish and Game in the special animals list, natural diversity database.*
- (5) *Areas which provide habitat for rare or endangered species which meet the definition of Section 15380 of the California Environmental Quality Act guidelines.*
- (6) *Areas which provide habitat for rare, endangered or threatened species as designated by the State Fish and Game Commission, United States Fish and Wildlife Service or California Native Plant Society.*
- (7) *Nearshore reefs, rocky intertidal areas, sea caves, islets, offshore rocks, kelp beds, marine mammal hauling grounds, sandy beaches, shorebird roosting, resting and nesting areas, cliff nesting areas and marine, wildlife or educational/research reserves.*
- (8) *Dune plant habitats.*
- (9) *All lakes, wetlands, estuaries, lagoons, streams and rivers.*

(10) *Riparian corridors.*

County code allows for limited uses within these sensitive habitats, including nature study and research and hunting, fishing, and equestrian trails that have no adverse impact on the species or habitat. Although no hunting or fishing will be allowed on the site, the proposed use of the site for pedestrian, bicycle, and equestrian trails is in line with the spirit of the County code.

Development within any sensitive habitat area is subject to the following conditions:

- *All development shall mitigate significant environmental impacts, as determined by the Environmental Coordinator.*
- *Dedication of an open space or conservation easement or an equivalent measure shall be required as necessary to protect the portion of a sensitive habitat which is undisturbed by the proposed development activity or to protect a sensitive habitat on an adjacent parcel.*
- *Restoration of any area which is a degraded sensitive habitat or has caused or is causing the degradation of a sensitive habitat shall be required; provided, that any restoration required shall be commensurate with the scale of the proposed development.*

2.1.7 Environmentally Sensitive Habitats Identified by the Santa Cruz County Local Coastal Program

The County of Santa Cruz Local Coastal Program (LCP; County of Santa Cruz 1994) defines Environmentally Sensitive Habitats protected under the California Coastal Act in the unincorporated portions of Santa Cruz County. In addition to areas shown on County General Plan and LCP Resources and Constraints Maps, the LCP considers all of the habitats listed above in Section 2.1.6 as Environmentally Sensitive Habitats for purposes of the California Coastal Act. The LCP also identifies a number of specific special-status plant and wildlife species, the habitat for which constitutes Environmentally Sensitive Habitat.

The LCP regulates development and other activities within and adjacent to Environmentally Sensitive Habitats and defines required buffers or setbacks from such habitats. The LCP defines allowed uses within Environmentally Sensitive Habitats and their buffers and specifically identifies “non-motorized recreation and pedestrian trails” as an allowed use compatible with riparian habitat. Because the Santa Cruz County LCP is contained within their General Plan, many of the LCP protections over Environmentally Sensitive Habitats within the Coastal Zone are aligned with the County Code regarding sensitive biological resources and implementation of the LCP is through the Riparian Corridor and Wetlands Protection Ordinance (16.30) and the Sensitive Habitat Ordinance (16.32) (see Section 2.1.6).

2.2 Special-Status Species

2.2.1 Special-Status Plants and Wildlife

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA). These acts afford protection to both listed species and those that are formal candidates for listing. In addition, CDFW Species of Special Concern, CDFW California Fully Protected species, USFWS Birds of Conservation Concern, and CDFW Special-Status Invertebrates are all considered special-status

species. Although these aforementioned species generally have no special legal status, they are given special consideration under the CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity. Bats listed as a “High Priority” or “Medium Priority” species for conservation by the WBWG are typically considered special-status and are considered under the CEQA. In addition to regulations for special-status species, most birds in the United States, including non-special-status native species, are protected by the Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws, destroying active bird nests, eggs, and/or young is illegal.

Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank; formerly known as CNPS “Lists”) of 1 and 2 are also considered special-status plant species and must be considered under the CEQA. Rank 3 and Rank 4 species are afforded little or no protection under the CEQA, but are included in this analysis for completeness.

Table 1. Description of California Rare Plant Ranks and Threat Codes

California Rare Plant Ranks	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

2.2.2 Critical Habitat

Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species’ recovery. In many cases, this level of protection is similar to that already provided to species by the ESA jeopardy standard. However, areas that are currently unoccupied by the species but which are needed for the species’ recovery are protected by the prohibition against adverse modification of critical habitat.

2.3 Protected Trees

Chapter 16 of the Santa Cruz County Municipal Code outlines policies for the protection of significant trees within the unincorporated portions of the County. County approval is required for projects that may result in impacts to “significant trees.” Per Chapter 16.34, a permit is needed for trees within the Coastal Zone that meet Definitions 1 or 2, below. A permit is also needed for trees within Sensitive Habitat (Definition 3).

1. *Within the Urban Services Line or Rural Services Line, any tree which is equal to or greater than 20 inches d.b.h. (approximately 5 feet in circumference); any sprout clump of five or more stems each of which is greater than 12 inches d.b.h. (approximately 3 feet in circumference); or any group consisting of five or more trees on one parcel, each of which is greater than 12 inches d.b.h. (approximately 3 feet in circumference).*
2. *Outside the Urban Services Line or Rural Services line, where visible from a scenic road, any beach, or within a designated scenic resource area, any tree which is equal to or greater than 40 inches d.b.h. (approximately 10 feet in circumference); any sprout clump of five or more stems, each of which is greater than 20 inches d.b.h. (approximately 5 feet in circumference); or, any group consisting of ten or more trees on one parcel, each greater than 20 inches d.b.h. (approximately 5 feet in circumference).*
3. *Any tree located in a sensitive habitat as defined in Chapter 16.32. Also see Section 16.34.090(c), exemption of projects with other permits.*

The following work is exempted from all provisions of Chapter 16.34 :

- (A) *Timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practices Act of 1973 (commencing with Section 4511).*
- (B) *Any activity done pursuant to a valid timber harvest permit, or a notice of timber harvesting, approved pursuant to Chapter 16.52 SCCC.*
- (C) *Any tree removal authorized pursuant to a valid discretionary permit approved pursuant to Chapter 13.10 (Zoning Regulations), Chapter 13.20 (Coastal Zone Regulations), Chapter 14.01 (Subdivision Regulations), Chapter 16.20 (Grading Regulations), Chapter 16.22 (Erosion Control), Chapter 16.30 (Riparian Corridor and Wetlands Protection), Chapter 16.32 (Sensitive Habitat Protection), or Chapter 16.54 SCCC (Mining Regulations).*
- (D) *Removal of tree crops pursuant to agricultural operations. [Ord. 3443 § 1, 1983; Ord. 3341 § 1, 1982].*

3.0 METHODS

On December 16-17, 2015; January 20-22, February 10-12, June 15-16, August 15-17, August 24-25, and October 21, 2016; and May 30-June 1, and August 8-9, 2017 the Project Area was traversed on foot to determine (1) plant communities present within the Project Area, (2) whether existing conditions may provide suitable habitat for any special-status plant or wildlife species, and (3) whether sensitive habitats are present. In addition, these surveys included a comprehensive mapping of San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)

middens and seasonally timed surveys for special-status plants. The Project Area for the assessment was defined to include the proposed trail alignment plus an approximately 50-foot buffer on both sides, as well as the proposed parking area adjacent to Empire Grade Road and a 50-foot buffer (Figure 2).

All plant and wildlife species encountered were recorded and are listed in Appendix B. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2017), except where noted. Because of recent changes in classification for many of the taxa treated by Baldwin et al. and the Jepson Flora Project, relevant synonyms are provided in brackets. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities.

3.1 Biological Communities

Prior to the site visit, an online soil survey of the Project Area (California Soil Resource Lab 2016) was examined to determine whether any unique soil types that could support sensitive plant communities and/or aquatic features are present in the Project Area. In addition, aerial imagery (Google Earth) of the Project Area was reviewed to determine where sensitive landscape features may occur. Biological communities present in the Project Area were classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and *A Manual of California Vegetation, Online Edition* (CNPS 2016a). However, in some cases it was necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature.

Mapping of plant communities relied on a high-level analysis of the site based on data from CalVeg (U.S. Forest Service 2009) which were augmented by local experts and the Land Trust of Santa Cruz County to document important local habitats such as sandhills, sandhill parklands, and stands of the Federal Endangered Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*) and to reflect the boundaries of urban and cultivated lands (ESA 2012). WRA did not refine the mapping of biological communities; however, WRA did note the occurrence of any sensitive biological communities within the Project Area (see Section 3.1.2). Sensitive biological communities with discrete boundaries (e.g., wetlands and streams) were mapped in the field; however, sensitive communities lacking discrete boundaries (e.g., forest types) were not mapped. Instead, the assessment focused on developing avoidance and minimization measures to prevent adverse impacts to such communities. Biological communities observed within the Project Area were classified as sensitive or non-sensitive as defined by the CEQA and other applicable laws and regulations (see below).

3.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities are those communities that are not afforded special protection under the CEQA or other state, federal, or local laws, regulations or ordinances. These communities may, however, provide suitable habitat for some special-status plant or wildlife species and are identified or described in Section 4.1.1 below.

3.1.2 Sensitive Biological Communities

Sensitive biological communities are defined as those communities that are given special protection under the CEQA or other applicable federal, state, or local laws, regulations or ordinances. Applicable laws and ordinances are discussed above in Section 2.0. Special methods used to identify sensitive biological communities are discussed below.

Wetlands and Non-Wetland Waters

The Project Area was surveyed to determine whether any wetlands and waters potentially subject to jurisdiction by the Corps, RWQCB, or CDFW are present. The assessment was based primarily on the presence of wetland plant indicators, but may also include any observed indicators of wetland hydrology or wetland soils. Potential wetland areas were identified as areas dominated by plant species with a wetland indicator status¹ of OBL, FACW, or FAC as given on the National Wetlands Plant List (Lichvar et al. 2016). Evidence of wetland hydrology can include direct evidence (primary indicators), such as visible inundation or saturation, algal mats, and oxidized root channels, or indirect (secondary) indicators, such as a water table within two feet of the soil surface during the dry season. Some indicators of wetland soils include dark colored soils, soils with a sulfidic odor, and soils that contain redoximorphic features as defined by the Corps Manual (Environmental Laboratory 1987) and Field Indicators of Hydric Soils in the United States (Natural Resources Conservation Service 2010).

Coastal Act/Local Coastal Program Wetlands

Whereas wetlands regulated under the Clean Water Act or the Porter-Cologne Act are identified based on the presence of three parameters (hydrophytic vegetation, hydric soils, and wetland hydrology), the Coastal Act defines wetlands as those areas meeting any one or more of the three wetland parameters. As such, WRA used the Coastal Act wetland definition to identify potentially jurisdictional wetlands within the portion of the Project Area that occurs within the Coastal Zone. Areas which were dominated by FACW- or OBL-rated vegetation or which contained hydric soils or displayed evidence of wetland hydrology were always treated as wetlands for the purposes of the Coastal Act. Areas which were dominated by FAC-rated vegetation and which were located in a suitable topographic position to support wetland hydrology were also always treated as wetlands for the purposes of the Coastal Act. Because FAC-rated vegetation is by definition equally likely to occur in wetlands and uplands (Lichvar et al. 2016), WRA biologists examined areas dominated by FAC-rated vegetation but which were not located in a typical wetland topographic position on a case by case basis. In those situations, WRA biologists looked for evidence that the vegetation was being supported by wetland hydrology (e.g., the presence of hydric soils, evidence of wetland hydrology, or suitable topographic position) before determining that the area should be considered a wetland for the purposes of the Coastal Act.

Sensitive Terrestrial Biological Communities

Prior to the site visit, aerial photographs, local soil maps, and *A Manual of California Vegetation, Online Edition* (CNPS 2016a) were reviewed to assess the potential for sensitive biological communities to occur in the Project Area. During the site visits, the Project Area was evaluated for the presence of sensitive terrestrial biological communities, including sensitive plant communities recognized by the CDFW and sensitive habitats identified in the General Plan/Local Coastal Program and the Santa Cruz County Code. Communities were identified based on descriptions and membership rules developed by the CDFW and the CNPS (Sawyer et al. 2009 and subsequent online updates). All alliances observed within the Project Area with a State Ranking ("S") of 1 through 3 were considered sensitive biological communities and are described in Section 4.1.2, below. Due to the scale of the Project Area, both its narrow width and its long length, and given the comparatively coarse scale at which vegetation alliances are mapped, it

¹ OBL = Obligate, always found in wetlands (> 99% frequency of occurrence); FACW = Facultative wetland, usually found in wetlands (67-99% frequency of occurrence); FAC = Facultative, equal occurrence in wetland or non-wetlands (34-66% frequency of occurrence).

was not practical or feasible to map discrete boundaries between sensitive terrestrial communities in the Project Area. Instead, the presence of these communities was noted, and potential impacts to such communities were assessed collectively at a programmatic level.

3.2 Special-Status Species

3.2.1 Literature Review

Potential occurrence of special-status species in the Project Area was evaluated by first determining which special-status species occur in the vicinity of the Project Area through a literature and database search. Database searches for known occurrences of special-status species focused on the Davenport 7.5-minute U.S. Geological Survey (USGS) quadrangle and the six surrounding quadrangles (Año Nuevo, Franklin Point, Big Basin, Castle Rock Ridge, Felton, and Santa Cruz). The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the Project Area:

- CNDDDB records (CDFW 2016a)
- USFWS quadrangle species lists (USFWS 2016a)
- CNPS Inventory records (CNPS 2016b)
- CDFG publication “California’s Wildlife, Volumes I-III” (Zeiner et al. 1990)
- CDFG publication “California Bird Species of Special Concern” (Shuford and Gardali 2008)
- CDFG publication “An Annotated Checklist of Amphibian and Reptile Species of California and Adjacent Waters” (Jennings 2004)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- University of California at Davis California Fish Data and Management Software (PISCES 2016)
- National Marine Fisheries Service Distribution Maps for California Salmonid Species (NMFS 2013)

In addition to these resources, WRA received additional unpublished information regarding the presence of local special-status plant occurrences, including for Rank 4 species which are not tracked in the CNDDDB (Nadia Hamey, Big Creek forester, personal communication to Matthew Richmond, April 6, 2016).

3.2.2 Site Assessment

Multiple site visits were made to the Project Area to search for suitable habitats for special-status species. Surveys covered the trail network and parking area, including approximately 50 feet on either side of the proposed trail alignment (25 feet on either side of the alignment for wood rat nest mapping) as well as 50-feet around the parking area. Habitat conditions within these areas were used to evaluate the potential for special-status species to occur there. The potential for each special-status species to occur in the Project Area was evaluated according to the following criteria:

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species is observed on the site or has been recorded (e.g., CNDDDB, other reports) on the site recently.

Not Observed. Species is identifiable year-round but was not observed during surveys or the survey occurred when the species should have been apparent and identifiable but the species was not observed. These species are assumed to not be present.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Project Area. The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, if a special-status species is observed during the site visit, its presence was recorded and is discussed in the following sections.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats. If necessary, recognized experts in individual species biology were contacted to obtain the most up-to-date information regarding species biology and ecology.

All special-status species observed during the site visit were documented and are discussed below in Section 4.2. For some species, a site assessment at the level conducted for this report may not be sufficient to determine the presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. In some cases, focused surveys may be sufficient to determine the presence or absence of a species for the purposes of the CEQA. WRA conducted seasonally-timed, focused surveys for special-special status plants documented from the region and focused surveys for San Francisco dusky-footed woodrat. The methods for these surveys are described in the following sections. Special-status species for which further focused or protocol-level surveys may be necessary are described below in Section 6.0.

3.2.3 Special-Status Species Surveys

Special-Status Plants

Surveys for special-status plants were conducted on the dates listed below; surveys were stratified such that each portion of the alignment was subjected to early- (December-February), mid- (May-June), and late-season (August-October) surveys.

Special-Status Plant Survey Dates:

<u>2015</u>	<u>2016</u>	<u>2017</u>
December 16-17	January 20-22	May 30-June 1
	February 10-12	August 8-9
	June 15-16	
	August 15-17, 24-25	
	October 21	

Surveys were conducted by WRA botanists familiar with the plants and vegetation of the Santa Cruz Mountains. Surveys covered the trail segments shown on Figure 2, including an approximately 50-foot buffer on all sides. Surveys were also conducted in the proposed parking and staging area adjacent to Empire Grade Road, including an approximately 50-foot buffer. All areas were traversed on foot and all species encountered were identified to the taxonomic level necessary to determine rarity. Occurrences of rare plants were captured as GPS points (for single plants or closely spaced, small groups of plants) and polygons (for larger or more widely spaced groups of plants).

Anderson's manzanita (*Arctostaphylos andersonii*; CNPS Rank 1B.2) was the only special-status plant observed within the Project Area. To calculate potential impacts to Anderson's manzanita associated with the proposed Project, WRA overlaid Anderson's manzanita point and polygon occurrences over a map of the proposed trail alignment; to give them dimensions, individual manzanita points were assigned an average 5-foot radius based on the average plant size observed in the field. All occurrences of Anderson's manzanita that intersected a 7-foot band representing the width of trail construction (5 feet of trail tread plus 1 foot of vegetation clearance on either side) running down the centerline of the trail alignment were considered to be directly impacted. Such impacts are theoretical given that there is flexibility to move the trail anywhere within the 100-foot-wide band surveyed for this report; however, it gives an indication of the maximum number of individuals that could be impacted.

Special-Status Wildlife

WRA wildlife biologists conducted a general assessment of habitat quality within the Project Area on December 16-17, 2015 and January 20-22 and February 10-12, 2016. Wildlife biologists walked the entirety of the proposed alignment, including an approximately 50-foot buffer on either side of the alignment, to note habitat conditions and document unique features for wildlife.

Concurrent with this assessment, biologists mapped all active San Francisco dusky-footed woodrat middens observed within the Project Area. WRA biologists familiar with the identification of woodrat middens and the biology of the species conducted the surveys. Surveys covered the trail alignments shown on Figure 2; all areas were traversed on foot and woodrat middens located within approximately 25 feet of the proposed trail alignment were mapped using handheld GPS units with sub-meter accuracy. Woodrat middens within the proposed parking area adjacent to Empire Grade Road, including a 50-foot buffer, were also mapped following the same approach. To estimate potential direct impacts to woodrat nests, each nest, or group of nests, was mapped using handheld GPS equipment, and all nests that intersect with a 7-foot band (5 feet of trail tread plus 1 foot of vegetation clearance on either side) running down the centerline of the trail alignment were considered to be directly impacted. Such impacts are theoretical in that there is flexibility to move the trail anywhere within the 50-foot-wide band surveyed for this report.

Within the Project Area, WRA biologists mapped locations of large old-growth trees with unique habitat features that may support special-status wildlife species such as roosting bats. Noted as "wildlife trees", these features had various combinations of exposed snags, open cavities, exfoliating bark, or unique crown formations that may provide good thermal properties for roosting or unique nesting habitat. In addition to WRA's observations, locations of old-growth Douglas fir and redwood trees and stands of old-growth that should be evaluated for the potential to support marbled murrelet have been historically mapped at the site by multiple groups and are shown on the associated special-status wildlife Figures in Appendix A (see ESA 2012 for additional information).

3.2.4 Critical Habitat

To determine whether Critical Habitat for listed plant or wildlife species has been designated within the Project Area, WRA reviewed the USFWS online Critical Habitat mapping tool (USFWS 2016b). For cases in which Critical Habitat has been designated at the site, WRA biologists assessed the area to determine whether it contained the primary constituent elements (PCEs) required by the species in question.

3.4 Protected Trees

WRA did not conduct a tree survey or any other type of assessment to determine whether protected trees occur within the Project Area. In the staging area, native trees were identified by registered professional forester Nadia Hamey and mapped by Fall Creek Engineers. Staging area construction is anticipated to result in the removal of the following native trees with diameter at breast height (DBH) greater than 12 inches: 11 oak trees (including coast live oak, canyon live oak, tanoak): 4 @ 12 inch DBH, 13 inch DBH, 15 inch DBH, 20 inch DBH, 2 @ 18 inch DBH, 19 inch DBH, 36 inch DBH, one Douglas fir: 30 inch DBH and, four madrone: 12 inch DBH, 13 inch DBH, 16 inch DBH, 17 inch DBH.

4.0 ENVIRONMENTAL SETTING

The larger San Vicente Redwoods property (i.e., the main parcel) is located in the heart of the Santa Cruz Mountains, situated among a number of other large, protected properties with very limited development. Rural residences occur in small communities adjacent to the site along Empire Grade Road and Pine Flat Road. The Project Area occurs within the North Coast Watersheds, an important area for multi-species benefits conservation identified in the Land Trust of Santa Cruz County's *A Conservation Blueprint* (Mackenzie et al. 2011). The San Vicente Redwoods property is contiguous with a large amount of protected lands including Cal Poly's Swanton Ranch, the Coast Dairies, Bonny Doon Ecological Preserve, Wilder Ranch State Park, and UC Santa Cruz's Natural Reserve (ESA 2012).

The majority of the main parcel and adjacent lands are characterized by dense redwood, coast/canyon live oak, and tanoak forest, with smaller areas of scrub and chaparral habitat. Elevations within the main parcel range from approximately 500 to 2,500 feet above sea level. The Project Area within the main parcel contains a number of east-west trending ridges extending from Empire Grade, transitioning into a north-south trending ridge that dips down into Cotoni Coast Dairies at the southern end of the main parcel. The southern portion of the Project Area burned in 2009, resulting in a mosaic of chaparral and forest regrowth and standing dead trees which provide high value for wildlife. The largest creek on the main parcel is San Vicente Creek, a perennial stream with its headwaters near Empire Grade.

The Laguna parcel is located to the southeast of the main parcel, adjacent to the Bonny Doon Ecological Reserve, home to a number of sensitive plant species adapted to the sandy soils that occur there. The Laguna parcel occurs on a different soil type and supports some sandhills or sand parkland habitat similar to that found on the adjacent Bonny Doon Ecological Reserve, however, the trail network avoids this area. On the Laguna parcel, the Project Area follows a more gentle south-westerly slope along the riparian corridor along Laguna Creek, a perennial creek with its headwaters near Empire Grade. Elevations within the Laguna parcel range from approximately 750 to 1,600 feet above sea level.

Both parcels were historically used for timber harvesting and contain dirt logging roads. Some active logging operations also occur on the main parcel. The main parcel contains portions of a utility road for high-tension electric transmission lines (referred to herein as the “powerline road”). The main parcel also contains a former quarry pit and a private inholding. Otherwise, both parcels are undeveloped and provide ample opportunity for both public access and wildland conservation.

5.0 RESULTS

The following sections present the results and discussion of the biological assessment within the Project Area. Figures showing the results of the assessment area included as Appendix A. Lists of all plant and wildlife species observed within the Project Area are included as Appendix B. An analysis of the potential for special-status plant species to occur within the Project Area is included as Appendix C. Photographs of the Project Area are included as Appendix D.

5.1 Biological Communities

Biological communities documented by ESA (2012) within the larger San Vicente Redwoods property are listed in Table 2 and are shown on Figure 3. These communities span a range of classification types ranging from high-level communities (*sensu* Holland 1986) to more refined vegetation alliances (*sensu* USFS 2009, Sawyer et al. 2009). Many of these communities, or elements of them, are present within the Project Area. Specific vegetation alliances and other biological communities observed by WRA within the Project Area are listed in Table 3. Descriptions of each community observed are provided in the following sections.

In general, the Project Area is dominated by a mix of redwood- and Douglas fir-dominated communities, with inclusions of other conifer and hardwood stands and patches of manzanita chaparral. Although some old-growth trees are present, most areas are dominated by second- or third-growth stands. Some stands appear to be relatively young, with a diverse understory. Other stands are well established and lack substantial understory vegetation. In many areas, it is clear that plant communities are transitioning from species that occur under open, sunny growing conditions to species that occur under dense, closed-canopy conditions. At the southern end of the Project Area within the main parcel, a large tract of forest was burned during 2009 and is currently dominated by a mix of chaparral and forest regrowth. A portion of the Laguna Parcel appears to have been burned in the 2008 Martin fire that affected the Bonny Doon Ecological Reserve; however, the portion of the Project Area that occurs on the Laguna Parcel is located away from the burned area. Limited riparian vegetation was observed in association with ephemeral and intermittent streams observed within the Project Area; often the vegetation adjacent to streams was indiscernible from adjacent upland vegetation. Larger intermittent and perennial streams contained more well-developed riparian vegetation.

In some portions of the Project Area (e.g., along Empire Grade Road and Warrenella Road), a shaded fuel break (*sensu* Agee et al. 2000) has been implemented. In these areas, all non-sensitive understory vegetation is removed and some overstory trees may be thinned. Shaded fuel breaks are thought to reduce fire fuel loads while maintaining habitat for species that prefer cover such as mountain lions. Shaded fuel breaks may also provide other habitat benefits, such as opening habitat for plant species that prefer light shade to open sun such as Anderson's manzanita. Within the Project Area, Anderson's manzanita was flagged and protected from removal. In these areas, Anderson's manzanita may benefit from the removal of dense understory brush and young saplings that can outcompete the species for sunlight and other resources.

Table 2. Coarse-Scale Biological Communities Mapped within the Larger San Vicente Redwoods Property by ESA (2012)

Community Name	Scientific Name ¹
Redwood	<i>Sequoia sempervirens</i> Alliance
Redwood-Douglas Fir	<i>Sequoia sempervirens</i> - <i>Pseudotsuga menziesii</i> Alliance
Pacific Douglas Fir	<i>Pseudotsuga menziesii</i> Alliance
Santa Cruz Cypress	<i>Callitropsis</i> [<i>Cupressus</i>] <i>abramsiana</i> Alliance
Maritime Chaparral	Multiple
Coast Live Oak	<i>Quercus agrifolia</i> Alliance
Knobcone Pine	<i>Pinus attenuata</i> Alliance
Coastal Scrub	Multiple
Grasslands	Multiple
Sandhills	n/a
Cultivated	n/a
Barren/Rock	n/a
Urban	n/a
Water	n/a

¹Scientific names from USFS (2009).

Table 3. Biological Communities Observed by WRA within the Project Area

Common Name	Scientific Name ¹	State Rank	Sensitive?
Tree-Dominated Communities			
Madrone Forest	<i>Arbutus menziesii</i> Forest Alliance	S3.2	Yes
Tanoak Forest	<i>Notholithocarpus densiflorus</i> Forest Alliance	S3.2	Yes
Coulter Pine Woodland (planted)	<i>Pinus coulteri</i> Woodland Alliance	S4	No
Douglas Fir Forest	<i>Pseudotsuga menziesii</i> Forest Alliance	S4	No
Coast Live Oak Woodland	<i>Quercus agrifolia</i> Woodland Alliance	S4	Yes
Canyon Live Oak Forest	<i>Quercus chrysolepis</i> Forest Alliance	S5	Yes
Redwood Forest	<i>Sequoia sempervirens</i> Forest Alliance	S3.2	Yes
California Bay Forest	<i>Umbellularia californica</i> Forest Alliance	S3	Yes
Shrub-Dominated Communities			
Anderson's Manzanita Chaparral ²	<i>Arctostaphylos andersonii</i> Shrubland Alliance ²	n/a	Yes
Brittle Leaf Manzanita Chaparral	<i>Arctostaphylos crustacea</i> Shrubland Alliance	S2	Yes
Aquatic Habitats			
Seasonal Wetland	n/a	n/a	Yes
Shrub-Scrub Wetland	n/a	n/a	Yes
Ephemeral/Intermittent Streams	n/a	n/a	Yes
Developed/Disturbed Areas			
Developed/Disturbed	n/a	n/a	No

¹Scientific names from CNPS (2016).²Community not described by CNPS (2016).

5.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities observed within the Project Area include Coulter pine woodland, Douglas fir forest, and developed/disturbed areas. These communities and habitats are described below.

Coulter Pine Woodland (*Pinus coulteri* Woodland Alliance); Rank G4 S4. Coulter pine woodlands typically occur on steep upper slopes and ridges on dry soils. Coulter pine is the dominant tree, with other species such as canyon live oak (*Quercus chrysolepis*) or black oak (*Q. kelloggii*) as subdominants. This community typically occurs from 2,250 to 6,500 feet in elevation and occurs from the San Francisco Bay south into Baja California (Sawyer et al. 2009). No natural stands are known to occur within Santa Cruz County (CNPS 2016a).

Within the Project Area, Coulter pine occurs as planted stands, primarily adjacent to Empire Grade Road and in other locations on the main parcel. The high density of these planted stands has resulted in a dense overstory canopy and a thick layer of pine needles on the forest floor. Understory vegetation is generally lacking in these areas due to the dark conditions resulting from the dense overstory canopy and the smothering effect of the thick layer of pine needles on the forest floor. Areas of planted Coulter pine woodland within the Project Area offer high potential for restoration particularly for Anderson's manzanita.

Douglas Fir Forest (*Pseudotsuga menziesii* Forest Alliance); Rank G5 S4. Douglas fir forests occur in a broad range of topographic positions and aspects and on a variety of substrates extending from the Pacific Northwest south to southern California (Sawyer et al. 2009). The community typically occurs from 2,250 to 5,000 feet in elevation (CNPS 2016a). Due to the wide distribution of this community, co-dominant and non-dominant understory species vary widely.

Within the Project Area, Douglas fir forest occurs as both single-species stands and mixed with other conifers and hardwoods on both the main parcel and the Laguna parcel. In many parts of the Project Area, Douglas fir occurs as a co-dominant with tanoak (*Notholithocarpus densiflorus*) in what has been described as a Douglas fir-tanoak forest (*Pseudotsuga menziesii*-*Notholithocarpus densiflorus* Forest Alliance; Rank G4 S4), also a non-sensitive community (State Rank S4). In most portions of the Project Area, Douglas fir forest and Douglas fir-tanoak forest occurs in dense stands with limited understory development. In younger stands, the understory is dominated by tanoak and madrone (*Arbutus menziesii*) saplings.

Developed/Disturbed Areas; No Rank. Developed and/or disturbed areas are not described in the literature, but include areas that have been significantly modified by human activity. Within the Project Area, disturbed areas are primarily limited to dirt roads and logging landings. Some of the roads are actively used for utility maintenance and by local residents with properties adjacent to the San Vicente Redwoods property; however, most roads within the Project Area are former logging roads that have been decommissioned. These areas generally lack natural vegetation or are dominated by early seral species, many of which are weedy non-natives. Developed and/or disturbed areas are not considered sensitive under the CEQA.

5.1.2 Sensitive Biological Communities

Sensitive biological communities observed within the Project Area include eight terrestrial communities (madrone forest, tanoak forest, redwood forest, coast live oak woodland, canyon live oak forest, California bay forest, Anderson's manzanita chaparral, and brittle leaf manzanita chaparral) and three aquatic communities (seasonal wetlands, shrub-scrub wetlands, and

streams). These communities and habitats would be considered sensitive under the CEQA and some may also be protected under other federal, state, or local laws (e.g., wetlands and streams).

Sensitive Terrestrial Communities

Madrone Forest (*Arbutus menziesii* Forest Alliance); Rank G4 S3.2. Madrone forests form a network of small stands extending along the west coast from British Columbia to the California border with Mexico (CNPS 2016a). These forests are located within a range of topographic positions and on a variety of soil types (Sawyer et al. 2009).

Within the Project Area, madrone forest occurs as small patches within a larger matrix of mixed coniferous forest primarily on the main parcel. Although only a few areas might be considered true madrone forest, the species occurs in large numbers throughout the Project Area and provides a valuable food source for birds and small mammals. During surveys conducted in early 2016, large numbers of migrating American robins (*Turdus migratorius*) were observed foraging among stands of fruiting madrone. The species responds well to fire, resprouting from burned stumps. This community would be considered sensitive under the CEQA.

Tanoak Forest (*Notholithocarpus densiflorus* Forest Alliance); Rank G4 S3.2. Tanoak forests occur primarily in hilly to mountainous regions from Oregon to Point Conception in southern California (CNPS 2016a). Tanoak forests occur on a range of topographic positions and aspects; however, they are generally restricted to areas with deep, well-drained soil (Sawyer et al. 2009). Tanoak seedlings and saplings are adapted to growth in densely forested areas with low light levels under the canopy (CNPS 2016a). The species responds well to fire, resprouting from burned stumps. Tanoaks produce large seed crops every other year, with mast years in 6-year cycles (CNPS 2016a).

Within the Project Area, tanoak occurs as a dominant understory species in redwood and Douglas fir forests and is the dominant overstory tree in many areas on both the main parcel and the Laguna parcel. Where tanoak is the dominant overstory tree, a dense layer of leaf litter accumulates, preventing the germination and establishment of many understory herbs and shrubs, creating a relatively sparse, low-diversity understory. The widespread distribution of this species within the larger San Vicente Redwoods property undoubtedly provides a valuable food source for many mammals. This community would be considered sensitive under the CEQA.

Coast Live Oak Woodland (*Quercus agrifolia* Woodland Alliance); Rank G5 S4. Coast live oak woodland is known from the outer and inner Coast Ranges and Transverse Ranges, and along the coast from northern Mendocino County south to San Diego County. This community is typically located on terraces, canyon bottoms, slopes, and flats underlain by deep, well-drained sandy or loam substrates with high organic content (Sawyer et al. 2009).

Within the Project Area, coast live oak woodland occurs in limited stands within pockets of other forest types, primarily on the main parcel. Coast live oak appears to co-occur with Canyon live oak (*Quercus chrysolepis*) and potentially with Shreve oak (*Quercus parvula* var. *shrevei*). However, due to the tall size of the trees, WRA biologists were limited to identifying trees using leaves and acorns that were fallen on the ground. Due to the co-occurrence of multiple oak species and potential hybridization, it was difficult to discern the relative dominance of each oak species. In addition, many of the oaks observed by WRA biologists displayed characteristics from multiple species, suggesting that the oaks may be hybridizing. Although coast live oak forest is not considered a sensitive community by the CDFW, it is considered sensitive by Santa Cruz County and would be considered sensitive under the CEQA.

Canyon Live Oak Forest (*Quercus chrysolepis* Forest Alliance); Rank G5 S5. Canyon live oak forest is known to occur throughout California, with the exception of the Modoc Plateau, the Central Valley, and parts of the desert region (CNPS 2016a). The community is known to occur in a wide range of topographic positions, from stream benches and canyon bottoms to steep, rocky slopes on infertile soils (CNPS 2016a). Due to the large range of this community, co-dominant species vary widely based on location within the State.

Within the Project Area, canyon live oak forest occurs in limited stands within pockets of other forest types, primarily on the main parcel. As noted for coast live oak woodland, canyon live oak appears to co-occur with other oaks such as coast live oak or Shreve oak. However, due to the difficulty in reaching fresh leaves and acorns and potential issues with hybridization, it was difficult to discern the relative dominance of each oak species. Although canyon live oak forest is not considered a sensitive community by the CDFW, it is considered sensitive by Santa Cruz County and would be considered sensitive under the CEQA.

Redwood Forest (*Sequoia sempervirens* Forest Alliance); Rank G3 S3.2. Redwood forests are known from extensive, nearly contiguous, stands in the North Coast Ranges and isolated stands in the Central Coast Ranges, from Del Norte County to Santa Barbara County (Sawyer et al. 2009). These forests are typically located on stream terraces, benches, coastal slopes, and canyon bottoms underlain by deep, well-drained loams (Sawyer et al. 2009). The species responds well to fire, resprouting from burned stumps (CNPS 2016a).

Within the Project Area, redwood forest forms the dominant plant community, often co-occurring with subdominant trees such as Douglas fir and tanoak on both the main parcel and the Laguna parcel. The dense overstory canopy of the redwood forest prevents the establishment of a diverse understory community; however, in many areas, the understory is dominated by tanoak saplings and young trees. Although most of the redwoods within the Project Area are second or third growth, some trees are considered old-growth, and many of the second or third growth trees are relatively large and provide valuable wildlife habitat. This community would be considered sensitive under the CEQA.

California Bay Forest (*Umbellularia californica* Forest Alliance); Rank G4 S3. California bay forests are known from the inner and outer Coast Ranges, Transverse Ranges, and Sierra Nevada Foothills from Del Norte County south to San Diego County (Sawyer et al. 2009). This community is typically located on terraces, canyon bottoms, north-facing slopes, and rock outcrops underlain by shallow to deep sand to loam substrates (Sawyer et al. 2009). The species responds well to fire, resprouting from burned stumps (CNPS 2016a).

Within the Project Area, California bay primarily occurs as a subdominant species within other forest types, primarily on the main parcel. Although it does not occur in as high of numbers as species such as tanoak or madrone, California bay is likely an important food source for wildlife within the Project Area. This community would be considered sensitive under the CEQA.

Anderson's Manzanita Chaparral (*Arctostaphylos andersonii* Shrubland Alliance); No Rank. Anderson's manzanita chaparral has not been described in the literature; however, given the widespread distribution of this species within the Project Area and its occurrence in many areas as large, single-species stands, WRA believes that it deserves consideration as its own plant community. Although this community has not been described and does not have an official global or state ranking, the dominant species in this community, Anderson's manzanita, has a California Rare Plant Rank of 1B.2, and therefore, the community should be considered sensitive under the CEQA. As a species, Anderson's manzanita is restricted to the Southern Santa Cruz Mountains (Kauffmann et al. 2015).

Within the Project Area, Anderson's manzanita occurs both as scattered individuals or small groups of individuals and as large, single-species stands, primarily on the main parcel, but also on the Laguna parcel. Because the dominant species in this community is a special-status plant, occurrences of this community were mapped during rare plant surveys. Collectively, these occurrences were estimated to occupy approximately 7.75 acres within the Project Area; this likely represents a small fraction of the total occurrences on the greater San Vicente Redwoods site.

The species is adapted to lightly shaded to open, sunny conditions and is best represented in forest openings and along road cuts within the forest. Where this species occurs under dense overstory canopy, it is experiencing significant mortality; in these areas, it is clear that the species became established under more open, sunny conditions following a timber harvest but is currently dying off due to the subsequent reestablishment of the overstory canopy. In the presence of fire suppression, active management may be required to maintain suitable open habitat for this species. This community would be considered sensitive under the CEQA.

Brittle Leaf Manzanita Chaparral (*Arctostaphylos crustacea* Shrubland Alliance); Rank G2 S2. Although brittle leaf manzanita is not considered a special-status species, as a community it has limited distribution and is therefore considered sensitive. The community occurs in the Coast Ranges, from the San Francisco Bay Area south to near Point Conception, and on the Catalina Islands (CNPS 2016a). Brittle leaf manzanita chaparral occurs in uplands near the coast and in adjacent areas subject to the maritime climate, primarily on nutrient-poor soils derived from sandstone, shale, and granite (CNPS 2016a).

Within the Project Area, this community is composed of the *crinita* subspecies. This community occurs in mixed conifer forest, as well as in open areas on ridges and other high points, primarily on the main parcel, but also on the Laguna parcel. The community typically occurs as small patches with a limited number of individuals; however, in some areas, this community occurs as large, single-species stands. This community would be considered sensitive under the CEQA.

Sensitive Aquatic Communities

The Project Area generally contains steep topography and well-drained soils. The proposed trail alignment occurs primarily on side slopes and ridges, avoiding low spots where water may collect and create wetland conditions. As such, the Project Area contained a relatively limited amount of sensitive aquatic resources. These resources were primarily limited to seasonal to perennial wetlands associated with seeps and compacted portions of old logging roads, as well as stream crossings and associated riparian wetlands. Wetlands, including both three-parameter Corps/RWQCB wetlands and one-parameter Coastal Act Wetlands, documented within or adjacent to the Project Area are shown on Figure 4. Locations where the proposed trail alignment crosses drainages or streams potentially subject to regulatory authority by one or more agency are shown on Figure 5. These features are protected by local, state, and federal laws and would be considered sensitive under the CEQA.

Seeps and Seasonal Wetlands; No Rank. Seeps and seasonal wetlands occur throughout the state in a wide range of topographic settings. As such, vegetation associated with seeps and seasonal wetlands varies greatly across the state. Outside of the Coastal Zone, seeps and seasonal wetlands are mapped following guidance from the U.S. Army Corps of Engineers which requires the presence of three parameters: wetland vegetation, wetland soils, and wetland hydrology. Within the Coastal Zone, wetlands are mapped based on the presence of a single parameter (wetland vegetation, wetland soils, or wetland hydrology; see Section 3.1.2).

A limited number of seeps and seasonal wetlands were observed within the Project Area. These features included hillside and roadside seeps dominated by golden chain fern (*Woodwardia fimbriata*) and a variety of sedge (*Carex* sp.) and rush (*Juncus* sp.) species, as well as compacted portions of old logging roads dominated by sedges and rushes.

Shrub-Scrub Wetlands, No Rank. The Project Area contained a limited number of shrub-scrub wetlands located at stream or drainage crossings. These areas were dominated by wetland- and riparian-associated shrubs such as western azalea (*Rhododendron occidentale*), ocean spray (*Holodiscus discolor*), or hazelnut (*Corylus cornuta*). In many cases, these wetlands lacked strong indicators of wetland hydrology or hydric soils and were considered wetlands only for the purposes of the Coastal Act. In other cases, all three parameters were present and the wetlands were mapped as wetlands for the purposes of the Clean Water Act and other laws. These tended to be larger, more well-developed wetlands associated with streams. These wetlands often had a strong understory dominated by species such as slough sedge (*Carex obnupta*), California spikenard (*Aralia californica*), and golden chain fern.

Ephemeral, Intermittent, and Perennial Streams; No Rank. The Project Area contains a number of ephemeral drainages and intermittent to perennial streams. The headwaters of these streams are typically shallow swales which convey water after major storms, but are differentiated from jurisdictional streams which convey water with greater regularity and for longer duration by the lack of a clear bed and bank, lack of an ordinary high water mark, and lack of any riparian vegetation that is discernably different from the adjacent vegetation. Larger intermittent and perennial streams occur lower in the watershed, and Laguna Creek, a perennial stream, features prominently in the Project Area for the Laguna parcel. These streams often contained more well-developed riparian vegetation.

The Project Area includes 64 crossings of ephemeral drainages and intermittent to perennial streams that would be considered jurisdictional by the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Wildlife. These crossings are shown on Figure 5. Streams within the Project Area are protected under State and Federal laws and would be considered sensitive under the CEQA.

5.2 Special-Status Species

5.2.1 Special-Status Plants

Based upon a review of the resources and databases given in Section 3.2.1, it was determined that 69 special-status plant species have been documented from the vicinity of the Project Area, exclusive of mosses and lichens. Figure 6 shows special-status plant species that have been documented in the CNDDDB within 5 miles of the Project Area (CDFW 2016a). Appendix C summarizes the potential for occurrence for each special-status plant species documented from the vicinity of the Project Area.

One special-status plant species was observed in the Project Area during the assessment site visits: Anderson's manzanita (*Arctostaphylos andersonii*; Rank 1B.2). Other special-status plants, such as Point Reyes horkelia (*H. marinensis*; Rank 1B.2), are known to occur on the greater San Vicente Redwoods Property, but were not observed within the Project Area. Figure 7 shows the special-status plant species that were observed within the Project Area during surveys conducted for this report.

In addition to the two special-status plant species known to occur within the Project Area, 24 additional special-status plant species were originally determined to have a moderate to high

potential to occur in the Project Area based on the presence of potentially suitable habitat and known occurrences of the plants from the immediate vicinity, including reports of some species from within the larger San Vicente Redwoods property:

- Schreiber's manzanita (*Arctostaphylos glutinosa*; Rank 1B.2)
- Ohlone manzanita (*A. ohloneana*; Rank 1B.1)
- Pajaro manzanita (*A. pajaroensis*; Rank 1B.1)
- Kings Mountain manzanita (*A. regismontana*; Rank 1B.2)
- Bonny Doon manzanita (*Arctostaphylos silvicola*; Rank 1B.2)
- Brewer's red maids (*Calandrinia breweri*; Rank 4.2)
- Santa Cruz Mountains pussypaws (*Calyptridium parryi* var. *hesseae*; Rank 1B.1)
- Bristly sedge (*Carex comosa*; Rank 2B.1)
- Deceiving sedge (*Carex saliniformis*; Rank 1B.2)
- Robust spineflower (*Chorizanthe robusta* var. *robusta*; FE, Rank 1B.1)
- Mountain lady's-slipper (*Cypripedium montanum*; Rank: 4.2)
- California bottle-brush grass (*Elymus californicus*, CNPS Rank 4.3)
- Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*; FE, SE, Rank 1B.2)
- Butano Ridge cypress (*Hesperocyparis abramsiana* var. *butanoensis*; FE, SE, Rank 1B.2)
- Point Reyes horkelia (*Horkelia marinensis*; Rank 1B.2)
- Arcuate bush-mallow (*Malacothamnus arcuatus*; Rank 1B.2)
- Santa Cruz County monkeyflower (*Mimulus rattanii* ssp. *decurtatus*; Rank 4.2)
- Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*; Rank 1B.2)
- Dudley's lousewort (*Pedicularis dudleyi*; State Rare, Rank 1B.2)
- Santa Cruz Mountains beard tongue (*Penstemon rattanii* var. *kleei*; Rank 1B.2)
- White-flowered rein orchid (*Piperia candida*; Rank 1B.2)
- Pine rose (*Rosa pinetorum*; Rank 1B.2)
- Hoffmann's sanicle (*Sanicula hoffmannii*; Rank 4.3)
- Rayless ragwort (*Senecio aphanactis*; Rank 2B.2)
- San Francisco campion (*Silene verecunda* ssp. *verecunda*; Rank 1B.2)
- Santa Cruz microseris (*Stebbinsoseris decipiens*; Rank 1B.2)

None of these species were observed during seasonally-timed, focused surveys along the entirety of the proposed alignment and parking and staging areas. The lack of additional special-status plant observations was largely attributed to the dense, closed canopy conditions and deep tanoak leaf litter that dominate a large percentage of the Project Area. Based on the lack of observations, it was determined that these species are unlikely to occur within the Project Area and no additional surveys are recommended. Details about these species are included in Appendix C.

The remaining 43 species documented from the vicinity of the Project Area were determined to be unlikely to occur based on a lack of suitable habitat conditions. In general, these are plants that occur along the immediate coast or that occur in open, sunny habitats such as grasslands, which are generally lacking within the Project Area. Many of these species are also known to occur on specific soil types which are not present within the Project Area such as serpentine soils or Zayante sands (Zayante sands are mapped at the western edge of the larger San Vicente Redwoods property, but do not occur near the Project Area). Finally, many of these species occur in perennially wet marsh or swamp habitats which generally do not occur within the Project Area. These species may have potential to occur within other portions of the larger San Vicente Redwoods property; however, they are unlikely to occur within the Project Area.

Special-status plant species that are present within in the Project Area are discussed below, as are federally listed plant species that were not observed and determined to be not present.

Special-Status Plant Species Present within the Project Area

Anderson's manzanita (*Arctostaphylos andersonii*). Rank 1B.2. Anderson's manzanita is a perennial shrub that occurs in the Santa Cruz Mountains in chaparral and at the openings and edges of broadleaf upland forest and North Coast coniferous forest habitats at elevations from 60 to 760 meters (Baldwin et al. 2012; Kauffmann et al 2015). The species blooms between November and May (CNPS 2016b). During surveys conducted for this report, numerous occurrences of this species were observed within the Project Area, both on the main parcel and the Laguna parcel (Figure 7). In many cases, the species occurs as scattered individuals or small clusters of individuals. However, in some areas, the species occurs as large, single-species stands. In open areas, the shrub is generally healthy in appearance; however, where the species occurs under closed canopy conditions, it is in decline. Many dead or dying individuals were observed within heavily forested portions of the Project Area. It is clear that many occurrences of this species became established under more open, sunny conditions such as after a timber harvest and are now in decline as the forest returns.

Federally Listed Plants that Occur in the Region but are Unlikely to Occur in the Project Area

Marsh sandwort (*Arenaria paludicola*); Federal Endangered, State Endangered, Rank 1B.1. Marsh sandwort is a stoloniferous herb in the pink family (Caryophyllaceae) that blooms from May to August (CNPS 2016b). This species occurs in sandy openings in freshwater or brackish marshes and swamps from 10 to 558 feet in elevation and is known from seven USGS 7.5-minute quadrangles in Los Angeles and San Luis Obispo counties (CDFW 2016a, CNPS 2016b). The species is believed extirpated from San Bernardino, Santa Cruz, and San Francisco counties, and Washington State. This species was determined to be unlikely to occur within the Project Area due to a lack of extant populations within the region and a lack of suitable marsh or swamp habitat within the Project Area.

Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*); Federal Endangered, Rank 1B.1. Ben Lomond spineflower is an annual herb in the buckwheat family (Polygonaceae) that blooms from April to July (CNPS 2016b). The species occurs in maritime ponderosa pine sandhills habitat in six USGS 7.5-minute quadrangles Santa Cruz County (CDFW 2016a, CNPS 2016b). The species is thought to be threatened by sand mining, development, and non-native plants (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable habitat. Suitable habitat for this species may be present within the larger San Vicente Redwoods property, but is not found within the Project Area.

Scotts Valley spineflower (*Chorizanthe robusta* var. *hartwegii*); Federal Endangered, Rank 1B.1. Scotts Valley spineflower is an annual herb in the buckwheat family (Polygonaceae) that blooms from April to July (CNPS 2016b). This variety occurs in meadows and seeps with sandy soils and in valley and foothill grassland on mudstone and Purisima outcrops from 755 to 804 feet in elevation (CDFW 2016a, CNPS 2016b). The species is a California endemic documented from only two USGS 7.5-minute quadrangles in Santa Cruz County (CNPS 2016b). Development and vehicles threaten the variety (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable meadows, seeps, or grasslands.

Robust spineflower (*Chorizanthe robusta* var. *robusta*); Federal Endangered, Rank 1B.1. Robust spineflower is a summer-flowering annual herb in the buckwheat family (Polygonaceae) found on sandy soils in chaparral, coastal dune, coastal scrub, sandy coastal prairie sites, and openings in cismontane woodland communities with coarse soils and relatively sparse ground cover (CDFW 2016a, CNPS 2016b). This species requires sand- or gravel-based soils and is

found at elevations from 10 to 1000 feet. Its blooming period is from April to September, although in years with late fall rains, fruiting structures may be obvious as late as November. It is found in Monterey, Santa Cruz, San Francisco, and San Mateo counties, and is thought to be extirpated in its historic range in Santa Clara and Alameda counties. The species is threatened by development, recreation, mining, and non-native plants (CNPS 2016b). Within the Project Area, this species was originally determined to have potential to occur in openings such as at road crossings. However, this species was not observed during seasonally-timed surveys and it is assumed to be not present.

Santa Cruz wallflower (*Erysimum teretifolium*); Federal Endangered, State Endangered, Rank 1B.1. Santa Cruz wallflower is a perennial herb in the mustard family (Brassicaceae) that blooms from March to July (CNPS 2016b). This species occurs on inland marine sands (Zayante sands) in chaparral and lower montane coniferous forest from 394 to 2001 feet in elevation (CDFW 2016a, CNPS 2016b). The range of this California endemic spans three USGS 7.5-minute quadrangles in Santa Cruz County (CNPS 2016b). Development, sand mining, and vandalism pose serious threats to the species (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable substrate (Zayante sands). Although potentially suitable substrate may be present within the larger San Vicente Redwoods property, it is unlikely to occur within the Project Area.

Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*); Federal Endangered, State Endangered, Rank 1B.1. Santa Cruz cypress is an evergreen, coniferous tree in the cypress family (Cupressaceae) with an elevational range of approximately 920 to 2650 feet (CNPS 2016b). This species is not a flowering plant and does not bloom, but produces male and female cones on the same plant and remnants, early cones, and/or open cones of one or both sexes should be visible on reproductive individuals year-round (i.e., the species is identifiable year-round). Santa Cruz cypress occurs in closed-cone coniferous forests, chaparral, and lower montane coniferous forests in areas underlain with sandstone-derived or granitic soils (CDFW 2016a, CNPS 2016b). The species is endemic to California and is known from less than ten natural populations in four USGS quadrangles in San Mateo and Santa Cruz counties (CNPS 2016b). This species may be threatened by development, agriculture, alteration of fire regimes, and introgression from the closely related species Monterey cypress (*H. macrocarpa*) (CNPS 2016b), which is planted as a common ornamental tree in the area. Although this species has been documented from the immediate vicinity of the Project Area along Empire Grade Road, WRA received anecdotal evidence that the population has been extirpated (Nadia Hamey, Big Creek forester, personal communication to Matthew Richmond, April 6, 2016). Moreover, this species is identifiable year-round, but was not observed during surveys within the Project Area. As such, this species was determined to be not present within the Project Area.

Butano Ridge cypress (*Hesperocyparis abramsiana* var. *butanoensis*); Federal Endangered, State Endangered, Rank 1B.1. Butano Ridge cypress is an evergreen, coniferous tree in the cypress family (Cupressaceae) with an elevational range of approximately 920 to 2650 feet (CNPS 2016b). This species is not a flowering plant and does not bloom, but produces male and female cones on the same plant and remnants, early cones, and/or open cones of one or both sexes should be visible on reproductive individuals year-round (i.e., the species is identifiable year-round). Butano Ridge cypress occurs in closed-cone coniferous forests, chaparral, and lower montane coniferous forests in areas underlain with sandstone-derived soils (CDFW 2016a, CNPS 2016b). The species is endemic to California and is known from Butano Ridge (CNPS 2016b), located over 8 miles from the Project Area. This species may be threatened by alteration of fire regimes and recreation (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area based on its hyperlocal occurrence on Butano Ridge. Moreover, the species is identifiable year-round, but was not observed during surveys within the Project Area. As such, this species was determined to be not present within the Project Area.

Santa Cruz tarplant (*Holocarpha macradenia*); Federal Threatened, State Endangered, Rank 1B.1. Santa Cruz tarplant is an annual herb from the sunflower family (Asteraceae) that blooms from June to October (CNPS 2016b). The species is found on grassy coastal terraces at elevations ranging from 33 to 726 feet (CDFW 2016a, CNPS 2016b). Suitable habitats include coastal prairie, coastal scrub, and valley and foothill grasslands (CDFW 2016a, CNPS 2016b). This species often occurs on moderately disturbed, sandy or clay soils (CNPS 2009). However, specific microhabitat preferences for this plant are not well known and some populations described in the CNDDDB occur on loamy soils (CDFW 2016a). The only remaining natural occurrences are known from Santa Cruz and Monterey counties, and the species has been largely extirpated from Marin, Contra Costa, and Alameda counties (CNPS 2016b). Extant populations in Solano County are recent re-introductions; most re-introduced populations have failed (CNPS 2016b). This species is severely threatened by urbanization, agriculture, and non-native plants and also depends on appropriate ecological disturbance for persistence in an area, which may be lacking from many areas (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable coastal terrace, coastal prairie, coastal scrub, and valley and foothill grassland habitats.

White-rayed pentachaeta (*Pentachaeta bellidiflora*); Federal Endangered, State Endangered, Rank 1B.1. White-rayed pentachaeta is an annual herb in the sunflower family (Asteraceae) that blooms from March to May (CNPS 2016b). The species occurs in cismontane woodlands and valley and foothill grassland habitats at elevations of approximately 115 - 2050 feet (CDFW 2016a, CNPS 2016b). When occurring in grassy habitats, this species is often found on serpentine-derived substrates (CNPS 2016b). Within other habitats, this species occurs on dry, rocky slopes (CDFW 2016a). White-rayed pentachaeta was known from 12 USGS 7.5-minute quadrangles in Marin, Santa Cruz, and San Mateo counties, but is now presumed extirpated from all historical locations except those in the Woodside quadrangle in San Mateo County. All of the previously known occurrences were lost to development, making this a major threat for the species. This species was determined to be unlikely to occur within the Project Area to a lack of suitable grassland habitat and dry, rocky openings within woodland habitat, in addition to being considered extirpated from the region.

Scotts Valley polygonum (*Polygonum hickmanii*); Federal Endangered, State Endangered, Rank 1B.1. Scotts Valley polygonum is an annual herb in the knotweed family (Polygonaceae) that blooms from May to August (CNPS 2016b). This species occurs on mudstone- and sandstone-derived substrates in valley and foothill grassland habitats from 689 to 820 feet in elevation. This California endemic is only known from two occurrences in Scotts Valley (CDFW 2016a). The species is threatened by development and invasive plants (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a general lack of grassland habitat.

5.2.2 Special-Status Wildlife

Seventy-seven special-status wildlife species have been recorded in the vicinity or have ranges that overlap with the Project Area based on a review of the resources outlined in Section 3.2.1. Figure 8 shows special-status wildlife species documented within 5 miles of the Project Area (CDFW 2016a). Appendix C summarizes the potential for each of these species to occur in the Project Area. Three special-status wildlife species were observed in the Project Area during the site assessment: oak titmouse (*Baeolophus inornatus*; USFWS Bird of Conservation Concern), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*; CDFW Species of Special Concern), and California red-legged frog (*Rana draytonii*; Federal Threatened, CDFW Special of Special Concern). In addition to these three species, six special-status wildlife species were determined to have a high potential to occur in the Project Area, seven special-status wildlife species were determined to have a moderate potential to occur, and it was determined that the

Project Area contains designated Critical Habitat for California red-legged frog (*Rana draytonii*). The remaining 61 species documented from within the vicinity of the Project Area were determined to be unlikely or have no potential to occur. Special-status wildlife species observed during WRA's site visits and significant wildlife life habitat features (i.e., large, complex old-growth trees) that may support special-status species are shown on Figure 9.

Special-Status Wildlife Present within the Project Area

Oak titmouse (*Baeolophus inornatus*); USFWS Bird of Conservation Concern. This relatively common species is a year-round resident throughout much of California, including most of the coastal slope, the Central Valley, and the western Sierra Nevada foothills. In addition, the species may also occur in residential settings where landscaping provides foraging and nesting habitat. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas (Cicero 2000). Oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, although they may partially excavate their own cavities (Cicero 2000). Seeds and arboreal invertebrates comprise the bird's diet. This species was observed foraging within various forest and edge habitat throughout the Project Area. Impacts to this species may be considered significant under the CEQA.

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*); CDFW Species of Special Concern. This subspecies of the dusky-footed woodrat occurs in the Coast Ranges between San Francisco Bay and the Salinas River (Matocq 2003). Occupied habitats are variable and include forest, woodland, and chaparral habitats, including riparian areas. Woodrats feed on woody plants, but will also consume fungi, grasses, flowers, and acorns. Foraging occurs on the ground and in bushes and trees. This species constructs robust stick houses/structures, also referred to as middens, in areas with moderate cover and an understory containing woody debris. Breeding takes place from December to September. Individuals are active year-round and are generally nocturnal.

This species was observed within the Project Area and large stick houses (i.e., middens) were found to be prolific throughout the Project Area, but concentrated in the northern portion of the main parcel. Middens were commonly found in every terrestrial/upland biological community within the Project Area, and were frequently encountered in high density. Surveyors mapped 1,815 middens within 25-feet on either side of the proposed trail alignment and within the proposed parking area and an associated 25-foot buffer (Figure 9). Based on the representative densities of woodrat middens within the Project Area (approximately 8.7 middens per acre), it is estimated that the greater San Vicente Redwoods site may harbor as many as 74,000 woodrat nests. Based on a 5-foot wide trail and 1 foot of vegetation clearance on either side (7 feet total disturbance), it is estimated that up to 144 woodrat middens could be directly impacted by trail construction. However, such impacts are theoretical given that there is flexibility to move the trail anywhere within the 50-foot-wide band surveyed for this report. Impacts to dusky-footed woodrat species must be considered under the CEQA; however, given the large number of middens potentially present at the site and the minor number of middens that would be directly impacted by trail construction, such impacts would clearly not threaten the existence of the species at the site and therefore should not be considered significant under the CEQA.

California red-legged frog (*Rana draytonii*); Federal Threatened, CDFW Species of Special Concern. The California red-legged frog (CLRf) is dependent on suitable aquatic, estivation, and upland habitats. During the rainy season, starting with the first rainfall in late fall, red-legged frogs disperse away from their estivation sites to seek suitable breeding habitat. Dispersal is more prevalent during wet weather such as during rain or heavy fog. Aquatic and breeding habitats are characterized by dense, shrubby, riparian vegetation and deep, still or slow-moving

water. Breeding occurs between late November and late April. California red-legged frogs estivate (a period of inactivity similar to hibernation) during the dry months in small mammal burrows, moist leaf litter, incised stream channels, and large cracks in the bottom of dried ponds.

This species has been documented to occur within the larger San Vicente Redwoods property, and the Project Area contains Critical Habitat for the species (Unit SCZ-1; see Section 4.2.3 for a discussion of CRLF Critical Habitat). A CRLF occurrence from 1997 is located adjacent to the Project Area, and there are many additional documented occurrences within 2 miles of the Project Area (CDFW 2016a). Although no suitable breeding habitat was observed (i.e., no slow or standing water with adequate depth to support breeding), the Project Area provides potential dispersal and aquatic non-breeding habitat that may support the species. During a June 2017 site visit WRA biologists observed an adult CRLF in a shallow pool along an existing road within the proposed alignment (Figure 9). The Project Area is located within dispersal distance of known occurrences. Although the species is unlikely to breed within the Project Area, it may occur seasonally, during dispersal events.

Special-Status Wildlife with High Potential to Occur within the Project Area

Townsend's big-eared bat, (*Corynorhinus townsendii townsendii*); State Candidate, CDFW Species of Special Concern, BWBG High Priority. This species ranges throughout western North America, from British Columbia to central Mexico. Its local distribution is strongly associated with the presence of caves, but roosting also occurs within human-made structures, including mines and buildings. While many bats species wedge themselves into tight cracks and crevices, big-eared bats hang from walls and ceilings in the open. Males roost singly during the spring and summer months whereas females aggregate at maternity roosts to give birth in the spring. Females roost with their young until late summer or early fall, until the young become independent, flying and foraging on their own. In central and southern California, hibernation roosts tend to be composed of small aggregations of individuals (Pierson and Rainey 1998). Foraging typically occurs along edge habitats near streams and wooded areas, where moths are the primary prey (BWBG 2015). This species has been documented roosting within cave habitat in close proximity to the Project Area and there are numerous occurrences documented within 5 miles of Project Area (CDFW 2016a). Therefore, the species was determined to have a high potential to occur within the Project Area. Impacts to this species could be considered significant under the CEQA.

Marbled murrelet (*Brachyramphus marmoratus*); Federal Threatened, State Endangered. The marbled murrelet is a small seabird that breeds up to 30 miles inland from the coast on large limbs of redwood and Douglas fir trees. At sea, it feeds on small fish near the shore and travels from nesting sites to feed at the coast at dawn and dusk during the breeding season. Breeding requirements for this species are not well documented in the southern portion of its range; however, it appears that dense, humid coastal forests of old-growth trees are necessary for breeding. The breeding range of the marbled murrelet in California is considered to be split, with the majority of the population breeding within the extreme northwest portion of its range (i.e., Oregon border south to Eureka) and a smaller population breeding south of San Francisco (Pillar Point south to Santa Cruz) (Small 1994).

There are numerous occurrences of this species documented throughout the Santa Cruz Mountains, the closest of which are located approximately 1 mile to the west and 1.9 miles to the east of the Project Area (CDFW 2016a). Critical Habitat for the species is also located approximately 1.2 miles south (Unit CA-15) and 2.4 miles north (Unit CA-14-b). Within the Project Area, several stands of old-growth redwood occur and provide potentially suitable nesting habitat

for the species. Several large old-growth trees with complex canopy structures have also been documented within the Project Area and are shown on Figure 9. Therefore, although the species has not been documented within the Project Area, nor does the Project Area contain Critical Habitat, the presence of trees that could support potentially suitable nesting habitat and the proximity of known occurrences and designated Critical Habitat gives this species a high potential to occur within the greater Project Area.

Vaux's swift (*Chaetura vauxi*); CDFW Species of Special Concern. The Vaux's swift is a summer resident in California, breeding on the coast from central California northward and in the Cascade and Sierra Nevada ranges. Nesting occurs in large, accessible, chimney-like tree cavities that allow birds to fly within the cavity directly to secluded nest sites. Such cavities usually occur in conifers, especially old-growth redwoods (Shuford and Gardali 2008). Chimneys and similar human-made substrates are also used for nesting. This species is highly aerial and forages widely for insects in areas of open airspace. During migration, nocturnal roosting occurs communally and favored sites may host thousands of individuals. Within the Project Area, large stands of coniferous forest with complex canopies and snags occur throughout and provide potentially suitable nesting and foraging habitat. Due to presence of available nesting and foraging habitat, this species was determined to have a high potential to occur within the Project Area.

Allen's hummingbird (*Selasphorus sasin*); USFWS Bird of Conservation Concern. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California and the Channel Islands. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian habitat, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). The species feeds on nectar, as well as insects and spiders. Within the Project Area, mature oaks, riparian woodland, and edge habitat provide potentially suitable nesting habitat, and thus, the species was determined to have a high potential to occur.

Nuttall's woodpecker (*Picoides nuttalli*); USFWS Bird of Conservation Concern. Nuttall's woodpecker, common in much of its range, is a year-round resident throughout most of California, west of the Sierra Nevada Range. Typical habitat is oak or mixed woodland, and riparian areas (Lowther 2000). Nesting occurs in tree cavities, principally those of oaks and larger riparian trees. Nuttall's woodpecker also occurs in older residential settings and orchards where trees provide suitable foraging and nesting habitat. This species forages on a variety of arboreal invertebrates. Within the Project Area, mature oaks and riparian woodland provide potentially suitable nesting habitat, and thus, the species was determined to have a high potential to occur.

Olive-sided flycatcher (*Contopus cooperi*); USFWS Bird of Conservation Concern, CDFW Species of Special Concern. This species is found within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands (Altman and Sallabanks 2000). The species is most numerous in montane coniferous forests where tall trees overlook canyons, meadows, lakes, or other open terrain. Within the Project Area, mixed conifer, redwood, pine forest, and edge habitats may provide suitable nesting habitat for this species. The species has also been observed frequently along roads surrounding the Project Area (eBird 2016). Therefore, this species was determined to have a high potential to occur within the Project Area.

Special-Status Wildlife with Moderate Potential to Occur within the Project Area

Hoary bat (*Lasiurus cinereus*); WBWG Medium Priority. Hoary bats are highly associated with forested habitats in the western United States, particularly in the Pacific Northwest. They are

a solitary species and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, usually at the edge of a clearing. Roosts are typically located 10 to 30 feet above the ground. They have also been documented roosting in caves, beneath rock ledges, in woodpecker holes, in grey squirrel nests, under driftwood, and clinging to the side of buildings, although the latter behavior is not typical. Hoary bats are thought to be highly migratory; however, wintering sites and migratory routes have not been well documented. This species tolerates a wide range of temperatures and has been captured at air temperatures between 0 and 22 degrees Celsius. Hoary bats probably mate in the fall, with delayed implantation leading to birth in May through July. They usually emerge late in the evening to forage, typically from just over one hour after sunset to after midnight. This species reportedly has a strong preference for moths, but is also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (WBWG 2015). This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016a). Within the Project Area, mature conifer and broadleaf trees have the potential to support roosting sites. Therefore, this species was determined to have a moderate potential to occur within the Project Area.

Pallid bat (*Antrozous pallidus*); CDFW Species of Special Concern, WBWG High Priority.

Pallid bats are distributed from southern British Columbia and Montana to central Mexico and east to Texas, Oklahoma, and Kansas. This species occurs in a number of habitats ranging from rocky, arid deserts to grasslands and into higher-elevation coniferous forests. They are most abundant in the arid Sonoran life zones below 6,000 feet in elevation, but have been found at elevations of up to 10,000 feet in the Sierra Nevada. Pallid bats often roost in colonies of between 20 and several hundred individuals. Roosts are typically located in rock crevices, tree hollows, mines, caves, and a variety of human-made structures, including vacant and occupied buildings. Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and within cavities in large oak trees. Pallid bats are primarily insectivorous, feeding on large prey that is usually taken on the ground, but also sometimes in flight. Prey items include arthropods such as scorpions, ground crickets, and cicadas (WBWG 2015). This species has been documented from within 3.75 miles of the Project Area (CDFW 2016a). Cavities within large, mature trees within the Project Area may provide potential roost habitat for pallid bat. Additionally, higher-quality rock outcroppings and cave features that may have the potential to support roosting sites are known to occur within the larger San Vicente Redwoods property, in close proximity to the Project Area. Therefore, this species was determined to have a moderate potential to occur within the Project Area.

Western red bat (*Lasiurus blossevillei*); CDFW Species of Special Concern, WBWG High Priority.

This species is highly migratory and broadly distributed, ranging from southern Canada through much of the western United States. Western red bats are believed to make seasonal shifts in their distribution, although there is no evidence of mass migrations (Pierson et al. 2006). They are typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly located in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas, possibly in association with riparian habitat (particularly willows, cottonwoods, and sycamores) (Pierson et al. 2006). It is believed that males and females maintain different distributions during pupping, where females take advantage of warmer inland areas and males occur in cooler areas along the coast. The Project Area contains potentially suitable maternity roosting habitat within riparian habitats along streams. Suitable foraging habitat is supported within and adjacent to streams throughout the Project Area. Although perennial streams and associated well-developed riparian habitat are not present within the Project Area, the species may utilize the Project Area for roosting and foraging, and therefore was determined to have a moderate potential to occur.

Silver-haired bat (*Lasionycteris noctivagans*); WBWG Medium Priority. Silver-haired bats occur in temperate conifer, mixed-conifer, and deciduous forests from southern Alaska to northeastern Mexico. Females form maternity roosts almost exclusively inside hollows or under loose bark of large trees and may switch roosts multiple times (WBWG 2015). Hibernation occurs in trees, rock crevices, leaf litter, in and under buildings, and in caves and mines. Foraging occurs above the tree canopy where the silver-haired bat preys on insects. Silver-haired bats are known to migrate south in the winter, although overwintering at northern latitudes has also been documented (WBWG 2015). The Project Area may contain potentially suitable maternity roosting habitat within mixed conifer forest. Suitable foraging habitat may be supported within and adjacent to streams throughout the Project Area. Therefore, this species was determined to have a moderate potential to occur.

Fringed myotis (*Myotis thysanodes*), WBWG High Priority. The fringed myotis ranges through much of western North America from southern British Columbia, Canada, south to Chiapas, Mexico and from Santa Cruz Island in California, east to the Black Hills of South Dakota. This species is found in desert scrubland, grassland, sage-grass steppe, old-growth forest, and subalpine coniferous and mixed deciduous forests. Oak and pinyon-juniper woodlands are most commonly used. The fringed myotis roosts in colonies from 10 to 2,000 individuals, although large colonies are rare. Caves, buildings, underground mines, crevices in cliff faces, and bridges are used for maternity and night roosts, whereas hibernation has only been documented in buildings and underground mines. Tree-roosting has also been documented in Oregon, New Mexico, and California (WBWG 2015). Within the Project Area, roosting habitat may occur in the large stands of conifer and hardwood forest habitat; however, higher quality roost habitat may be found in cave and cliff habitats that occur near the San Vicente Quarry in the southern portion of the larger site. The species is likely to forage over the Project Area, and based on the proximity to roost habitat, the species was determined to have a moderate potential to occur.

Ring-tailed cat (*Bassariscus astutus*); CDFW Fully Protected Species. The ring-tailed cat is an uncommon but widespread resident of California, excluding the Central Valley, south to Mexico. This species is found in remote riparian habitats, rocky canyons, and stands of forest and shrub habitats that contain trees, brush, and rock crevices for cover. This species is also usually found within 0.6 mile of water (Zeiner et al. 1990). Hollow trees, snags, rock crevices, and other cavities are used for cover and nesting. Ring-tailed cats are primarily carnivorous and mostly nocturnal. Within the Project Area, wooded habitat of varying composition could support the species and its foraging needs. The Project Area is also surrounded by large tracts of undeveloped forest, which provides a habitat corridor for the species. Although perennial water sources were not observed within the Project Area, seasonal streams may make portions of the Project Area more suitable under during different periods of the year. Based on these conditions, it was determined that this species has a moderate potential to occur.

Purple martin (*Progne subis*); CDFW Species of Special Concern. Purple martin is an uncommon summer resident in California, occurring in woodlands and low-elevation hardwood and coniferous forests. It usually feeds on insects captured in flight 100 to 200 feet above the ground. Purple martin nests in cavities often located in tall, isolated trees or snags in open forest or woodland habitats. The Project Area contains large tracts of coniferous forest that may provide suitable nesting habitat for this species. This species has been observed east of the Project Area, in the Bonny Doon Ecological Reserve (eBird 2016). Foraging habitat is also likely to be supported above the tree canopy above Project Area. Due to the dominance of coniferous forest habitat within the Project Area, this species was determined to have a moderate potential to occur.

Mountain Lion and Wildlife Corridors

While not protected by the CESA or the ESA, the 1990 California Wildlife Protection Act prohibits sport hunting of mountain lion (*Puma concolor*) in California. These top predators serve an important ecological role within the region, and while mountain lion are primarily solitary, individuals exhibit localized approaches to foraging and spatial use (Allen et al. 2015). Mountain lion are active year-round and tend to hunt and move between the hours of dawn and dusk; however, mountain lions have been found to opportunistically hunt during daytime hours when prey is available (Allen et al. 2015). This carnivore is primarily an ambush hunter, and feeds mainly on black-tailed deer, but will also take a number of species including rabbit, rodents, turkey, and various smaller predators including coyote and raccoon. Mountain lions are capable of breeding any time of year, but kittens are typically born in June or July in dens such as a shallow cave, rock overhang, or area of dense vegetation.

Mountain lions maintain large home ranges, with females utilizing areas 3 to 12 square miles and males occupying habitats from 25 to 96 square miles (CDFW 2016a). Population densities for mountain lions have been found to vary from 0.37 individuals per 100 square kilometers in resource-limited portions of Utah up to 3.6 individuals per 100 square kilometers in coastal California (Allen et al. 2015). Whereas home range size and habitat use vary based on prey availability, illegal hunting has also been found to result in lower population densities (Allen et al. 2015).

The species is well documented within the Santa Cruz Mountains, as UC Santa Cruz and the CDFW have collaborated on tracking studies with radio-collared individuals to better understand their movement and the status of the population. Sign from this species (i.e., scrapes, tracks, and scat) was observed during WRA's fieldwork, and the Santa Cruz Puma Project has documented radio-collared individuals moving through the Project Area.

The Project Area is known to support mountain lions and is located within an area identified by the CDFW as a wildlife corridor and part of the essential connectivity for this species (CDFW 2014). Maintaining large, interconnected tracks of contiguous forest habitats allows the movement of mountain lion, their prey, and other native species. Because of the ecological importance mountain lion play within the region and the critical role wildlife corridors play in facilitating the movement of native species, wildlife corridors are considered a significant resource under the CEQA, and the potential impact of the Project on wildlife corridors is discussed in more detail in Section 6.3.7.

Federally Listed Wildlife that Occur in the Region but are Unlikely to Occur in the Project Area

Federally listed species that have been documented to occur within the vicinity or adjacent to the Project Area but which are unlikely to occur there include: least Bell's vireo (*Vireo bellii pusillus*), steelhead Central California Coast DPS (*Oncorhynchus mykiss*), and Central California Coast Ecologically Significant Unit (ESU) of Coho salmon (*Oncorhynchus kisutch*). These species are discussed below (also see Appendix C).

Least Bell's vireo (*Vireo bellii pusillus*); Federal Endangered, State Endangered, CDFW Species of Special Concern. This subspecies of Bell's vireo is a neotropical migrant and summer resident in California and northern Baja California, wintering in southern Baja California (Brown 1993). Nesting occurs in riparian areas in the vicinity of water or in dry river bottoms. Nests are often located along margins of bushes or on twigs projecting into pathways, usually on species such as willow, coyote brush, or mesquite. This vireo was once common in lowland riparian habitats throughout California but declined precipitously during the twentieth century

(USFWS 1998). By the time its federal listing in 1986, the population was restricted to an estimated 300 pairs in southern California, primarily in San Diego County (USFWS 1998). The population has increased since that time, with the number of nesting territories in the state in 2006 estimated to be approximately ten times greater than in 1986 (USFWS 2006). However, the distribution of the vireo at that time remained almost entirely within southern California (USFWS 2006). This species was determined to be unlikely to occur within the Project Area due to the absence of suitable riparian and scrub habitats required by the species for nesting. Furthermore, the species is not known to nest or occur within the Santa Cruz Mountains.

Steelhead - Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened. The Central California Coast distinct population segment (DPS) of steelhead includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending two years in freshwater, although they may stay in freshwater for up to seven years. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead includes perennial streams with cool to cold water, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas (i.e., shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. This species is known to occur within the mainstem of San Vicente Creek, up to the quarry tunnel and the lower reaches of Mill Creek; however, partial fish passage barriers, narrow, steep channels, and the ephemeral nature of the streams within the Project Area make it unlikely for this species to occur (ESA 2012; Ross Taylor and Associates 2004). Similarly, a natural fish passage barrier on Laguna Creek, downstream of the Laguna Parcel, precludes the presence of steelhead in that reach of Laguna Creek (Ross Taylor and Associates 2004). Given these reasons, it was determined that steelhead are unlikely to occur within the Project Area.

Coho Salmon - Central California Coast ESU (*Oncorhynchus kisutch*), Federal Endangered, State Endangered. The Central California Coast ESU of Coho salmon includes all naturally spawned populations of Coho salmon (and their progeny) in California streams from the Eel River to Aptos Creek, including the Russian River and its tributaries, excluding the Sacramento-San Joaquin River Basin. Coho salmon typically migrate in late fall to early winter to spawn in smaller coastal streams. Spawning migration, known as “runs”, occur throughout the year. Spawning occurs mainly between November and January, but can occur as late as March during drought conditions. Juveniles may spend several years in the freshwater habitat before migrating to the ocean. Most adult fish return “home”, maintaining fidelity to their natal stream. Preferred spawning habitat for Coho salmon is small freshwater streams with cool to cold water temperature, medium to small gravel substrate, and high dissolved oxygen levels at the head of a riffle where water changes from laminar flow to turbulent flow (providing greater dissolved oxygen). Abundant riffle areas (i.e., shallow areas with gravel substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. This species is known to occur within the mainstem of San Vicente Creek, up to the quarry tunnel and the lower reaches of Mill Creek; however, fish passage barriers, narrow, steep channels, and the ephemeral nature of the streams make the Project Area unsuitable for the species (ESA 2012). Similarly, a natural fish passage barrier on Laguna Creek prevents the occurrence of Coho salmon within the Laguna parcel (Ross Taylor and Associates 2004).

5.2.3 Critical Habitat

Based on WRA's review of the USFWS Critical Habitat Mapper (USFWS 2016b), it was determined that the Project Area contains Critical Habitat for CRLF. There are four physical and biological features, formerly referred to as PCEs, that are considered to be essential for the conservation or survival of a species. The features for the CRLF include: aquatic breeding habitat; non-breeding aquatic habitat; upland habitat; and dispersal habitat (USFWS 2010).

Aquatic breeding habitat consists of low-gradient fresh water bodies, including natural and manmade (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. It does not include deep water habitat, such as lakes and reservoirs. Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years. This is the average amount of time needed for egg, larval, and tadpole development and metamorphosis so that juveniles can become capable of surviving in upland habitats (USFWS 2010).

Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal habitat for juvenile and adult CRLF. These waterbodies include plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. The third habitat type is upland habitats, which include areas within 300 feet of aquatic and riparian habitat and are composed of grasslands, woodlands, and/or vegetation that provides shelter, forage, and predator avoidance. Upland habitat can include structural features such as boulders, rocks, and organic debris (e.g., downed trees), as well as small mammal burrows and moist leaf litter (USFWS 2010). Finally, dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites. Although California red-legged frog is highly aquatic, this species has been documented to make overland movements of several hundred meters and up to one mile during a winter/spring wet season in Northern California (Bulger et al. 2003, Fellers and Kleeman 2007) and 2,860 meters (1.8 miles) in the central California coast (Rathbun and Schneider 2001).

The Project Area does not contain aquatic breeding habitat for CRLF; however, the Project Area may provide dispersal habitat to off-site breeding features. Additionally, intermittent drainages within the Project Area may be considered seasonal aquatic non-breeding habitat by the USFWS; associated areas within 300 feet of seasonal aquatic non-breeding habitat would be considered upland foraging habitat.

5.3 Protected Trees

Although a tree survey was not conducted for this report, any tree located within one of the sensitive habitats described in Section 4.1.2 may be protected by the County. A tree removal permit may be required for the removal of such trees.

6.0 PROJECT DESCRIPTION

The Draft Public Access Plan outlines a site-wide, programmatic approach to public access for recreation at the San Vicente Redwoods. The Plan outlines goals and policies related to public access, access plans for recreation, an implementation plan, and design and maintenance guidelines. This report focuses on the trail network and attendant features described in the Draft Public Access Plan (PlaceWorks 2018), and more specifically on the trail segments shown on Figure 2.

Under the Draft Public Access Plan, a network of approximately 38 miles of trails will be constructed as part of the overall proposed Project. The trail network will include a combination of single- and multi-use trails which will allow public access for the following allowable uses:

- Hiking
- Biking
- Horse riding
- Dog walking (on-leash only)
- Picnicking and small group gatherings
- Nature observation

These uses will be allowed during daylight hours only, except on a limited basis by permit.

Prohibited uses will include:

- Smoking
- Unpermitted alcohol use
- Fire making
- Collecting
- Hunting
- Fishing
- Off-road vehicles or motorized dirt biking
- Rock climbing
- Rappelling
- Caving

Key design goals for the development of the trail network include the following:

- Provide for a variety of experiences through different habitats
- Concentrate loop trails in the northern part of the property, where they can be accessed from the Empire Grade staging area(s)
- Establish through-trails connecting the Empire Grade staging areas down to the Coast Dairies property
- Provide buffers around private property
- Accommodate other property uses, including timber harvest and research uses
- Avoid, to the extent possible: neighbor views, safety hazards, and impacts to sensitive resources including water sources, mountain lions, and cultural resources
- Allow for sustainable trail grades and orientation. Use of existing roads as recreational trails should be limited to roads identified as suitable (grades under 15 percent and without fall-line alignment) where possible, and new trail construction should emphasize narrow trails and should result in separate use trails

The Draft Public Access Plan will be implemented in two phases: an initial 10-mile set of multi-use trails easily accessible from the proposed parking and staging area adjacent to Empire Grade Road. Hiking, horse riding, and mountain biking would be allowed on the Phase I trails, with dog walking limited to a frontage trail that parallels Empire Grade Road. Implementation of the Phase I trails is expected to occur over a 1- to 3-year period. Phase II will include approximately 9-11 additional miles of trails to be implemented over a 2- to 3-year period, as well as an expansion of

the staging and parking area adjacent to Empire Grade Road. Phase III will include approximately 16-19 additional miles of trails over a 2- to 3-year period.

During the phased implementation of the Draft Public Access Plan, trail use for all phases will be approximately 35% horse/hike, 40% horse/bike, 25% hike/horse/bike with 1.5 miles of the hike/horse/bike trails allowing dog walking.

In conjunction with the construction of the Phase I trails, a staging area will be constructed along Empire Grade Road, as shown on Figure 2. The staging area will initially have space for at least 45 cars and may be expanded in later phases of the proposed Project. Staging areas may include entry gates, signage, informational kiosks, benches, picnic area/gathering area, trash and recycling receptacles, dog-courtesy stations and restrooms (composting or pump-out toilets).

Trail dimensions will be determined based on the type (or use) of trail as shown on Table 4. Additional details regarding specific design specifications or construction methods are provided in the Draft Public Access Plan. Most trail construction will occur by hand with limited use of heavy machinery or vehicles; the use of the latter would be limited to areas with existing vehicular access (e.g., on former logging roads). However, it is expected that construction of the parking area adjacent to Empire Grade Road will entail the use of standard construction machinery and equipment.

Table 4. Trail Dimensions by Type

Trail Type	Constructed Tread Width	Vegetation Clearance
Accessible Trails	5 feet +	2 feet horizontal 10 feet vertical
Multi-Use Trails	5 feet +	1 foot horizontal 10 feet vertical
Equestrian and Hiking Trails	2 to 5 feet	1 foot horizontal 10 feet vertical
Mountain Biking and Hiking Trails	2 to 4 feet	1 foot horizontal 10 feet vertical

7.0 POTENTIAL IMPACTS, MINIMIZATION, AND AVOIDANCE MEASURES

As described in Section 5.0, the proposed Project entails the construction of approximately 38 miles of recreational trails and an associated 4.7-acre parking area. To the extent feasible, trails and the parking area have been located in non-sensitive habitat and have been designed to have minimal impact on the land and the sensitive biological resources that may occur there. Although the proposed Project covers a large amount of undeveloped land in an area with a rich diversity of biological resources, the proposed Project is relatively minimal in scope and is not expected to result in significant adverse impacts to sensitive resources. The following sections discuss potential impacts to sensitive biological resources associated with the proposed trail alignment (including both initial construction and subsequent use and maintenance) and provide recommended avoidance and minimization measures. With the implementation of these measures, WRA believes that the proposed Project will not result in significant adverse impacts to the environment.

7.1 Sensitive Biological Communities

A range of sensitive terrestrial and aquatic biological communities occur within the Project Area, including: madrone forest, tanoak forest, coast live oak woodland, canyon live oak forest, redwood forest, California bay forest, Anderson's manzanita chaparral (not described in the literature), brittle leaf manzanita chaparral, seasonal wetlands, shrub-scrub wetlands, and streams (including limited riparian vegetation). The proposed trail network has the potential to impact these communities through both initial trail construction and subsequent use and maintenance.

7.1.1 Sensitive Terrestrial Communities

Biology Impact 1

The proposed trail network and staging area have the potential to directly impact sensitive terrestrial communities through removal of vegetation and grading activities during construction, as well as by subsequent damage (e.g., trampling) from pedestrians, cyclists, equestrians, or dogs. The proposed Project also has potential to indirectly impact sensitive terrestrial communities through compaction, erosion, and other disturbances caused by pedestrians, cyclists, horses, or dogs. This may include the introduction of invasive weeds or plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases) which could adversely affect susceptible species. With the implementation of the minimization measures listed below, WRA believes that the project will not result in any significant adverse impacts to sensitive terrestrial communities within the Project Area.

Biology Minimization Measure 1A

Given the widespread nature of sensitive terrestrial communities, protective fencing or flagging is not practical or feasible (fencing or flagging is recommended for occurrences of Anderson's manzanita chaparral due its dual role as a special-status plant; see Section 6.2). However, to minimize impacts to sensitive vegetation, the work area, including any staging areas, should be minimized to the fullest extent feasible and trails should be the minimum width necessary to support the proposed use (i.e., hiking, cycling, horse riding) as defined in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018).

Biology Minimization Measure 1B

To minimize inadvertent impacts to sensitive vegetation, all construction personnel should be educated on the sensitivity of the biological communities and species at the site and the importance of minimizing impacts to vegetation outside of the work area. This should occur prior to the start the construction for each phase of trail and staging area construction during a pre-construction environmental awareness training by a qualified, County-approved biologist and given to all construction personnel working on the proposed Project. A designated staff member from the contractor's crew should provide follow-up training to any employees who begin work after the initial pre-construction training.

The training should include a photograph and/or description of sensitive communities and species at the site, measures being taken to avoid or reduce impacts to the community, reporting and follow-up actions if sensitive communities are impacted, and the worker's responsibility under the applicable environmental regulation(s).

Biology Minimization Measure 1C

To minimize removal of sensitive vegetation, trails should be routed around sensitive vegetation to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of

vegetation removal and ground disturbance during construction) should avoid the dripline of sensitive vegetation, with greater separation between the trail and sensitive vegetation being preferred. If trails are re-routed, they should be re-routed downslope of any sensitive vegetation to avoid causing erosion or sedimentation issues which could be detrimental to sensitive vegetation. If other considerations such as slope or soil stability make it impossible to avoid sensitive vegetation, a qualified, County-approved biologist should develop appropriate mitigation measures based on the type of sensitive vegetation, the size of the impact, and the likelihood of success with various mitigation approaches such as transplantation, propagation, or habitat enhancement. Mitigation measures for unavoidable impacts should be approved by the County prior to any removal of sensitive vegetation.

Biology Minimization Measure 1D

To avoid the introduction of invasive weeds or plant pathogens that could adversely impact sensitive vegetation, prior to arriving on the site all equipment and vehicles shall be inspected to ensure they are clean of any dirt or debris.

Biology Minimization Measure 1E

To minimize both construction-related and post-construction impacts to sensitive vegetation, trail design should incorporate the best available technology and industry-standard Best Management Practices (BMPs) to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance. Specific standards (including standard details) for trail construction are provided in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018).

Biology Minimization Measures 1F

To minimize effects on sensitive vegetation from erosion and sedimentation due to construction activities, all disturbed ground should be stabilized concurrent with trail construction. Stabilization methods may include: compacting the soil¹, covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat should be used as outlined in Biology Minimization Measure 1H. If other erosion control materials are to be used, they should be certified weed-free and as otherwise specified in Biology Minimization Measures 1I.

Biology Minimization Measure 1G

To minimize the introduction of invasive plants or plant pathogens that could threaten sensitive vegetation, parking and staging areas should include signage or other materials aimed at instructing the general public on the potential threats associated with invasive plants, plant pathogens, and other pests of concern. These materials should include basic prevention methods that the general public can implement such as inspecting shoes and pet fur for weed seeds or avoiding the movement of plant material or soil from one area to another. This education signage should be in place prior to opening the trails for public access and should be maintained annually by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

¹ Although compaction may be used with any of the other soil stabilization measures, it is only suitable for use on its own on trail surfaces which typically would not be treated with other erosion control materials.

Biology Minimization Measure 1H

To minimize the introduction of invasive plant species and/or plant pathogens which could adversely impact sensitive vegetation, any restoration or landscape plantings (e.g., plantings around the proposed parking/staging area) should use native species appropriate for plant communities found at the site. To the extent feasible, plant material should be salvaged from trail construction activities at the site. If not possible, plant material should be propagated by a reputable nursery with protocols in place for minimizing the potential spread of *Phytophthora* or other plant diseases. Any propagated plant material should be sourced from as close to the site as possible, ideally from within the site itself.

Biology Minimization Measure 1I

To avoid the introduction of weed seed or plant pathogens that could adversely impact sensitive vegetation, the importation of soils for construction of the parking/staging area or other parts of the Project Area should be minimized to the fullest extent feasible. To the extent feasible, soils should be salvaged from onsite before being imported from offsite. If it is necessary to import soils, they should be certified weed-free and from a County-approved source with protocols in place for minimizing the potential spread of *Phytophthora* or other plant diseases.

Biology Minimization Measure 1J

To minimize impacts to sensitive vegetation from use of the trail network, the Trail Maintenance System should be implemented as described in Chapter 6 of the Draft San Vicente Redwoods Public Access Plan. The Trail Maintenance System includes an annual monitoring program aimed at identifying maintenance issues (e.g., erosion) and other problems (e.g., nuisance trash areas or other impacts from trail users). The Trail Maintenance System should include specific methods for routinely documenting and implementing the necessary maintenance by the Public Access Manager.

7.1.2 Sensitive Aquatic Communities

Biology Impact 2

The proposed trail network and staging area have the potential to directly affect sensitive aquatic communities that may be protected by the Clean Water Act or other Federal, State, or local laws through removal of vegetation, placement of fill, or other grading activities that could impact wetlands, the bed and bank of streams, or riparian vegetation. The proposed Project also has potential to indirectly impact sensitive aquatic communities through increased rates of erosion and sedimentation, the introduction of invasive weeds, and other disturbances from trail users or trail maintenance. The proposed trail network may entail minor impacts to vegetation within the buffers of Environmentally Sensitive Habitats protected under the County of Santa Cruz LCP; however, passive recreational trails are an allowed use within the riparian corridor. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to any wetlands, streams, or their buffers/riparian corridor.

Biology Minimization Measure 2A

To minimize adverse impacts to sensitive aquatic communities, implement Biology Minimization Measures 1A through 1J.

Biology Minimization Measure 2B

To the extent feasible, wetlands and streams should be avoided by trail and staging area construction by a minimum of 100 feet. The jurisdictional boundaries of wetlands, within the 100-foot survey buffer, should be re-flagged in the field prior to construction by a qualified, County-approved individual and trails should be routed around these areas when possible. Trails should be routed downslope of wetland areas, if possible, to avoid the potential for detrimental erosion or sedimentation. When not possible, trails should be sited to avoid altering any obvious source of wetland hydrology and should be sloped downhill crossways so no water accumulates and instead flows off immediately. This avoids concentration of stormwater into “gutters” which then have to be discharged via water bars.

Crossings of regulated streams should be appropriately located to minimize impacts to riparian vegetation and to minimize the potential for long-term impacts to the stream. Trails should be routed in areas with less riparian vegetation to minimize the need for vegetation removal in these areas. Trails should also be located in areas that will minimize the potential for detrimental erosion or sedimentation. Stream crossings should be designed to minimize trail erosion following the specific standards for trail construction provided in the Draft Public Access Plan (PlaceWorks 2018). Crossings should be designed to fre-span the channel and should ideally be anchored above the top of bank. In some locations however, hardened crossings that include work below the top of bank may be the least impactful approach.

Crossings of regulated streams that avoid work below the ordinary high water mark do not require a permit from the United States Army Corps of Engineers. However, such crossings may require notification to the California Department of Fish and Wildlife (CDFW), the Regional Water Quality Control Board (RWQCB), and the County, even if located above the top of bank. If the CDFW, RWQCB, or County issue authorizations for such work, the measures included in any such authorizations should be incorporated into the proposed Project design.

Biology Minimization Measure 2C

Where wetlands or streams cannot be avoided, appropriate approvals from the United States Army Corps of Engineers (for impacts to regulated wetlands or areas below the ordinary high water mark of regulated streams) and/or the Regional Water Quality Control Board and the California Department of Fish and Wildlife (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) should be secured prior to initiating work in these areas. Additional County approvals may be required under the Riparian Corridor and Wetlands Protection Ordinance. The measures included in any such authorizations should be incorporated into the proposed Project design.

Biology Minimization Measure 2D

To prevent erosion or sedimentation during construction, appropriate Best Management Practices (BMPs) (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) should be installed around wetlands and streams. All materials should be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs should be determined by the contractor based on specific Project site conditions and the type of work being conducted. BMPs should remain in place until all disturbed ground has been stabilized either through compaction, re-vegetation, or other methods provided for in Biology Minimization Measure 1F.

Biology Minimization Measure 2E

Any fueling or maintenance of equipment or vehicles should be conducted at a minimum of 100 feet from any wetland or stream. A spill containment kit should be maintained at any fueling or maintenance area. Any spills should be cleaned as soon as feasibly possible and all resulting materials should be disposed of properly. All construction vehicles should be inspected daily for leaks of oil, hydraulic fluid, or other potentially hazardous materials by a qualified, construction-crew member and drip pans should be placed under parked vehicles during prolonged periods of disuse (e.g., during evenings and weekends).

7.2 Special-Status Plant and Wildlife Species

7.2.1 Special-Status Plants

One special-status plant species is known to occur within the Project Area: Anderson's manzanita (Rank 1B.2). Based on the current alignment, there is potential for impacting up to 0.54 acre of Anderson's manzanita. These impacts are based on a 7-foot band of disturbance (5-foot trail tread plus 1 foot of vegetation clearance on either side) located down the centerline of the trail alignment and may not reflect actual impacts due to the potential for reducing the width of the trail in critical areas and for re-routing the trail alignment anywhere within the 100-foot-wide band surveyed for this report. It is anticipated that the flexibility built into the trail alignment will help to minimize impacts to Anderson's manzanita.

The proposed Project has the potential to impact Anderson's manzanita through both initial trail construction and subsequent use and maintenance. Suitable measures for avoiding, minimizing, or mitigating impacts to Anderson's manzanita, are provided below.

Biology Impact 3

The proposed trail network and staging area have the potential to directly impact Anderson's manzanita through direct vegetation removal and grading activities, as well as by subsequent damage (e.g., trampling) from pedestrians, cyclists, horses, or dogs. The proposed Project also has potential to indirectly impact Anderson's manzanita through compaction and other disturbances caused by pedestrians, cyclists, horses, or dogs. This may include the introduction of invasive weeds or plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases) which could adversely affect susceptible species. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to Anderson's manzanita.

Biology Minimization Measure 3A

Implement Biology Minimization Measures 1A-1J.

Biology Minimization Measure 3B

Where work will occur within 10 feet of a special-status plant to be preserved, orange construction fencing (or similar) should be installed at the edge of the work area and no work should occur beyond the fence. If such occurrences of special-status plants occur downslope from the work area, silt fencing should be installed at the edge of the work area to prevent soil or other materials from being transported downslope where they may impact special-status plants.

Biology Minimization Measure 3C

To the extent feasible and practicable, occurrences of special-status plants should be avoided by re-routing the trail alignment. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal) should avoid the dripline of any special-status shrubs and should avoid special-status herbs by a minimum of 10 feet. If trails are re-routed, they should be re-routed downslope, where feasible, of any special-status plants to avoid causing erosion or sedimentation issues which could be detrimental to special-status plants. If not feasible then re-route the drainage away from the special-status plants. If other considerations such as slope or soil stability make it impossible to avoid special-status plants, a qualified, County-approved biologist should develop appropriate mitigation measures based on the species in question, the size and type of the anticipated impact, and the likelihood of success with various minimization approaches approved by the CNPS (1998) including:

- (a) Avoiding the impact altogether by not taking a certain action*
- (b) Minimizing impacts by limiting the degree or magnitude of the action*
- (c) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment*
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the Project*
- (e) Compensating for the impact by replacing or providing substitute resources or environments (for example Anderson's manzanita habitat enhancement could be used to offset impacts on-site near disturbance areas by the removal of overstory trees, including non-native trees)*

7.2.2 Special-Status Wildlife

Two special-status wildlife species were observed within the Project Area: San Francisco dusky-footed woodrat and oak titmouse. An additional 13 special-status wildlife species were determined to have moderate to high potential to occur there. The proposed Project has the potential to impact these wildlife species through both initial trail construction and subsequent use and maintenance.

Special-Status Bats

Biology Impact 4

The proposed trail network and staging area have the potential to directly impact special-status bats with the potential to occur within the Project Area through direct tree removal and grading activities. Tree removal and roost disturbance could occur during vegetation clearing associated with the establishment of parking and multi-use trail areas. Additionally, the operation of loud machinery in the immediate vicinity of a maternity roost site could impact the species by causing the parent to abandon the roost or induce elevated stress levels for the individuals occupying the maternity site. Although there are potential direct and indirect impacts to roost habitat associated with the Project, the clearing of vegetation may actually improve foraging habitat in locations that are currently too dense for bats to forage within. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to any special-status bats.

Biology Minimization Measure 4A

Potentially significant impacts to roosting special-status bats may be minimized through avoiding disturbance to active roost sites. If any tree removal, regardless of size, or trimming is required, it is recommended to take place between September and October. This window falls outside of both the maternity and hibernation period for bats and avoids the breeding bird window (see Biology Minimization Measure 5A, below). Tree removal can take place during this period without a breeding bird or bat roost survey, although a tree removal permit may still be necessary.

Biology Minimization Measure 4B

If removal of large trees (diameter at breast height >12 inches) occurs during the bat roosting season (November through August), these trees should be inspected by a qualified, County-approved biologist for the presence of bat roosts. Potential bat roosts include large oak trees, riparian trees, exfoliating bark, tree cavities, and snags. If a maternity roost is detected, up to a 200-foot buffer should be placed around the maternity site until the bats are no longer utilizing the site. Non-maternity roost sites can be removed under the direction of a qualified, County-approved biologist.

Biology Minimization Measure 4C

Any large tree (diameter at breast height >12 inches) that will be removed should be left on the ground for 24 hours before being taken offsite or being chipped. This period will allow any day-roosting bats the opportunity to leave before the tree is either removed from the area or is chipped.

Biology Minimization Measure 4D

Consultation with the California Department of Fish and Wildlife (CDFW) should be initiated to determine appropriate mitigation measures if roosts are disturbed; this should be conducted by a qualified, County-approved biologist and any mitigation measures required by the CDFW should be implemented under the guidance of the same biologist.

Special-Status Birds and Other Avian Species

Biology Impact 5

Several species of special-status birds were observed or were determined to have the potential to occur within the Project Area; they include: oak titmouse, Vaux's swift, Nuttall's woodpecker, Allen's hummingbird, olive-sided flycatcher, and purple martin. (In addition to these species, marbled murrelet may also occur within the Project Area; however, impacts and minimization for this species is discussed under Biology Impact 6.)

The proposed Project will entail minor amounts of vegetation removal which has the potential to impact potential nesting and foraging habitat for avian species. The operation of construction machinery during the breeding season could also cause disturbance to breeding birds and could impact nesting activity. Indirect impacts to nesting birds may also occur as increased noise and human disturbance will occur as hikers, cyclists, horses, and dogs utilize various trail segments. Special-status and other native bird species are protected during the nesting season by the Migratory Bird Treaty Act and the California Fish and Game Code, as well as the California Environmental Quality Act. Potential significant impacts to nesting special-status birds may be minimized through avoiding disturbance to active nests through implementation of the following measures.

Biology Minimization Measure 5A

If construction, vegetation removal, or ground disturbance activities occur during the breeding season (February 1 to August 31), pre-construction breeding bird surveys should be conducted by a qualified individual within 14 days of the start of these activities to avoid disturbance of active nests, eggs, and/or young.

Biology Minimization Measure 5B

If construction, vegetation removal, or ground disturbance activities stop or lapse for a period of 14 days or more during the breeding season, a follow-up breeding bird survey should be conducted to ensure no new breeding activity has occurred within the anticipated work area. Outside of the breeding season, no pre-construction breeding bird survey would be required for construction, vegetation removal, or ground disturbance activities.

Biology Minimization Measure 5C

If nesting birds are located, an exclusion zone in which no construction activities would be allowed should be established around any active nests of any avian species protected by the Migratory Bird Treaty Act and California Fish and Game Code until a qualified, County-approved biologist has determined that all young have fledged. Suggested exclusion zone distances differ depending on species, location, and placement of nest, and should be at the discretion of the approved biologist based on the species in question, the proximity of the nest to the work area, and the type of work being conducted (e.g., use of hand tools versus gas-operated machinery).

Marbled Murrelet

Biology Impact 6

Marbled murrelet may occur within stands of old-growth forest with complex canopy such as shown on Figure 9. However, these areas have not been evaluated for their potential to support marbled murrelet following United States Fish and Wildlife Service protocols and it is unknown whether they represent potential habitat for marbled murrelet. If the species is present, the operation of construction machinery during the breeding season could result in disturbance to breeding individuals and could impact nesting activity. Additionally, although direct impacts to this species from vegetation and tree removal are unlikely, the species may still be impacted from a resulting increase in edge habitat and the presence of trash or food waste from trail users. An increase in edge habitat and/or food waste can result in an increased occurrence of corvids, including Steller's jay (*Cyanocitta stelleri*), which can increase nest predation and reduce reproductive success. This may be particularly prevalent in or around the parking lot and picnic areas where trash and food scraps are more likely to concentrate. Potential significant impacts to marbled murrelet may be minimized through the measures listed below. Informal consultation with the United States Fish and Wildlife Service (USFWS) should be initiated and any additional measures recommended by the USFWS should be implemented as part of the project.

Biology Minimization Measure 6A

During construction, all workers should ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the construction area is deposited in wildlife-proof trash containers. The trash containers should not be left open and unattended overnight.

Biology Minimization Measure 6B

Ensure the Public Access Plan includes specific measures that include the installation of animal-proof trash receptacles and describe specific methods for routine trash pickup and ongoing monitoring by the Public Access Manager to ensure that trash removal occurs at a frequency sufficient to prevent trash overflow at the receptacles.

Biology Minimization Measure 6C

Educational signage should be placed within the parking lot and at picnic areas informing the public to remove trash and food waste. Signage should provide information on the marbled murrelet and the impact that corvid and avian predators can have on nest sites. This education signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

Biology Minimization Measure 6D

Picnic locations should be located outside of old-growth stands.

San Francisco Dusky-Footed Woodrat

Biology Impact 7

The proposed trail network and staging area have the potential to directly impact San Francisco dusky-footed woodrat through mortality and destruction of their large stick nests, potentially containing young, that could occur during vegetation removal, grubbing, grading, or other ground-disturbing activities. Potential indirect impacts to woodrats may include increased predation through increased access for predators, such as raccoon or coyote. Predators may also be attracted to food waste and trash created by trail users, particularly within the picnic and parking lot areas. Multi-use trail and parking lot areas will also introduce domestic animals including dogs to the Project Area, which could disturb nests by marking their scent or direct destruction of nests in close proximity to multi-use trails. The Draft Public Access Plan (PlaceWorks 2018) limits dogs to the proposed 1.5-mile-long Northern Frontage Trail that parallels Empire Grade Road.

San Francisco dusky-footed woodrat middens are found in very high numbers throughout all portions of the Project Area. Approximately 1,815 woodrat middens were mapped within the Project Area; based on the representative densities (8.7 middens per acre) observed across the 38 miles of trail surveyed for this report, it is estimated that the greater San Vicente Redwoods property may support up to 74,000 woodrat middens. Based on the current trail alignment, it is estimated that 144 middens may be directly impacted; this represents less than 0.2% of the estimated population of the greater site.

As with all impacts to special-status species discussed in this Biological Resources Assessment, these impacts are theoretical in that they are based on a 7-foot-wide area of disturbance running down the center of the proposed trail alignment shown on Figure 2; by strategically aligning the trail within the survey corridor, these impacts may be reduced or avoided. While some direct impacts to woodrat nests may be unavoidable, this would not be considered a significant impact as the species is prolific at the site and suitable habitat is abundant within both the Project Area and the greater San Vicente Redwoods. Minimization measures listed below are recommended to reduce impacts to woodrat to a less-than-significant level.

Biology Minimization Measure 7A

Implement Biology Minimization Measures 1A, 1B, 6A, and 6B.

Biology Minimization Measure 7B

A pre-construction survey of the parking lot area should be conducted by a qualified, County-approved biologist to flag and delineate any woodrat middens within the planned disturbance footprint. During construction of the parking lot, a biological monitor should be onsite to ensure vegetation and ground disturbance with heavy equipment should not impact those delineated resources. When avoidance of woodrat middens is not possible, the qualified, County-approved biologist should dismantle the nest in accordance with Minimization Measure 7D.

Biology Minimization Measure 7C

During construction and trail installation, a qualified, County-approved biologist or trained designee from the contractor's crew should identify woodrat middens located along the trail alignment. If the latter, a qualified, County-approved biologist should provide the training prior to the start of each construction phase. To the extent feasible and practicable, the trail alignment should avoid woodrat middens by re-routing the trail alignment. The trail should avoid woodrat nests. To accomplish this, a qualified member of the contractor's crew should be trained in the identification of woodrat nests and this person should be responsible for making minor adjustments to the trail alignment during construction to avoid woodrat nests. Where is not possible to avoid all woodrat nests, impacts to woodrats and their middens implementation of Minimization Measure 7D would be required.

Biology Minimization Measure 7D

When construction of the trail alignment or the parking area will result in a direct impact to a woodrat midden, a qualified, County-approved biologist should dismantle the nest and scatter the nest material a minimum of 10 feet outside of the trail alignment or the footprint of the parking area. If young are encountered during the dismantling process, the material should be placed back on the nest and the nest should remain unmolested for three weeks in order to give the young enough time to mature and leave of their own accord. After three weeks, the nest dismantling process may resume.

Biology Minimization Measure 7E

For trail segments where dogs on leash are permitted, educational signage should be posted to inform trail users of woodrats, their middens, and the importance of keeping dogs on trails and away from the structures. This educational signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

California Red-Legged Frog

Biology Impact 8

The proposed trail network and staging area have the potential to directly impact California red-legged frog (CRLF) which may disperse through the Project Area. Furthermore, the Project Area contains Critical Habitat for the species. The development of stream crossings and the associated vegetation and ground clearing activities may impact or impede CRLF movement. Indirect impacts to CRLF may include increased predation through increased access for predators, such

as raccoon or coyote. Predators may also be attracted to food waste and trash created by hikers within the picnic and parking lot areas.

Impacts to CRLF and the species Critical Habitat may also occur if aquatic features are degraded through increased rates of erosion and sedimentation, the introduction of invasive weeds, and other disturbances from trail users or trail maintenance. Minimization measures listed below are recommended to prevent impacts to CRLF and to maintain the physical or biological features of the species Critical Habitat. If these measures are implemented, no take is expected to occur during the proposed Project. Consultation with the United States Fish and Wildlife Service (USFWS) may still be required due to the presence of Critical Habitat; however, the physical and biological features of the species' Critical Habitat is anticipated to remain unchanged with the Project. If consultation with the USFWS is required, and additional measures by the USFWS are warranted, those measures should be implemented with the Project in addition to those identified below.

Biology Minimization Measure 8A

Implement Biology Minimization Measures 2B through 2E.

Biology Minimization Measure 8B

For stream crossings and areas within 100 feet of wetted features, pre-construction surveys by a qualified, County-approved biologist should be performed immediately prior to the start of any ground-disturbing activities. If California red-legged frog (CRLF) are found within the Project Area, all work should cease within the immediate vicinity (approximately 25-feet around the work area) until the individual(s) have been allowed to leave the Project Area on their own. If CRLF cannot passively leave the Project Area, work should cease and the United States Fish and Wildlife Service (USFWS) should be contacted by the approved biologist to determine the appropriate course of action. The approved biologist should then implement the appropriate course of action as determined by the USFWS.

Biology Minimization Measure 8C

Because dusk and dawn are often the times when California red-legged frog (CRLF) are most active and likely to disperse, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Furthermore, no mechanized work should occur during significant rain events, defined here as 0.25 inch or greater within a 24 hour period, when CRLF are more likely to disperse and occur within the Project Area.

Wildlife Corridors

Biology Impact 9

The Project Area is located within the western portion of an important wildlife corridor, as identified by the California Department of Fish and Wildlife's (CDFW) essential connectivity network mapping project (CDFW 2014). Wildlife corridors and essential connectivity areas have been mapped by the CDFW to include the Project Area and continuing through to the north, east, and southeast (CDFW 2014). The proposed trail network and staging area have the potential to impact wildlife migration, including mountain lion, through the introduction of new human disturbance and increased noise. New scents will also occur as multi-use trails allow horses and dogs to access the area. The Project will not, however, result in the development of any physical structures or barriers that would restrict or prevent wildlife migration (i.e., no new roads, large fences, urban development, etc.). Mountain lion and other native species often utilize trail

networks, and the development of trails within the Project Area is not anticipated to result in an impact to wildlife corridors or movement.

Biology Minimization Measure 9

The proposed Project is not anticipated to impact wildlife corridors within Santa Cruz County, and therefore no additional minimization measures are recommended.

7.3 Protected Trees

Biology Impact 10

The proposed trail network and staging area have the potential to directly impact trees protected under the Santa Cruz County Tree Protection Ordinance. Protected trees include trees within any of the sensitive habitats defined by the Santa Cruz County Municipal Code (see Section 2.3).

Biology Minimization Measure 10

All tree removals should adhere to the County's tree protection ordinance. Tree removal should be conducted by a licensed arborist or a registered professional forester using industry-standard best management practices (BMPs) to prevent the spread of invasive weeds or plant pathogens and avoid damage to vegetation to be retained.

8.0 CONCLUSION

Based on the results of this Biological Resources Assessment, it was determined that the Project Area contains sensitive resources which could be adversely impacted by the proposed Project. Elements of at least eight sensitive terrestrial biological communities and three sensitive aquatic biological communities were observed within the areas designated for trail construction. One special-status plant, Anderson's manzanita, was determined to be present. Based on a lack of observations during seasonally-timed surveys, it was determined that other special-status plants are unlikely to occur within the Project Area. Two special-status wildlife species were determined to be present, San Francisco dusky-footed woodrat and oak titmouse, and another 13 special-status wildlife species were determined to have moderate to high potential to occur. Additionally, the Project Area contains designated Critical Habitat for CRLF.

Although the proposed Project covers a large amount of wild lands containing a high diversity of biological resources, the proposed Project is relatively minimal in scope and is not expected to result in significant adverse impacts to sensitive resources. Due to the significant efforts that have gone into understanding ecology of the property (ESA 2012) and developing the proposed trail network (PlaceWorks 2018), areas with the most sensitive resources have been avoided and large tracts of wild land will remain off limits to public access. When implemented appropriately, the proposed trail network and the associated recreational, research, and educational activities are compatible with the conservation and long-term maintenance of sensitive biological resources. To this effect, the alignment of the trail and the specific construction methods proposed will largely avoid sensitive resources and will reduce the potential for long-term adverse impacts. With the implementation of the minimization measures included in Section 6.0, as well as the detailed management actions listed in the Draft Public Access Plan, it is anticipated that any potential impacts to sensitive biological resources associated with the Project will be reduced to a less-than-significant level.

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APPENDIX A
PROJECT FIGURES

- Figure 1. Location Map
- Figure 2. Project Area Overview
- Figure 3. Biological Communities Documented within the Greater San Vicente Redwoods Property
- Figure 4. Wetlands Documented within the Project Area
- Figure 5. Regulated Stream Crossings within the Project Area
- Figure 6. Special-Status Plants Documented within a 5-Mile Radius of the Project Area
- Figure 7. Special-Status Plants Documented within the Project Area
- Figure 8. Special-Status Wildlife Documented within a 5-Mile Radius of the Project Area
- Figure 9. Special-Status Wildlife Documented within the Project Area

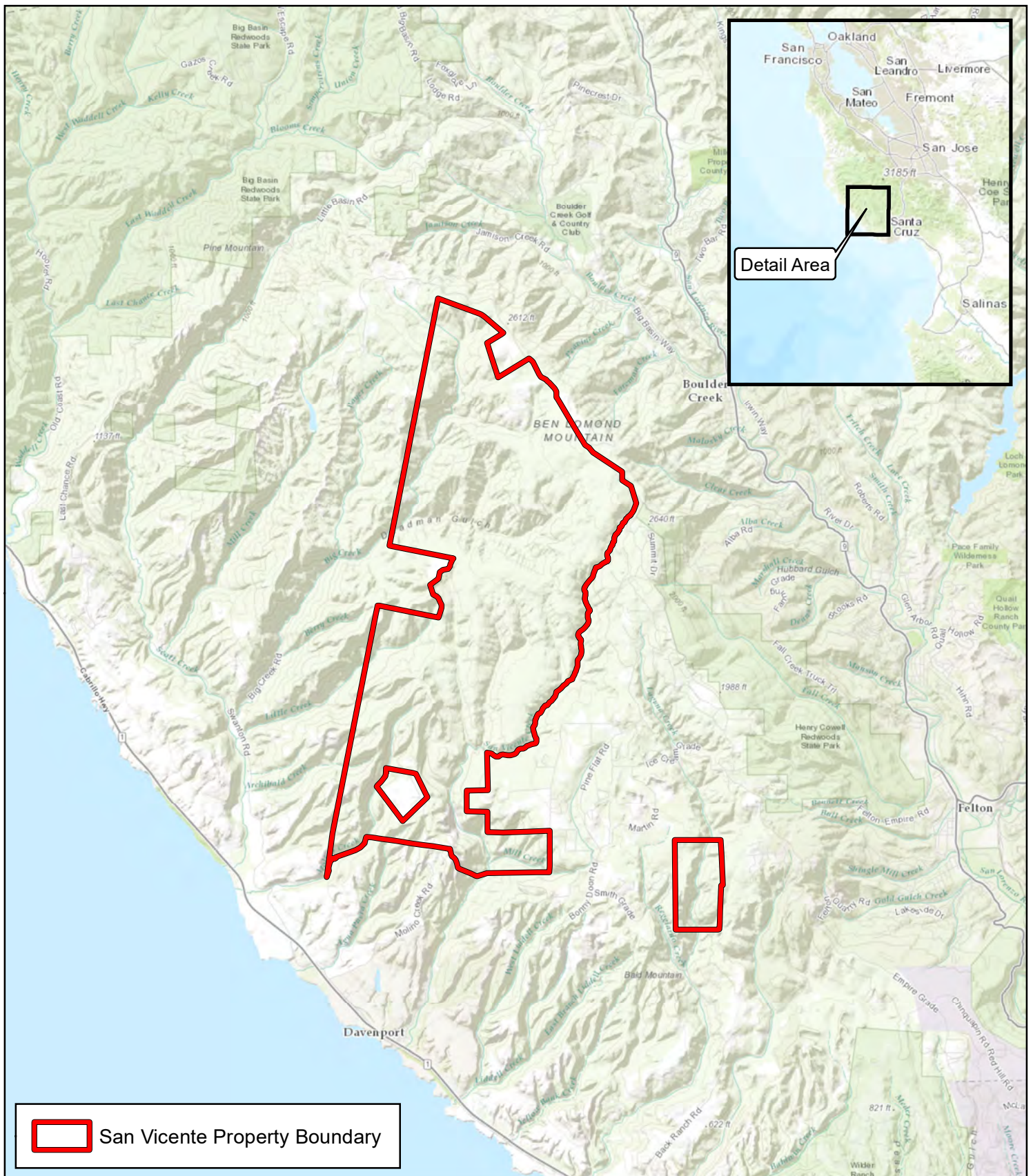


Figure 1. Location Map

San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California



0 0.5 1 2
Miles

Map Prepared Date: 11/8/2016
Map Prepared By: sgillespie
Base Source: Esri World Topo
Data Source(s): WRA

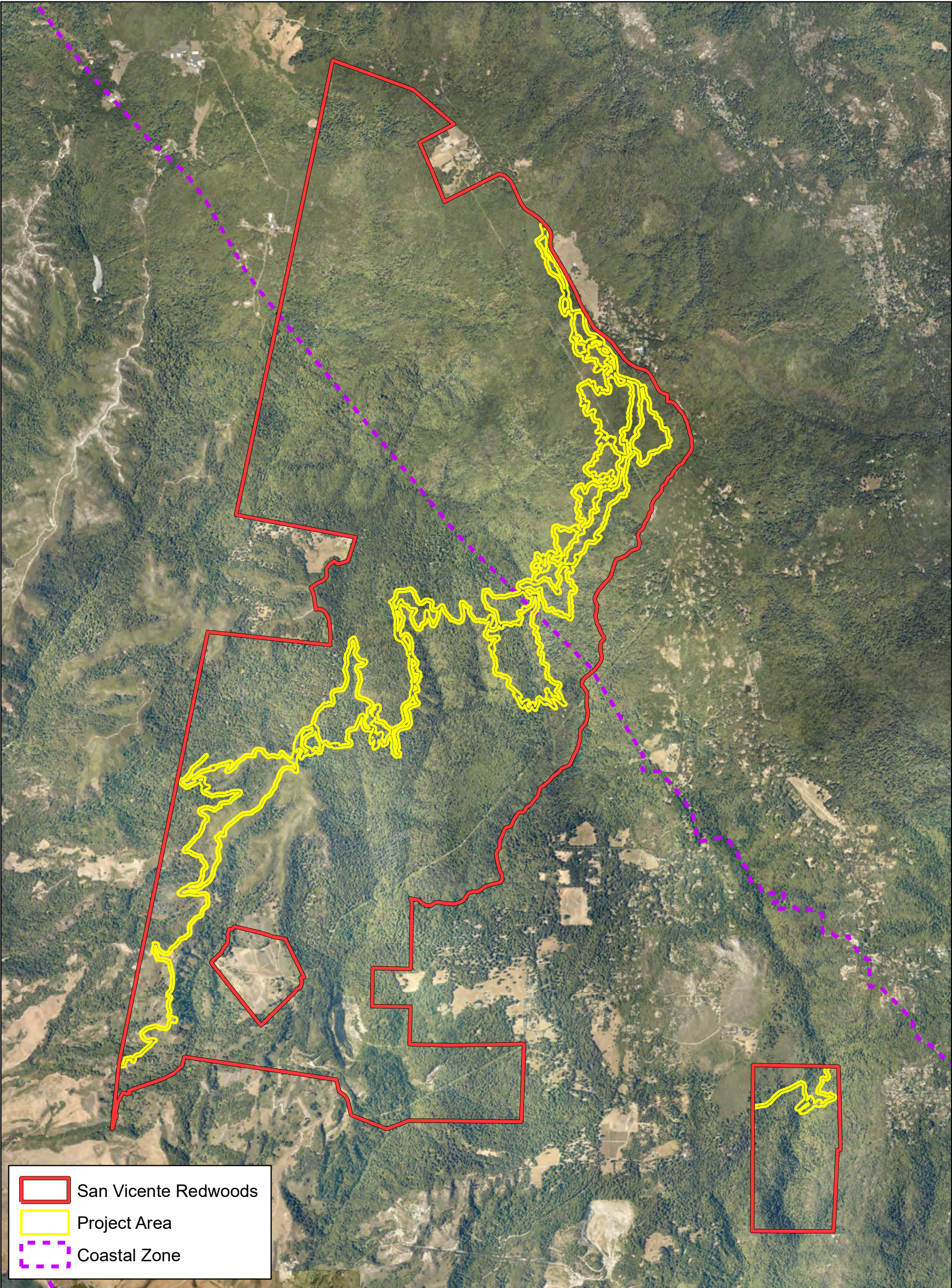
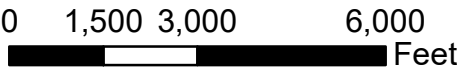


Figure 2. Overview of Project Area

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California



Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

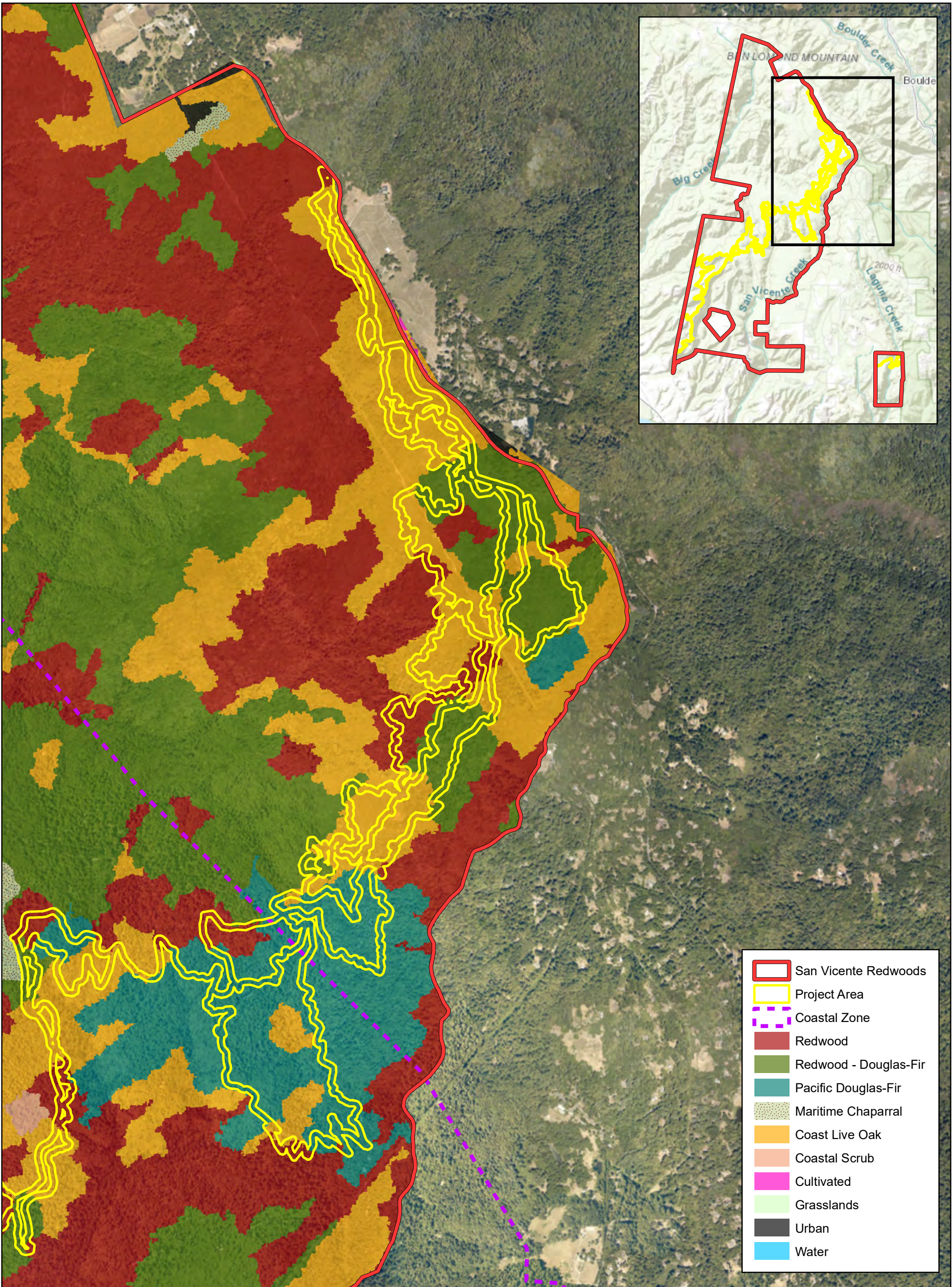


Figure 3A. Biological Communities North

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

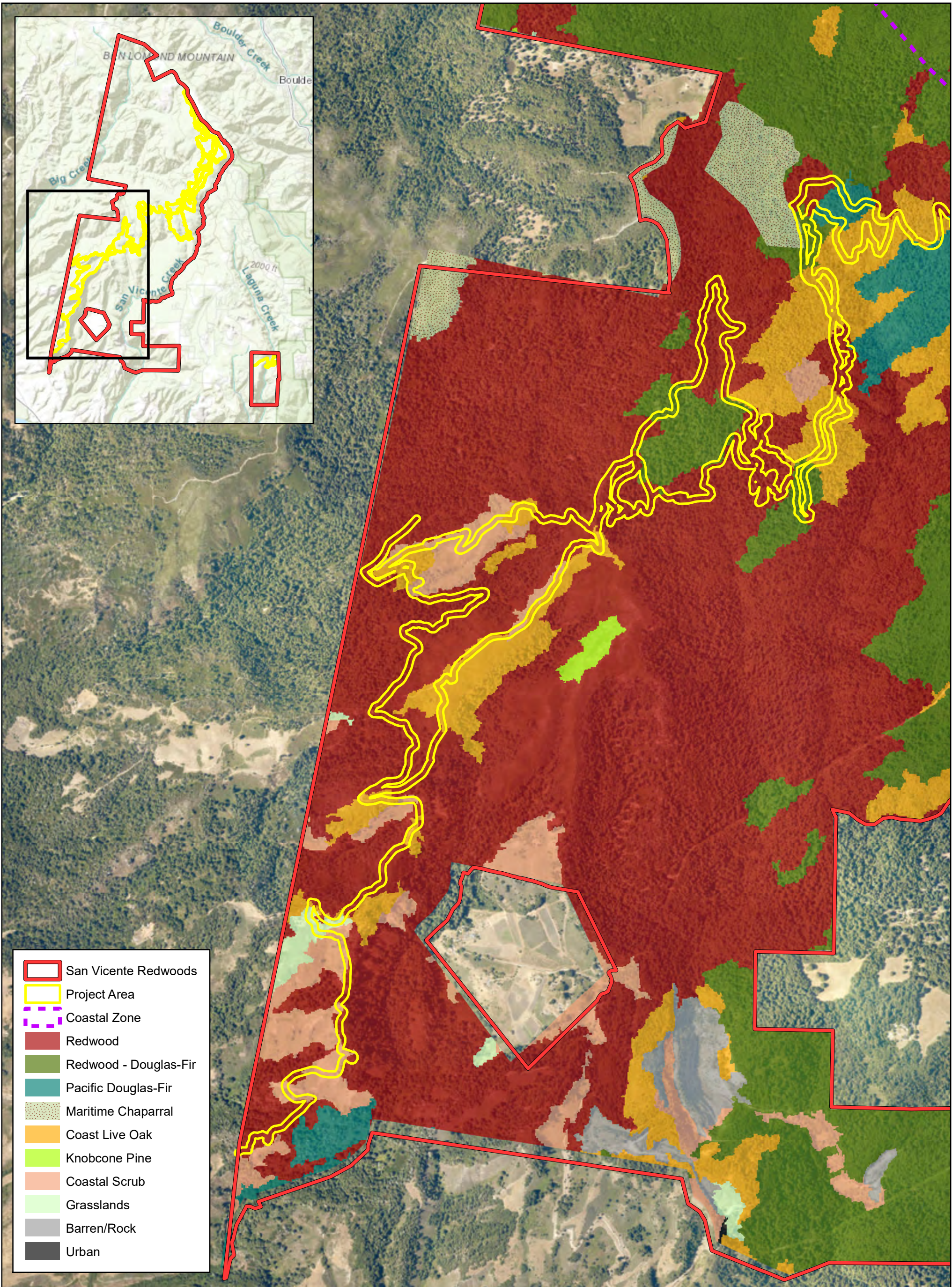


Figure 3B. Biological Communities South

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

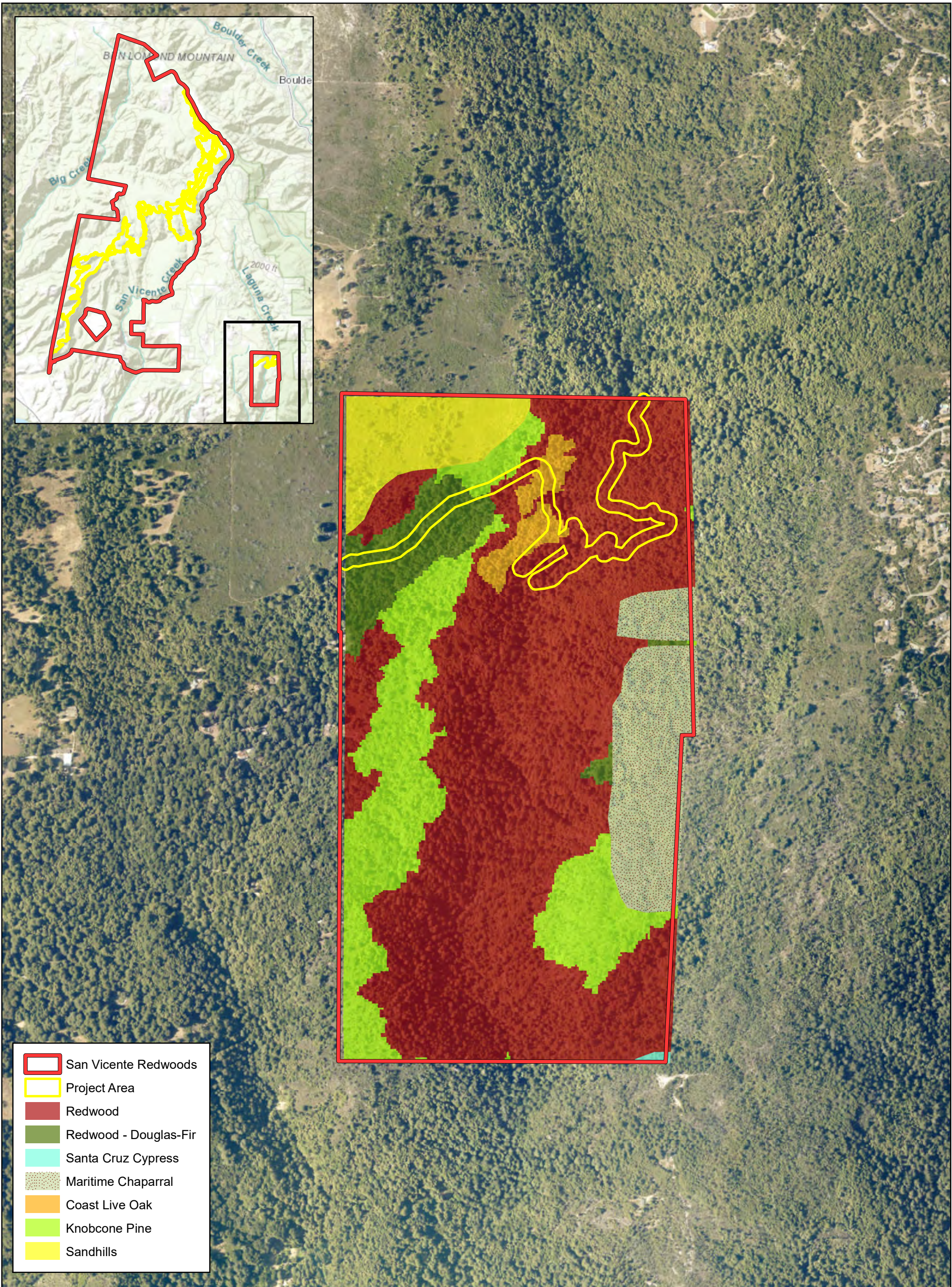


Figure 3C. Biological Communities Laguna Parcel

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

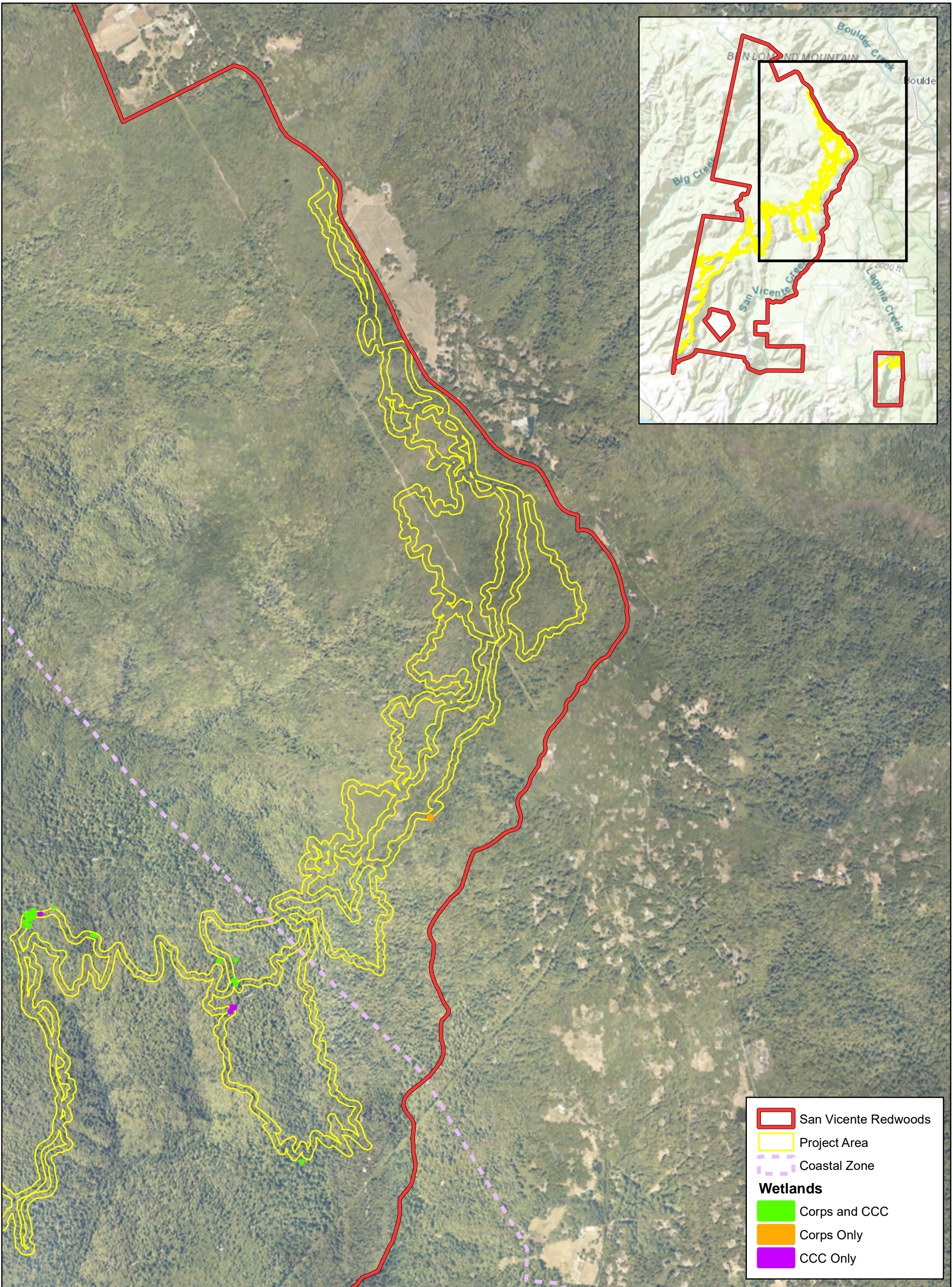


Figure 4A. Wetlands North

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

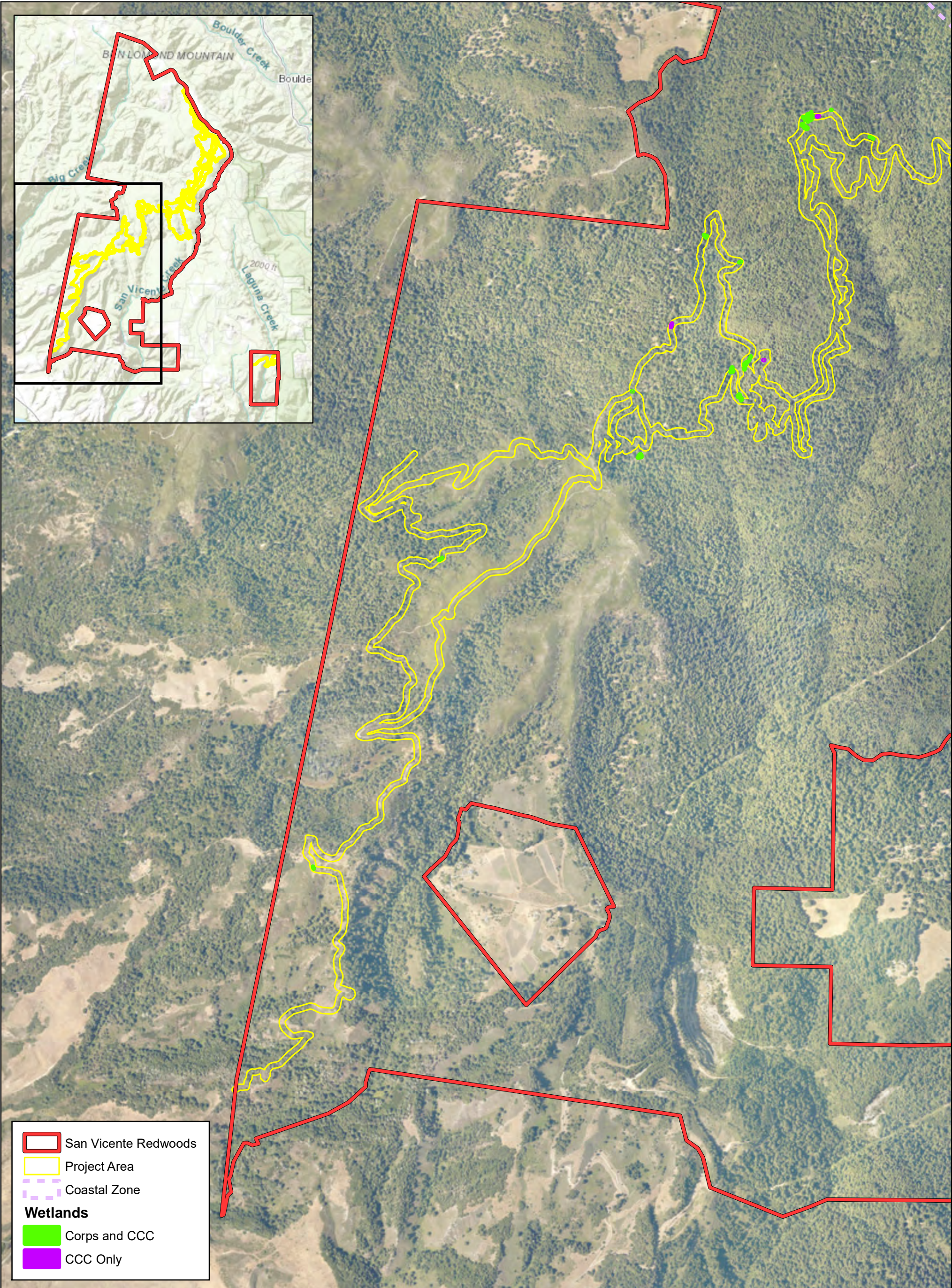


Figure 4B. Wetlands South

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

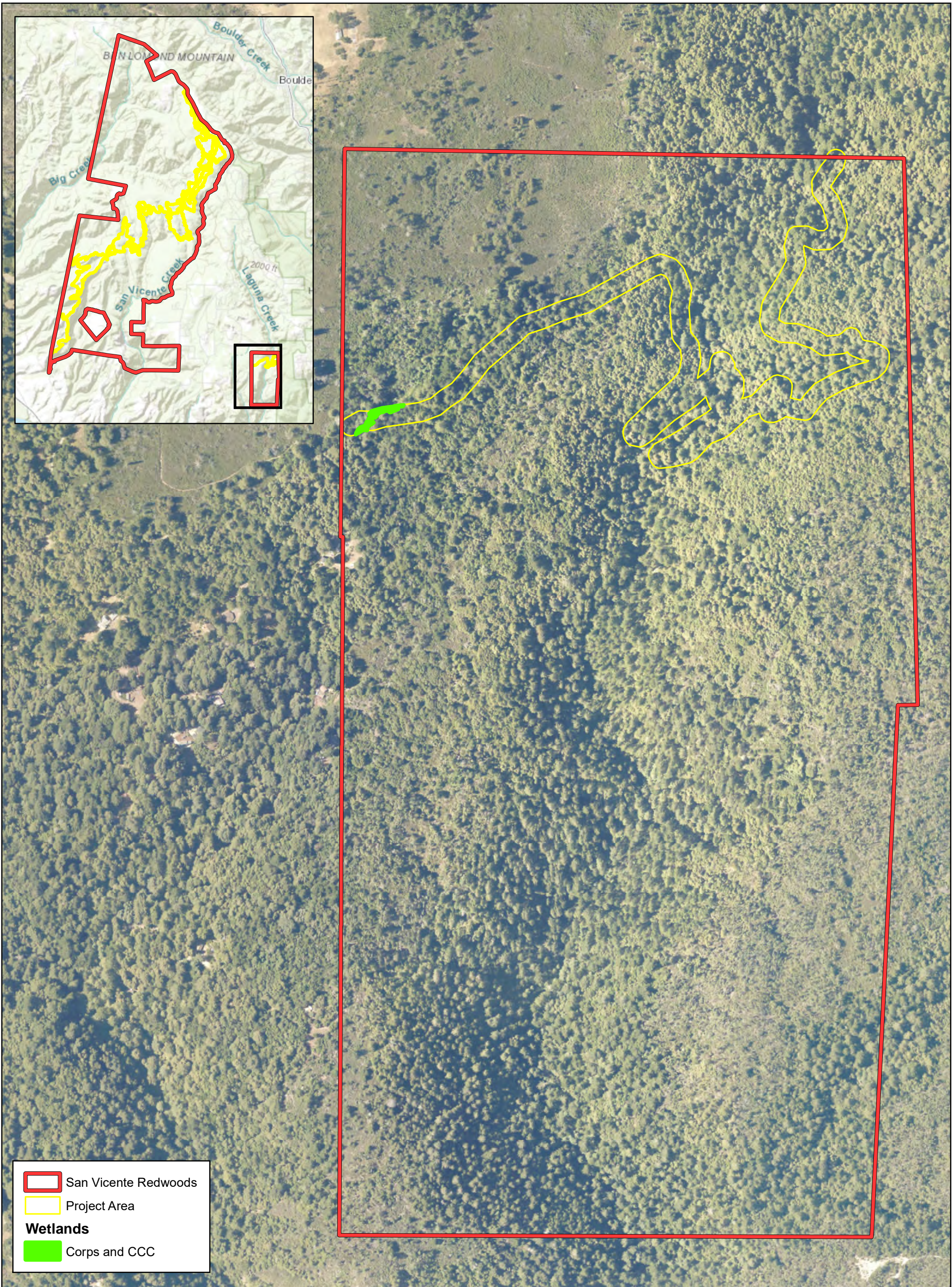


Figure 4C. Wetlands Laguna Parcel

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 250 500 1,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

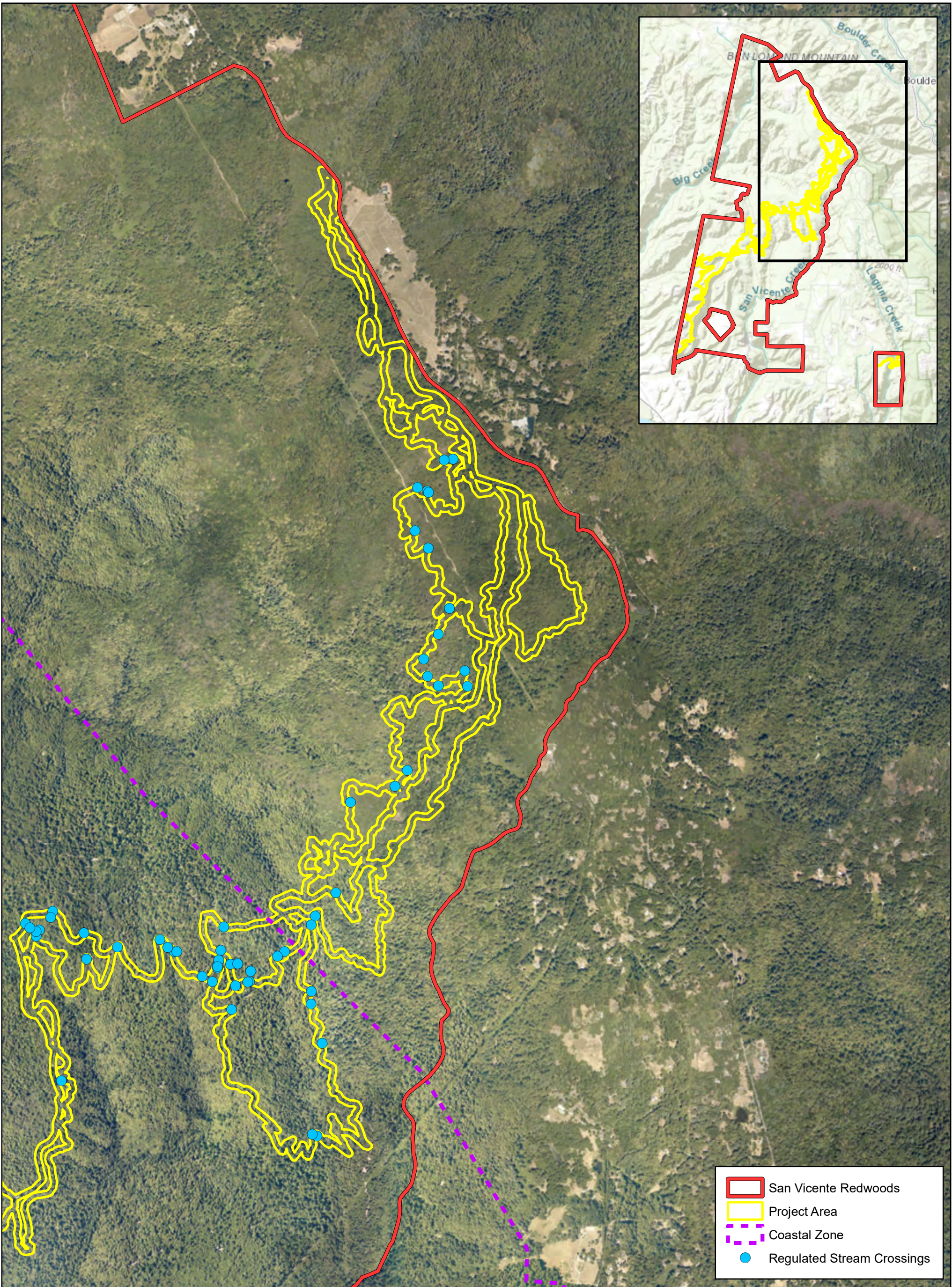


Figure 5A.Regulated Stream Crossings North

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

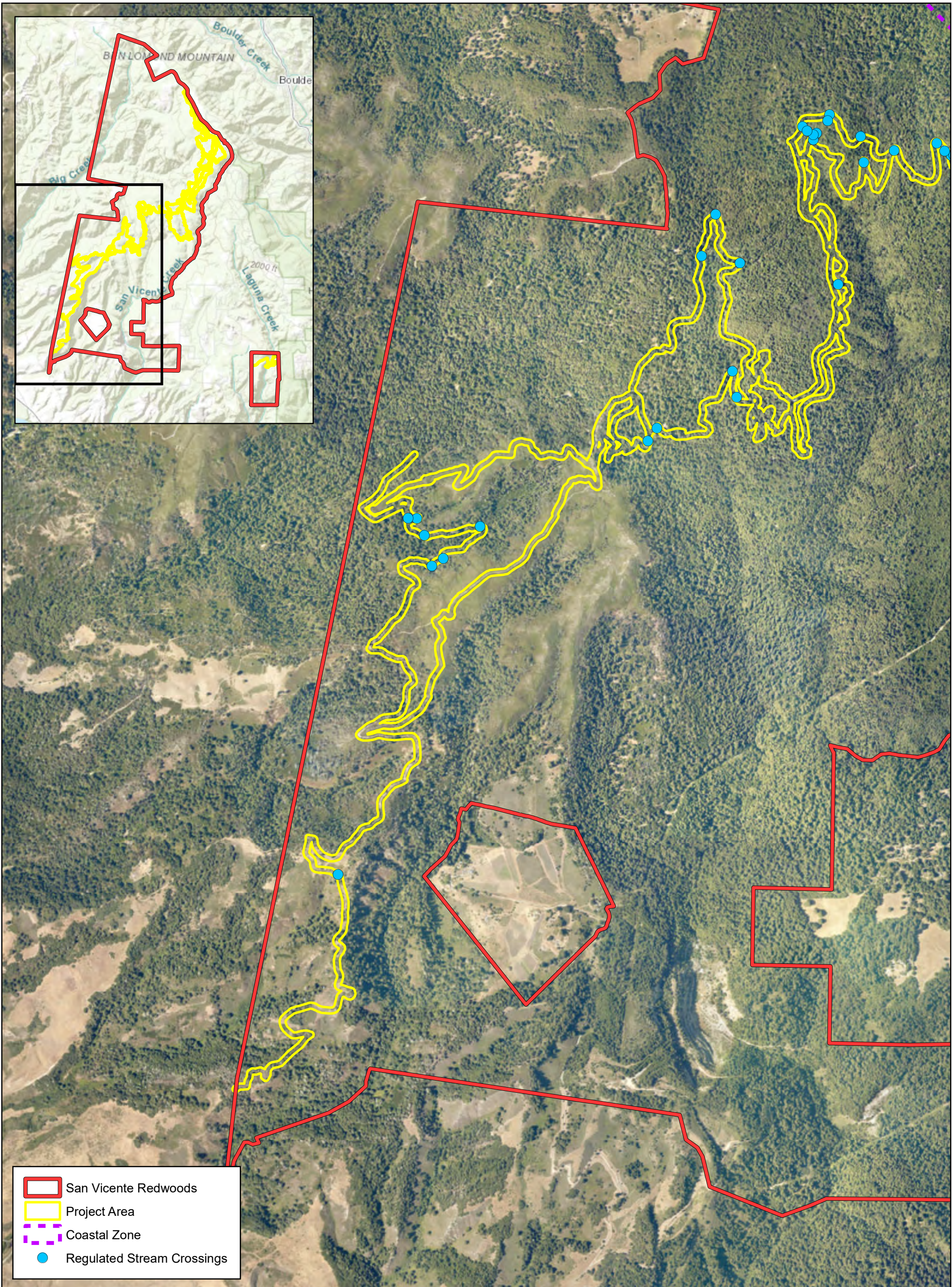


Figure 5B. Regulated Stream Crossings South

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

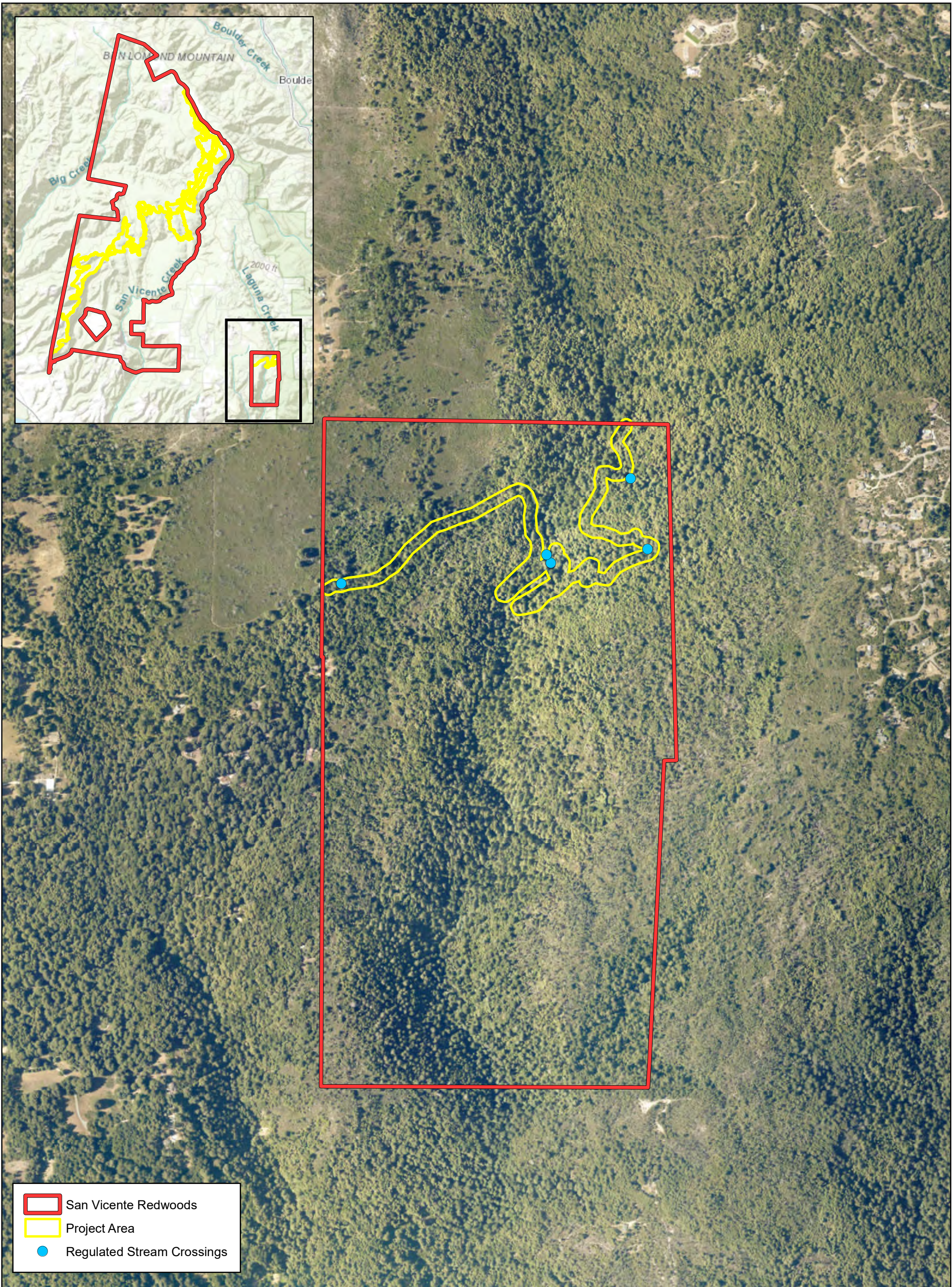


Figure 5C. Regulated Stream Crossings Laguna Parcel **DRAFT**



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

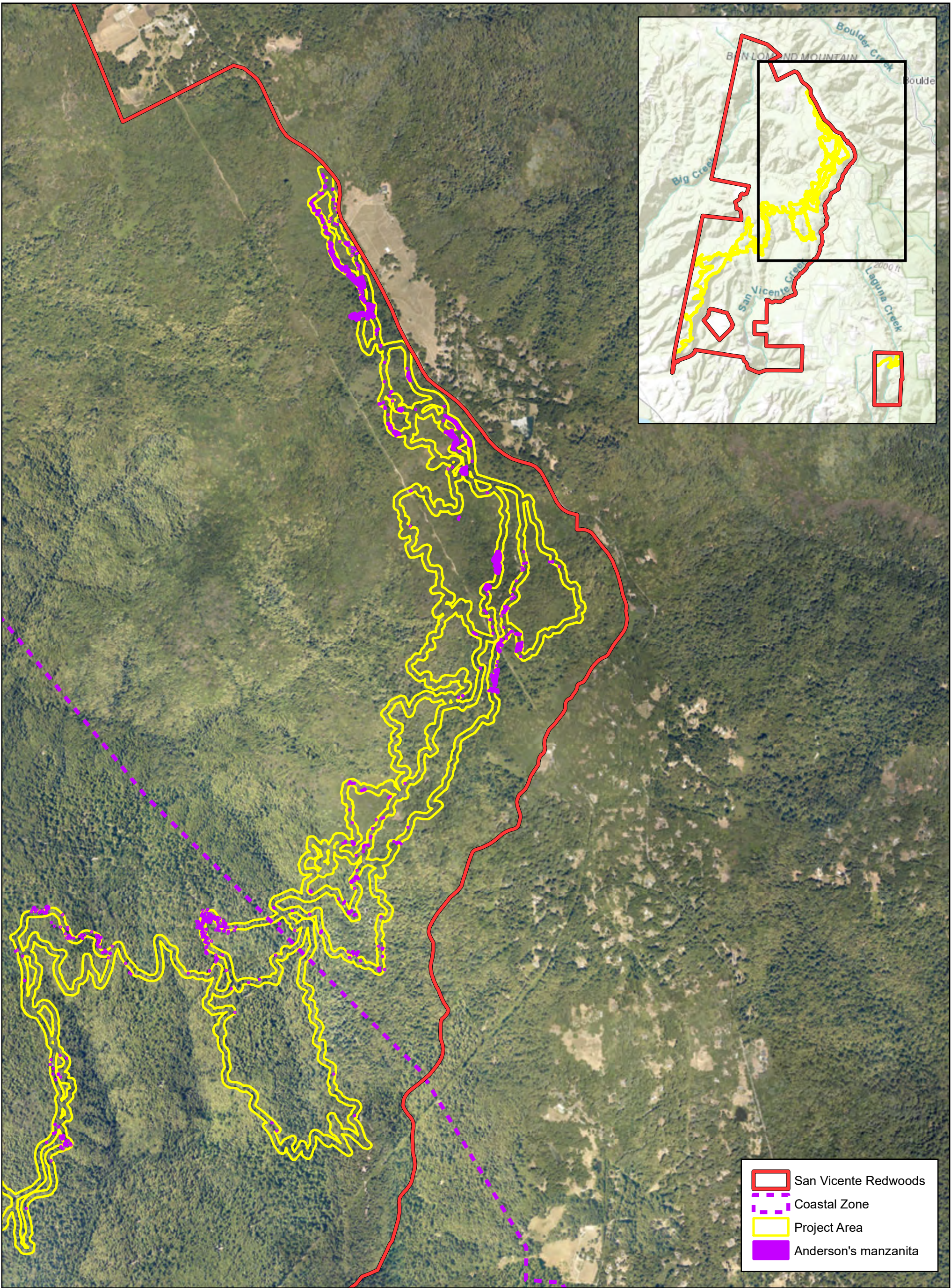


Figure 7A. Special-Status Plant Species North

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

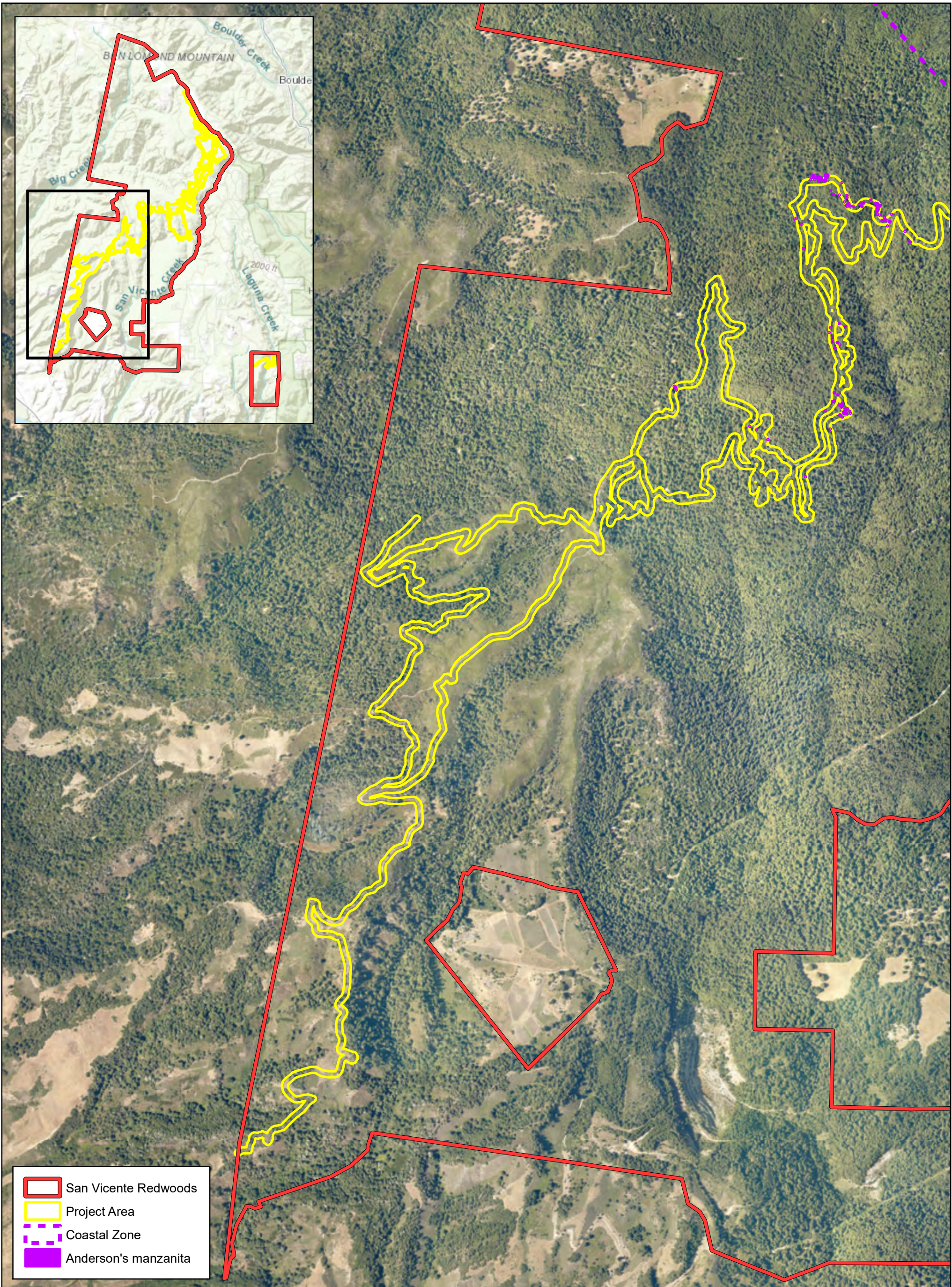


Figure 7B. Special Status Plants South

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

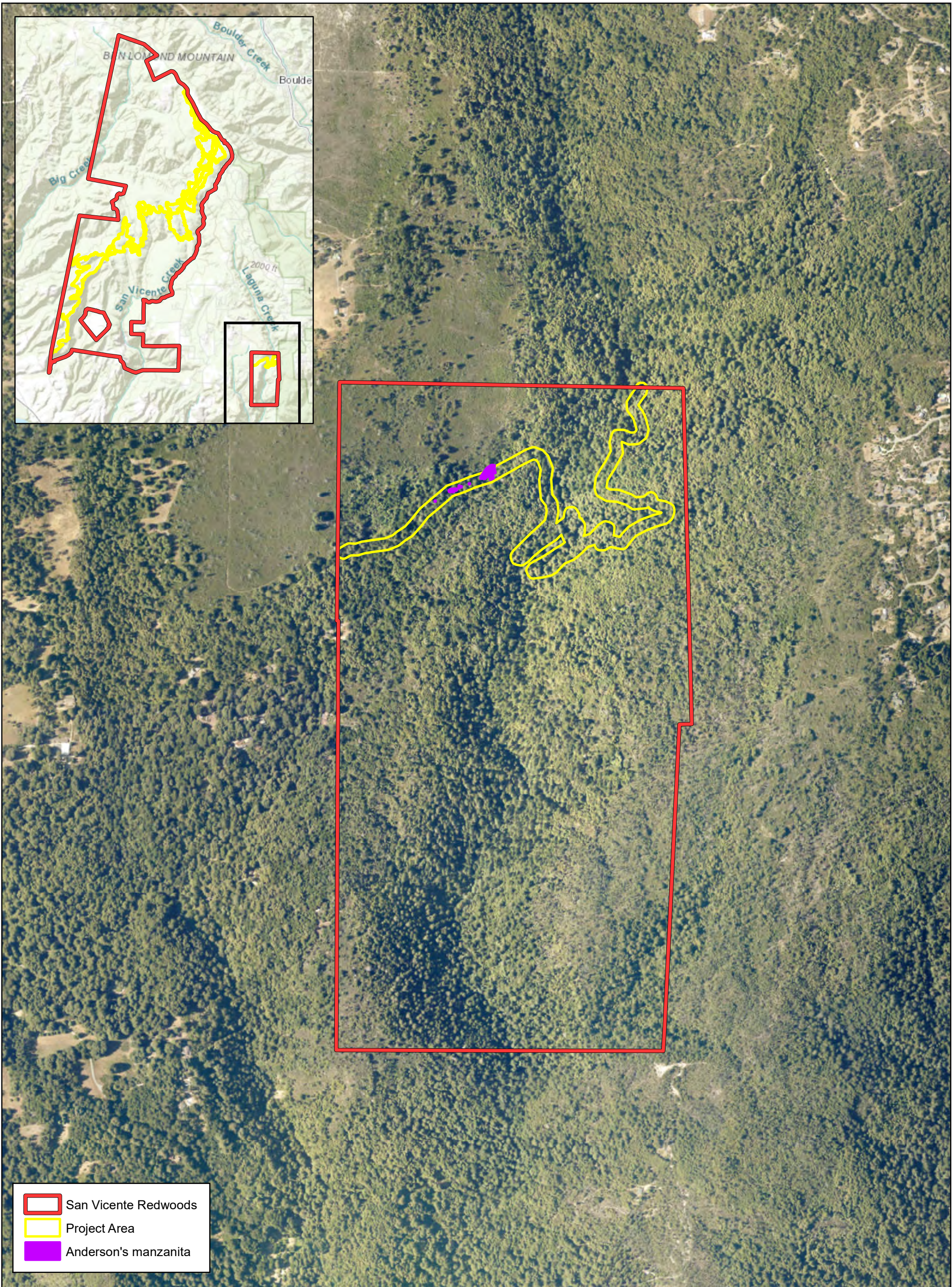


Figure 7C. Special Status Plants Laguna Parcel

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000 Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

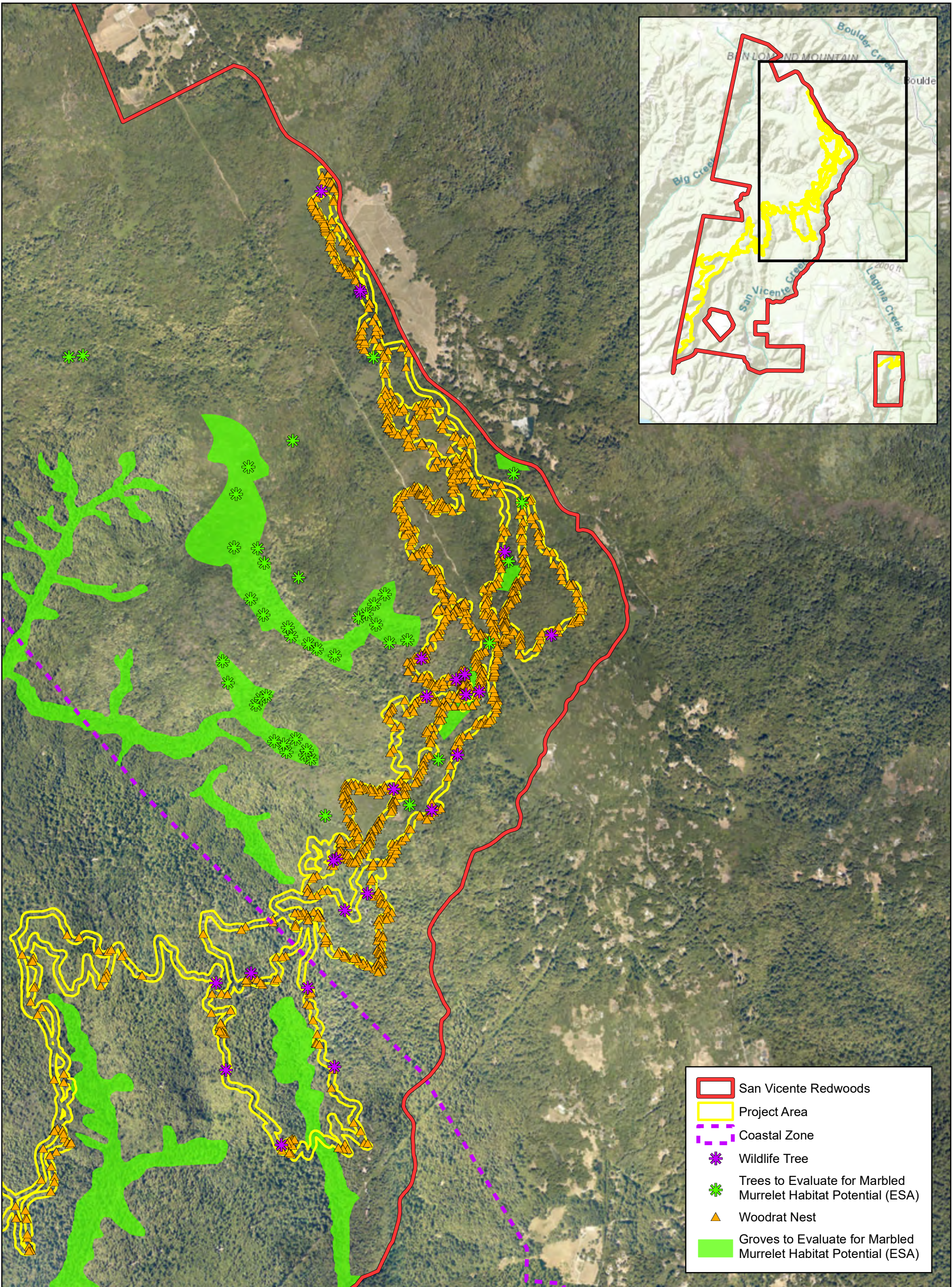
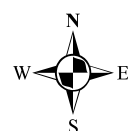


Figure 9A. Special-Status Wildlife Species North

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
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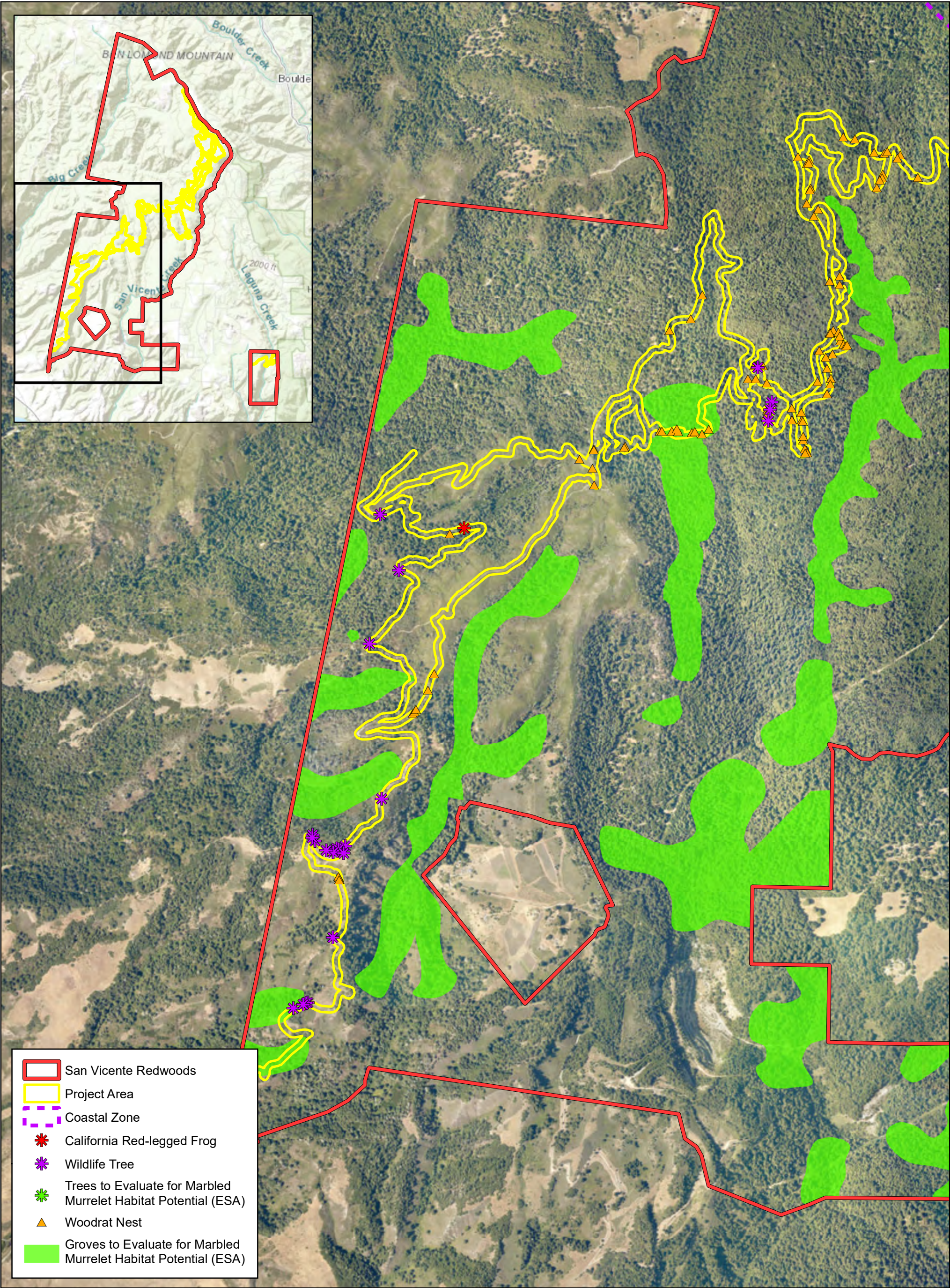


Figure 9B. Special Status Plants South

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
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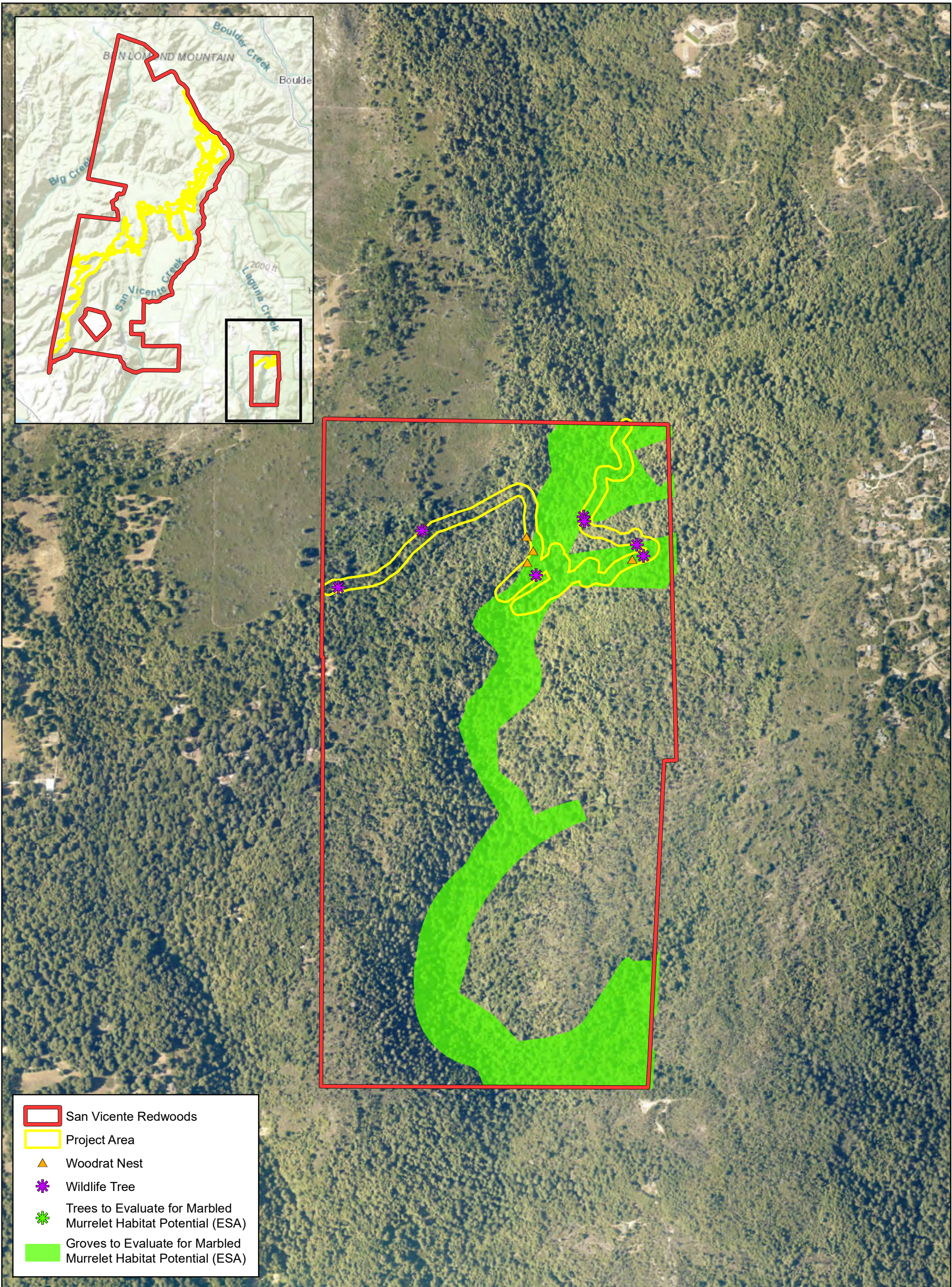


Figure 9C. Special Status Wildlife Laguna Parcel

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000 Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

APPENDIX B

LIST OF OBSERVED PLANT AND WILDLIFE SPECIES

Appendix B1. Plant species observed within the Project Area for the San Vicente Redwoods Public Access Plan (PlaceWorks 2018) during surveys conducted by WRA biologists on December 16-17, 2015, January 20-22, February 10-12, June 15-16, August 15-17 and 24-25, and October 21, 2016, and May 30-June 1 and August 8-9, 2017. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2017).

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Acacia dealbata</i>	Silver wattle	non-native (invasive)	tree, shrub	-	Moderate
<i>Acer macrophyllum</i>	Bigleaf maple	native	tree	-	-
<i>Achillea millefolium</i>	Yarrow	native	perennial herb	-	-
<i>Acmispon americanus</i> var. <i>americanus</i>	Spanish lotus	native	annual herb	-	-
<i>Acmispon glaber</i>	Deerweed, california broom	native	perennial herb	-	-
<i>Acmispon heermannii</i> var. <i>orbicularis</i>	Round leaved heermann's lotus	native	perennial herb	-	-
<i>Acmispon parviflorus</i>	Hill lotus	native	annual herb	-	-
<i>Adenostoma fasciculatum</i>	Chamise	native	tree, shrub	-	-
<i>Agoseris grandiflora</i>	Giant mountain dandelion	native	perennial herb	-	-
<i>Agrostis</i> sp.	-	-	-	-	-
<i>Aira caryophylla</i>	Silvery hairgrass	non-native (invasive)	annual grass	-	-
<i>Anaphalis margaritacea</i>	Pearly everlasting	native	perennial herb	-	-
<i>Anisocarpus madioides</i>	Woodland madia	native	perennial herb	-	-
<i>Aralia californica</i>	California spikenard	native	perennial herb	-	-
<i>Arbutus menziesii</i>	Madrono	native	tree	-	-
<i>Arctostaphylos andersonii</i>	Anderson's manzanita	native	shrub	Rank 1B.2	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Arctostaphylos crustacea</i> ssp. <i>crinita</i>	Crinite manzanita	native	shrub	-	-
<i>Arnica discoidea</i>	Rayless arnica	native	perennial herb	-	-
<i>Artemisia californica</i>	Coastal sage brush	native	shrub	-	-
<i>Artemisia douglasiana</i>	California mugwort	native	perennial herb	-	-
<i>Asarum caudatum</i>	Creeping wild ginger	native	perennial herb	-	-
<i>Asyneuma prenanthoides</i>	California harebell	native	perennial herb	-	-
<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	Western lady fern	native	fern	-	-
<i>Avena barbata</i>	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate
<i>Baccharis pilularis</i> ssp. <i>consanguinea</i>	Coyote brush	native	shrub	-	-
<i>Brachypodium distachyon</i>	Purple false brome	non-native (invasive)	annual, perennial grass	-	Moderate
<i>Briza maxima</i>	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited
<i>Briza minor</i>	Little rattlesnake grass	non-native	annual grass	-	-
<i>Bromus carinatus</i>	California brome grass	native	perennial grass	-	-
<i>Bromus diandrus</i>	Ripgut brome	non-native (invasive)	annual grass	-	Moderate
<i>Bromus hordeaceus</i>	Soft chess	non-native (invasive)	annual grass	-	Limited

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Bromus laevipes</i>	Narrow flowered brome	native	annual, perennial grass	-	-
<i>Bromus racemosus</i>	Smooth brome	non-native	perennial grass	-	-
<i>Calochortus albus</i>	White fairy lantern	native	perennial herb	-	-
<i>Calyptridium monandrum</i>	Common pussypaws	native	annual herb	-	-
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	Coast morning glory	native	perennial herb, vine	-	-
<i>Calystegia purpurata</i> ssp. <i>purpurata</i>	Smooth western morning glory	native	perennial herb	-	-
<i>Camissoniopsis hirtella</i>	Hairy sun cup	native	annual herb	-	-
<i>Cardamine hirsuta</i>	Hairy bitter cress	non-native	annual herb	-	-
<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	Italian thistle	non-native (invasive)	annual herb	-	Moderate
<i>Carex barbarae</i>	Valley sedge	native	perennial grasslike herb	-	-
<i>Carex globosa</i>	Round fruit sedge	native	perennial grasslike herb	-	-
<i>Carex leptopoda</i>	Slender-footed sedge	native	perennial grasslike herb	-	-
<i>Carex obnupta</i>	Slough sedge	native	perennial grasslike herb	-	-
<i>Carex tumulicola</i>	Split awn sedge	native	perennial grasslike herb	-	-
<i>Castilleja affinis</i> ssp. <i>affinis</i>	Wight's indian paint brush	native	perennial herb	-	-
<i>Ceanothus leucodermis</i>	Chaparral whitethorn	native	shrub	-	-
<i>Ceanothus papillosus</i>	Wartleaf ceanothus	native	shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Ceanothus thyrsiflorus</i> var. <i>thyrsiflorus</i>	Blue blossom	native	tree, shrub	-	-
<i>Centaurea melitensis</i>	Tocalote	non-native (invasive)	annual herb	-	Moderate
<i>Centaureum tenuiflorum</i>	Slender centaury	non-native	annual herb	-	-
<i>Cephalanthera austiniiae</i>	Phantom orchid	native	perennial herb	-	-
<i>Cerastium glomeratum</i>	Large mouse ears	non-native	annual herb	-	-
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	Common soaproot	native	perennial herb	-	-
<i>Chorizanthe diffusa</i>	Diffuse spineflower	native	annual herb	-	-
<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	Golden chinquapin	native	tree, shrub	-	-
<i>Cirsium brevistylum</i>	Indian thistle	native	perennial herb	-	-
<i>Cirsium occidentale</i>	Western thistle	native	perennial herb	-	-
<i>Cirsium vulgare</i>	Bull thistle	non-native (invasive)	perennial herb	-	Moderate
<i>Claytonia parviflora</i>	Narrow leaved miner's lettuce	native	annual herb	-	-
<i>Claytonia perfoliata</i>	Miner's lettuce	native	annual herb	-	-
<i>Clinopodium douglasii</i>	Yerba buena	native	perennial herb	-	-
<i>Clintonia andrewsiana</i>	Red clintonia	native	perennial herb	-	-
<i>Collomia heterophylla</i>	Varied leaved collomia	native	annual herb	-	-
<i>Conium maculatum</i>	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate
<i>Corallorhiza maculata</i>	Summer coral root	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Cortaderia jubata</i>	Andean pampas grass	non-native (invasive)	perennial grass	-	High
<i>Corylus cornuta ssp. californica</i>	Beaked hazelnut	native	shrub	-	-
<i>Crassula connata</i>	Sand pygmy weed	native	annual herb	-	-
<i>Crocanthemum scoparium</i>	Bisbee Peak Rushrose	native	shrub	-	-
<i>Croton setiger</i>	Turkey-mullein	native	perennial herb	-	-
<i>Cryptantha sp.</i>	Cryptantha	native	annual herb	-	-
<i>Cuscuta sp.</i>	Dodder	-	annual herb	-	-
<i>Cynoglossum grande</i>	Houndstongue	native	perennial herb	-	-
<i>Cynosurus echinatus</i>	Dogtail grass	non-native (invasive)	annual grass	-	Moderate
<i>Cyperus eragrostis</i>	Tall cyperus	native	perennial grasslike herb	-	-
<i>Dactylis glomerata</i>	Orchardgrass	non-native (invasive)	perennial grass	-	Limited
<i>Daucus pusillus</i>	Wild carrot	native	annual herb	-	-
<i>Deinandra increscens ssp. increscens</i>	Grassland tarweed	native	annual herb	-	-
<i>Dendromecon rigida</i>	Bush poppy	native	shrub	-	-
<i>Dichelostemma capitatum ssp. capitatum</i>	Wild hyacinth	native	perennial herb	-	-
<i>Digitalis purpurea</i>	Foxglove	non-native (invasive)	perennial herb	-	Limited
<i>Drymocallis glandulosa</i>	Sticky cinquefoil	native	perennial herb	-	-
<i>Dudleya lanceolata</i>	Southern California dudleya	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Elymus glaucus</i>	Blue wildrye	native	perennial grass	-	-
<i>Epilobium canum</i>	California fuchsia, zauschneria	native	perennial herb	-	-
<i>Epilobium ciliatum</i>	Slender willow herb	native	perennial herb	-	-
<i>Epilobium minutum</i>	Minute willowherb	native	annual herb	-	-
<i>Epipactis helleborine</i>	Helleborine	non-native	perennial herb	-	-
<i>Equisetum telmateia ssp. braunii</i>	Giant horsetail	native	fern	-	-
<i>Ericameria arborescens</i>	Golden fleece	native	shrub	-	-
<i>Erigeron canadensis</i>	Canada horseweed	native	annual herb	-	-
<i>Eriodictyon californicum</i>	Yerba santa	native	shrub	-	-
<i>Eriogonum nudum</i>	Naked buckwheat	native	shrub	-	-
<i>Eriophyllum confertiflorum</i>	Yellow yarrow	native	shrub	-	-
<i>Eriophyllum lanatum</i>	Wooly sunflower	native	perennial herb	-	-
<i>Eriophyllum staechadifolium</i>	Lizard tail	native	perennial herb	-	-
<i>Erodium botrys</i>	Big heron bill	non-native (invasive)	annual herb	-	-
<i>Erodium cicutarium</i>	Coastal heron's bill	non-native (invasive)	annual herb	-	Limited
<i>Eschscholzia californica</i>	California poppy	native	annual, perennial herb	-	-
<i>Eurybia radulina</i>	Roughleaf aster	native	perennial herb	-	-
<i>Festuca bromoides</i>	Brome fescue	non-native	annual grass	-	-
<i>Festuca californica</i>	California fescue	native	perennial grass	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Festuca myuros</i>	Rattail sixweeks grass	non-native (invasive)	annual grass	-	-
<i>Festuca perennis</i>	Italian rye grass	non-native	annual, perennial grass	-	-
<i>Festuca rubra</i>	Red fescue	native	perennial grass	-	-
<i>Fragaria vesca</i>	Wild strawberry	native	perennial herb	-	-
<i>Frangula californica</i>	California coffeeberry	native	shrub	-	-
<i>Fumaria parviflora</i>	Fine leaved fumitory	non-native	annual herb	-	-
<i>Galium aparine</i>	Cleavers	native	annual herb	-	-
<i>Galium californicum</i>	California bedstraw	native	perennial herb	-	-
<i>Galium porrigens</i>	Climbing bedstraw	native	vine, shrub	-	-
<i>Gamochaeta ustulata</i>	Featherweed	native	perennial herb	-	-
<i>Garrya elliptica</i>	Coast silk tassel	native	tree, shrub	-	-
<i>Gastridium phleoides</i>	Nit grass	non-native	annual grass	-	-
<i>Gaultheria shallon</i>	Salal	native	shrub	-	-
<i>Genista monspessulana</i>	French broom	non-native (invasive)	shrub	-	High
<i>Helenium puberulum</i>	Sneezeweed	native	perennial herb	-	-
<i>Heracleum maximum</i>	Common cowparsnip	native	perennial herb	-	-
<i>Heteromeles arbutifolia</i>	Toyon	native	shrub	-	-
<i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i>	Golden aster	native	perennial herb	-	-
<i>Heuchera micrantha</i>	Alum root	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Hieracium albiflorum</i>	White flowered hawkweed	native	perennial herb	-	-
<i>Holcus lanatus</i>	Common velvetgrass	non-native (invasive)	perennial grass	-	Moderate
<i>Holodiscus discolor</i>	Oceanspray	native	shrub	-	-
<i>Hulsea heterochroma</i>	Red rayed hulsea	native	perennial herb	-	-
<i>Hypericum perforatum</i> ssp. <i>perforatum</i>	Klamathweed	non-native	perennial herb	-	-
<i>Hypochaeris glabra</i>	Smooth cats ear	non-native (invasive)	annual herb	-	Limited
<i>Hypochaeris radicata</i>	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate
<i>Iris fernaldii</i>	Fernald's iris	native	perennial herb	-	-
<i>Juncus bufonius</i>	Common toad rush	native	annual grasslike herb	-	-
<i>Juncus effusus</i> ssp. <i>pacificus</i>	Pacific rush	native	perennial grasslike herb	-	-
<i>Juncus hesperius</i>	Coast or bog rush	native	perennial grasslike herb	-	-
<i>Juncus patens</i>	Spreading rush	native	perennial grasslike herb	-	-
<i>Lathyrus vestitus</i>	Common pacific pea	native	perennial herb	-	-
<i>Lepechinia calycina</i>	Pitcher sage	native	shrub	-	-
<i>Linum bienne</i>	Flax	non-native	annual herb	-	-
<i>Logfia gallica</i>	Narrowleaf cottonrose	non-native	annual herb	-	-
<i>Lonicera hispidula</i>	Pink honeysuckle	native	vine, shrub	-	-
<i>Lupinus albus</i> var. <i>collinus</i>	Silver bush lupine	native	shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Lupinus bicolor</i>	Bicolored lupine	native	annual, perennial herb	-	-
<i>Lupinus succulentus</i>	Arroyo lupine	native	annual herb	-	-
<i>Lysimachia arvensis</i>	Scarlet pimpernel	non-native	annual herb	-	-
<i>Lysimachia latifolia</i>	Pacific starflower	native	perennial herb	-	-
<i>Madia gracilis</i>	Gumweed	native	annual herb	-	-
<i>Maianthemum racemosum</i>	Feathery false lily of the valley	native	perennial herb	-	-
<i>Marah fabacea</i>	California man-root	native	perennial herb, vine	-	-
<i>Melica geyeri</i>	Geyer's onion grass	native	perennial grass	-	-
<i>Melica imperfecta</i>	Coast range melic	native	perennial grass	-	-
<i>Mimulus aurantiacus</i>	Sticky monkeyflower	native	shrub	-	-
<i>Mimulus moschatus</i>	Musk monkeyflower	native	perennial herb	-	-
<i>Mimulus pilosus</i>	Snouted monkeyflower	native	annual herb	-	-
<i>Monardella villosa</i>	Coyote mint	native	perennial herb	-	-
<i>Morella californica</i>	California wax myrtle	native	shrub	-	-
<i>Myosotis latifolia</i>	Wide leaved forget-me-not	non-native (invasive)	perennial herb	-	Limited
<i>Navarretia squarrosa</i>	Skunkweed	native	annual herb	-	-
<i>Nemophila parviflora</i>	Small flowered nemophila	native	annual herb	-	-
<i>Notholithocarpus densiflorus</i> var. <i>densiflorus</i>	Tanoak	native	tree, shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Nuttallanthus texanus</i>	Blue toadflax	native	annual, perennial herb	-	-
<i>Orobanche fasciculata</i>	Pinyon broomrape	native	perennial herb (parasitic)	-	-
<i>Osmorhiza berteroi</i>	Sweetcicely	native	perennial herb	-	-
<i>Oxalis corniculata</i>	Creeping wood sorrel	non-native (invasive)	perennial herb	-	-
<i>Oxalis oregana</i>	Redwood sorrel	native	perennial herb	-	-
<i>Panicum sp.</i>	-	-	-	-	-
<i>Pellaea andromedifolia</i>	Coffee fern	native	fern	-	-
<i>Pentagramma triangularis</i>	Gold back fern	native	fern	-	-
<i>Perideridia kelloggii</i>	Yampah	native	perennial herb	-	-
<i>Phacelia malvifolia</i>	Stinging phacelia	native	annual herb	-	-
<i>Phacelia rattanii</i>	Rattan's phacelia	native	annual herb	-	-
<i>Pinus attenuata</i>	Scrub pine	native	tree	-	-
<i>Pinus coulteri</i>	Coulter pine	native	tree	-	-
<i>Pinus ponderosa</i>	Yellow pine	native	tree	-	-
<i>Piperia elegans ssp. elegans</i>	Elegant piperia	native	perennial herb	-	-
<i>Plantago lanceolata</i>	Ribwort	non-native (invasive)	perennial herb	-	Limited
<i>Polygala californica</i>	Milkwort	native	perennial herb	-	-
<i>Polypogon interruptus</i>	Ditch beard grass	non-native	perennial grass	-	-
<i>Polystichum munitum</i>	Western sword fern	native	fern	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Prosartes hookeri</i>	Drops of gold	native	perennial herb	-	-
<i>Prunella vulgaris</i>	Self heal	native	perennial herb	-	-
<i>Pseudognaphalium californicum</i>	Ladies' tobacco	native	annual, perennial herb	-	-
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	non-native	annual herb	-	-
<i>Pseudognaphalium ramosissimum</i>	Pink cudweed	native	biennial herb	-	-
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas fir	native	tree	-	-
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	Western bracken fern	native	fern	-	-
<i>Quercus agrifolia</i> var. <i>agrifolia</i>	Coast live oak	native	tree	-	-
<i>Quercus chrysolepis</i>	Gold cup live oak	native	tree	-	-
<i>Quercus parvula</i> var. <i>shrevei</i>	Shreve's oak	native	tree	-	-
<i>Quercus wislizeni</i> var. <i>wislizeni</i>	Interior live oak	native	tree, shrub	-	-
<i>Rhododendron occidentale</i>	Western azalea	native	tree, shrub	-	-
<i>Ribes</i> sp.	Currant, gooseberry	native	shrub	-	-
<i>Rosa gymnocarpa</i> var. <i>gymnocarpa</i>	Wood rose	native	shrub	-	-
<i>Rubus leucodermis</i>	White bark raspberry	native	shrub	-	-
<i>Rubus parviflorus</i>	Thimbleberry	native	vine, shrub	-	-
<i>Rubus ursinus</i>	California blackberry	native	vine, shrub	-	-
<i>Rumex acetosella</i>	Sheep sorrel	non-native (invasive)	perennial herb	-	Moderate
<i>Rumex salicifolius</i>	Willow leaved dock	native	perennial herb	-	-
<i>Rupertia physodes</i>	Common rupertia	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Rytidosperma penicillatum</i>	Purple awned wallaby grass	non-native (invasive)	perennial grass	-	Limited
<i>Salix scouleriana</i>	Scouler willow	native	tree, shrub	-	-
<i>Sambucus nigra ssp. caerulea</i>	Blue elderberry	native	shrub	-	-
<i>Sambucus racemosa var. racemosa</i>	Red elderberry	native	shrub	-	-
<i>Scirpus microcarpus</i>	Mountain bog bulrush	native	perennial grasslike herb	-	-
<i>Scrophularia californica</i>	California bee plant	native	perennial herb	-	-
<i>Senecio minimus</i>	Coastal burnweed	non-native (invasive)	annual, perennial herb	-	-
<i>Sequoia sempervirens</i>	Coast redwood	native	tree	-	-
<i>Sisyrinchium bellum</i>	Blue eyed grass	native	perennial herb	-	-
<i>Solanum douglasii</i>	Douglas' nightshade	native	perennial herb	-	-
<i>Solanum umbelliferum</i>	Blue witch	native	shrub	-	-
<i>Solidago velutina ssp. californica</i>	California goldenrod	native	perennial herb	-	-
<i>Sonchus asper ssp. asper</i>	Sow thistle	non-native (invasive)	annual herb	-	-
<i>Sonchus oleraceus</i>	Sow thistle	non-native	annual herb	-	-
<i>Stachys rigida var. quercetorum</i>	Rough hedgenettle	native	perennial herb	-	-
<i>Stephanomeria exigua ssp. coronaria</i>	White plume wirelettuce	native	annual herb	-	-
<i>Stipa pulchra</i>	Purple needle grass	native	perennial grass	-	-
<i>Symphoricarpos mollis</i>	Snowberry	native	shrub	-	-
<i>Symphyotrichum subspicatum</i>	Douglas aster	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Torilis arvensis</i>	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate
<i>Toxicodendron diversilobum</i>	Poison oak	native	vine, shrub	-	-
<i>Toxicoscordion fremontii</i>	Fremont's star lily	native	perennial herb	-	-
<i>Trifolium angustifolium</i>	Narrow leaved clover	non-native	annual herb	-	-
<i>Trifolium campestre</i>	Hop clover	non-native	annual herb	-	-
<i>Trifolium dubium</i>	Shamrock	non-native	annual herb	-	-
<i>Trifolium glomeratum</i>	Clustered clover	non-native	annual herb	-	-
<i>Trifolium hirtum</i>	Rose clover	non-native (invasive)	annual herb	-	Limited
<i>Trifolium microcephalum</i>	Small head clover	native	annual herb	-	-
<i>Trifolium variegatum</i>	Variegated clover	native	annual herb	-	-
<i>Trifolium willdenovii</i>	Tomcat clover	native	annual herb	-	-
<i>Trillium chloropetalum</i>	Giant wakerobin	native	perennial herb	-	-
<i>Trillium ovatum ssp. ovatum</i>	Western wakerobin	native	perennial herb	-	-
<i>Umbellularia californica</i>	California bay	native	tree	-	-
<i>Urtica dioica</i>	Stinging nettle	native	perennial herb	-	-
<i>Vaccinium ovatum</i>	Evergreen huckleberry	native	shrub	-	-
<i>Verbascum thapsus</i>	Woolly mullein	non-native (invasive)	perennial herb	-	Limited
<i>Verbascum virgatum</i>	Wand mullein	non-native	perennial herb	-	-
<i>Verbena lasiostachys</i> var. <i>lasiostachys</i>	Vervain	native	perennial herb	-	-
<i>Vicia hassei</i>	Hasse's vetch	native	vine	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Vicia sativa</i>	Spring vetch	non-native	annual herb, vine	-	-
<i>Viola ocellata</i>	Western heart's ease	native	perennial herb	-	-
<i>Viola sempervirens</i>	Redwood violet	native	perennial herb	-	-
<i>Whipplea modesta</i>	Modesty	native	vine, shrub	-	-
<i>Woodwardia fimbriata</i>	Western chain fern	native	fern	-	-
<i>Zeltnera muehlenbergii</i>	Muehlenberg's centaury	native	annual herb	-	-

¹Key to Rarity Status

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
SR	State Rare
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

²Key to Cal-IPC Status

High	These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate	These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited	These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Appendix B2. Wildlife species observed within the Project Area for the San Vicente Redwoods Public Access Plan (PlaceWorks 2018) during surveys conducted by WRA biologists on December 16-17, 2015, January 20-22, February 10-12, June 15-16, August 15-17 and 24-25, and October 21, 2016, and May 30-June 1 and August 8-9, 2017.

Common Name	Species
MAMMALS	
mountain lion	<i>Puma concolor</i>
black-tailed deer	<i>Odocoileus hemionus</i>
coyote	<i>Canis latrans</i>
mole	<i>Scapanus spp.</i>
San Francisco dusky-footed woodrat	<i>Neotoma fuscipes annectens</i>
Western grey squirrel	<i>Sciurus griseus</i>
BIRDS	
American robin	<i>Turdus migratorius</i>
Anna's Hummingbird	<i>Calypte anna</i>
chestnut-backed chickadee	<i>Poecile rufescens</i>
dark-eyed junco	<i>Junco hyemalis</i>
Eurasian collared-dove	<i>Streptopelia decaocto</i>
oak titmouse	<i>Baeolophus inornatus</i>
pileated woodpecker	<i>Dryocopus pileatus</i>
Steller's jay	<i>Cyanocitta stelleri</i>
Townsend's warbler	<i>Setophaga townsendii</i>
western scrub-jay	<i>Aphelocoma californica</i>
AMPHIBIANS	
California slender salamander	<i>Batrachoseps attenuatus</i>
black salamander	<i>Aneides flavipunctatus</i>

APPENDIX C

POTENTIAL FOR SPECIAL-STATUS SPECIES TO OCCUR IN THE PROJECT AREA

Appendix C. Potential for special-status species to occur in the Project Area. List compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database, U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory search of the Franklin Point, Big Basin, Año Nuevo, Davenport, Felton, Castle Rock Ridge, and Santa Cruz USGS 7.5 minute quadrangles and a review of other CDFW lists and publications (Jennings and Hayes 1994, Zeiner et al. 1990).

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Plants				
Blasdale's bent grass <i>Agrostis blasdalei</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 20 to 490 feet (5 to 150 meters). Blooms May-Jul.	Unlikely. Although the Project Area is located within 2 miles of an occurrence of this species, the Project Area does not contain coastal bluff scrub, coastal dune, or coastal prairie habitat.	No further action recommended for this species.
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 10 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	Unlikely. Although this species has been documented less than 2 miles to the west of the Project Area, the Project Area lacks suitable grassy openings required to support this species.	No further action recommended for this species.
coast rockcress <i>Arabis blepharophylla</i>	Rank 4.3	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub/rocky. Elevation ranges from 10 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	Unlikely. Although the Project Area contains suitable broadleaved upland forest habitat, it does not contain the open, rocky habitat required by this species.	No further action recommended for this species.
Anderson's manzanita <i>Arctostaphylos andersonii</i>	Rank 1B.2	Broadleaved upland forest, chaparral, north coast coniferous forest/openings, edges. Elevation ranges from 200 to 2490 feet (60 to 760 meters). Blooms Nov-May.	Present. This species was observed in the Project Area.	See Section 7.0 of the BRA for recommended avoidance, minimization, and mitigation measures for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Schreiber's manzanita <i>Arctostaphylos glutinosa</i>	Rank 1B.2	Closed-cone coniferous forest, chaparral; on diatomaceous shale. Elevation ranges from 560 to 2250 feet (170 to 685 meters). Blooms (Nov), Mar-Apr.	Not Observed. This species has been documented adjacent to the west of the Project Area on siliceous shale soil, which is also present in the Project Area. However, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. glutinosa</i> was not observed. It is assumed this species is not present.	No further action recommended for this species.
Ohlone manzanita <i>Arctostaphylos ohloneana</i>	Rank 1B.1	Closed-cone coniferous forest, coastal scrub/siliceous shale. Elevation ranges from 1480 to 1740 feet (450 to 530 meters). Blooms Feb-Mar.	Not Observed. This species has been documented adjacent to the west of the Project Area on siliceous shale soil, which is also present in the Project Area. However, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. ohloneana</i> was not observed. It is assumed this species is not present.	No further action recommended for this species.
Pajaro manzanita <i>Arctostaphylos pajaroensis</i>	Rank 1B.1	Chaparral (sandy). Elevation ranges from 100 to 2490 feet (30 to 760 meters). Blooms Dec-Mar.	Not Observed. Although this species is reported in the CNDDDB to occur within the larger San Vicente Redwoods property, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level, and <i>A. pajaroensis</i> was not observed. It is assumed that this species is not present.	No further action recommended for this species.
Kings Mountain manzanita <i>Arctostaphylos regismontana</i>	Rank 1B.2	Broadleaved upland forest, chaparral, north coast coniferous forest/granitic or sandstone. Elevation ranges from 1000 to 2400 feet (305 to 730 meters). Blooms Jan-Apr.	Not Observed. All <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. regismontana</i> was not observed. It is assumed that this species is not present.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Bonny Doon manzanita <i>Arctostaphylos silvicola</i>	Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/inland marine sands. Elevation ranges from 390 to 1970 feet (120 to 600 meters). Blooms Jan-Mar.	Not Observed. All <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. silvicola</i> was not observed. In addition, the Project Area does not contain suitable Zayante coarse sands required to support this species. It is assumed that this species is not present.	No further action recommended for this species.
marsh sandwort <i>Arenaria paludicola</i>	FE, SE, Rank 1B.1	Marshes and swamps (freshwater or brackish)/sandy, openings. Elevation ranges from 10 to 560 feet (3 to 170 meters). Blooms May-Aug.	Unlikely. The Project Area does not contain suitable open marsh or swamp habitat and the species is thought to be extirpated from Santa Cruz County.	No further action recommended for this species.
coastal marsh milk-vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	Rank 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides). Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms Apr-Oct.	Unlikely. The Project Area does not contain suitable coastal marsh, swamp, or other saline mesic habitats required to support this species. The Project Area is also outside of the known elevation range for this species.	No further action recommended for this species.
Brewer's calandrinia <i>Calandrinia breweri</i>	Rank 4.2	Disturbed or burned sites on sandy or loamy soils in chaparral or coastal scrub. Elevation ranges from 30 to 4000 feet (10-1220 meters). Blooms Jan-Jun.	Unlikely. This species was originally determined to have potential to occur in open, disturbed areas such as along the powerline road; however, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Mountains pussypaws <i>Calyptridium parryi</i> var. <i>hesseae</i>	Rank 1B.1	Chaparral, cismontane woodland/sandy or gravelly, openings. Elevation ranges from 1000 to 5020 feet (305 to 1530 meters). Blooms May-Aug.	Unlikely. This species has been documented in the vicinity and was originally determined to have potential to occur in suitable sandy openings in chaparral and cismontane woodland habitat. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
swamp harebell <i>Campanula californica</i>	Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), north coast coniferous forest/mesic. Elevation ranges from 0 to 1330 feet (1 to 405 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable bog, marsh, or other mesic habitats required to support this species and the nearest known occurrence is located over 8 miles away.	No further action recommended for this species.
bristly sedge <i>Carex comosa</i>	Rank 2B.1	Coastal prairie, marshes and swamps (lake margins), valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	Unlikely. This species was originally determined to have potential to occur along streams within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
deceiving sedge <i>Carex saliniformis</i>	Rank 1B.2	Coastal prairie, coastal scrub, meadows and seeps, marshes and swamps (coastal salt)/mesic. Elevation ranges from 10 to 750 feet (3 to 230 meters). Blooms Jun (Jul).	Unlikely. This species was originally determined to have potential to occur along streams within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
johnny-nip <i>Castilleja ambigua</i> var. <i>ambigua</i>	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pool margins. Elevation ranges from 0 to 1430 feet (0 to 435 meters). Blooms Mar-Aug.	Unlikely. The Project Area does not contain suitable openings in coastal prairie, coastal scrub, marsh, swamp, grassland, or other mesic habitats required to support this species.	No further action recommended for this species.
Ben Lomond spineflower <i>Chorizanthe pungens</i> var. <i>hartwegiana</i>	FE, Rank 1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills). Elevation ranges from 300 to 2000 feet (90 to 610 meters). Blooms Apr-Jul.	Unlikely. The Project Area does not contain suitable ponderosa pine sandhill habitat or Zayante coarse sands required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Scotts Valley spineflower <i>Chorizanthe robusta</i> <i>var. hartwegii</i>	FE, Rank 1B.1	Meadows and seeps (sandy), valley and foothill grassland (mudstone and purissima outcrops). Elevation ranges from 750 to 800 feet (230 to 245 meters). Blooms Apr-Jul.	Unlikely. The Project Area does not contain suitable open grassland habitat necessary to support this species.	No further action recommended for this species.
robust spineflower <i>Chorizanthe robusta</i> <i>var. robusta</i>	FE, Rank 1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub/sandy or gravelly. Elevation ranges from 10 to 980 feet (3 to 300 meters). Blooms Apr-Sep.	Unlikely. Although most of the Project Area is dominated by dense forest which is not suitable for this species, this species was originally determined to have potential to occur in openings at road crossings such as along the powerline alignment may have potential to support this species. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Franciscan thistle <i>Cirsium andrewsii</i>	Rank 1B.2	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub/mesic, sometimes serpentine. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	Unlikely. Although the Project Area may contain suitable habitat elements, it does not contain mesic sites on serpentine soils. Additionally, the nearest known occurrence is over 8 miles from the Project Area.	No further action recommended for this species.
Santa Clara red ribbons <i>Clarkia concinna</i> ssp. <i>automixa</i>	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 300 to 4920 feet (90 to 1500 meters). Blooms (Apr), May-Jun (Jul).	Unlikely. Although the Project Area contains suitable habitat elements, the nearest known occurrences are located over 10 miles away on the eastern slopes of the Santa Cruz Mountains. No occurrences are known from the western slopes.	No further action recommended for this species.
San Francisco collinsia <i>Collinsia multicolor</i>	Rank 1B.2	Closed-cone coniferous forest, coastal scrub/sometimes serpentine. Elevation ranges from 100 to 820 feet (30 to 250 meters). Blooms (Feb), Mar-May.	Unlikely. The Project Area lacks suitable closed cone coniferous forest or coastal scrub necessary to support this species. In addition, the Project Area is located above the known elevation range of this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
branching beach aster <i>Corethrogyne leucophylla</i>	Rank 3.2	Closed-cone coniferous forest, coastal dunes. Elevation ranges from 10 to 200 feet (3 to 60 meters). Blooms May-Dec.	Unlikely. The Project Area lacks suitable closed cone coniferous forest or coastal dunes and is located above the known elevation range for this species.	No further action recommended for this species.
clustered lady's-slipper <i>Cypripedium fasciculatum</i>	Rank 4.2	Lower montane coniferous forest, north coast coniferous forest/usually serpentine seeps and streambanks. Elevation ranges from 330 to 7990 feet (100 to 2435 meters). Blooms Mar-Aug.	Unlikely. Although the Project Area contains streams, they are located high in the watershed and do not support the hydrology required by this species. In addition, no serpentine seeps occur within the Project Area.	No further action recommended for this species.
mountain lady's-slipper <i>Cypripedium montanum</i>	Rank 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 610 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	Unlikely. This species was originally determined to have potential to occur in broadleaved upland forest, cismontane woodland, and lower montane coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
California bottle brush <i>Elymus californicus</i>	Rank 4.3	Moist openings in mixed evergreen/redwood forest and oak/riparian forest. Elevation ranges from 50-155 feet (15-47 meters). Blooms May-Nov.	Moderate Potential. This species was originally determined to have potential to occur in moist openings in forested habitats within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Ben Lomond buckwheat <i>Eriogonum nudum</i> var. <i>decurrens</i>	Rank 1B.1	Chaparral, cismontane woodland, lower montane coniferous forest (maritime ponderosa pine sandhills)/sandy. Elevation ranges from 160 to 2620 feet (50 to 800 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable Ponderosa pine sandhill habitat required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
sand-loving wallflower <i>Erysimum ammophilum</i>	Rank 1B.2	Chaparral (maritime), coastal dunes, coastal scrub/sandy, openings. Elevation ranges from 0 to 200 feet (0 to 60 meters). Blooms Feb-Jun.	Unlikely. The Project Area does not contain suitable sandy openings in maritime chaparral, coastal dunes, or coastal scrub required to support this species and the nearest known occurrence is located over 8 miles from the Project Area.	No further action recommended for this species.
Santa Cruz wallflower <i>Erysimum teretifolium</i>	FE, SE, Rank 1B.1	Chaparral, lower montane coniferous forest/inland marine sands. Elevation ranges from 390 to 2000 feet (120 to 610 meters). Blooms Mar-Jul.	Unlikely. Although the Project Area may contain suitable habitat elements, it does not contain Zayante coarse sands necessary to support this species.	No further action recommended for this species.
stinkbells <i>Fritillaria agrestis</i>	Rank 4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland/clay, sometimes serpentine. Elevation ranges from 30 to 5100 feet (10 to 1555 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable grassy openings required by this species and the nearest known occurrence is over 8 miles away.	No further action recommended for this species.
fragrant fritillary <i>Fritillaria liliacea</i>	Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland/often serpentine. Elevation ranges from 10 to 1350 feet (3 to 410 meters). Blooms Feb-Apr.	Unlikely. The Project Area does not contain suitable grassy openings, heavy clay, or serpentine soils required by this species.	No further action recommended for this species.
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	Rank 3.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland/sandy or serpentine. Elevation ranges from 50 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	Unlikely. The Project Area does not contain suitable open, coastal habitats or serpentine soils required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
short-leaved evax <i>Hesperovax sparsiflora</i> var. <i>brevifolia</i>	Rank 1B.2	Coastal bluff scrub (sandy), coastal dunes, coastal prairie. Elevation ranges from 0 to 710 feet (0 to 215 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable coastal bluff scrub, coastal dunes, or coastal prairie. Although an occurrence is located in seemingly unsuitable habitat less than 2 miles from the site, the occurrence is from 1954 and no other occurrences occur within the quadrangles examined for this report.	No further action recommended for this species.
Santa Cruz cypress <i>Hesperocyparis abramsiana</i> var. <i>abramsiana</i>	FE, SE, Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/sandstone or granitic. Elevation ranges from 920 to 2620 feet (280 to 800 meters).	Not Observed. Although this species is known to occur within the immediate vicinity of the Project Area, WRA received anecdotal evidence that the population has been extirpated (Nadia Hamey, forester for Santa Cruz Land Trust, pers comm, April 6, 2016). The species was not observed during surveys conducted for this report. The species is identifiable year-round and would have been observed if present. Therefore, it is assumed that the species is not present within the Project Area.	No further action recommended for this species.
Butano Ridge cypress <i>Hesperocyparis abramsiana</i> var. <i>butanoensis</i>	FE, SE, Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/sandstone. Elevation ranges from 1310 to 1610 feet (400 to 490 meters). Blooms Oct.	Not Observed. This species was not observed during surveys conducted for this report. The species is identifiable year-round and would have been observed if present. Moreover, the species is only known from Butano Ridge, located over 8 miles from the Project Area. Therefore, it is assumed that the species is not present within the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Loma Prieta hoita <i>Hoita strobilina</i>	Rank 1B.1	Chaparral, cismontane woodland, riparian woodland/usually serpentine, mesic. Elevation ranges from 100 to 2820 feet (30 to 860 meters). Blooms May-Jul (Aug), (Oct).	Unlikely. Suitable mesic serpentine soils are not present within the Project Area and the nearest known occurrence is located over 12 miles away on the eastern slopes of the Santa Cruz Mountains.	No further action recommended for this species.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT, SE, Rank 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland/often clay, sandy. Elevation ranges from 30 to 720 feet (10 to 220 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable coastal prairie, coastal scrub, or valley or foothill grassland habitats required to support this species and the Project Area is located above the known elevation range for this species.	No further action recommended for this species.
Kellogg's horkelia <i>Horkelia cuneata</i> var. <i>sericea</i>	Rank 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub/sandy or gravelly, openings. Elevation ranges from 30 to 660 feet (10 to 200 meters). Blooms Apr-Sep.	Unlikely. The Project Area does not contain suitable coastal sandhill habitat necessary to support this species and the Project Area is located above the known elevation range of this species.	No further action recommended for this species.
Point Reyes horkelia <i>Horkelia marinensis</i>	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub/sandy. Elevation ranges from 20 to 2480 feet (5 to 755 meters). Blooms May-Sep.	Unlikely. Although the Project Area contains at least three known occurrences of this species and the species was observed outside of the Project Area by WRA biologists, the species was not observed within the Project Area.	No further action recommended for this species.
harlequin lotus <i>Hosackia gracilis</i>	Rank 4.2	Wet areas in meadows and other grassy habitats, roadside ditches, etc. Elevation ranges from 0-2300 feet (0-700 meters). Blooms Mar-Jul.	Unlikely. The Project Area does not contain suitable mesic meadows, grasslands, or grassy road shoulders capable of supporting this species.	No further action recommended for this species.
coast iris <i>Iris longipetala</i>	Rank 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps/mesic. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable mesic sites on heavy soils required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
large-flowered leptosiphon <i>Leptosiphon grandiflorus</i>	Rank 4.2	Sandy soils in open, grassy flats. Elevation ranges from 15-4000 feet (5-1220 meters). Blooms Apr-Aug.	Unlikely. The Project Area does not contain suitable open, grassy habitats necessary to support this species.	No further action recommended for this species.
woolly-headed lessingia <i>Lessingia hololeuca</i>	Rank 3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland/clay, serpentine. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable serpentine soils required to support this species.	No further action recommended for this species.
smooth lessingia <i>Lessingia micradenia</i> var. <i>glabrata</i>	Rank 1B.2	Chaparral, cismontane woodland/serpentine, often roadsides. Elevation ranges from 390 to 1380 feet (120 to 420 meters). Blooms (May), (Jun), Jul-Nov.	Unlikely. The Project Area does not contain suitable serpentine soils required to support this species.	No further action recommended for this species.
Point Reyes meadowfoam <i>Limnanthes douglasii</i> ssp. <i>sulphurea</i>	SE, Rank 1B.2	Coastal prairie, meadows and seeps (mesic), marshes and swamps (freshwater), vernal pools. Elevation ranges from 0 to 460 feet (0 to 140 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable vernal wet depressional features required to support this species and the nearest known occurrence is located over 10 miles away.	No further action recommended for this species.
arcuate bush-mallow <i>Malacothamnus arcuatus</i>	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 50 to 1160 feet (15 to 355 meters). Blooms Apr-Sep.	Unlikely. This species was originally determined to have potential to occur in gravelly openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	Rank 3.2	Broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland/rocky. Elevation ranges from 150 to 2710 feet (45 to 825 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain sunny, open rocky areas necessary to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
marsh Microseris <i>Microseris paludosa</i>	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 20 to 1160 feet (5 to 355 meters). Blooms Apr-Jun (Jul).	Unlikely. The Project Area does not contain sunny openings on mesic soils necessary to support this species.	No further action recommended for this species.
Santa Cruz County monkeyflower <i>Mimulus rattanii</i> ssp. <i>decurtatus</i>	Rank 4.2	Chaparral, lower montane coniferous forest/margins, gravelly. Elevation ranges from 1310 to 1640 feet (400 to 500 meters). Blooms May-Jul.	Unlikely. This species was originally determined to have potential to occur in gravelly openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
northern curly-leaved Monardella <i>Monardella sinuata</i> ssp. <i>nigrescens</i>	Rank 1B.2	Chaparral, coastal dunes, coastal scrub, lower montane coniferous forest (ponderosa pine sandhills)/sandy. Elevation ranges from 0 to 980 feet (0 to 300 meters). Blooms (Apr), May-Jul (Aug), (Sep).	Unlikely. This species was originally determined to have potential to occur in openings on sandy soils throughout the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
woodland woollythreads <i>Monolopia gracilens</i>	Rank 1B.2	Broadleaved upland forest (openings), chaparral (openings), cismontane woodland, north coast coniferous forest (openings), valley and foothill grassland/serpentine. Elevation ranges from 330 to 3940 feet (100 to 1200 meters). Blooms (Feb), Mar-Jul.	Unlikely. The Project Area does not contain serpentine soils or suitable forest openings required to support this species. In addition, the nearest known occurrence is located over 6 miles away from the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Dudley's lousewort <i>Pedicularis dudleyi</i>	SR, Rank 1B.2	Chaparral (maritime), cismontane woodland, north coast coniferous forest, valley and foothill grassland. Elevation ranges from 200 to 2950 feet (60 to 900 meters). Blooms Apr-Jun.	Unlikely. An occurrence of this species is located approximately 2 miles to the northeast of the Project Area and this species was originally determined to have potential to occur in cismontane woodland and coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> <i>var. kleei</i>	Rank 1B.2	Chaparral, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 1310 to 3610 feet (400 to 1100 meters). Blooms May-Jun.	Unlikely. An occurrence is known within less than 1 mile from the Project Area and this species was originally determined to have potential to occur in coniferous forest habitat within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland (often serpentine). Elevation ranges from 110 to 2030 feet (35 to 620 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable open, dry rocky slopes and grassy areas necessary to support this species, nor does the Project Area contain serpentine soils.	No further action recommended for this species.
Monterey pine <i>Pinus radiata</i>	Rank 1B.1	Closed-cone coniferous forest, cismontane woodland. Elevation ranges from 80 to 610 feet (25 to 185 meters).	Not Observed. Monterey pine is identifiable year-round, but was not observed within the Project Area during surveys conducted for this report. It is assumed that this species is not present.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
white-flowered rein orchid <i>Piperia candida</i>	Rank 1B.2	Broadleaved upland forest, lower montane coniferous forest, north coast coniferous forest/sometimes serpentine. Elevation ranges from 100 to 4300 feet (30 to 1310 meters). Blooms (Mar), May-Sep.	Unlikely. There is a known occurrence of this species within 2.5 miles from the site and the species was originally determined to have potential to occur in suitable habitat within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Choris' popcornflower <i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	Rank 1B.2	Chaparral, coastal prairie, coastal scrub/mesic. Elevation ranges from 50 to 520 feet (15 to 160 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable mesic sites in chaparral, coastal prairie, or coastal scrub habitats necessary to support this species. In addition, the Project Area is located above the known elevation range for this species.	No further action recommended for this species.
Hickman's popcorn flower <i>Plagiobothrys chorisianus</i> var. <i>hickmanii</i>	Rank 4.2	Moist depressions in sandy deposits over clay. Elevation ranges from 50-600 feet (15-185 meters). Blooms Apr-Jun.	Unlikely. The Project Area does not contain suitable open, mesic sites necessary to support this species.	No further action recommended for this species.
San Francisco popcornflower <i>Plagiobothrys diffusus</i>	SE, Rank 1B.1	Coastal prairie, valley and foothill grassland. Elevation ranges from 200 to 1180 feet (60 to 360 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable coastal prairie or other grassland habitats required to support this species.	No further action recommended for this species.
Scotts Valley Polygonum <i>Polygonum hickmanii</i>	FE, SE, Rank 1B.1	Valley and foothill grassland (mudstone and sandstone). Elevation ranges from 690 to 820 feet (210 to 250 meters). Blooms May-Aug.	Unlikely. The Project Area does not contain suitable grassland habitats required to support this species and the species is only known from one location in Scott's Valley.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
pine rose <i>Rosa pinetorum</i>	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland. Elevation ranges from 10 to 3100 feet (2 to 945 meters). Blooms May-Jul.	Unlikely. This species was originally determined to have potential to occur in coniferous forest or cismontane woodland within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
<i>Sanicula hoffmannii</i> Hoffmann's sanicle	Rank 4.3	Broadleaved upland forest, coastal bluff scrub, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest/often serpentine or clay. Elevation ranges from 100 to 980 feet (30 to 300 meters). Blooms Mar-May.	Unlikely. This species was originally determined to have potential to occur in broadleaved upland forest and lower montane coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
chaparral ragwort <i>Senecio aphanactis</i>	Rank 2B.2	Chaparral, cismontane woodland, coastal scrub/sometimes alkaline. Elevation ranges from 50 to 2620 feet (15 to 800 meters). Blooms Jan-Apr.	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	Rank 4.2	Broadleaved upland forest, coastal prairie, coastal scrub, north coast coniferous forest, riparian woodland/often in disturbed areas. Elevation ranges from 0 to 2400 feet (0 to 730 meters). Blooms (Mar), Apr-Aug.	Unlikely. Although the Project Area may contain suitable habitat elements, the nearest known occurrence is located over 10 miles to the southeast of the site and is listed as possibly extirpated.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
San Francisco campion <i>Silene verecunda</i> <i>ssp. verecunda</i>	Rank 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland/sandy. Elevation ranges from 100 to 2120 feet (30 to 645 meters). Blooms (Feb), Mar-Jun (Aug).	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Microseris <i>Stebbinsoseris</i> <i>decipiens</i>	Rank 1B.2	Broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland/open areas, sometimes serpentine. Elevation ranges from 30 to 1640 feet (10 to 500 meters). Blooms Apr-May.	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
slender-leaved pondweed <i>Stuckenia filiformis</i> <i>ssp. alpina</i>	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7050 feet (300 to 2150 meters). Blooms May-Jul.	Unlikely. The Project Area lacks suitable marsh or swamp habitat necessary to support this species.	No further action recommended for this species.
Santa Cruz clover <i>Trifolium</i> <i>buckwestiorum</i>	Rank 1B.1	Broadleaved upland forest, cismontane woodland, coastal prairie/gravelly, margins. Elevation ranges from 340 to 2000 feet (105 to 610 meters). Blooms Apr-Oct.	Unlikely. The Project Area lacks openings with moist grassland and gravelly margins necessary to support this species.	No further action recommended for this species.
Mammals				
Hoary bat <i>Lasiurus cinereus</i>	WBWG Medium	Hoary bats are solitary and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, 3-12 meters above the ground (WBWG 2012). Roosts are usually at the edge of a clearing. Summer tree roosts are typically located along edge habitats close to feeding grounds.	Moderate. This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016). Mature conifer and broadleaf trees in the Project Area have the potential to support roosting sites.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Pallid bat <i>Antrozous pallidus</i>	SSC, WBWG High	Roost habitat for this species includes buildings, hollows in trees, caverns, and bridges.	Moderate. This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016). Cavities within large mature trees in the Project Area and nearby rock outcroppings, and cave features in the have the potential to support roosting sites.	Recommendations for this species are provided in Section 7.2.2
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SSC, WBWG High	Lives in a wide variety of habitats but most common in mesic sites. Day roosts highly associated with caves and mines. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance.	High. This species has been documented roosting within cave habitat within the property and near the Project Area and there are numerous occurrences within 5 miles of Project Area.	Recommendations for this species are provided in Section 7.2.2
western red bat <i>Lasiurus blossevillei</i>	SSC, WBWG; High	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores).	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the riparian habitat. Suitable foraging habitat is supported within and adjacent to creek habitat throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2
silver-haired Bat <i>Lasionycteris noctivagans</i>	WBWG; Medium	Summer habitats include coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. This species is primarily a forest dweller, feeding over streams, ponds, and open brushy areas. It roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the forest habitat. Suitable foraging habitat is supported within and adjacent to creek habitat throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
fringed myotis <i>Myotis thysanodes</i>	WBWG; High	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwoods/sequoia groves. Buildings, mines, and large snags are important day and night roosts.	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the large stands of conifer and hardwood forest habitat found throughout the Project Area. Nearby cave and cliff area of the San Vicente Quarry may also support roosting.	Recommendations for this species are provided in Section 7.2.2
long-legged myotis <i>Myotis volans</i>	WBWG; High	Generally associated with woodlands and forested habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	Unlikely. This species is more common in coastal regions with redwood/sequoia stands. This species may occasionally forage or occur as a migrant through the area; however, roosting habitat is suboptimal and the Project Area is unlikely to support maternity roosting.	No further actions are recommended.
western mastiff bat <i>Eumops perotis</i>	SSC, WBWG; High	Found in a wide variety of open, arid and semi-arid habitats. Distribution appears to be tied to large rock structures which provide suitable roosting sites, including cliff crevices and cracks in boulders.	Unlikely. The Project Area does not contain open arid habitats. While potential roosting habitat for this species may occur within the rock and cliff crevices of the San Vicente Quarry, the Project Area does not contain such rock habitat and therefore is unlikely to support roosting.	No further actions are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
ringtail (ring-tailed cat) <i>Bassariscus astutus</i>	CFP	Ringtail is widely distributed throughout most of California, absent from some portions of the Central Valley and northeastern California. Found in a variety of habitats throughout the western US including riparian areas, semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands and montane conifer forests usually under 1400m in elevation. Typically uses cliffs or large trees for shelter.	Moderate. The Project Area provides wooded habitat of varying composition that could support the species and it's foraging needs. The Project Area is also surrounded by forest which provides a habitat corridor for the species.	Due to the elusive nature of this species, it is unlikely to be directly impacted by construction or trail activities and no further surveys or avoidance measures are recommended.
Salt-marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE, SE, CFP	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is the primary habitat. Does not burrow, but builds loosely organized nests and requires higher areas for flood escape.	No Potential. Suitable salt-marsh habitat is not present in the Project Area. There are no documented occurrences within 5 miles of the Permanente Property (CDFW 2016).	No further surveys or avoidance measures are recommended.
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	SSC	Forest habitats of moderate canopy and moderate to dense understory. Also in chaparral habitats. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials.	Present. This species has been observed throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2
Monterey ornate shrew <i>Sorex ornatus salarius</i>	SSC	Riparian, wetland and upland areas in the vicinity of the Salinas River delta. Prefers moist microhabitats. Feeds on insects and other invertebrates found under logs, rocks, and litter.	Unlikely. The Project Area is located outside of the species known range.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
American badger <i>Taxidea taxus</i>	SSC	Occurs in drier open stages of most scrub, forest, and herbaceous habitats where friable soils and prey populations are present.	Unlikely. Dense woodland within the Project Area provides unsuitable habitat for this species, and no badger burrows were observed in the Project Area during the site assessment. While there are documented occurrences >2.5 miles southeast of the Project Area, burrow habitat and open herbaceous habitat more characteristic of the species does not occur.	No further surveys or avoidance measures are recommended.
Birds				
California brown pelican <i>Pelecanus occidentalis californicus</i>	FD, SD, CFP	Generally a winter visitor to the region (though present nearly year-round). Nests colonially on offshore islands; nearest rookeries are on the Channel Islands. San Francisco Bay provides important foraging and loafing habitat.	No Potential. No foraging or nesting habitat is present, and this species does not nest in the area.	No further surveys or avoidance measures are recommended.
golden eagle <i>Aquila chrysaetos</i>	CFP, BCC	Resident in rolling foothill and mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range.	Unlikely. The Project Area does not provide suitable nesting habitat for this species, nor does it provide foraging habitat. The species may fly over the Project Area.	No further surveys or avoidance measures are recommended.
bald eagle <i>Haliaeetus leucocephalus</i>	FD, SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	Unlikely. The Project Area does not provide suitable nesting habitat for this species, nor does it provide foraging habitat. The species may fly over the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
white-tailed kite <i>Elanus leucurus</i>	CFP	Resident in coastal and valley lowlands. Preys on small mammals and other small vertebrates, and insects. Nests in trees and larger shrubs, often in relatively isolated stands.	Unlikely. The dense forest that dominates the Project Area does not provide typical nesting or foraging habitat for this species.	No further surveys or avoidance measures are recommended.
ferruginous hawk <i>Buteo regalis</i>	BCC	Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys and fringes of pinyon-juniper habitats. Winters west of Cascades-Sierra Nevada.	Unlikely. Occasionally observed along the open coast terraces of Santa Cruz County (eBird 2016). However, dense forest within the Project Area provides unsuitable habitat for this species.	No further surveys or avoidance measures are recommended.
northern harrier <i>Circus cyaneus</i>	SSC	Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. May also occur in alkali desert sinks.	Unlikely. The dense forest habitat that dominates the Project Area does not provide suitable nesting for the species. Foraging habitat is largely precluded, and while the species may occur along nearby open coast terraces of Santa Cruz County (eBird 2016), the Project Area is not anticipated to support the species.	No further surveys or avoidance measures are recommended.
prairie falcon <i>Falco mexicanus</i>	BCC	Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	Unlikely. Occasionally observed in coastal Santa Cruz County (eBird 2016). However, dense forest that dominates the Project Area provides unsuitable habitat for this species.	No further surveys or avoidance measures are recommended.
American peregrine falcon <i>Falco peregrinus anatum</i>	FD, SD, CFP	Largely resident. Requires protected cliffs, ledges or manmade structures for nesting. Often associated with coasts, bays, marshes and other open expanses of water. Preys primarily upon waterbirds; forages widely.	Unlikely. The Project Area does not contain suitable cliff habitat to support nesting. While the species has been documented to nest along the cliffs of the San Vicente Quarry, and may fly overhead, the Project Area does not support nesting.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California clapper rail <i>Rallus longirostris obsoletus</i>	FE, SE, CFP	Resident in salt marshes of the San Francisco Bay Estuary, with largest populations in south San Francisco Bay. Requires mud flats for foraging and dense marsh vegetation on higher ground for nesting.	No Potential. Suitable salt-marsh habitat is not present in the Project Area.	No further surveys or avoidance measures are recommended.
marbled murrelet <i>Brachyramphus marmoratus</i>	FT, SE	(Nesting) Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	High Potential. There are numerous occurrences of this species throughout the Santa Cruz Mountains, the closest of which are approximately 1 mile to the west and 1.9 miles to the east of the Project Area (CDFW 2016). Within the Project Area, several stands of old-growth redwood potentially suitable for nesting habitat occur. Therefore, while the species has not be documented within the Project Area, the presence of potentially suitable nesting habitat and the proximity to known occurrences makes it likely that the species would utilize the Project Area.	Recommendations for this species are provided in Section 7.2.2
western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT, SSC, BCC	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, dry salt ponds, mudflats and adjacent levees, and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	No Potential. Project Area lacks sandy beaches, dry salt ponds, mudflats, levees or shores.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California least tern <i>Sterna antillarum browni</i>	FE, SE, CFP	Summer resident. Breeds along the California coast from San Francisco Bay south. Nests colonially on barren or sparsely vegetated, flat substrates near water. Forages for small fish, typically in shallow shoreline habitats. San Francisco Bay colonies usually located on dry/abandoned salt ponds and along estuarine shores.	No Potential. Project Area lacks nesting colony and foraging habitat.	No further surveys or avoidance measures are recommended.
California black rail <i>Laterallus jamaicensis coturniculus</i>	ST, CFP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	No Potential. The Project Area does not contain suitable marsh habitat.	No further surveys or avoidance measures are recommended.
burrowing owl <i>Athene cunicularia</i>	SSC, BCC	Largely resident in the region. Found in grasslands and other open habitats with a sparse to absent shrub/tree canopy. Nests and roosts in old mammal burrows, typically those of ground squirrels. Preys upon insects, and also small mammals, reptiles and birds.	Unlikely. The dense forest that dominates the Project Area precludes the presence of this species. No ground squirrel burrows were observed in the Project Area and the dense woodlands do not provide suitable habitat for this species. No sign of burrowing owl was observed during the site assessment.	No further surveys or avoidance measures are recommended.
short-eared owl <i>Asio flammeus</i>	SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	No potential. No suitable marshland to support nesting or foraging is present within the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
long-eared owl <i>Asio otus</i>	SSC	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Unlikely. The Project Area does not provide suitable riparian bottomland habitat characteristic of the species nesting areas.	No further surveys or avoidance measures are recommended.
Vaux's swift <i>Chaetura vauxi</i>	SSC	Redwood, Douglas-fir, and other coniferous forests. Nests in large hollow trees and snags. Often nests in flocks. Forages over most terrains and habitats but shows a preference for foraging over rivers and lakes.	High potential. Large stands of coniferous forest with complex canopies and snags occur throughout the Project Area. Potentially suitable nesting and foraging habitat is prevalent in the Project Area.	Recommendations for this species are provided in Section 7.2.2
black swift <i>Cypseloides niger</i>	SSC, BCC	Summer resident. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above surf. Forages widely.	Unlikely. The Project Area is not known to contain cliffs with waterfall features that would be suitable for nesting. While nesting along the coastline to the west and south has been documented, and the species may opportunistically forage or fly over the Project Area, nesting is not anticipated to be supported in the Project Area.	No further surveys or avoidance measures are recommended.
Allen's hummingbird <i>Selasphorus sasin</i>	BCC	Inhabits mixed evergreen, riparian woodlands, eucalyptus and cypress groves, oak woodlands, and coastal scrub during breeding season. Nest in shrubs and trees with dense vegetation.	High Potential. Mature oak and riparian woodland within the Project Area provides suitable nesting habitat.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Lewis' woodpecker <i>Melanerpes lewis</i>	BCC	Uncommon winter resident occurring on open oak savannahs, broken deciduous and coniferous habitats.	Unlikely. The species does not nest along coastal California, and while the species has been sporadically observed in Santa Cruz County, the dense woodland of the Project Area is not conducive to the open foraging areas needed for the species (eBird 2016).	No further surveys or avoidance measures are recommended.
Nuttall's woodpecker <i>Picoides nuttallii</i>	BCC	Relatively dense oak and riparian woods. Can also occur in urban and residential settings.	High Potential. Mature oak and riparian woodland provides suitable nesting habitat for this relatively common species.	Recommendations for this species are provided in Section 7.2.2
olive-sided flycatcher <i>Contopus cooperi</i>	SSC, BCC	Nesting habitats are mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir and lodgepole pine. Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	High Potential. Mixed conifer, redwood, and pine forest throughout the Project Area provide suitable nesting habitat for this species. The species has been observed frequently along roads surrounding the Project Area (eBird 2016).	Recommendations for this species are provided in Section 7.2.2
willow flycatcher <i>Empidonax traillii</i>	SE, BCC	Inhabits extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2000 to 8000 foot elevation. Require dense willow thickets for nesting/roosting. Low, exposed branches are used for singing posts/hunting perches	Unlikely. No suitable willow nesting habitat exists within the Project Area, and there are no CNDDDB records within the vicinity (CDFW 2016). The species may occur briefly during migration.	No further surveys or avoidance measures are recommended.
loggerhead shrike <i>Lanius ludovicianus</i>	SSC, BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Unlikely. The dense forest and woodland within the Project Area is not typical foraging and nesting habitat for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Least Bell's vireo <i>Vireo bellii pusillus</i>	FE, SE	This species is a Summer resident of Southern California but whose range is extending northward. Nesting occurs in riparian areas in the vicinity of water or in dry river bottoms. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, coyote brush or mesquite.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
bank swallow <i>Riparia riparia</i>	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean.	Unlikely. No suitable nesting habitat exists within the Project Area, and the species is unlikely to forage/ pass through here. The nearest CNDDDB record for this species is located 8 miles northwest of the Project Area and dated 1987 (CDFW 2016).	No further surveys or avoidance measures are recommended.
oak titmouse <i>Baeolophus inornatus</i>	BCC	Oak woodland and savannah, open broad-leaved evergreen forests containing oaks, and riparian woodlands. Associated with oak and pine-oak woodland and arborescent chaparral.	Present. This species is commonly found within mature oak woodland habitat, which occurs in the Project Area.	Recommendations for this species are provided in Section 7.2.2
yellow warbler <i>Setophaga petechia</i>	SSC, BCC	Frequents riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores and alders for nesting and foraging. Also nests in montane shrubbery in open conifer forests.	Unlikely. No suitable willow nesting habitat exists within the Project Area, and there are no CNDDDB records within the vicinity (CDFW 2016). The species may occur briefly during migration.	No further surveys or avoidance measures are recommended.
San Francisco (saltmarsh) common yellowthroat <i>Geothlypis trichas sinuosa</i>	SSC, BCC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	Unlikely. No suitable marsh habitat exists in or near the area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
yellow-breasted chat <i>Icteria virens</i>	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forage and nest within 10 feet of ground.	Unlikely. Suitable riparian thickets do not exist in the Project Area, and the species has not been observed in the vicinity of the Project Area (CDFW 2016, eBird 2016).	No further surveys or avoidance measures are recommended.
grasshopper sparrow <i>Ammodramus savannarum</i>	SSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs. Loosely colonial when nesting.	Unlikely. Dense forest and woodland habitat occurs throughout the Project Area, which does not provide suitable grassland habitat.	No further surveys or avoidance measures are recommended.
Bryant's savannah sparrow <i>Passerculus sandwichensis alaudinus</i>	SSC	Associated with the coastal fog belt, primarily between Humboldt and northern Monterey Counties. Occupies low tidally influenced habitats, adjacent to ruderal areas; often found where pickleweed communities merge into grassland. Infrequently found in drier grasslands.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
Bell's sage sparrow <i>Amphispiza belli belli</i>	BCC	Year-round resident, though shows seasonal movements. Prefers dense chaparral and scrub habitats for breeding; strongly associated with chamise. Also occurs in more open habitats during winter.	Unlikely. The Project Area does not contain patches of scrub habitat and lacks suitable nesting habitat for the species. While the species has been documented to the east and north of the Project Area (eBird 2016), the Project Area contains suboptimal foraging habitat relative to areas outside of the Project Area and is unlikely to support nesting.	No further surveys or avoidance measures are recommended.
Lawrence's goldfinch <i>Spinus lawrencei</i>	BCC	Nests in open oak or other arid woodland and chaparral, near water. Nearby herbaceous habitats used for feeding. Closely associated with oaks.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
tricolored blackbird <i>Agelaius tricolor</i>	SSC	Resident, though disperses somewhat when not breeding. Typically nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs. Highly colonial; breeding aggregations tend to be large.	Unlikely. No suitable freshwater marsh or riparian thicket habitat is present in the Project Area. There are no CNDDDB records in the vicinity (CDFW 2016).	No further surveys or avoidance measures are recommended.
purple martin <i>Progne subis</i>	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	Moderate Potential. The Project Area contains coniferous forests that may provide suitable nesting habitat. This species has been observed east of the Project Area in Bonny Doon Ecological Preserve (eBird 2016).	Recommendations for this species are provided in Section 7.2.2
Reptiles and Amphibians				
California tiger salamander <i>Ambystoma californiense</i>	FT, ST, SSC	Inhabits annual grasslands, spending most of the year underground in mammal burrows. Breeding occurs in vernal pools and other seasonal aquatic features. In the immediate vicinity of San Francisco Bay, occurs only in Fremont.	No Potential. There is no suitable aquatic breeding or upland aestivation habitat present for this species. This species has not been documented to occur within 5 miles of the Project Area (CDFW 2016).	No further surveys or avoidance measures are recommended.
Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i>	FE, SE, CFP	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey counties. Aquatic larvae prefer shallow (<12 inches) water, using clumps of vegetation or debris for cover. Adults use mammal burrows.	No Potential. This species has a limited range, and is not documented to occur north of Aptos, which is over 15 miles southeast of the Project Area (USFWS 2009). The Project Area does not support habitat for this species, and the species is not known for the area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California red-legged frog <i>Rana aurora</i>	FT, SSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	Moderate Potential. This species has been documented to occur within the property and adjacent to the Project Area in 1997 and there are many documented occurrences within 2 miles (CDFW 2016). While no suitable aquatic breeding habitat was observed, the Project Area provides dispersal and seasonal aquatic non-breeding habitat that may support the species. The Project Area is located within dispersal distance of known occurrences.	Recommendations for this species are provided in Section 7.2.2
foothill yellow-legged frog <i>Rana boylei</i>	SSC	Found in rocky streams in a variety of habitats. Feeds on both aquatic and terrestrial invertebrates. Closely associated with water.	Unlikely. There are no CNDDDB occurrences within 5 miles of the Project Area (CDFW 2016). The Project Area does not contain perennial streams with suitable basking habitat.	No further surveys or avoidance measures are recommended.
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	FT, ST	Alameda Whipsnake is restricted to valley-foothill hardwood habitat of the Coast Ranges between Monterey and San Francisco Bay. They inhabit south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	No Potential. The Project Area is outside of the species' known range, and does not contain suitable habitat.	No further surveys or avoidance measures are recommended.
Blainville's (coast) horned lizard <i>Phrynosoma blainvillii</i>	SSC	Habitat variable, most common in lowlands along sandy washes with low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of insect forage are primary microhabitat components.	No Potential. No suitable lowland or wash habitat is present in the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE, SE, CFP	Found in the vicinity of freshwater marshes, ponds and slow-moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot. Upland areas near water are also very important. Adults prey chiefly on large frogs.	No Potential. The Project Area is outside of this subspecies' known range, and provides no typical aquatic habitat or forage.	No further surveys or avoidance measures are recommended.
Pacific pond turtle <i>Actinemys marmorata</i>	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter. Nests are excavated in areas with friable soil and vegetative cover.	Unlikely. There are no perennial streams or pond habitat that would support the species. Basking habitat is limited within the dense woodland of the Project Area. The nearest CNDDDB occurrence for this species is over 4 miles east of the Project Area (CDFW 2016).	No further surveys or avoidance measures are recommended.
Fishes				
green sturgeon <i>Acipenser medirostris</i>	FT, SSC	Anadromous. Spawns in the Sacramento and Klamath River systems. Lingering transients may be found throughout the San Francisco Bay Estuary, particularly juveniles.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
tidewater goby <i>Eucyclogobius newberryi</i>	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	No Potential. No brackish water habitat is present within or immediately adjacent to the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Delta smelt <i>Hypomesus transpacificus</i>	FT, ST	Endemic to the Sacramento-San Joaquin delta area; found in areas where salt and freshwater systems meet. It occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	No Potential. The Project Area is outside of the range for this species and does not contain suitable habitat.	No further surveys or avoidance measures are recommended.
longfin smelt <i>Spirinchus thaleichthys</i>	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	No Potential. The Project Area does not contain suitable estuarine habitat.	No further surveys or avoidance measures are recommended.
Coho salmon - Central CA Coast ESU <i>Oncorhynchus kisutch</i>	FE, SE	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	No Potential. Coho is known to occur within the lower reaches of San Vicente Creek; however, fish passage barriers, steep gradient, and the ephemeral nature of the streams in the Project Area make it unlikely for this species to occur. Coho is not known from Laguna Creek, and known natural fish passage barriers downstream of the Project Area make it unlikely that Coho to occur.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
steelhead - Central CA Coast DPS <i>Oncorhynchus mykiss irideus</i>	FT	Anadromous, spending most of life cycle in the ocean. This ESU occurs from the Russian River south to Soquel Creek and Pajaro River, including the San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	Unlikely. Steelhead occur within the mainstem of San Vicente Creek up to the quarry tunnel and the lower reaches of Mill Creek; however, partial fish passage barriers, narrow steep channels, and the ephemeral nature of the streams in the main parcel make it unlikely for this species to occur there. Steelhead are known from the lower reaches of Laguna Creek; however, a known natural barrier occurs downstream of the site, making it unlikely that steelhead would occur there.	No further surveys or avoidance measures are recommended.
steelhead – South/ Central CA Coast DPS <i>Oncorhynchus mykiss irideus</i>	FT	Occurs in coastal basins from the Pajaro River south to, but not including, the Santa Maria River. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	Unlikely. Steelhead occur within the mainstem of San Vicente Creek up to the quarry tunnel and the lower reaches of Mill Creek; however, this location is in the territorial area for Central California Coast DPS steelhead. Therefore the Project Area is outside of the range for this DPS. Further, steelhead are unlikely to occur in the Project Area for the reasons outlined for the Central California Coast DPS.	No further surveys or avoidance measures are recommended.
Chinook salmon - Winter-run ESU <i>Oncorhynchus tshawytscha</i>	FE, SE	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Chinook salmon - Central Valley Spring-run ESU <i>Oncorhynchus</i> <i>tshawytscha</i>	FT, ST	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year, or remain in freshwater and migrate as yearlings.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
Invertebrates				
Conservancy fairy shrimp <i>Branchinecta</i> <i>conservatio</i>	FE	Lives in ephemeral or temporary pools of freshwater (vernal pools) that form in the cool, wet months of the year. Highly turbid water is preferred.	No Potential. No vernal pool or seasonal wetland habitat is present within the Project Area.	No further surveys or avoidance measures are recommended.
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Inhabits small, clear-water sandstone-depression pools, grassy swales, slumps, or basalt-flow depression pools.	No Potential. No vernal pool or seasonal wetland habitat is present within the Project Area.	No further surveys or avoidance measures are recommended.
Ohlone tiger beetle <i>Cicindela ohlone</i>	FE	Sparsely vegetated native grasslands on costal terrace in Santa Cruz County. Substrate is poorly-drained clay or sandy clay soil over bedrock of Santa Cruz mudstone.	No Potential. The nearest CNDDDB occurrence for this species is located 4.8 miles southeast of the Project Area (CDFW 2016). The Project Area is not within the coastal terrace and does not contain native grasslands.	No further surveys or avoidance measures are recommended.
Valley elderberry longhorn beetle <i>Desmocerus</i> <i>californicus</i> <i>dimorphus</i>	FT	Occurs only in the central valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	No Potential. The Project Area is out of the species' known range.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE	VPTS pools are commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No Potential. The Project Area provides no suitable vernal/seasonal pool habitat, and is outside of this species' known range (the nearest population is isolated in Fremont on the eastern shore of the Bay).	No further surveys or avoidance measures are recommended.
Myrtle's silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval foodplant thought to be <i>Viola adunca</i> .	No Potential. The Project Area is outside of the species known range.	No further surveys or avoidance measures are recommended.
monarch butterfly <i>Danaus plexippus</i>	Roost Habitat Protected by CDFW	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	Unlikely. Typical winter roost sites do not exist in the Project Area.	No further surveys or avoidance measures are recommended.
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. <i>Plantago erecta</i> is the primary host plant.	No Potential. No native serpentine grasslands or larval host or nectar plants are present in the Project Area.	No further surveys or avoidance measures are recommended.
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	FE	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz counties. <i>Eriogonum latifolium</i> and <i>Eriogonum parvifolium</i> are utilized as host plants and adult food plants.	No Potential. Suitable habitat and host/food plants are not present in the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Mount Hermon (=barbate) June beetle <i>Polyphylla barbata</i>	FE	Known only from sand hills in Santa Cruz County (type locality). Occurs in open, sandy habitat on Zayante series soils.	No Potential. The nearest CNDDDB occurrence for this species is located 4.8 miles east of the Project Area (CDFW 2016). No sand hill habitat or suitable Zayante soils are present in the Project Area.	No further surveys or avoidance measures are recommended.
Zayante band-winged grasshopper <i>Trimerotropis infantilis</i>	FE	Endemic to isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem). Restricted to sand parkland habitat found on ridges and hills within this very limited ecosystem.	No Potential. No sandhills habitat or suitable Zayante soils are present in the Project Area.	No further surveys or avoidance measures are recommended.

¹Key to status codes

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
ST	State Threatened
SR	State Rare
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group Priority Species
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

²Key to Potential for Occurrence

No Potential	None of the habitat components meeting the species requirements are present. The habitat is clearly unsuitable for the species.
Unlikely	Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
Moderate Potential	Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
High Potential	All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
Present	Species is observed on the site or has been recorded (i.e. CNDDDB, other reports) on the site recently.
Not Observed	The species is identifiable year-round but was not observed during surveys or the survey occurred when the species should have been apparent and identifiable but the species was not observed. These species are assumed to not be present.

APPENDIX D
SITE PHOTOGRAPHS



Example of shaded fuel break within the Project Area.



Example of shaded fuel break within the Project Area.



Example of open, sunny edge habitat where plant diversity is expected to be higher and a larger number of rare plants have potential to occur.



Example of dense, shaded understory habitat where plant diversity is expected to be lower and fewer rare plants have potential to occur.



Anderson's manzanita flowers.



Typical leaf arrangement for Anderson's manzanita.



Anderson's manzanita in flower.



Anderson's manzanita growth form under open, sunny conditions.



Example of a regulated stream.



Example of a regulated stream.



Example of a drainage feature determined to be non-jurisdictional.



Example of a drainage feature determined to be non-jurisdictional.



Example of a woodrat midden in the Project Area.



Example of a woodrat midden in the Project Area.



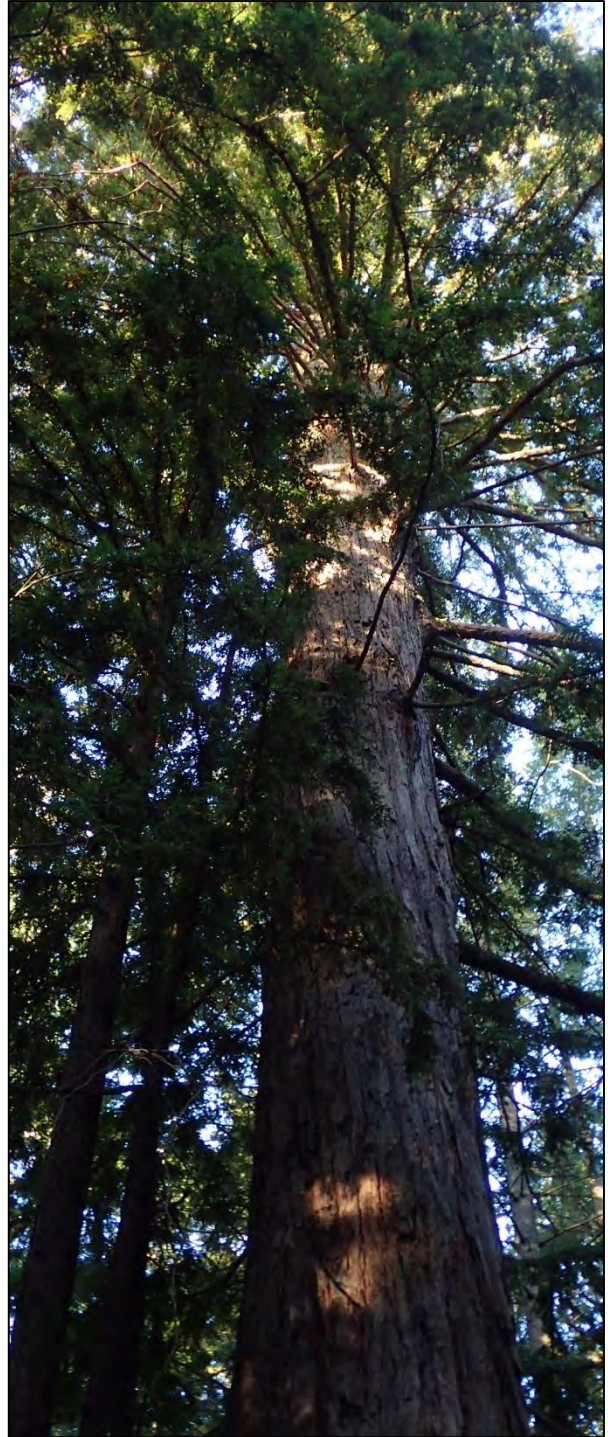
Example of a woodrat midden in the Project Area.



Example of a woodrat midden in the Project Area.



Example of a potentially significant wildlife tree.



Example of a potentially significant wildlife tree.



Laguna Creek, a perennial stream located on the Laguna parcel.



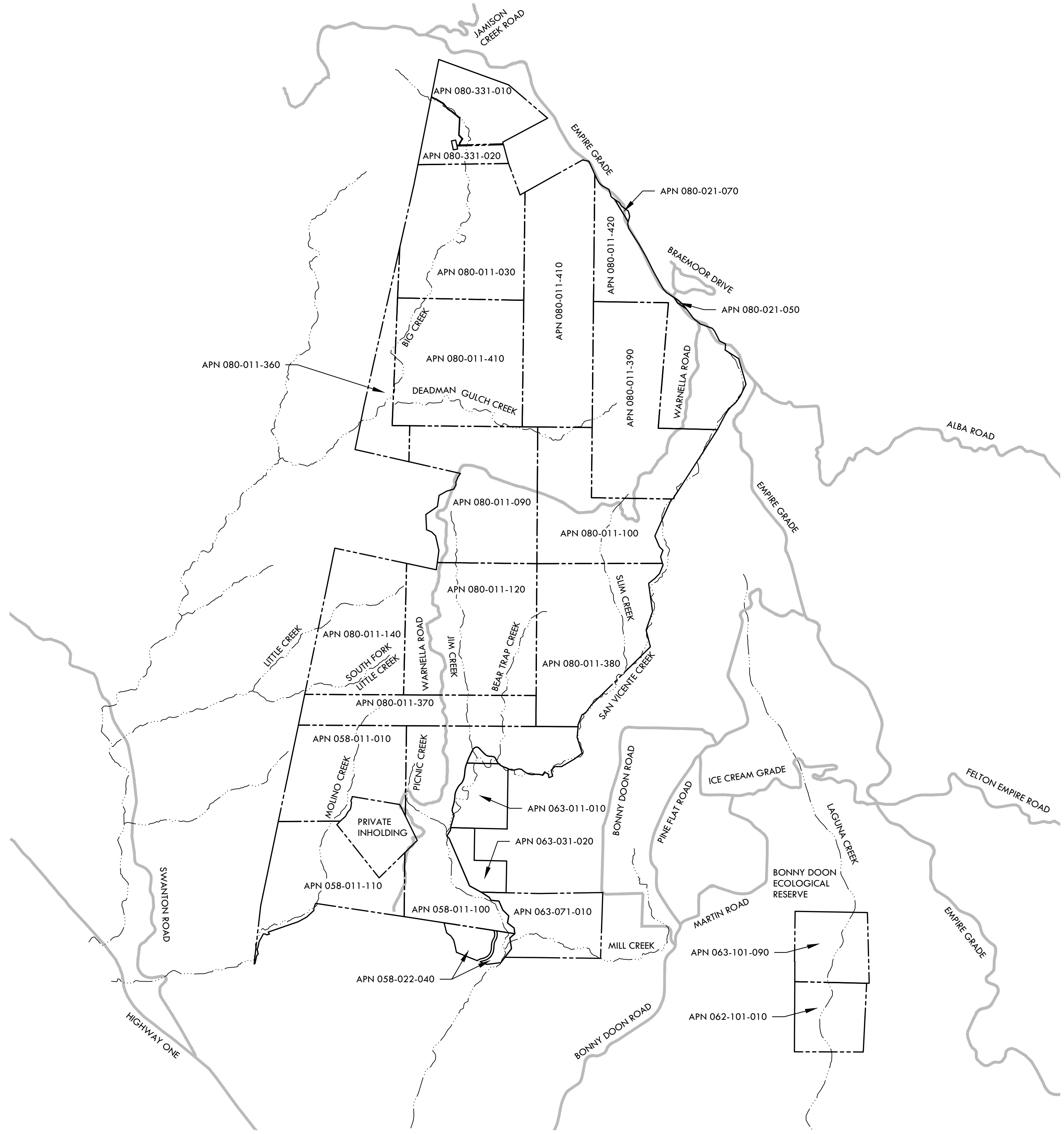
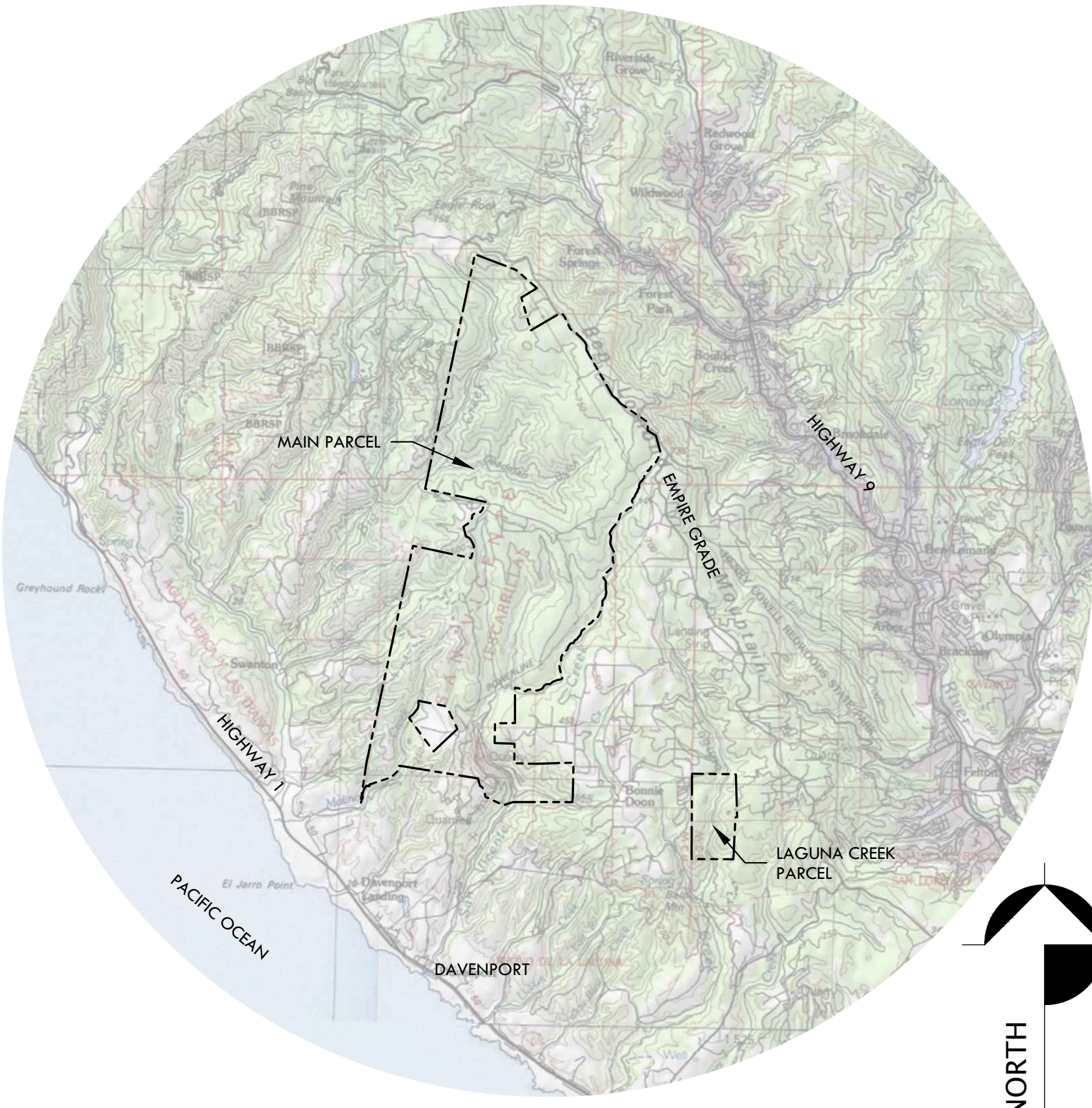
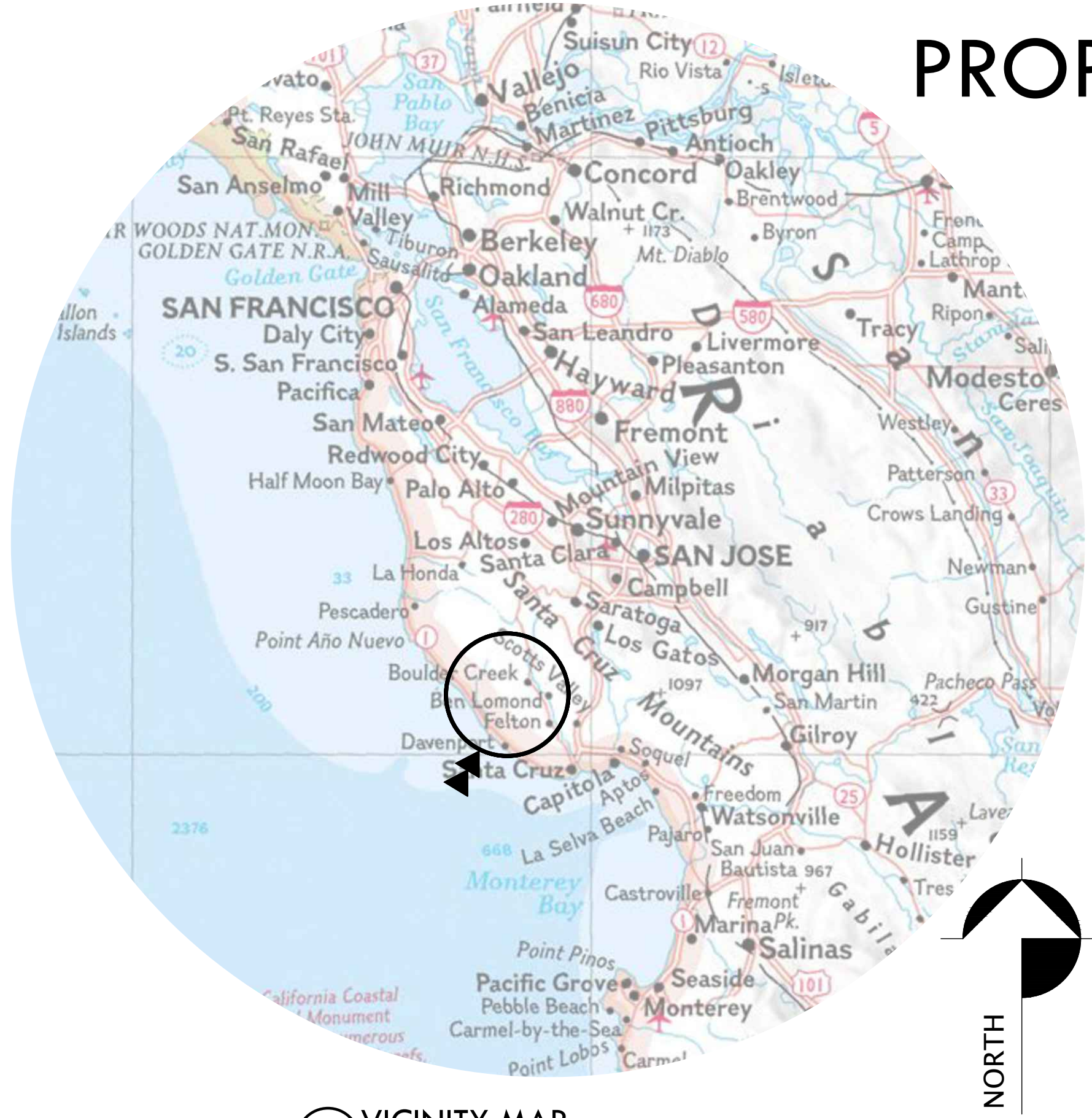
in association with

Timothy C. Best | WRA Environmental Consultants
Law Office of Pamela J. Asselmeier | Tom Origer & Associates

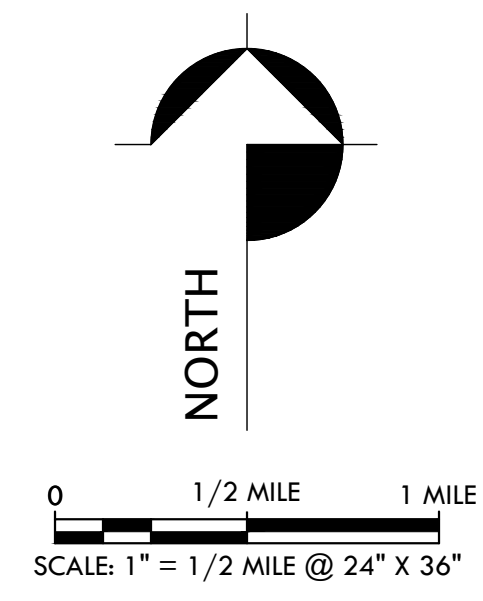
Attachment 3

Trails and Staging Area Plan

SAN VICENTE REDWOODS
SANTA CRUZ COUNTY, CALIFORNIA
PROPOSED TRAIL NETWORK AND STAGING AREA
CONDENSED PERMITTING SET



LEGEND:
--- PROPERTY LINE
--- STREAM - MAJOR
--- EXISTING ROAD - MAJOR



SHEET TITLE:
COVER SHEET

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.

Civil • Environmental • Water Resources
1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL (831) 426-9054

DRAWN BY: SLS
CHECKED BY: RLC
DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
SHEET:
C0.0
1 OF 17

24" X 36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.

24"x36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.

PROJECT CONTACTS

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WATSONVILLE, CA 95076
PHONE: 831-722-9446
CONTACT: SOMA GORESKY, P.E., G.E.

STRUCTURAL ENGINEER

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2571 MAIN STREET, SUITE C
SOQUEL, CA 95073
PHONE: 831-477-1781
CONTACT: BRAD STREETER, P.E., S.E.

BIOLOGIST

WRA ENVIRONMENTAL CONSULTANTS, INC.
2169-G EAST FRANCISCO BOULEVARD
SAN RAFAEL, CA 94901
PHONE: 415-454-8868
CONTACT: MATT RICHMOND

PLANNER

PLACEWORKS, INC.
1625 SHATTUCK AVE #300
BERKELEY, CA 94709
PHONE: 510-848-3815
CONTACT: ISBY FLEISCHMANN

SHEET LIST INDEX		
NUMBER	TITLE	SHEET
1	COVER SHEET	C0.0
2	SYMBOLS, ABBREVIATIONS, LEGEND, AND NOTES	C0.1
3	OVERALL SITE PLAN	C1.0
4	SITE PLAN - TRAILS - SHEET 1	C2.0
5	SITE PLAN - TRAILS - SHEET 2	C2.1
6	SITE PLAN - TRAILS - SHEET 3	C2.2
7	SITE PLAN - TRAILS - SHEET 4	C2.3
8	TRAIL INSTALLATION DETAILS	C2.4
9	TRAIL CROSSING DETAILS	C2.5
10	ROAD CROSSING DETAILS	C2.6
11	BRIDGE PLANS AND DETAILS	S1.0
12	PUNCHEON PLANS AND DETAILS	S2.0
13	SITE PLAN - STAGING AREA	C3.0
14	STAGING AREA DETAILS	C3.1
15	STAGING AREA DETAILS CONTINUED	C3.2
16	EROSION CONTROL AND LANDSCAPE PLAN - STAGING AREA	C4.0
17	EROSION CONTROL DETAILS AND NOTES	C4.1

ABBREVIATIONS LEGEND	
AC	ACRE
℄	CENTERLINE
CDFW	CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARDS
DIA/Ø	DIAMETER
(E)	EXISTING
EL	ELEVATION
FCE	FALL CREEK ENGINEERING
FT	FOOT
LCT	LAGUNA CREEK TRAIL
LF	LINEAL FOOT
NCALM	NATIONAL CENTER FOR AIRBORNE LASER MAPPING
MAX	MAXIMUM
MIN	MINIMUM
MP	MAP POINT
N#	NORTH TRAIL #
(N)	NEW
NTS	NOT TO SCALE
OC	ON CENTER
ORAR	OUTDOOR RECREATION ACCESS ROUTE
S#	SOUTH TRAIL #
SCC	SANTA CRUZ COUNTY
SF	SQUARE FEET
STA	STATION
TBR	TO BE REMOVED
TYP	TYPICAL
USACOE	US ARMY CORPS OF ENGINEERS

LINE TYPES	
-----	PROPERTY LINE
-----	STREAMS - MAJOR
-----	STREAMS - MINOR
-----	EXISTING ROAD
-----	PROPOSED TRAIL

SYMBOLS AND MATERIALS LEGEND	
	EXISTING GATE
	SPRING
	WOODRAT NEST
	WILDLIFE TREE
	ANDERSON'S MANZANITA
	WETLAND WITH 100-FOOT BUFFER
	PROPOSED TRAIL CORRIDOR
	PROPOSED CROSSING

DRAWING NOTATION	
DETAIL CALLOUT	
	DETAIL NUMBER
	SHEET NUMBER

PROJECT DATA	
APNs: 058-011-01, 058-011-100, 058-011-110, 058-022-040, 062-101-010, 063-011-010, 063-011-090, 063-031-020, 063-071-010, 063-101-090, 080-011-030, 080-011-060, 080-011-090, 080-011-100, 080-011-120, 080-011-140, 080-011-360, 080-011-370, 080-011-380, 080-011-390, 080-011-410, 080-011-420, 080-021-050, 080-021-070, 080-331-010, AND 080-331-020	
OWNER: PENINSULA OPEN SPACE TRUST AND SEMPERVIRENS FUND PUBLIC ACCESS MANAGEMENT: LAND TRUST OF SANTA CRUZ COUNTY	
AREA OF DISTURBANCE (AC)	
STAGING AREA	2.6
TRAILS	17.0
CROSSINGS	0.2
TEMPORARY CONSTRUCTION STAGING AREAS	0.1
CONSTRUCTION ACCESS	9.3

PROJECT DESCRIPTION	
THE LAND TRUST OF SANTA CRUZ COUNTY IN COLLABORATION WITH OTHERS PLANS TO CONSTRUCT A NEW TRAIL NETWORK AT SAN VICENTE REDWOODS FOR USE BY HIKERS, BIKE RIDERS, AND HORSEBACK RIDERS.	
THE PROPOSED TRAIL NETWORK AT SAN VICENTE REDWOODS INCLUDES CONSTRUCTION OF APPROXIMATELY 38 MILES OF TRAILS FOR USE BY HIKERS, BIKE RIDERS, AND HORSEBACK RIDERS. APPROXIMATELY 2/3 OF THE TRAIL NETWORK WILL BE CONSTRUCTED AS NEW TRAIL AND APPROXIMATELY 1/3 OF THE TRAIL NETWORK WILL BE CONSTRUCTED ON EXISTING ROADS. THE PROPOSED TRAIL NETWORK INCLUDES 108 DRAINAGE AND CREEK CROSSINGS, MANY OF WHICH RARELY CARRY SURFACE WATER. THE PROPOSED CROSSING IMPROVEMENTS INCLUDE ARMORED CROSSINGS, PUNCHEONS, BRIDGES, IMPROVEMENTS TO EXISTING CULVERTS, AND WAIT AND WATCH CROSSINGS WITH IMPROVEMENTS TO BE INSTALLED IN THE FUTURE AS NEEDED.	
A NEW STAGING AREA IS PROPOSED AT THE TRAIL HEAD OF THE PROPOSED TRAIL NETWORK. THE STAGING AREA INCLUDES SITE CLEARING INCLUDING TREE REMOVAL IN THE AREA OF THE PROPOSED WORK, GRADING, DRAINAGE, AND SITE IMPROVEMENTS INCLUDING 90 PARKING SPACES, 4 ACCESSIBLE PARKING SPACES, 4 HORSE TRAILER PARKING SPACES, A VAULT RESTROOM, EMERGENCY FIRE WATER, AND EMERGENCY ACCESS TO THE STAGING AREA.	
THE LAGUNA CREEK TRAIL WILL BE ACCESSED THROUGH THE EXISTING BONNY DOON ECOLOGICAL PRESERVE TRAIL NETWORK. VISITORS WILL PARK AT THE EXISTING STAGING AREA ON MARTIN ROAD.	

TECHNICAL REFERENCES	
1. BASIS OF DESIGN FOR TRAILS AND DRAINAGE CROSSINGS, SAN VICENTE REDWOODS, PREPARED BY FALL CREEK ENGINEERING, INC., DATED APRIL 21, 2017.	
2. BASIS OF DESIGN FOR STAGING AREA, SAN VICENTE REDWOODS, PREPARED BY FALL CREEK ENGINEERING, INC., DATED JUNE 27, 2017.	
3. HYDROLOGY AND HYDRAULIC ANALYSIS FOR SAN VICENTE REDWOODS, PREPARED BY FALL CREEK ENGINEERING, INC., DATED APRIL 21, 2017.	
4. DRAINAGE ANALYSIS, SAN VICENTE REDWOODS STAGING AREA, APN 080-011-42, EMPIRE GRADE, SANTA CRUZ COUNTY, CALIFORNIA. PREPARED BY FALL CREEK ENGINEERING, DATED AUGUST 2018.	
5. GEOTECHNICAL INVESTIGATION FOR SAN VICENTE REDWOODS STAGING AREA, PREPARED BY PACIFIC CREST ENGINEERING, INC., DATED JANUARY 11, 2018.	
6. SAN VICENTE REDWOODS PUBLIC ACCESS PLAN, PREPARED BY PLACEWORKS, DATED MARCH 20, 2018.	
7. BIOLOGICAL RESOURCES ASSESSMENT, SAN VICENTE REDWOODS PUBLIC ACCESS PLAN, PREPARED BY WRA ENVIRONMENTAL CONSULTANTS, DATED APRIL 10, 2018.	
8. A CULTURAL RESOURCES STUDY FOR THE SAN VICENTE REDWOODS PUBLIC ACCESS PLAN, PREPARED BY TOM ORIGER & ASSOCIATES, DATED NOVEMBER 7, 2016.	
9. CEMEX THP 1-06-080SCR 2008 PHASE 1 ROAD ASSESSMENT PROJECT, SAN VICENTE REDWOODS, PREPARED BY PACIFIC WATERSHED ASSOCIATES, INC., DATED JANUARY 2009 (UNPUBLISHED DRAFT).	
10.FIELD DATA COLLECTED BY PACIFIC WATERSHED ASSOCIATES, INC., DATED 2008 - 2009 (UNPUBLISHED DRAFT).	

GRADING VOLUMES

GRADING VOLUMES - TRAILS		
CUT	FILL	NET
12,040 CY	12,389 CY	349 CY FILL

GRADING VOLUMES - STAGING AREA

CUT	FILL	NET
2,791 CY	2,867 CY	76 CY FILL

GRADING VOLUMES - TOTAL

CUT	FILL	NET
14,831 CY	15,256 CY	425 CY FILL

NOTES:

- THESE GRADING VOLUMES ARE PRELIMINARY.
- NO COMPACTION FACTOR HAS BEEN APPLIED TO THE FILL VOLUMES.
- NO EXPANSION FACTOR HAS BEEN APPLIED TO THE CUT VOLUMES.
- ALL CONSTRUCTED SLOPES SHALL NOT EXCEED 2:1 (H:V) UNLESS STATED OTHERWISE.
- CONTRACTOR SHALL DISPOSE OF SOILS IN A LOCATION SPECIFIED BY THE LAND TRUST'S REPRESENTATIVE.
- ALL GRADING SHALL CONFORM TO SANTA CRUZ COUNTY REQUIREMENTS AND THE CALIFORNIA BUILDING CODE.
- GRADING VOLUMES FOR TRAILS WERE DETERMINED ASSUMING THE FOLLOWING GRADING VOLUMES PER LINEAR FOOT FOR EACH TRAIL TYPE:

UNIT GRADING VOLUMES		
TRAIL TYPE	CUT (CY/LF)	FILL (CY/LF)
ROAD TO TRAIL CONVERSION	0	0
INSTALL TRAIL ON GRADE	0.07	0.07
PARTIAL BENCH	0.02	0.12
FULL BENCH	0.09	0.03
BUTTRESS TRAIL	0	0.2

- GRADING VOLUMES FOR CROSSINGS WERE DETERMINED ASSUMING THE FOLLOWING FOR EACH TYPE:
 - ARMORED CROSSINGS AND ARMORED ROAD CROSSINGS - AREA OF CROSSING PLUS 1 FOOT LENGTH AND WIDTH BY 1 FOOT DEPTH
 - PUNCHEONS AND BRIDGES - AREA OF FOOTING PLUS 1 FOOT LENGTH AND WIDTH BY 5 FOOT DEPTH (ASSUMED DEPTH TO CONSOLIDATED MATERIAL)
 - CULVERTS - AREA OF IMPROVEMENT PLUS 1 FOOT LENGTH AND WIDTH BY 2 FOOT DEPTH
- GRADING VOLUMES DO NOT ACCOUNT FOR ROCK AND OTHER MATERIALS USED IN CONSTRUCTION THAT WILL OFFSET THE VOLUME OF CUT AND FILL.

STANDARD NOTES

1. **TRAIL CORRIDORS.** THE PROPOSED TRAIL NETWORK INCLUDES TRAIL CORRIDORS: 100-FOOT CORRIDORS FOR NEW TRAILS (50-FOOT ON EITHER SIDE OF THE PROPOSED TRAIL ALIGNMENT) AND 50-FOOT CORRIDORS FOR TRAILS TO BE INSTALLED ON EXISTING ROADS (25-FOOT ON EITHER SIDE OF THE PROPOSED TRAIL ALIGNMENT). THESE TRAIL CORRIDORS ALLOW THE TRAIL BUILDERS FLEXIBILITY IN CONSTRUCTING THE FINAL TRAIL ALIGNMENTS IN ORDER TO ALLOW FOR GRADE REVERSALS TO BE CONSTRUCTED ALONG TRAILS FOR PROPER DRAINAGE AND TO AVOID ANY BIOLOGICAL OR CULTURAL RESOURCES THAT MAY EXIST WITHIN THE TRAIL CORRIDOR. IN SOME CASES THE TRAIL CORRIDOR IS RESTRICTED IN ORDER TO MAINTAIN SEPARATION FROM PROPERTY LINES, EXISTING ROADS, OTHER TRAILS, WATERCOURSES, AND AREAS WITH INSTABILITY.

2. **TRAIL GRADE.** THE MAXIMUM TRAIL GRADE IS 15% FOR ANY EXTENDED SECTION OF TRAIL UNLESS OTHERWISE NOTED ON THE TRAIL IMPROVEMENT PLANS. MOST OF THE TRAIL GRADES ARE LESS THAN 10%. STEEPER GRADES ARE ALLOWED ON EXISTING ROADS AND IN SOME CASES ON NEW TRAILS, WHERE INDICATED.

3. **ORAR REQUIREMENTS.** OUTDOOR RECREATION ACCESS ROUTES (ORARS) SHALL FOLLOW THE UNITED STATES ACCESS BOARD REQUIREMENTS, AS FOLLOWS:

3.1. RUNNING SLOPE: ORARS SHALL HAVE A MAXIMUM RUNNING SLOPE OF 5%. STEEPER SEGMENTS ARE ALLOWED WITH RESTING INTERVALS PROVIDED AT THE SPECIFIED LENGTHS:

ORAR - MAXIMUM RUNNING SLOPE AND SEGMENT LENGTH		
RUNNING SLOPE OF ORAR SEGMENT		MAXIMUM LENGTH OF SEGMENT
STEEPER THAN	BUT NOT STEEPER THAN	50 FEET
1:20 (5%)	1:12 (8.33%)	
1:12 (8.33%)	1:10 (10%)	30 FEET

3.2. CROSS SLOPE: ORARS SHALL HAVE A MAXIMUM CROSS SLOPE OF 2% FOR SURFACES CONSTRUCTED OF CONCRETE, ASPHALT, OR BOARDS AND A MAXIMUM CROSS SLOPE OF 5% FOR SURFACES CONSTRUCTED FROM OTHER MATERIALS.

3.3. RESTING INTERVALS: LEVEL AREAS SHALL BE PROVIDED AT THE TOP AND BOTTOM OF AN ORAR SECTION AND ANY TIME THE RUNNING SLOPE EXCEEDS 5% ACCORDING TO THE TABLE ABOVE. RESTING INTERVALS SHALL BE A MINIMUM OF 60" LONG AND 36" WIDE. THE MAXIMUM SLOPE OF A RESTING AREA SHALL BE 2% IN ANY DIRECTION FOR SURFACES CONSTRUCTED OF CONCRETE, ASPHALT, OR BOARDS AND 5% IN ANY DIRECTION FOR SURFACES CONSTRUCTED OF OTHER MATERIALS.

4. **TRAIL DRAINAGE.** TRAILS SHALL BE OUTSLOPED IN THE DIRECTION OF NATURAL DRAINAGE TO THE EXTENT FEASIBLE. INSLOPING IS ALLOWED IN CERTAIN SITUATIONS AT THE DISCRETION OF THE TRAIL BUILDERS AND APPROVED BY THE CIVIL ENGINEER. GRADE REVERSALS SHALL BE INSTALLED ALONG TRAILS TO MANAGE DRAINAGE. GRADE REVERSALS SHALL BE INSTALLED AT A MINIMUM OF EVERY 150 FEET. FREQUENCY OF GRADE REVERSALS SHALL INCREASE AS THE TRAIL GRADE INCREASES.

5. **WATERCOURSE SEPARATION.** FINAL TRAIL ALIGNMENTS SHALL MAINTAIN SEPARATION FROM WATERCOURSES. FOR CLASS I AND CLASS II WATERCOURSES, TRAILS SHALL MAINTAIN THE FOLLOWING SEPARATION:

SLOPE	CLASS I	CLASS II
<30%	75-FT SEPARATION	50-FT SEPARATION
30 - 50%	100-FT SEPARATION	75-FT SEPARATION
>50%	150-FT SEPARATION	100-FT SEPARATION

FOR CLASS III WATERCOURSES, TRAILS SHALL MAINTAIN A MINIMUM 50-FOOT SEPARATION TO THE EXTENT FEASIBLE UNLESS OTHERWISE SPECIFIED ON THE TRAIL IMPROVEMENT PLANS. TRAILS MAY ENROACH ON THE STREAM SETBACK WHEN APPROACHING AND DEPARTING A CROSSING, AND WHEN ACTIVELY CROSSING. IN CROSSING LOCATIONS, TRAILS SHALL BE ALIGNED TO QUICKLY DEPART THE STREAM SETBACK AS QUICKLY AS POSSIBLE, WHILE ADHERING TO MAXIMUM TRAIL GRADES, AND ALLOWING FOR ADEQUATE DRAINAGE.

6. **CROSSING NOMENCLATURE.** THE RIGHT BANK/LEFT BANK NOMENCLATURE FOR CROSSINGS REFERS TO THE SIDE OF THE CROSSING FROM THE PERSPECTIVE OF THE VIEWER LOOKING UPSTREAM.

7. **SIGNAGE.** EXTENSIVE WAYFINDING SIGNAGE WILL BE INCLUDED WITH IMPLEMENTATION OF THE PROPOSED TRAILS.

8. **BIOTIC RESOURCES.** FINAL TRAIL ALIGNMENTS AND TRAIL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS IN THE BIOLOGICAL RESOURCES ASSESSMENT PREPARED BY WRA ENVIRONMENTAL CONSULTANTS. THE FOLLOWING AVOIDANCE MEASURES SHALL BE FOLLOWED WHEN LAYING OUT THE FINAL TRAIL ALIGNMENTS:

8.1. ANDERSON'S MANZANITA

8.1.1. TO THE EXTENT FEASIBLE, TRAILS SHALL BE RE-ROUTED WITHIN THE APPROVED TRAIL CORRIDOR ON AN AS-NEEDED BASIS TO AVOID INDIVIDUALS OF ANDERSON'S MANZANITA.

8.1.2. TO THE EXTENT FEASIBLE, NO GRADING SHALL OCCUR WITHIN THE DRIPLINE OF ANY INDIVIDUAL OF ANDERSON'S MANZANITA.

8.1.3. WHERE IT IS NOT POSSIBLE TO ROUTE TRAILS AROUND OCCURRENCES OR AVOID GRADING WITHIN THE DRIPLINE, IMPACTS SHALL BE QUANTIFIED AND MITIGATION SHALL BE IMPLEMENTED ACCORDING TO THE REGULATORY AUTHORIZATIONS FOR THE PROJECT.

8.2. OTHER RARE PLANTS

8.2.1. OTHER THAN AS DESCRIBED FOR ANDERSON'S MANZANITA, TRAILS SHALL BE RE-ROUTED WITHIN THE APPROVED TRAIL CORRIDOR ON AN AS-NEEDED BASIS TO AVOID OCCURRENCES OF RARE PLANTS.

8.2.2. TRAILS SHALL AVOID OCCURRENCES OF RARE PLANTS, OTHER THAN ANDERSON'S MANZANITA, BY A MINIMUM OF 10 FEET.

8.2.3. WHERE IT IS NOT POSSIBLE TO PROVIDE A MINIMUM 10-FOOT BUFFER AROUND OCCURRENCES OF RARE PLANTS, OTHER THAN ANDERSON'S MANZANITA, IMPACTS SHALL BE QUANTIFIED AND MITIGATION SHALL BE IMPLEMENTED ACCORDING TO THE REGULATORY AUTHORIZATIONS FOR THE PROJECT.

8.3. WETLANDS

8.3.1. TO THE EXTENT FEASIBLE, TRAILS SHALL BE RE-ROUTED WITHIN THE APPROVED TRAIL CORRIDOR ON AN AS-NEEDED BASIS TO AVOID ALL WETLANDS AND 100-FOOT BUFFERS.

8.3.2. WHERE WETLANDS OCCUR ON EXISTING ROADS THAT ARE TO BE USED AS TRAILS, THE TRAIL FOOTPRINT WILL BE ROUTED TO AVOID WETLANDS TO THE EXTENT FEASIBLE, WHILE MINIMIZING DISTURBANCE TO SURROUNDING AREAS.

8.3.3. TRAILS MAY IMPACT WETLANDS AND 100-FOOT BUFFERS WHERE INDICATED ON THE TRAIL IMPROVEMENT PLANS.

8.3.4. TOTAL IMPACTS TO WETLANDS IS ESTIMATED TO BE LESS THAN 0.1 ACRE.

8.4. WOODRAT NESTS

8.4.3. TO THE EXTENT FEASIBLE, TRAILS SHALL BE RE-ROUTED WITHIN THE APPROVED TRAIL CORRIDOR TO AVOID WOODRAT NESTS, PROVIDING AS LARGE OF AN UNDISTURBED BUFFER BETWEEN THE TRAIL AND NESTS AS REASONABLY POSSIBLE.

8.4.4. WHERE IT IS NOT REASONABLY POSSIBLE TO AVOID WOODRAT NESTS, EACH NEST SHALL BE DISMANTLED BY A QUALIFIED BIOLOGIST FOLLOWING GUIDANCE PROVIDED IN THE REGULATORY AUTHORIZATIONS FOR THE PROJECT.

8.5. WILDLIFE TREES

8.5.1. TO THE EXTENT FEASIBLE, TRAILS SHALL BE RE-ROUTED WITHIN THE APPROVED TRAIL CORRIDOR TO BE CONSTRUCTED OUTSIDE THE DRIPLINE OF WILDLIFE TREES.

9. **ARCHEOLOGICAL RESOURCES.** FINAL TRAIL ALIGNMENTS AND TRAIL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS IN THE CULTURAL RESOURCES STUDY PREPARED BY TOM ORIGER & ASSOCIATES.

10.**GEOTECHNICAL REQUIREMENTS.** FINAL TRAIL ALIGNMENTS AND TRAIL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS IN THE FORTHCOMING GEOTECHNICAL ENGINEERING REPORT FOR THE PROJECT, TO BE PREPARED BY PACIFIC CREST ENGINEERING, INC.

11.**COUNTY REQUIREMENTS.** TRAIL CONSTRUCTION, GRADING, DRAINAGE, AND EROSION CONTROL SHALL FOLLOW THE REQUIREMENTS OF THE SANTA CRUZ COUNTY DESIGN CRITERIA, DATED FEBRUARY 2017.

12.**CONSTRUCTION OVERSIGHT.** FINAL TRAIL ALIGNMENTS SHALL BE REVIEWED BY FALL CREEK ENGINEERING, INC. PRIOR TO CONSTRUCTION. CONSTRUCTION OF TRAILS SHALL BE OVERSEEN BY FALL CREEK ENGINEERING, INC. AND PACIFIC CREST ENGINEERING, INC.

13.**EXISTING ROADS.** EXISTING ROAD IDENTIFICATION NUMBERS REFER TO THE ROAD IDS IN THE CEMEX ROAD ASSESSMENT COMPLETED BY PACIFIC WATERSHED ASSOCIATES IN 2008 - 2009.

14.**MAPPING INCONSISTENCIES.** THERE ARE SOME MAPPING INCONSISTENCIES DUE TO THE INHERENT ERROR WITH ANY PIECE OF GPS EQUIPMENT BETWEEN SPATIAL DATA COLLECTED BY FCE, WRA ENVIRONMENTAL CONSULTANTS, THE LAND TRUST OF SANTA CRUZ COUNTY, AND OTHER DATA COLLECTORS. IT WAS DECIDED FOR THIS PROJECT TO REPRESENT THE SPATIAL DATA AS PROVIDED BY OTHER DATA COLLECTORS RATHER THAN MANIPULATE THE DATA FOR A MORE ACCURATE REPRESENTATION. DATA INCONSISTENCIES WILL BE IDENTIFIED IN NOTES IN THE TABLES ON THE TRAIL IMPROVEMENT PLANS.

15.**DESIGN REVISIONS.** THE PROJECT CIVIL ENGINEER HAS THE AUTHORITY TO MAKE REVISIONS TO THE TRAIL DESIGN AS NECESSARY DURING CONSTRUCTION.

SHEET TITLE:
SYMBOLS, ABBREVIATIONS,
LEGEND, AND NOTES

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.



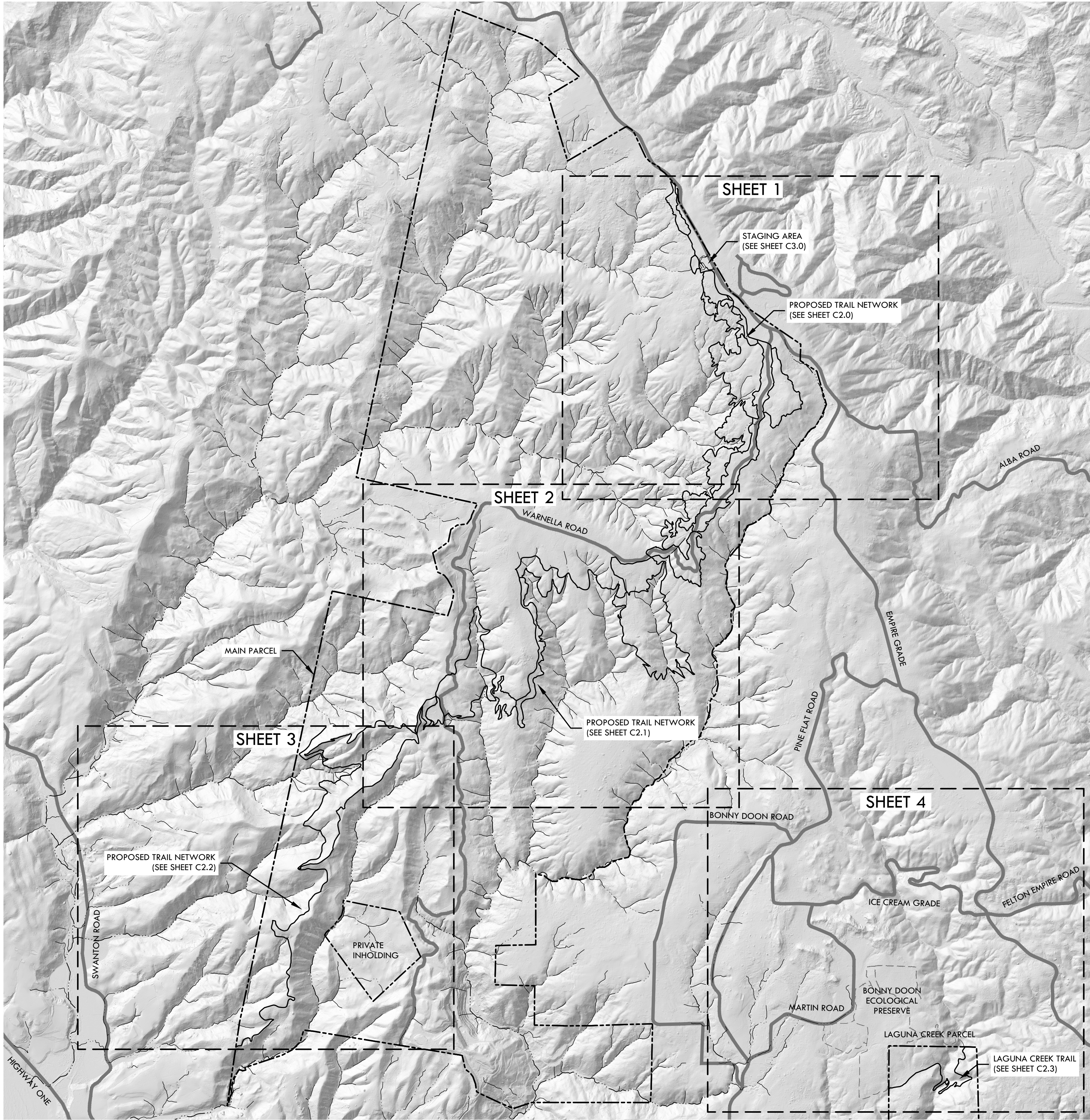
Civil • Environmental • Water Resources

1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL (831) 426-9054



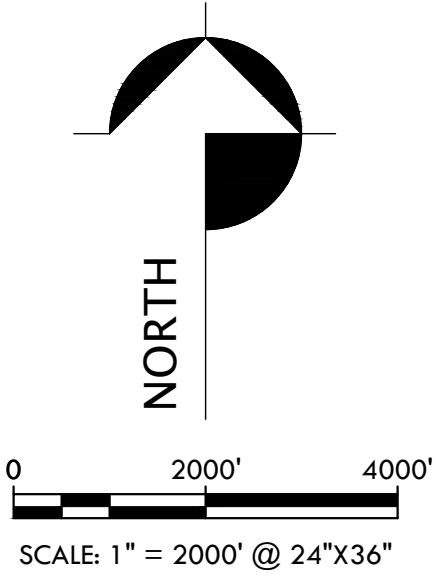
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CHECKED BY: RLC
DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
SHEET:

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- NOTES:
- HILLSHADE BACKGROUND IMAGE
EXTRACTED FROM LIDAR CONTOURS
ACQUIRED FROM SANTA CRUZ COUNTY.

- LEGEND:
- PROPERTY LINE
 - STREAM - MAJOR
 - STREAM - MINOR
 - EXISTING ROAD
 - PROPOSED TRAIL ALIGNMENT



1 OVERALL SITE PLAN

SCALE: 1" = 2000' @ 24"X36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

SHEET TITLE:
OVERALL SITE PLAN

CLIENT:

LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA 95060

PROJECT TITLE:

SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.

 **Consulting Engineers**
Civil • Environmental • Water Resources

1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL: (831) 426-9054



DRAWN BY: SLS

CHECKED BY: RLC

DATE: AUGUST 2018

JOB NO: 21514/21633

SCALE: AS SHOWN

SHEET:

C1.0

3 OF 17

24"x36" SHEET: IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



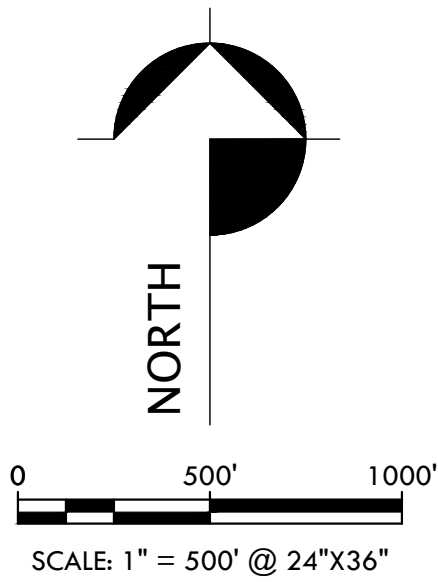
1 SITE PLAN - TRAILS - SHEET 1
SCALE: 1" = 500' @ 24"x36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

TRAIL NAME	LENGTH (FT)	TREAD WIDTH	INTENDED USE	PHASING
N2	4,745	24"	HIKE, HORSE	PHASE 1
N3	469	24"	HIKE, BIKE	PHASE 1
N4	1,179	36"	HIKE, BIKE, HORSE, DOG	PHASE 1
N5	3,594	24"	HIKE, BIKE	TBD
N6	4,195	24"	HIKE, BIKE	PHASE 1
N7	1,358	24"	HIKE, BIKE	PHASE 1
N8	1,307	24"	HIKE, BIKE	PHASE 1
N11	3,820	24"	HIKE, BIKE	TBD
N12	2,865	24"	HIKE, BIKE	TBD
N13	3,847	36"	HIKE, BIKE, HORSE, DOG	PHASE 1
N14	1,587	24"	HIKE, BIKE	PHASE 1
N16	5,464	24"	HIKE, BIKE	PHASE 2
N17	2,518	24"	HIKE, BIKE	PHASE 1
N19	1,670	24"	HIKE, BIKE	PHASE 1
N20	688	24"	HIKE, BIKE	PHASE 1
N21	1,029	24"	HIKE, BIKE, HORSE, DOG	PHASE 1
N22	3,627	24"	HIKE, BIKE, HORSE, DOG	PHASE 1
N23	2,172	24"	HIKE, BIKE, HORSE, DOG	PHASE 1
N24	8,395	24"	HIKE, HORSE	PHASE 1/2
N25	1,990	24"	HIKE, BIKE	PHASE 1
N26	3,787	24"	HIKE, BIKE	PHASE 1

- NOTES:
- TRAIL CONSTRUCTION SHALL FOLLOW STANDARD NOTES ON SHEET C0.1.
 - HILLSHADE BACKGROUND IMAGE EXTRACTED FROM LIDAR CONTOURS ACQUIRED FROM SANTA CRUZ COUNTY.

- LEGEND:
- PROPERTY LINE
 - STREAM - MAJOR
 - STREAM - MINOR
 - EXISTING ROAD
 - GATE
 - SPRING
 - WOODRAT NEST
 - WILDLIFE TREE
 - ANDERSON'S MANZANITA
 - WETLAND WITH 100-FOOT BUFFER
 - PROPOSED TRAIL ALIGNMENT
 - PROPOSED TRAIL CORRIDOR
 - PROPOSED CROSSING #X ON TRAIL Y (SEE SHEETS C2.5 & C2.6)



SHEET TITLE:
SITE PLAN - TRAILS - SHEET 1

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.
 Consulting Engineers
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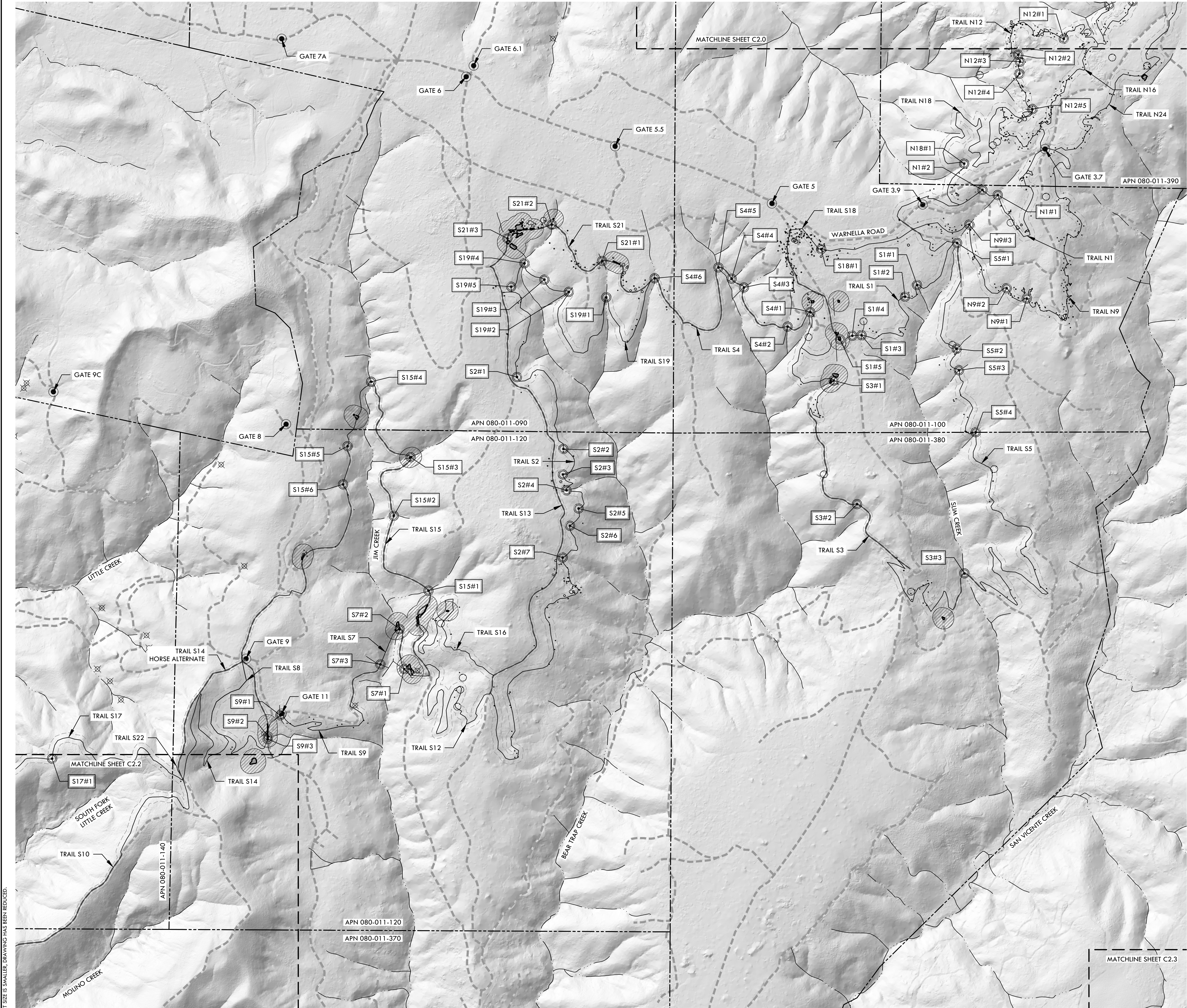
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SANTA CRUZ, CA 95062
TEL: (831) 426-9054



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DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
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4 OF 17

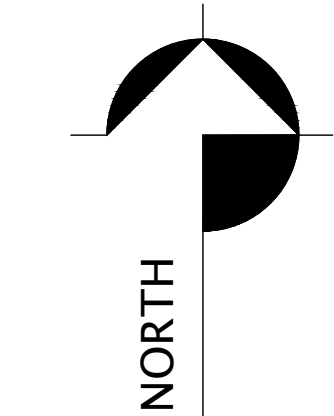
24"x36" SHEET: IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



TRAIL NAME	LENGTH (FT)	TREAD WIDTH	INTENDED USE	PHASING
N1	3,047	24"	HIKE, BIKE	PHASE 2
N9	5,116	24"	HIKE, HORSE	PHASE 2
N12	2,865	24"	HIKE, BIKE	TBD
N16	5,464	24"	HIKE, BIKE	PHASE 2
N18	4,494	24"	HIKE, BIKE	TBD
N24	8,395	24"	HIKE, HORSE	PHASE 1/2
S1	3,702	24"	HIKE, BIKE	PHASE 2
S2	7,778	24"	HIKE, BIKE	PHASE 3
S3	6,716	24"	HIKE, BIKE	PHASE 2
S4	3,236	24"	HIKE, BIKE, HORSE	PHASE 3
S5	6,998	24"	HIKE, BIKE	PHASE 2
S7	1,832	24"	HIKE, BIKE	PHASE 3
S8	1,081	24"	HIKE	PHASE 3
S9	1,839	24"	HIKE, BIKE	PHASE 3
S10	7,251	24"	HIKE, HORSE	PHASE 3
S12	3,111	24"	HIKE, BIKE	PHASE 3
S13	5,233	24"	HIKE, HORSE	PHASE 3
S14	3,235	24"	HIKE, BIKE	PHASE 3
S14 HORSE ALTERNATE	2,309	24"	HORSE ONLY	PHASE 3
S15	7,958	24"	HIKE, HORSE	PHASE 3
S16	2,481	24"	HIKE, HORSE	PHASE 3
S17	6,713	24"	HIKE, BIKE	PHASE 3
S18	2,830	24"	HIKE, HORSE	PHASE 2
S19	3,903	24"	HIKE, BIKE	PHASE 3
S21	2,575	24"	HIKE, HORSE	PHASE 3
S22	162	24"	HIKE, BIKE, HORSE	PHASE 3

- NOTES:
- TRAIL CONSTRUCTION SHALL FOLLOW STANDARD NOTES ON SHEET C0.1.
 - HILLSHADE BACKGROUND IMAGE EXTRACTED FROM LIDAR CONTOURS ACQUIRED FROM SANTA CRUZ COUNTY.

- LEGEND:
- PROPERTY LINE
 - STREAM - MAJOR
 - STREAM - MINOR
 - EXISTING ROAD
 - GATE
 - SPRING
 - WOODRAT NEST
 - WILDLIFE TREE
 - ANDERSON'S MANZANITA
 - WETLAND WITH 100-FOOT BUFFER
 - PROPOSED TRAIL ALIGNMENT
 - PROPOSED TRAIL CORRIDOR
 - PROPOSED CROSSING #X ON TRAIL Y (SEE SHEETS C2.5 & C2.6)



0 500' 1000'
SCALE: 1" = 500' @ 24"x36"

SHEET TITLE:
SITE PLAN - TRAILS - SHEET 2

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.
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SHEET:

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5 OF 17

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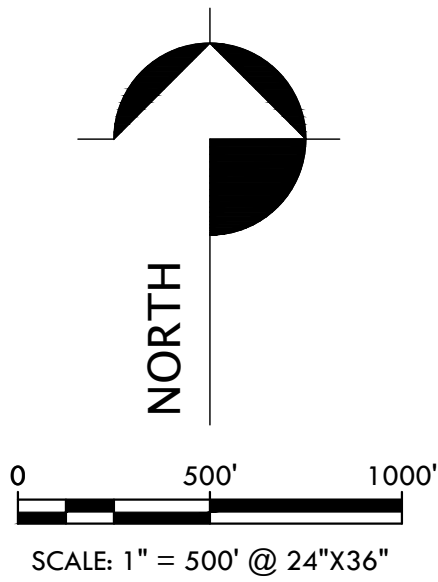
24"x36" SHEET: IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



TRAIL NAME	LENGTH (FT)	TREAD WIDTH	INTENDED USE	PHASING
S6	9,787	24"	HIKE, BIKE, HORSE	PHASE 3
S10	7,251	24"	HIKE, BIKE, HORSE	PHASE 3
S11	1,827	24"	HIKE, BIKE, HORSE	PHASE 3
S17	6,713	24"	HIKE, BIKE	PHASE 3
S20	9,630	24"	HIKE, BIKE, HORSE	PHASE 3
S22	162	24"	HIKE, BIKE, HORSE	PHASE 3

- NOTES:
- TRAIL CONSTRUCTION SHALL FOLLOW STANDARD NOTES ON SHEET C0.1.
 - HILLSHADE BACKGROUND IMAGE EXTRACTED FROM LIDAR CONTOURS ACQUIRED FROM SANTA CRUZ COUNTY.

- LEGEND:
- PROPERTY LINE
 - STREAM - MAJOR
 - STREAM - MINOR
 - EXISTING ROAD
 - GATE
 - SPRING
 - WOODRAT NEST
 - WILDLIFE TREE
 - ANDERSON'S MANZANITA
 - WETLAND WITH 100-FOOT BUFFER
 - PROPOSED TRAIL ALIGNMENT
 - PROPOSED TRAIL CORRIDOR
 - PROPOSED CROSSING #X ON TRAIL Y (SEE SHEETS C2.5 & C2.6)



1 SITE PLAN - TRAILS - SHEET 3

SCALE: 1" = 500' @ 24"x36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

SHEET TITLE:
SITE PLAN - TRAILS - SHEET 3

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
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TEL: (831) 426-9054



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DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
SHEET:

C2.2
6 OF 17

24"x36" SHEET: IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



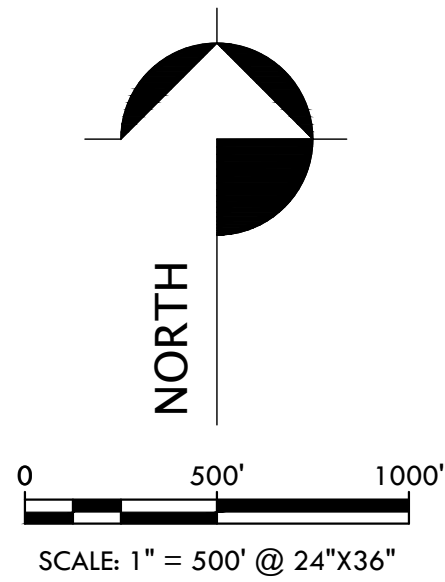
1 SITE PLAN - TRAILS - SHEET 4
SCALE: 1" = 500' @ 24"x36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

TRAIL NAME	LENGTH (FT)	TREAD WIDTH	INTENDED USE	PHASING
LCT	7,577	24"	HIKE ONLY	PHASE 1

- NOTES:
- TRAIL CONSTRUCTION SHALL FOLLOW STANDARD NOTES ON SHEET C0.1.
 - HILLSHADE BACKGROUND IMAGE EXTRACTED FROM LIDAR CONTOURS ACQUIRED FROM SANTA CRUZ COUNTY.

- LEGEND:
- PROPERTY LINE
 - STREAM - MAJOR
 - STREAM - MINOR
 - EXISTING ROAD
 - GATE
 - SPRING
 - WOODRAT NEST
 - WILDLIFE TREE
 - ANDERSON'S MANZANITA
 - WETLAND WITH 100-FOOT BUFFER
 - PROPOSED TRAIL ALIGNMENT
 - PROPOSED TRAIL CORRIDOR
 - PROPOSED CROSSING #X ON TRAIL Y (SEE SHEETS C2.5 & C2.6)



SHEET TITLE:
SITE PLAN - TRAILS - SHEET 4

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

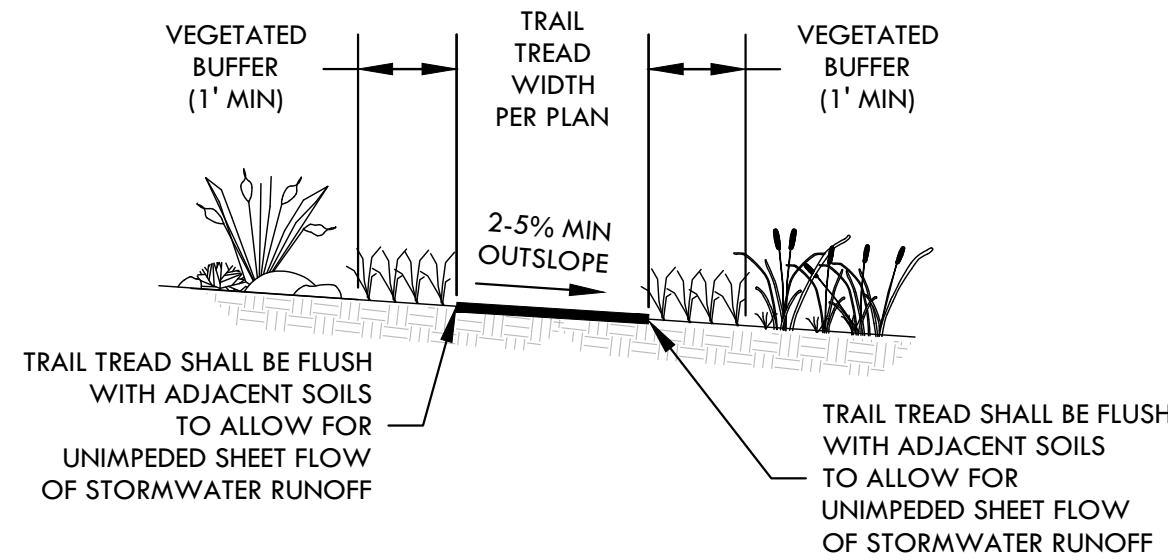
FALL CREEK ENGINEERING, INC.
 *Consulting Engineers*
Civil • Environmental • Water Resources

1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL (831) 426-9054



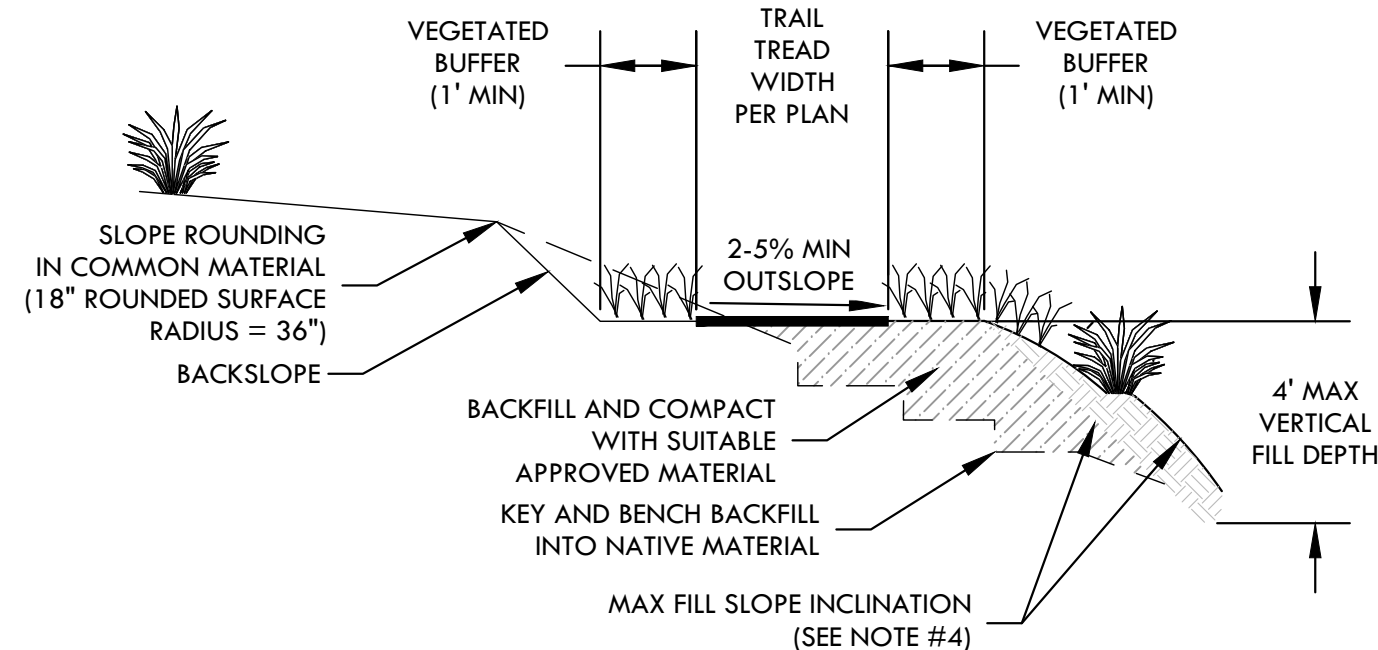
DRAWN BY: SLS
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DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
SHEET:

C2.3
7 OF 17



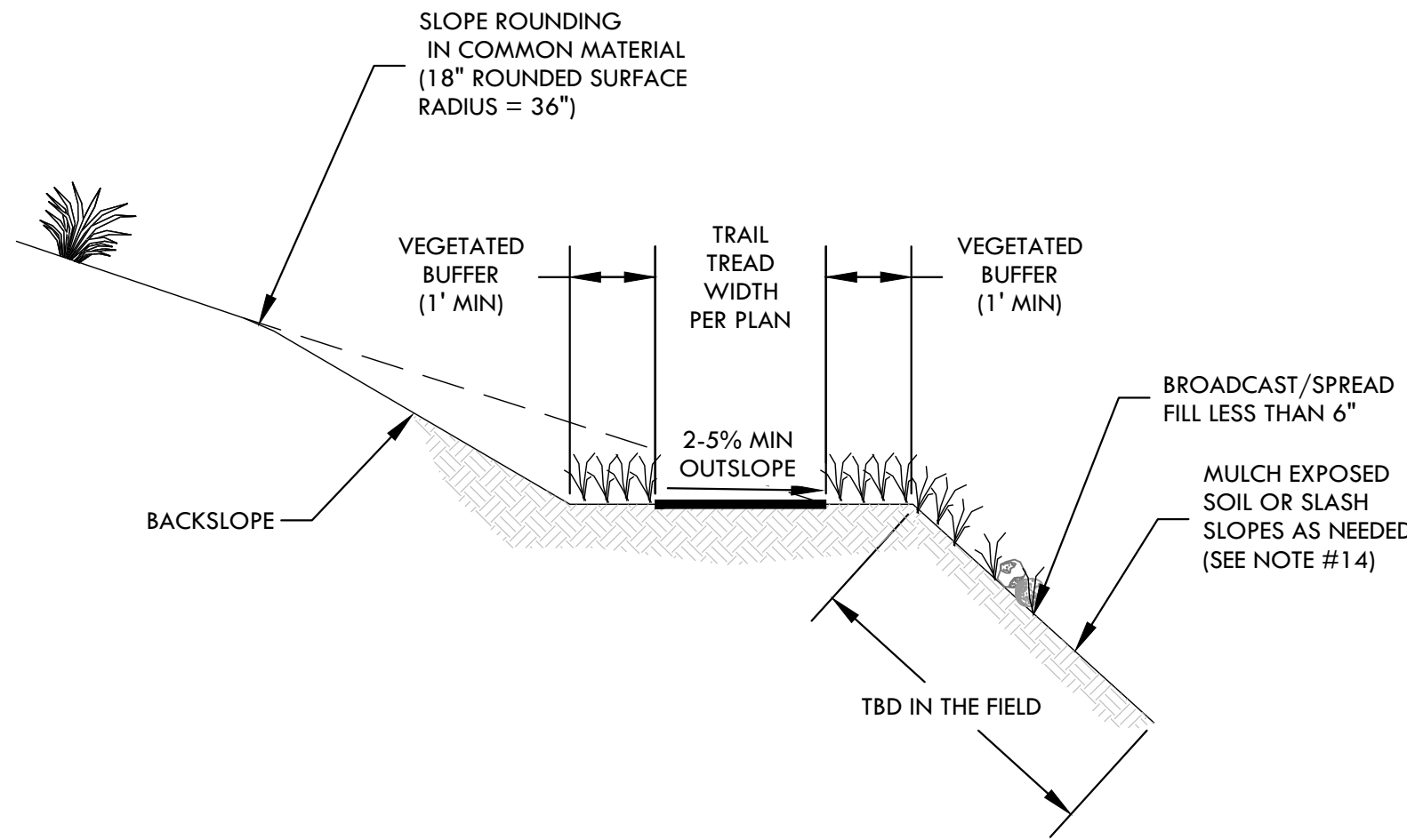
- NOTES:
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
 2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
 3. VERTICAL CLEARANCE SHALL BE A MINIMUM OF 10 FEET FOR ALL TRAILS.
 4. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
 5. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
 6. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
 7. FILL ROOT HOLES TO CREATE A SMOOTH OUTSLOPE TRAIL TREAD.
 8. COMPACT TRAIL TREAD.
 9. OUTSLOPE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE OR 2% FOR ACCESSIBLE TRAILS.
 10. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
 11. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
 12. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

INSTALL TRAIL ON GRADE



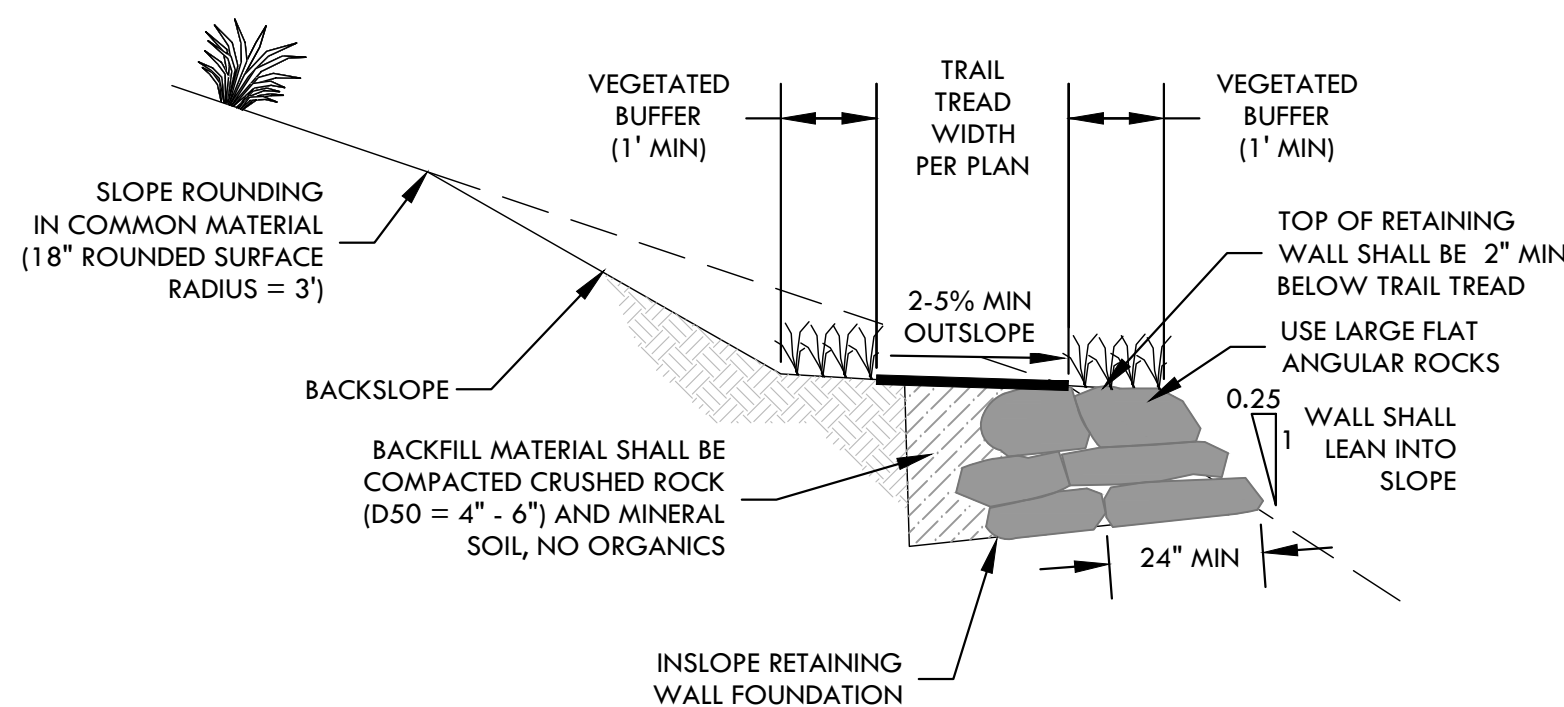
- NOTES:
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
 2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
 3. VERTICAL CLEARANCE SHALL BE A MINIMUM OF 10 FEET FOR ALL TRAILS.
 4. WHERE FILL IS TO BE PLACED ON EXISTING SLOPES STEEPER THAN 5:1 (HORIZONTAL:VERTICAL), KEY AND BENCH INTO EXISTING NATIVE MATERIAL.
 5. SURPLUS MATERIAL FROM PARTIAL BENCH TRAIL INSTALLATION SHALL BE BROADCAST BELOW TRAIL TO A DEPTH LESS THAN 6 INCHES. SOILS SHALL NOT BE BROADCAST WITHIN THE STREAM SETBACKS INDICATED IN STANDARD NOTE #5 ON SHEET C0.1.
 6. MAX CUT SLOPE (BACKSLOPE) AND FILL SLOPE (FRONTSLOPE) INCLINATION OF 1:1 (HORIZONTAL:VERTICAL) IN BEDROCK; 2:1 IN SOIL; ALTERNATIVE STEEPER SLOPES MUST BE APPROVED BY CIVIL ENGINEER.
 7. IF THESE CUT SLOPE OR FILL SLOPE INCLINATIONS RESULT IN MORE EXTENSIVE GRADING THAN DESIRABLE, AND IF INCREASED TRAIL MAINTENANCE IS ACCEPTABLE, THEN SLOPES COULD BE CONSTRUCTED AT STEEPER INCLINATIONS WHEREVER BEDROCK IS ENCOUNTERED.
 8. MINIMUM COMPACTION 85% FOR ALL FILL SLOPES.
 9. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
 10. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
 11. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
 12. FILL ROOT HOLES TO CREATE A SMOOTH OUTSLOPE TRAIL TREAD.
 13. COMPACT TRAIL TREAD.
 14. OUTSLOPE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE, 2% FOR ACCESSIBLE TRAILS.
 15. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
 16. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS. IF BROADCASTED SOILS ARE SPREAD AT A MAXIMUM THICKNESS OF 2" AND THERE IS A VEGETATIVE BUFFER DOWNSLOPE, THEN EROSION CONTROL MEASURES ARE NOT REQUIRED FOR BROADCASTED SOILS.
 17. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

PARTIAL BENCH



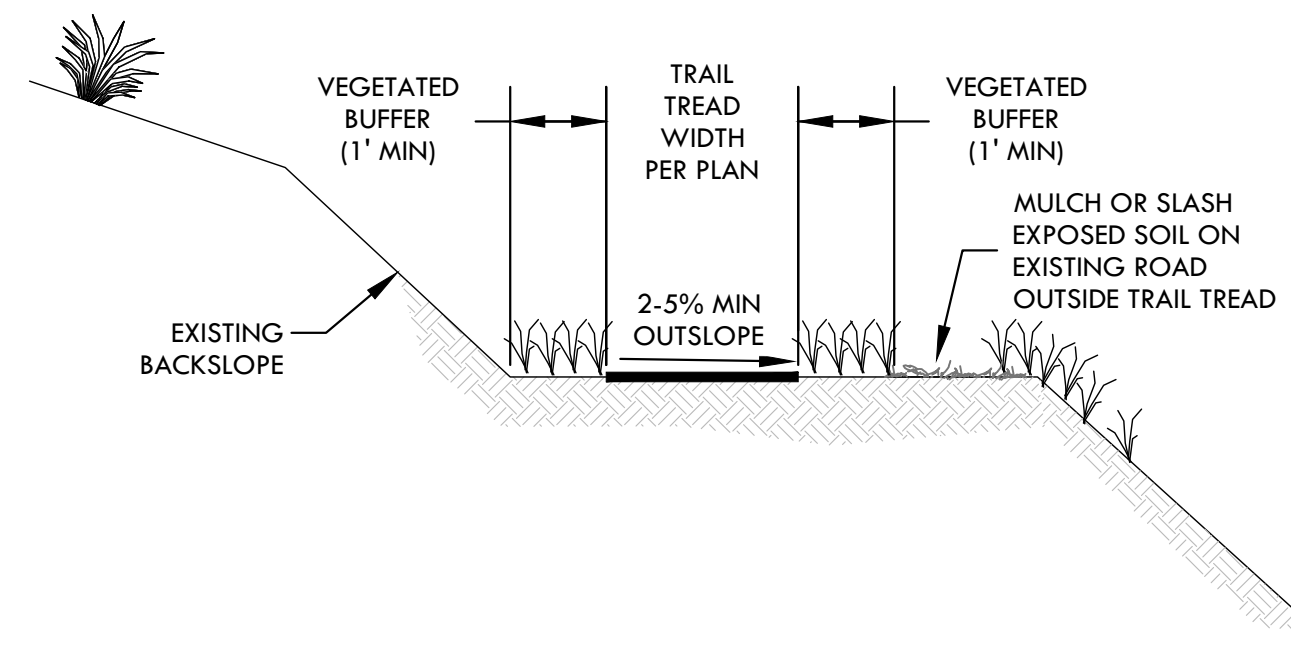
- NOTES:
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
 2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
 3. VERTICAL CLEARANCE SHALL BE A MINIMUM OF 10 FEET FOR ALL TRAILS.
 4. WHERE TRAIL CONSTRUCTED WITH FULL BENCH, BROADCAST EXCAVATED SOILS BELOW TRAIL TO A DEPTH LESS THAN 6 INCHES. SOILS SHALL NOT BE BROADCAST WITHIN THE STREAM SETBACKS INDICATED IN STANDARD NOTE #5 ON SHEET C0.1.
 5. MAX CUT SLOPE (BACKSLOPE) INCLINATION OF 1:1 (HORIZONTAL:VERTICAL) IN BEDROCK; 2:1 IN SOIL; ALTERNATIVE STEEPER BACKSLOPES MUST BE APPROVED BY CIVIL ENGINEER.
 6. IF THESE CUT SLOPE INCLINATIONS RESULT IN MORE EXTENSIVE GRADING THAN DESIRABLE, AND IF INCREASED TRAIL MAINTENANCE IS ACCEPTABLE, THEN CUT SLOPES COULD BE CONSTRUCTED AT STEEPER INCLINATIONS WHEREVER BEDROCK IS ENCOUNTERED.
 7. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
 8. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
 9. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
 10. FILL ROOT HOLES TO CREATE A SMOOTH OUTLOPE TRAIL TREAD.
 11. COMPACT TRAIL TREAD.
 12. OUTSLOPE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE, 2% FOR ACCESSIBLE TRAILS.
 13. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
 14. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS. IF BROADCASTED SOILS ARE SPREAD AT A MAXIMUM THICKNESS OF 2" AND THERE IS A VEGETATIVE BUFFER DOWNSLOPE, THEN EROSION CONTROL MEASURES ARE NOT REQUIRED FOR BROADCASTED SOILS.
 15. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

FULL BENCH



- NOTES:
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
 2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
 3. VERTICAL CLEARANCE SHALL BE A MINIMUM OF 10 FEET FOR ALL TRAILS.
 4. MAX CUT SLOPE (BACKSLOPE) INCLINATION OF 1:1 (HORIZONTAL:VERTICAL) IN BEDROCK; 2:1 IN SOIL; ALTERNATIVE STEEPER BACKSLOPES MUST BE APPROVED BY CIVIL ENGINEER.
 5. IF THESE CUT SLOPE INCLINATIONS RESULT IN MORE EXTENSIVE GRADING THAN DESIRABLE, AND IF INCREASED TRAIL MAINTENANCE IS ACCEPTABLE, THEN CUT SLOPES COULD BE CONSTRUCTED AT STEEPER INCLINATIONS WHEREVER BEDROCK IS ENCOUNTERED.
 6. LARGE FLAT ANGULAR ROCKS (50-150 POUNDS EACH) SHALL BE USED IN RETAINING WALL.
 7. CUT SLOPE BACKFILL SHALL BE CRUSHED ROCK (D50 = 4" - 6") AND MINERAL SOIL, CONTAINING NO ORGANICS.
 8. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
 9. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
 10. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
 11. FILL ROOT HOLES TO CREATE A SMOOTH OUTSLOPE TRAIL TREAD.
 12. COMPACT TRAIL TREAD.
 13. OUTSLOPE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE, 2% FOR ACCESSIBLE TRAILS.
 14. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
 15. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
 16. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

BUTTRESS TRAIL



- NOTES:
1. TRAIL INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
 2. TRAIL TREAD SHALL BE CONSTRUCTED WITH WIDTH PER PLAN WITH 1 FOOT MIN VEGETATED BUFFERS ON BOTH SIDES OF TRAIL.
 3. VERTICAL CLEARANCE SHALL BE A MINIMUM OF 10 FEET FOR ALL TRAILS.
 4. TRAIL TREAD SHALL BE LOCATED ON THE CUT SLOPE (BACKSLOPE) SIDE OF THE ROAD SECTION. HOWEVER, TRAIL CAN MEANDER ACROSS EXISTING ROAD AS NEEDED TO FACILITATE DRAINAGE AND AVOID RESOURCES AS LONG AS THE FILL SLOPE SIDE OF THE ROAD IS DETERMINED TO BE STABLE BY THE CIVIL ENGINEER.
 5. CLEAR BRUSH, TREES AND ROOTS WITHIN LIMITS OF TRAIL INSTALLATION. ROOTS SHALL BE CLEAN CUT TO AVOID TREE DAMAGE.
 6. CLEAR TOP SOIL DOWN TO CONSOLIDATED STABLE SOIL.
 7. BACKFILL TRAIL TREAD TO MATCH EXISTING GRADE. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
 8. FILL ROOT HOLES TO CREATE A SMOOTH OUTSLOPE TRAIL TREAD.
 9. COMPACT TRAIL TREAD.
 10. OUTSLOPE WHERE FEASIBLE IN DIRECTION OF NATURAL DRAINAGE WITH A MINIMUM OF 5% SLOPE, 2% FOR ACCESSIBLE TRAILS. WHERE TRAIL IS INSLOPED, ADEQUATE DRAINAGE FEATURES SHALL BE PROVIDED TO PREVENT EROSION AND SEDIMENT TRANSPORT IN INBOARD ROADSIDE DITCHES.
 11. ACCESSIBLE TRAILS MUST MEET ODA/ORAR GUIDELINES.
 12. ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
 13. THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

ROAD TO TRAIL CONVERSION

1 TYPICAL TRAIL INSTALLATION DETAILS

SCALE: AS DIMENSIONED

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

SHEET TITLE:
TRAIL INSTALLATION DETAILS

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:
SAN VICENTE REDWOODS
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CEMEX PROPERTY, EMPIRE GRADE
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DRAWN BY: SLS
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DATE: AUGUST 2018
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SCALE: AS SHOWN
SHEET:

C2.4

8 OF 17

24" x 36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.

24"x36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.

1 TYPICAL ARMORED CROSSING

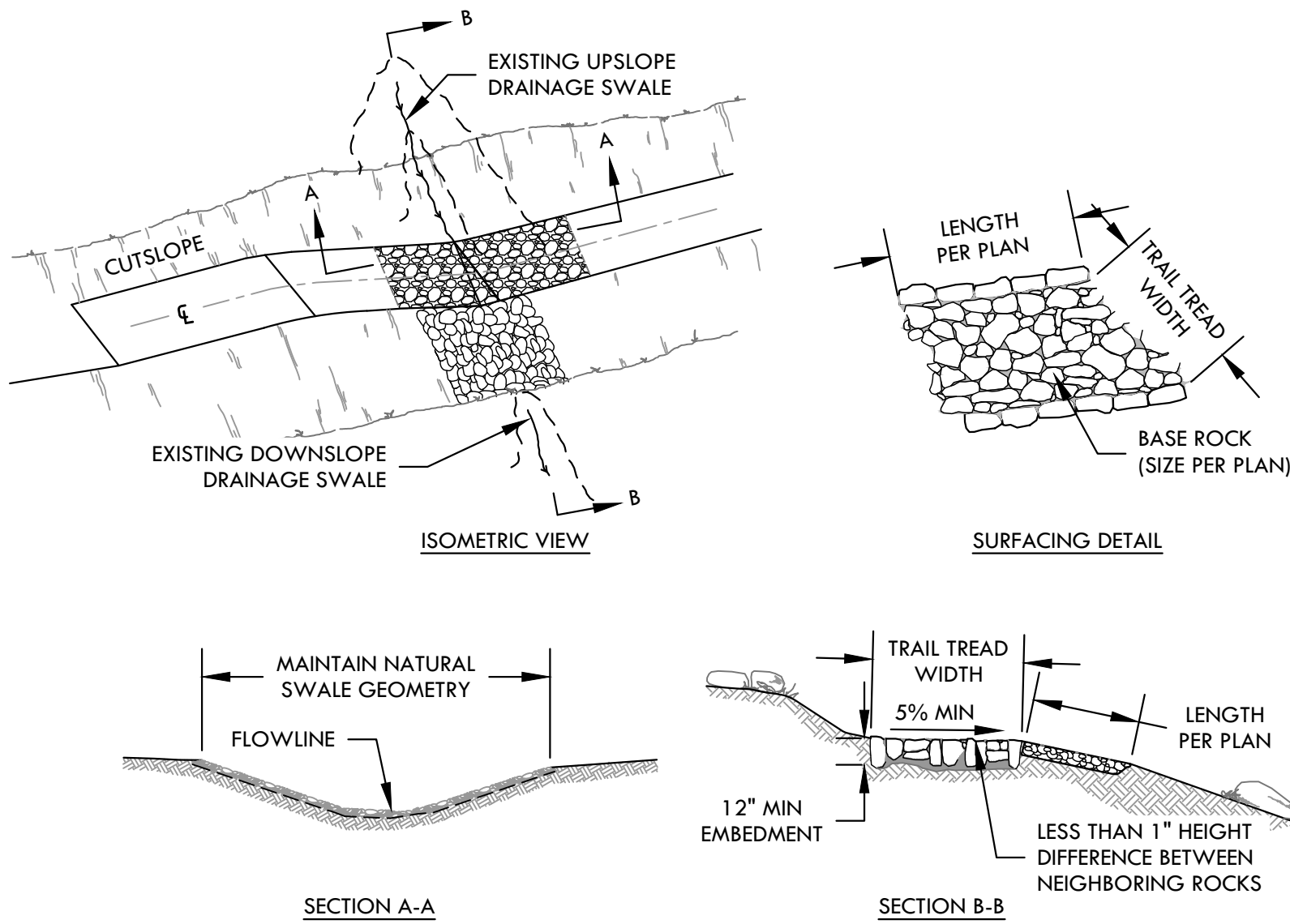
SCALE: AS DIMENSIONED

CROSSING NUMBER	TYPE	CROSSING LENGTH	CROSSING WIDTH	DOWNSTREAM ARMOR LENGTH	DOWNSTREAM ARMOR WIDTH	ROCK SIZE (D50)	25-YEAR FLOW DEPTH (FEET)	NOTES
N1 #1	TYPE 1	12.3'	5'	N/A	N/A	12"	0.39	TRAIL TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
N1 #2	TYPE 1	10.4'	5'	N/A	N/A	9"	0.253	IMPROVE DRAINAGE ON EXISTING TRAIL BY INSTALLING A GRADE REVERSAL (SEE DETAIL 3 ON SHEET C5.1)
N5 #4	TYPE 1	7.2'	5'	N/A	N/A	6"	0.138	
N6 #3	TYPE 1	6.9'	5'	N/A	N/A	6"	0.365	
N6 #4	TYPE 1	7.7'	5'	N/A	N/A	6"	0.162	
N8 #1	TYPE 1	15.8'	5'	N/A	N/A	6"	0.27	
N8 #2	TYPE 1	6.8'	5'	N/A	N/A	6"	0.398	
N9 #1	TYPE 1	7.4'	5'	N/A	N/A	9"	0.317	
N9 #2	TYPE 1	9.7'	5'	N/A	N/A	6"	0.213	
N11 #1	TYPE 1	7.0'	5'	N/A	N/A	6"	0.303	
N12 #1	TYPE 1	9.9'	5'	N/A	N/A	6"	0.164	
N12 #3	TYPE 1	8.4'	5'	N/A	N/A	9"	0.392	
N12 #4	TYPE 1	8.7'	5'	N/A	N/A	6"	0.278	
N12 #5	TYPE 1	7.6'	5'	N/A	N/A	12"	0.455	
N16 #1	TYPE 1	13.3'	5'	N/A	N/A	6"	0.322	
N17 #2	TYPE 1	6.0'	5'	N/A	N/A	6"	0.333	CHANNEL TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
N18 #1	TYPE 1	8.0'	5'	N/A	N/A	9"	0.299	
N19 #1	TYPE 1	6.3'	5'	N/A	N/A	6"	0.298	
N21 #1	TYPE 2	13.6'	5'	5'	5'	6"	0.28	
N24 #1	TYPE 1	6.2'	5'	N/A	N/A	9"	0.544	
N25 #1	TYPE 1	6.1'	5'	N/A	N/A	6"	0.206	CHANNEL TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
N25 #2	TYPE 1	5.3'	5'	N/A	N/A	6"	0.288	
N25 #3	TYPE 1	5.5'	5'	N/A	N/A	9"	0.169	CHANNEL TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
N26 #1	TYPE 1	6.3'	5'	N/A	N/A	6"	0.309	
N26 #2	TYPE 1	6.8'	5'	N/A	N/A	6"	0.445	CHANNEL TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
S2 #1	TYPE 1	15.3'	5'	N/A	N/A	6"	0.332	
S2 #2	TYPE 1	10.0'	5'	N/A	N/A	6"	0.212	
S2 #3	TYPE 1	11.5'	5'	N/A	N/A	9"	0.464	
S5 #4	TYPE I	10.9'	5'	N/A	N/A	12"	0.33	
S9 #3	TYPE 1	9.4'	5'	N/A	N/A	6"	0.863	ROAD SIDE DITCH TO BE GRADED TO ACCOMMODATE 25-YEAR DEPTH OF FLOW
S17 #1	TYPE 1	3.9'	5'	N/A	N/A	9"	0.227	
S17 #2	TYPE 1	2.5'	5'	N/A	N/A	6"	0.324	
S19 #2	TYPE 1	14.9'	5'	N/A	N/A	6"	0.321	
S19 #3	TYPE 1	7.6'	5'	N/A	N/A	9"	0.248	
S19 #5	TYPE 1	9.2'	5'	N/A	N/A	6"	0.215	

NOTES:

- CROSSING INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
- TRAIL SHALL BE INSTALLED TO FOLLOW NATURAL UNDULATION OF SWALE AT CROSSING, AND TO NOT IMPEDE FLOW THROUGH SWALE.
- REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
- BACKFILL TO PROVIDE LEVELING AND SUPPORT OF BASE ROCK. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
- LAY ROCK WITH A MINIMUM OF 3 POINTS OF CONTACT WITH ADJACENT ROCKS.
- LAY ROCKS IN A RANDOM ARRANGEMENT.
- FILL VOIDS WITH BROKEN ROCK OR SUITABLE BACKFILL. COMPACT BACKFILL TO PROVIDE A STABLE SURFACE.
- ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
- THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

TYPE 1 - ARMORED CROSSING



NOTES:

- CROSSING INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
- TRAIL SHALL BE INSTALLED TO FOLLOW NATURAL UNDULATION OF SWALE AT CROSSING, AND TO NOT IMPEDE FLOW THROUGH SWALE.
- REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
- BACKFILL TO PROVIDE LEVELING AND SUPPORT OF BASE ROCK. BACKFILL MATERIAL SHALL BE ONSITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
- LAY ROCK WITH A MINIMUM OF 3 POINTS OF CONTACT WITH ADJACENT ROCKS.
- LAY ROCKS IN A RANDOM ARRANGEMENT.
- FILL VOIDS WITH BROKEN ROCK OR SUITABLE BACKFILL. COMPACT BACKFILL TO PROVIDE A STABLE SURFACE.
- ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
- THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

TYPE 2 - ARMORED CROSSING WITH DOWNSTREAM ARMOR

CROSSING NUMBER	PUNCHEON LENGTH	PUNCHEON WIDTH	PUNCHEON HEIGHT (FEET)	25-YEAR FLOW DEPTH (FEET)	NOTES
LCT #1	14'-0"	5'-0"	1.13	0.91	
LCT #2	14'-0"	5'-0"	0.33	0.31	
LCT #4	22'-0"	5'-0"	0.71	0.7	
N5 #1	8'-0"	5'-0"	0.77	0.27	
N5 #3	8'-0"	5'-0"	1.14	0.1	
N5 #5	8'-0"	5'-0"	0.77	0.16	
N5 #7	10'-0"	5'-0"	1	0.51	
N9 #3	10'-0"	5'-0"	0.25	0.52	
N25 #4	8'-0"	5'-0"	0.77	0.19	
N25 #5	10'-0"	5'-0"	1.39	0.3	
S1 #1	14'-0"	5'-0"	0.8	0.32	
S1 #2	16'-0"	5'-0"	0.4	0.16	
S1 #4	14'-0"	5'-0"	1.83	0.12	
S2 #4	12'-0"	5'-0"	1.02	0.27	
S3 #1	20'-0"	5'-0"	0.57	0.23	
S5 #3	10'-0"	5'-0"	1.72	0.46	
S5 #4	8'-0"	5'-0"	1.72	0.25	INCLUDE ARMORED CROSSING ON RIGHT BANK APPROACH TO CROSSING (SEE DETAIL 1 ON SHEET C5.6)

NOTES:

- FOR TYPICAL PUNCHEON DETAIL, SEE SHEET S2.
- CONSTRUCTION OF PUNCHEONS SHALL FOLLOW STRUCTURAL NOTES AND SPECIFICATIONS AND RECOMMENDATIONS IN THE PROJECT GEOTECHNICAL ENGINEERING REPORT.
- PUNCHEONS ARE INTENDED TO BE MINIMAL STRUCTURES THAT ARE NOT FIXED IN PLACE. DURING LARGE ENOUGH STORM EVENTS, PUNCHEONS MAY BE MOBILIZED.

2 PUNCHEON SCHEDULE

SCALE: AS DIMENSIONED

CROSSING NUMBER	BRIDGE LENGTH	BRIDGE WIDTH	BRIDGE HEIGHT (FEET)	100-YEAR FLOW DEPTH (FEET)	FREEBOARD (FEET)	PLAN AND PROFILE SHEET
N17 #3	26'-0"	5'-0"	3.54	0.56	2.98	C4.0
N17 #4	14'-0"	5'-0"	2.26	0.42	1.84	C4.1
N6 #1	20'-0"	5'-0"	4.84	0.61	4.23	C4.2
N6 #2	14'-0"	5'-0"	2.85	0.6	2.25	C4.3
N6 #5	16'-0"	5'-0"	2.38	1.1	1.28	C4.4
N5 #6	16'-0"	5'-0"	3.13	0.65	2.48	C4.5
N11 #2	18'-0"	5'-0"	2.55	0.9	1.65	C4.6
N12 #2	10'-0"	5'-0"	2.05	0.17	1.88	C4.7
S5 #2	14'-0"	5'-0"	2.1	0.25	1.85	C4.8
S1 #3	14'-0"	5'-0"	1.97	0.24	1.73	C4.9
S19 #1	22'-0"	5'-0"	5.17	0.57	4.6	C4.10
S19 #4	36'-0"	5'-0"	9.81	1.12	8.69	C4.11
S15 #3	22'-0"	5'-0"	3.16	0.77	2.39	C4.12
S15 #4	42'-0"	5'-0"	5.71	1.21	4.5	C4.13
S15 #6	18'-0"	5'-0"	1.63	0.16	1.47	C4.14
S17 #3	20'-0"	5'-0"	5.38	0.53	4.85	C4.15

NOTES:

- FOR TYPICAL BRIDGE DETAILS, SEE SHEET S1.
- CONSTRUCTION OF BRIDGES SHALL FOLLOW STRUCTURAL NOTES AND SPECIFICATIONS AND RECOMMENDATIONS IN THE PROJECT GEOTECHNICAL ENGINEERING REPORT.
- BRIDGES ARE SIZED TO PASS THE 100-YEAR STORM WITH DEBRIS (MINIMUM 1 FOOT FREEBOARD).

3 BRIDGE SCHEDULE

SCALE: AS DIMENSIONED

CROSSING NUMBER	TYPE
LCT #3	SEASONAL ROCK HOP
N5 #2	NO IMPROVEMENT - WAIT AND WATCH
N17 #1	NO IMPROVEMENT - WAIT AND WATCH
N25 #6	NO IMPROVEMENT - WAIT AND WATCH
S2 #5	NO IMPROVEMENT - WAIT AND WATCH
S2 #6	NO IMPROVEMENT - WAIT AND WATCH
S2 #7	NO IMPROVEMENT - WAIT AND WATCH
S6 #1	NO IMPROVEMENT - WAIT AND WATCH
S6 #6	NO IMPROVEMENT - WAIT AND WATCH
S6 #7	NO IMPROVEMENT - WAIT AND WATCH
S15 #1	NO IMPROVEMENT - WAIT AND WATCH
S15 #2	NO IMPROVEMENT - WAIT AND WATCH
S18 #1	NO IMPROVEMENT - WAIT AND WATCH

NOTES:

- WAIT AND WATCH CROSSINGS SHALL BE MONITORED FOR SEDIMENT TRANSPORT AND WET AREAS. THESE CROSSINGS SHALL BE HARDENED IN THE FUTURE, AS NEEDED.

4 NO IMPROVEMENT AND WAIT & WATCH CROSSINGS SCHEDULE

SCALE: AS DIMENSIONED

SHEET TITLE:

TRAIL CROSSING DETAILS

CLIENT:

LAND TRUST OF SANTA CRUZ COUNTY

ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:

SAN VICENTE REDWOODS

PROPOSED TRAIL NETWORK AND STAGING AREA
CEMEX PROPERTY, EMPIRE GRADE
SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.

 Consulting Engineers
Civil • Environmental • Water Resources

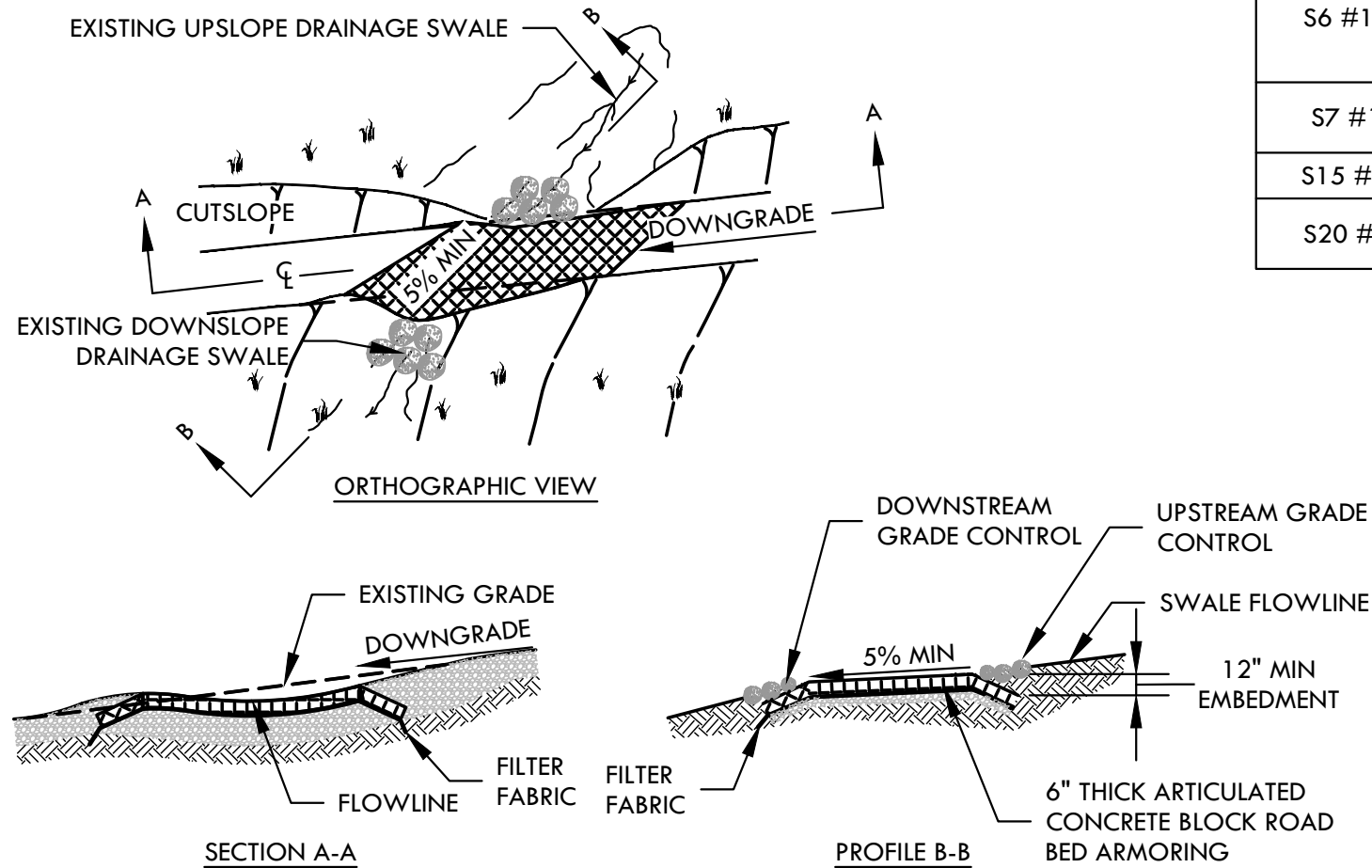
1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL (831) 426-9054



DRAWN BY: SLS
CHECKED BY: RLC
DATE: AUGUST 2018
JOB NO: 21514/21633
SCALE: AS SHOWN
SHEET:

C2.5

24"x36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



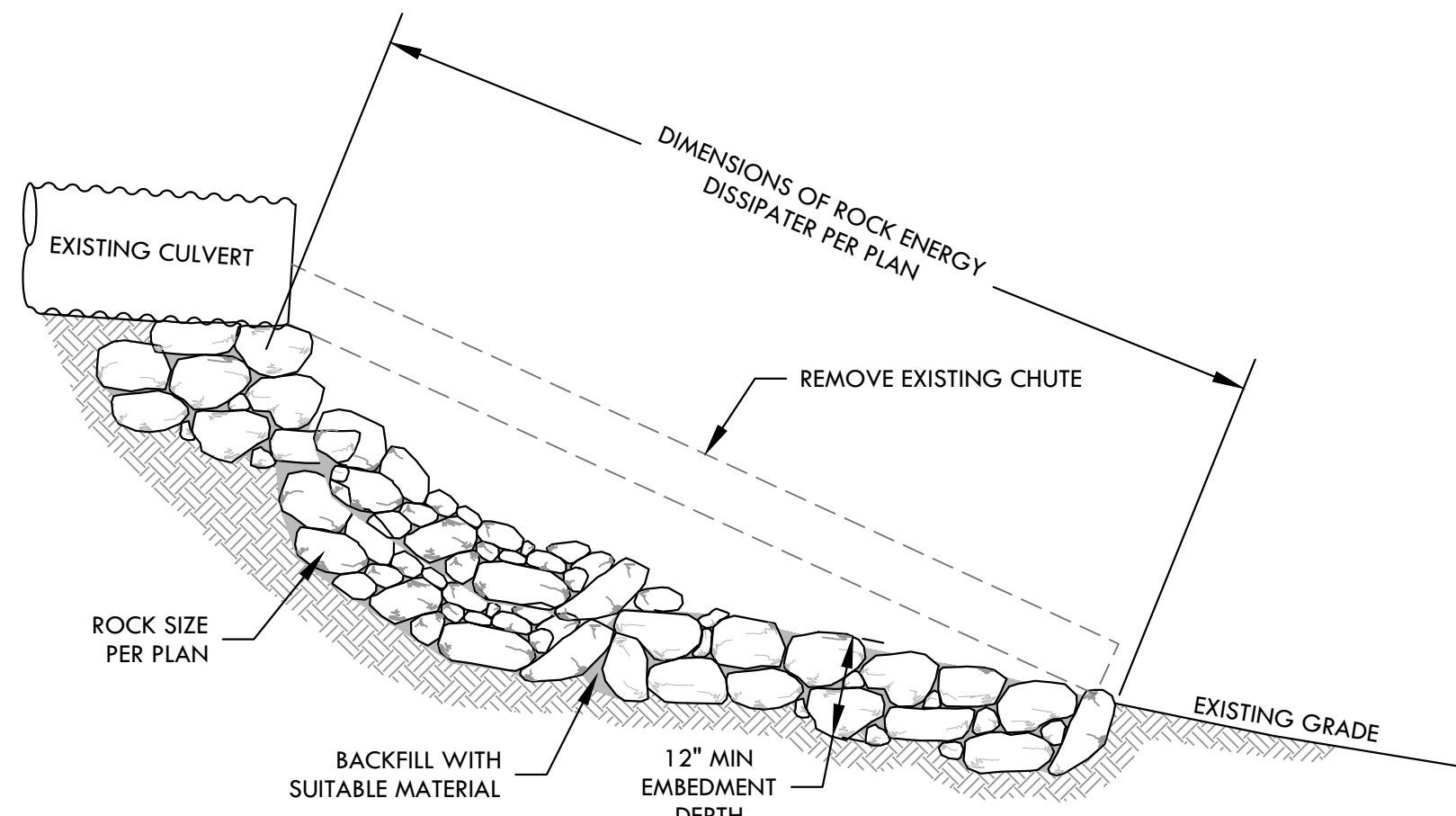
CROSSING NUMBER	TYPE	CLASS	CROSSING LENGTH	CROSSING WIDTH	DOWNSTREAM ARMOR LENGTH	DOWNSTREAM ARMOR WIDTH	ROCK SIZE (D50)	25-YEAR FLOW DEPTH (FEET)	NOTES
S1 #5	TYPE 1	III	11.4'	10'	N/A	N/A	6"	0.403	
S3 #2	TYPE 1	SWALE	19.6'	10'	N/A	N/A	6"	0.116	ROAD TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
S4 #4	TYPE 1	III	13.1'	10'	N/A	N/A	6"	0.095	ROAD TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
S4 #5	TYPE 1	III	40'	15'	N/A	N/A	9"	1.39	
S5 #1	TYPE 1	III	50'	10'	N/A	N/A	18"	1.373	
S6 #3	TYPE 2	III	15.2'	10'	7.4'	5'	6"	0.112	
S6 #4	TYPE 1	SPRING	21.5'	10'	N/A	N/A	6"	0.194	
S6 #10	TYPE 1	SWALE	14.6'	10'	N/A	N/A	6"	0.254	ROAD TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW. INSTALL A GRADE REVERSAL TO IMPROVE DRAINAGE ON ROAD (SEE DETAIL 3 ON SHEET C5.1).
S6 #11	TYPE 1	SWALE	6.1'	10'	N/A	N/A	12"	0.374	IMPROVE ROAD DRAINAGE BY OUT-SLOPING ROAD AT 2% AND MAINTAINING A DOWNSTREAM EDGE SO A BERM DOESN'T BUILD UP
S7 #1	TYPE 1	SWALE	7'	20'	N/A	N/A	6"	0.85	ROAD TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW
S15 #5	TYPE 2	III	16.9'	40'	23'	4' - 8'	9"	0.208	
S20 #1	TYPE 2	SWALE	22.8'	17.4'	28'	10'	9"	0.208	ROAD TO BE GRADED TO ACCOMMODATE THE 25-YEAR DEPTH OF FLOW

NOTES:

- CROSSING INSTALLATION SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
- REMOVE AND DISPOSE OF DUFF AND TOP ORGANIC LAYERS DOWN TO MINERAL SOIL.
- SUBGRADE SHALL BE OVEREXCAVATED AND RECOMPACTED TO AVOID SETTLING OF ARTICULATED CONCRETE BLOCKS.
- BACKFILL TO PROVIDE LEVELING AND SUPPORT OF ARTICULATED CONCRETE BLOCKS. BACKFILL MATERIAL SHALL BE ON-SITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
- COMPACT BACKFILL IN 6 INCH LIFTS TO 95% RELATIVE COMPACTION.
- ARTICULATED CONCRETE BLOCKS TO BE BEDDED AND BACKFILLED WITH COMPACTED FINES TO CREATE A SMOOTH DRIVING SURFACE.
- ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
- THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

1 TYPICAL ARMORED ROAD CROSSING

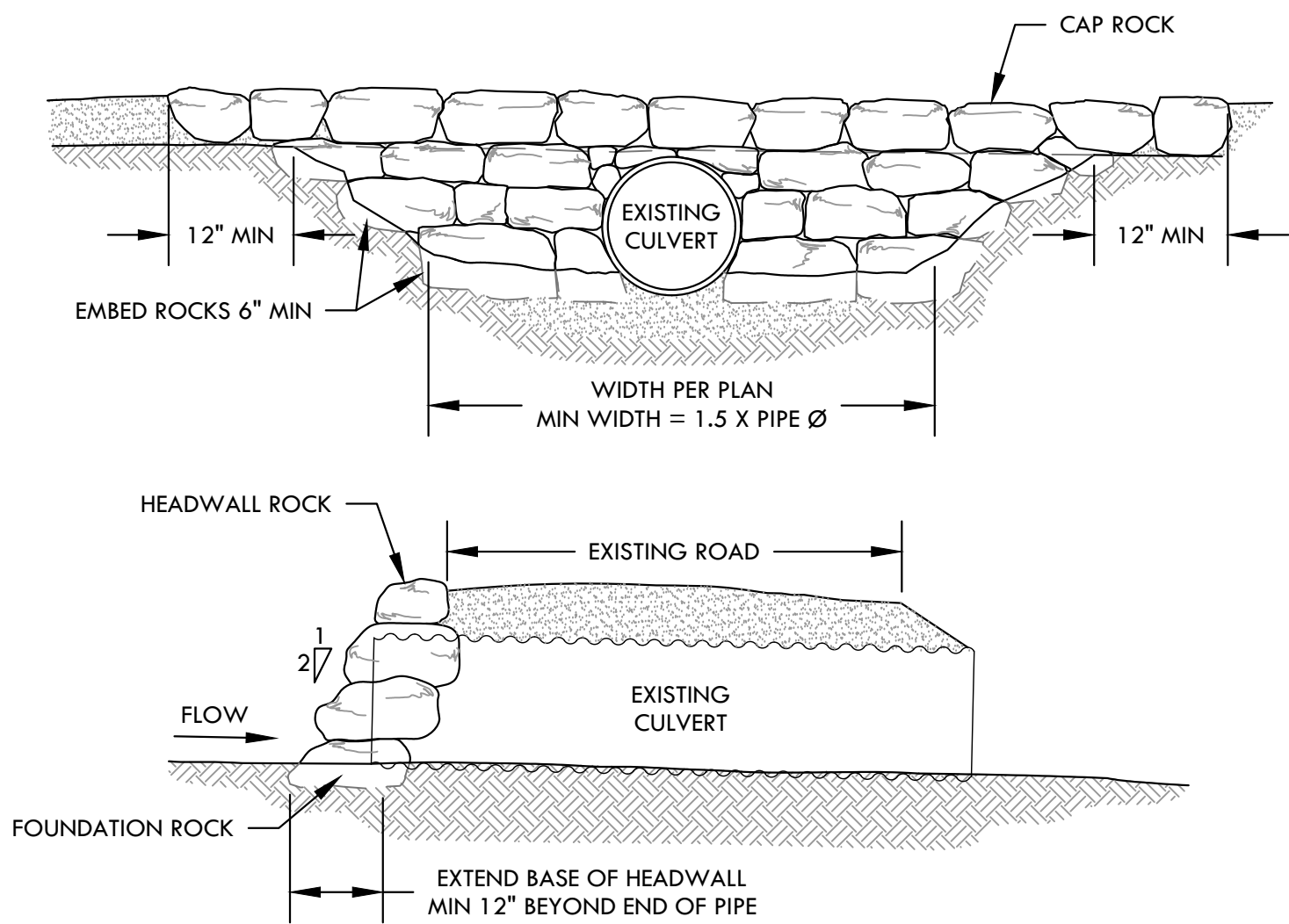
SCALE: AS DIMENSIONED



NOTES:

- CULVERT IMPROVEMENT SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
- ROCK ENERGY DISSIPATER SHALL BE CONSTRUCTED WITH APPROVED, WELL-GRADED, SOUND, DURABLE, ANGULAR ROCK. D50 ROCK SIZE PER PLAN.
- OVEREXCAVATE AND COMPACT BACKFILL TO PROVIDE LEVELING AND SUPPORT OF BASE ROCK. BACKFILL MATERIAL SHALL BE ON-SITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
- LAY ROCK WITH A MINIMUM OF 3 POINTS OF CONTACT WITH ADJACENT ROCKS.
- LAY ROCKS IN A RANDOM ARRANGEMENT.
- ROCKS SHALL BE KEYED IN PLACE AND VOIDS FILLED WITH FINER MATERIAL.
- FILL VOIDS WITH BROKEN ROCK OR SUITABLE BACKFILL. COMPACT BACKFILL TO LOCK IN PLACE.
- ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
- THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

REMOVE CHUTE AND INSTALL ROCK ENERGY DISSIPATER



NOTES:

- CULVERT IMPROVEMENT SHALL FOLLOW DETAIL UNLESS OTHERWISE SPECIFIED ON PLANS OR DIRECTED IN FIELD.
- HEADWALL SHALL BE CONSTRUCTED WITH APPROVED, SOUND, DURABLE, ANGULAR ROCK.
- OVEREXCAVATE AND COMPACT BACKFILL TO PROVIDE LEVELING AND SUPPORT OF HEADWALL. BACKFILL MATERIAL SHALL BE ON-SITE SOIL, FREE OF ORGANICS AND AGGREGATE LARGER THAN 2 INCHES.
- COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
- ROCKS SHALL BE KEYED IN PLACE AND VOIDS FILLED WITH FINER MATERIAL.
- FILL VOIDS WITH BROKEN ROCK OR SUITABLE BACKFILL. COMPACT BACKFILL TO LOCK IN PLACE.
- ALL DISTURBED AREAS OUTSIDE TRAIL TREAD SHALL BE TREATED WITH EROSION CONTROL MEASURES PER PLANS AND SPECIFICATIONS. INSTALL NATIVE SLASH PERPENDICULAR TO TRAIL IN DISTURBED AREAS.
- THESE DETAILS ARE INTENDED AS A GUIDELINE; MODIFICATIONS MAY BE MADE IN THE FIELD BY ENGINEER.

INSTALL CULVERT HEADWALL

CROSSING NUMBER	PWA ID	CLASS	CULVERT SIZE AND MATERIAL	CULVERT LENGTH	CHUTE LENGTH	IMPROVEMENT
S3 #3	#88	I	24"Ø CMP	40'	N/A	NO IMPROVEMENT - CULVERT REPLACEMENT PLANNING UNDER THE CURRENT THP
S4 #1	#23	II/III	15"Ø CMP	30'	18'	REMOVE CHUTE, GRADE OVER-STEEPENED AREAS TO REDUCE SLOPE, AND INSTALL RIPRAP (11" WIDE BY 17" LONG, D50 = 9") AT CULVERT OUTLET ALONG CHUTE FLOW PATH AND OVER CULVERT. WAIT AND WATCH ROAD CONDITION AND ARMOR ROAD IF NEEDED (SEE DETAIL 1 ON SHEET C5.6)
S4 #2	#2	III	15"Ø CMP	30'	10'	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED. INSTALL RIPRAP (6.2' WIDE BY 7' LONG, D50 = 6") PLUNGE POOL AT CHUTE OUTLET.
S4 #3	#3	III	18"Ø CMP	25'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED.
S4 #5	#5	III	18"Ø CMP	40'	N/A	REMOVE CULVERT AND INSTALL ARMORED ROAD CROSSING WITH DOWNSTREAM ARMOR (SEE DETAIL 1 ON SHEET C5.6)
S4 #6	#6	II/III	15"Ø CMP	40'	8'	REMOVE CHUTE AND INSTALL RIPRAP (6' WIDE BY 10' LONG, D50 = 9") AT CULVERT OUTLET
S5 #1	#86	III	18"Ø CMP	40'	N/A	REMOVE CULVERT AND INSTALL ARMORED ROAD CROSSING WITH DOWNSTREAM ARMOR (SEE DETAIL 1 ON SHEET C5.6)
S6 #2	#6	II/III	15"Ø CMP	20'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED.
S6 #5	#205	III	36"Ø CMP	30'	N/A	INSTALL HEADWALL AT INLET. INSTALL CONCRETE ALONG FLOWLINE OF CULVERT. INSTALL RIPRAP (10' WIDE BY 5' LONG, D50 = 9") AT CULVERT OUTLET.
S6 #8	#201	III	18"Ø CMP	40'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED.
S6 #9	#200	III	15"Ø CMP	20'	N/A	REMOVE FALLEN TREE AND DEBRIS AT INLET OF CULVERT AND REASSESS TO DETERMINE IF CULVERT NEEDS IMPROVEMENT.
S7 #1	#34	III	12"Ø CMP	20'	N/A	REMOVE CULVERT AND INSTALL ARMORED ROAD CROSSING (SEE DETAIL 1 ON SHEET C5.6).
S7 #2	#33	I				NO IMPROVEMENT - CULVERT WAS RECENTLY REPLACED
S7 #3	#32	SWALE	15"Ø CMP	20'	N/A	REMOVE AND REPLACE BROKEN INLET SECTION OF CULVERT. INSTALL RESOURCE PROTECTION FENCING (SEE DETAIL 7 ON SHEET C5.3) TO PREVENT VEHICLES FROM DRIVING OVER INLET SECTION WHERE THERE IS INSUFFICIENT SOIL COVER.
S9 #1	#31	III	15"Ø CMP	20'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED.
S9 #2	#44	IV	24"Ø CMP	20'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED.
S15 #5	N/A	III	24"Ø CMP	40'	N/A	REMOVE CULVERT AND INSTALL ARMORED ROAD CROSSING WITH DOWNSTREAM ARMOR (SEE DETAIL 1 ON SHEET C5.6)
S20 #1	#154	SWALE	15"Ø CMP	20'	15'	REMOVE CULVERT AND INSTALL ARMORED ROAD CROSSING WITH DOWNSTREAM ARMOR (SEE DETAIL 1 ON SHEET C5.6)
S21 #1	#7	III	15"Ø CMP	40'	N/A	WAIT AND WATCH CULVERT AND REPLACE IF NEEDED. INSTALL RIPRAP (10' WIDE BY 5' LONG, D50 = 9") AT CULVERT OUTLET.
S21 #2	#8	II	15"Ø CMP	40'	8'	REMOVE CHUTE AND INSTALL RIPRAP (10' WIDE BY 7' LONG, D50 = 12") AT CULVERT OUTLET
S21 #3	#9	II	15"Ø CMP	20'	6'	INSTALL HEADWALL AT INLET. REMOVE CHUTE AND INSTALL RIPRAP (15' WIDE BY 7' LONG, D50 = 9") AT CULVERT OUTLET

2 TYPICAL CULVERT IMPROVEMENT

SCALE: AS DIMENSIONED

SHEET TITLE:

ROAD CROSSING DETAILS

CLIENT:

LAND TRUST OF SANTA CRUZ COUNTY

ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:

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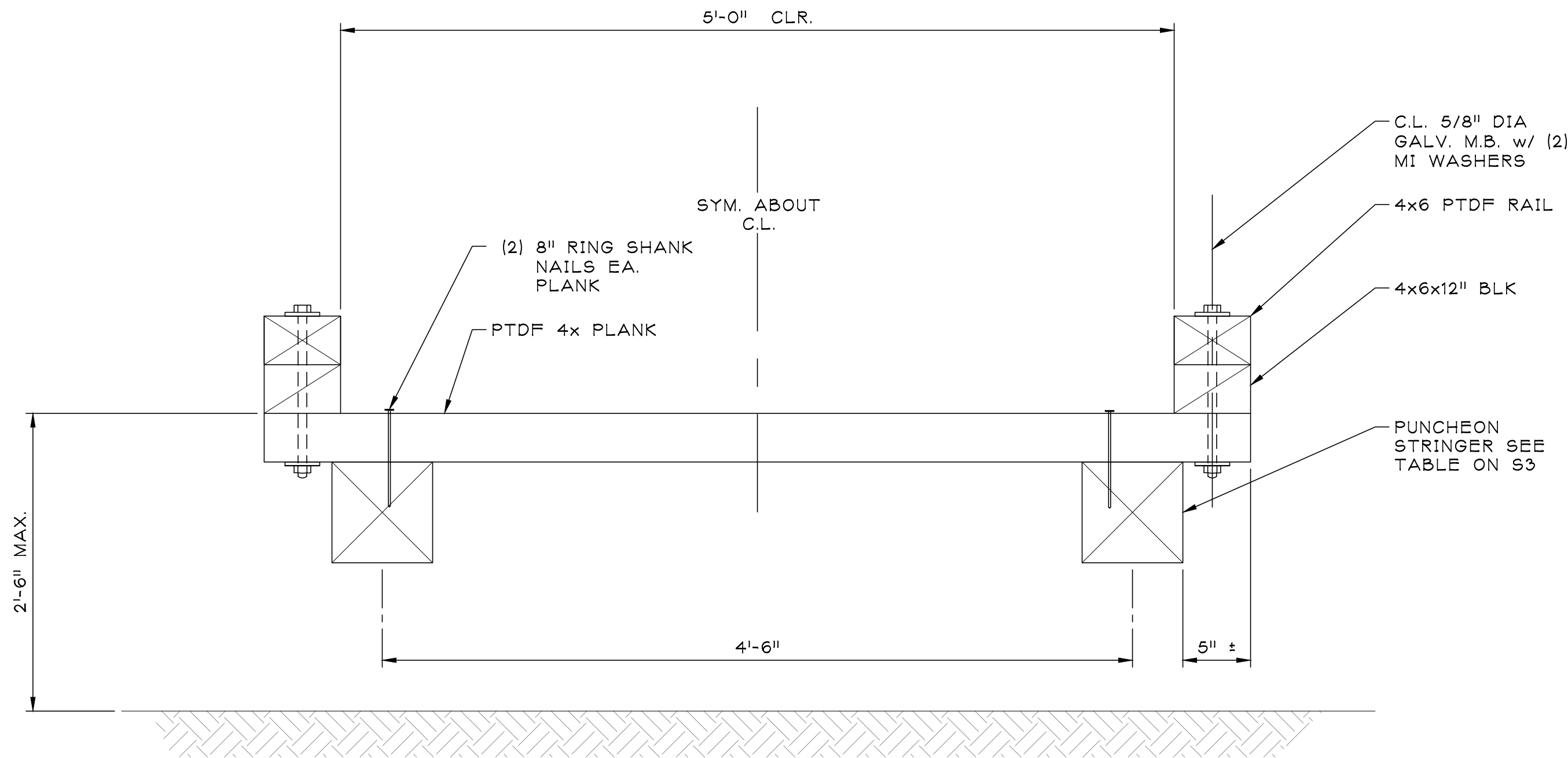


BRIDGE STRINGER BEAM SIZES



- STRINGER LENGTH OUT-TO-OUT AND RAILING SYSTEM
- STRINGER SPAN (CL BEARING - CL BEARING)



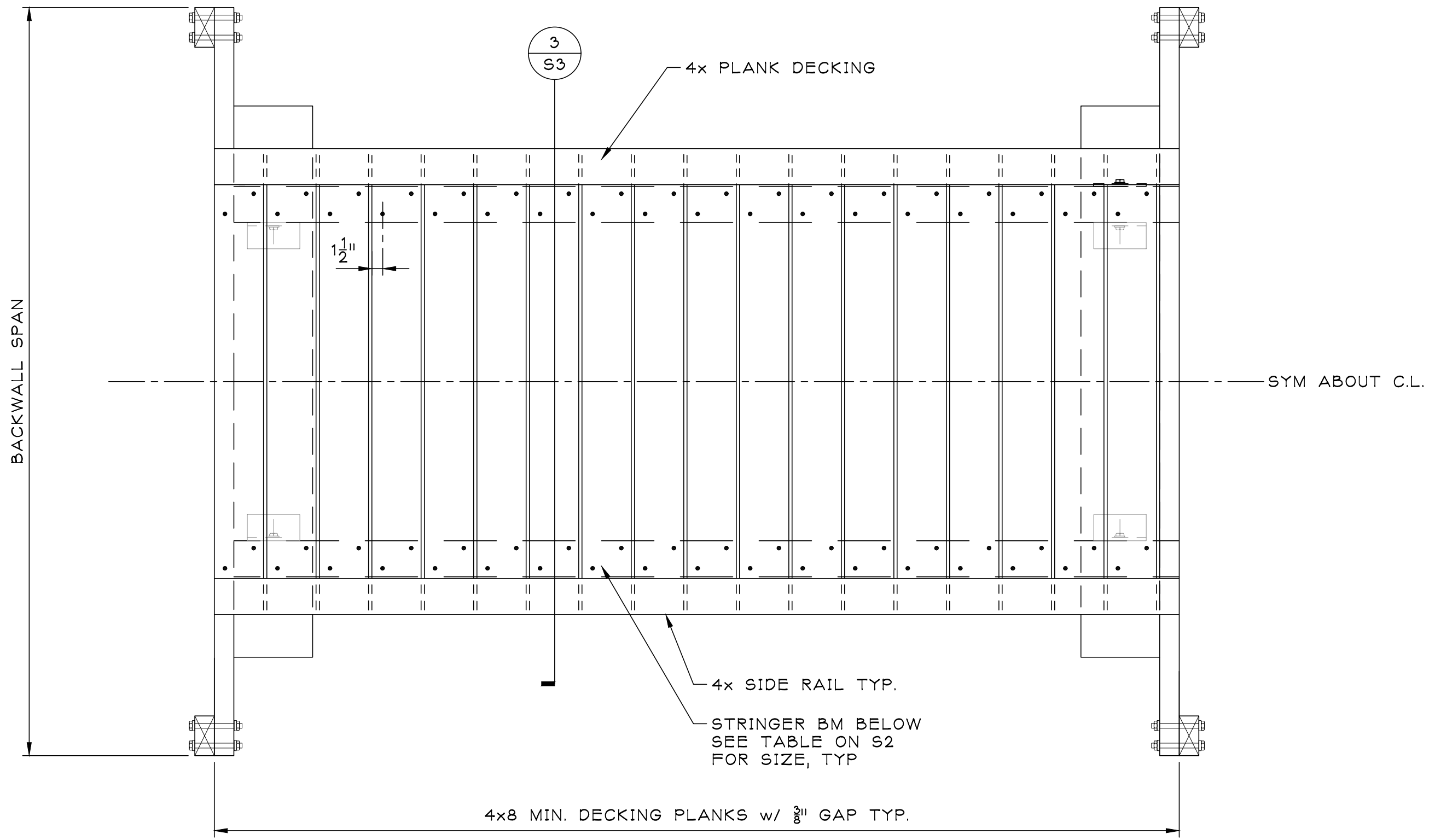


TYP PUNCHEON SECTION

3
S2

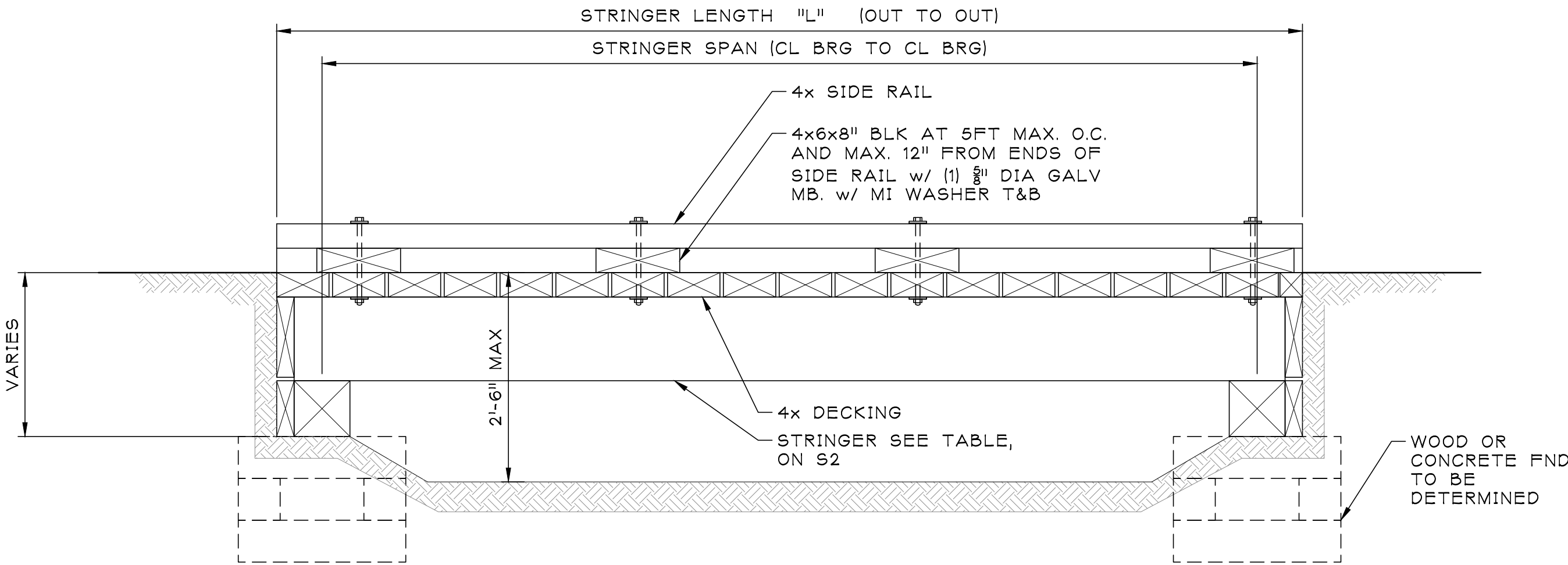
San Vicente Trail Puncheon		
Crossing #	Length (ft)	Bridge Stringer Beam Size
N5 #1	8'-0"	6x10 PTDF #1 or Better
N5 #3	8'-0"	
N5 #5	8'-0"	
N25 #4	8'-0"	
S5 #4	8'-0"	
S5 #3	10'-0"	
S2 #4	12'-0"	
LCT #1	14'-0"	
LCT #2	14'-0"	
S1 #1	14'-0"	
S1 #4	14'-0"	Glu-lam 5 1/8" x 13 1/2"
S1 #2	16'-0"	
S3 #1	20'-0"	
LCT #4	22'-0"	

PUNCHEON STRINGER BEAM SIZES



PUNCHEON PLAN

1
S2

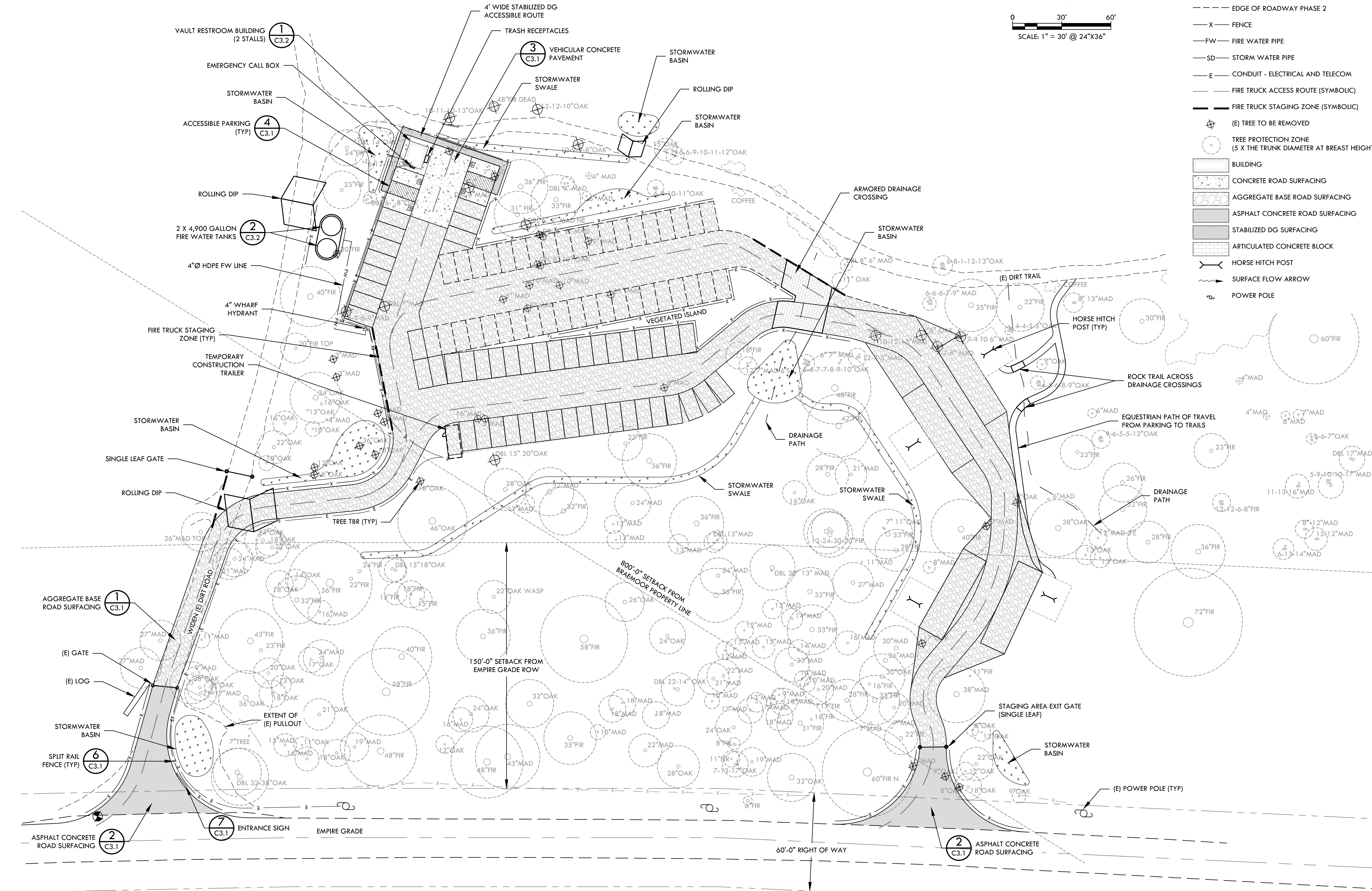


PUNCHEON ELEVATION

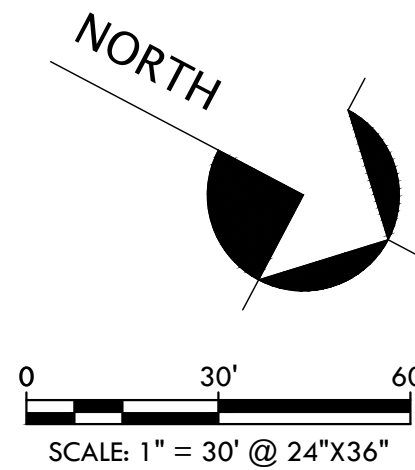
2
S2

- NOTES:
1. FASTEN DECK PLANKS TO STRINGERS WITH TWO ROWS 5/8" DIA x 8" RING SHANK NAILS PER PLANK AT EACH STRINGER. ALTERNATE SIDES AS SHOWN.
 2. SEE TABLE ON S2 FOR STRINGER SIZE.

24"x36" SHEET. IF SHEET SIZE IS SMALLER, DRAWING HAS BEEN REDUCED.



- NOTES:
1. TREES TO BE REMOVED DO NOT INCLUDE COULTER PINES ON SITE, WHICH WERE NOT INCLUDED IN THE SURVEY.
 2. FIRE HYDRANT SHALL BE LOCATED A MINIMUM OF 50' AND A MAXIMUM OF 150' FROM THE RESTROOM.
 3. SEE DETAIL 4 ON SHEET C5.0 FOR TYPICAL PARKING SPACE DIMENSIONS.



- LEGEND:
- (E) CONTOUR
 - (E) DIRT ROAD/TRAIL EDGE
 - (E) ASPHALT ROAD EDGE
 - X- (E) FENCE
 - (E) DRAINAGE PATH
 - LIMIT OF DISTURBANCE
 - EDGE OF ROADWAY PHASE 1
 - EDGE OF ROADWAY PHASE 2
 - X- FENCE
 - FW--- FIRE WATER PIPE
 - SD--- STORM WATER PIPE
 - E--- CONDUIT - ELECTRICAL AND TELECOM
 - FIRE TRUCK ACCESS ROUTE (SYMBOLIC)
 - FIRE TRUCK STAGING ZONE (SYMBOLIC)
 - ⊗ (E) TREE TO BE REMOVED
 - TREE PROTECTION ZONE (5 X THE TRUNK DIAMETER AT BREAST HEIGHT)
 - [Hatched Box] BUILDING
 - [Dotted Box] CONCRETE ROAD SURFACING
 - [Cross-hatched Box] AGGREGATE BASE ROAD SURFACING
 - [Solid Grey Box] ASPHALT CONCRETE ROAD SURFACING
 - [Stippled Box] STABILIZED DG SURFACING
 - [Grid Box] ARTICULATED CONCRETE BLOCK
 - Y HORSE HITCH POST
 - ~ SURFACE FLOW ARROW
 - ⊕ POWER POLE

1 SITE PLAN - STAGING AREA
SCALE: 1" = 30' @ 24" X 36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

SHEET TITLE:
SITE PLAN - STAGING AREA

CLIENT:
LAND TRUST OF SANTA CRUZ COUNTY
ATTN: BRYAN LARGAY
617 WATER STREET
SANTA CRUZ, CALIFORNIA, 95060

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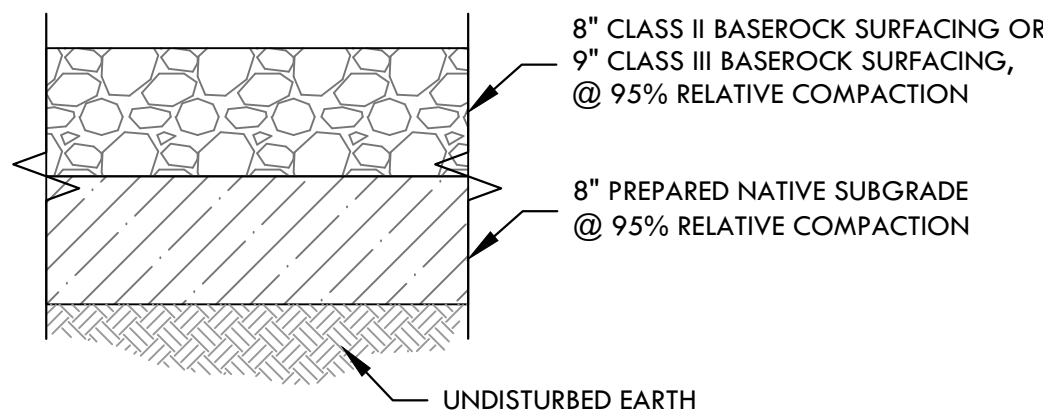


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13 OF 17

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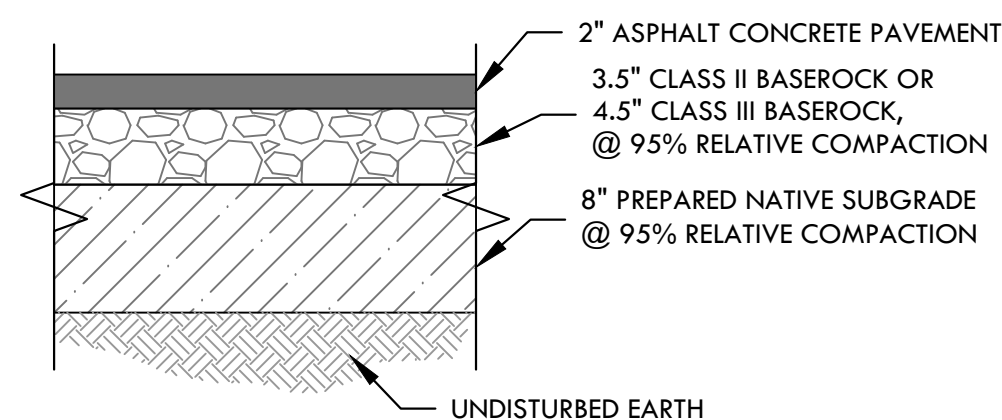
NOTE:
1. FOLLOW RECOMMENDATIONS IN GEOTECHNICAL ENGINEERING REPORT.



1 TYPICAL AGGREGATE BASE PAVEMENT SECTION

SCALE: AS DIMENSIONED

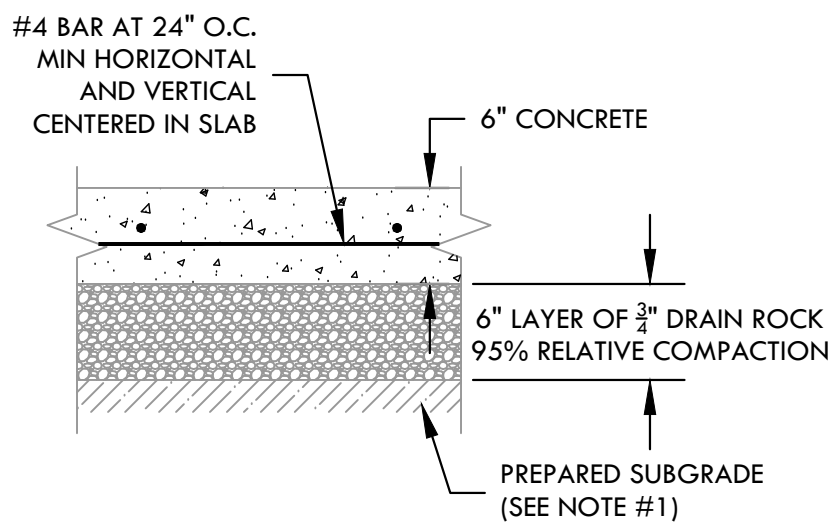
NOTES:
1. FOLLOW RECOMMENDATIONS IN GEOTECHNICAL ENGINEERING REPORT.



2 TYPICAL ASPHALT CONCRETE PAVEMENT SECTION

SCALE: AS DIMENSIONED

NOTES:
1. PREPARE SUBGRADE BY REMOVING ANY LARGE ROCKS AND BY SMOOTHING SUBGRADE.
2. FOLLOW RECOMMENDATIONS IN GEOTECHNICAL ENGINEERING REPORT.

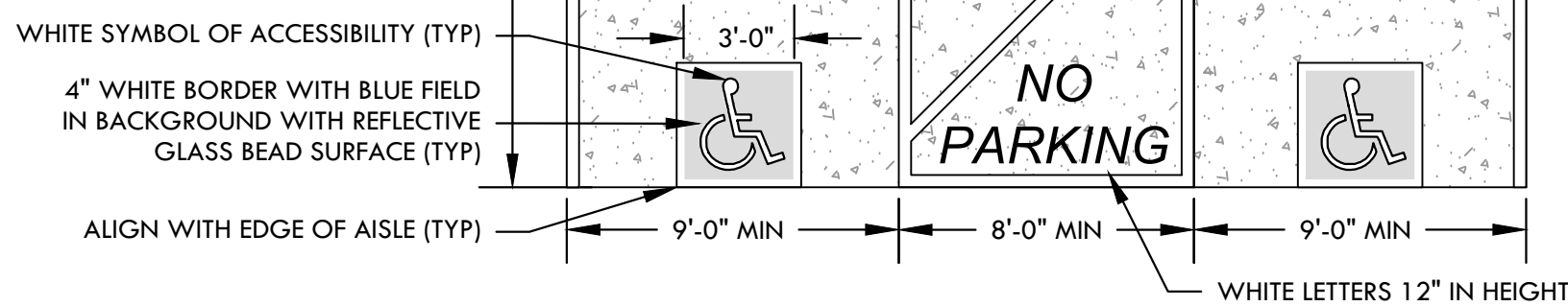


3 TYPICAL VEHICULAR CONCRETE PAVEMENT SECTION

SCALE: AS DIMENSIONED

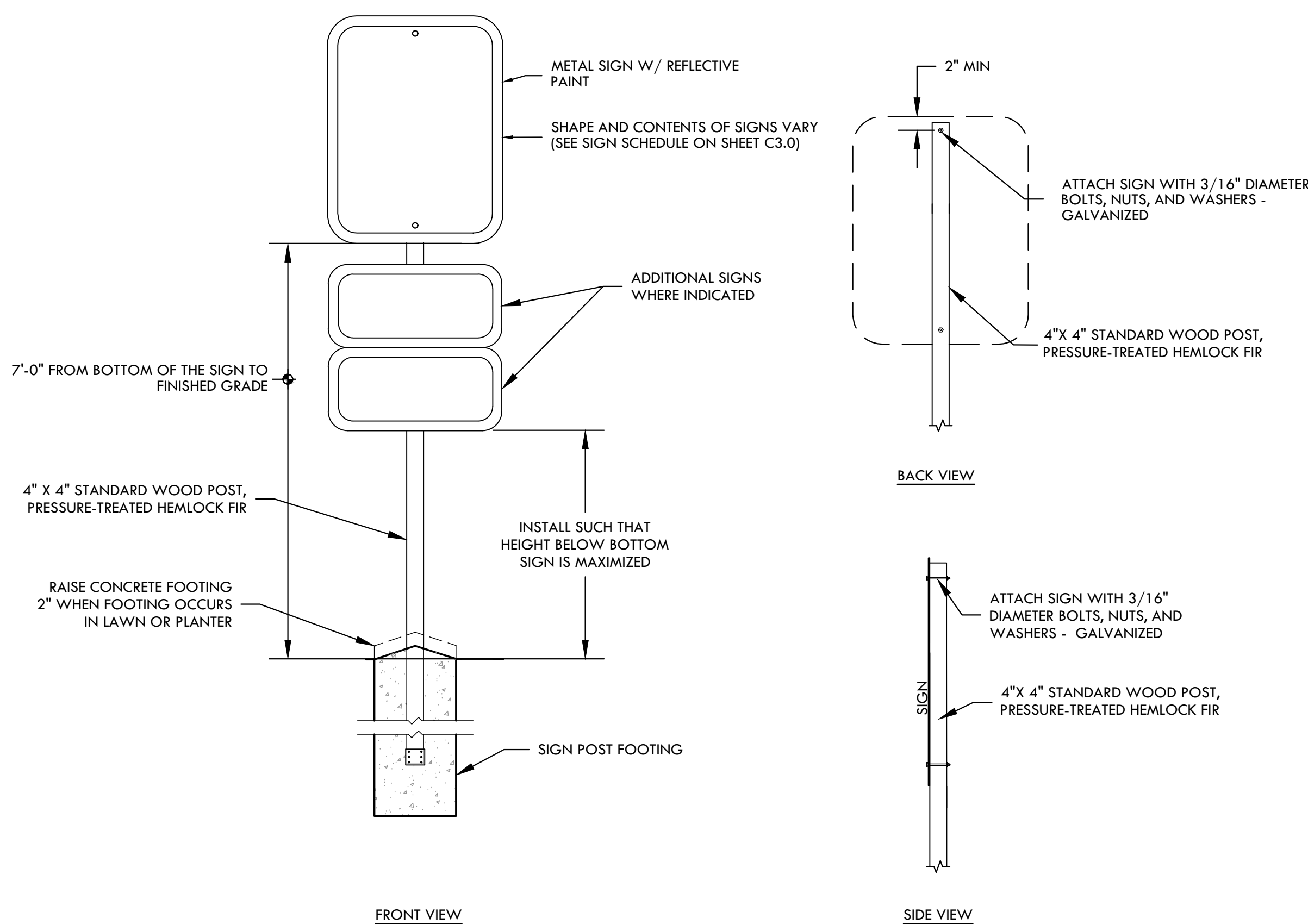
ACCESSIBLE PARKING AND VAN ACCESSIBLE SIGNS (TYP)
(CA MUTCD SIGN NO. R99 AND R7-8b)

- NOTES:
- PARKING SHALL MEET CURRENT ACCESSIBILITY GUIDELINES FOR DIMENSIONS AND SLOPES.
 - STRIPING SHALL INCLUDE 4" WIDE PAINTED WHITE LINES, TYPICAL.
 - ACCESS AISLE EXTERIOR PAINT TO BE BLUE.
 - 45 DEGREE LINES SHALL BE 36" ON CENTER.



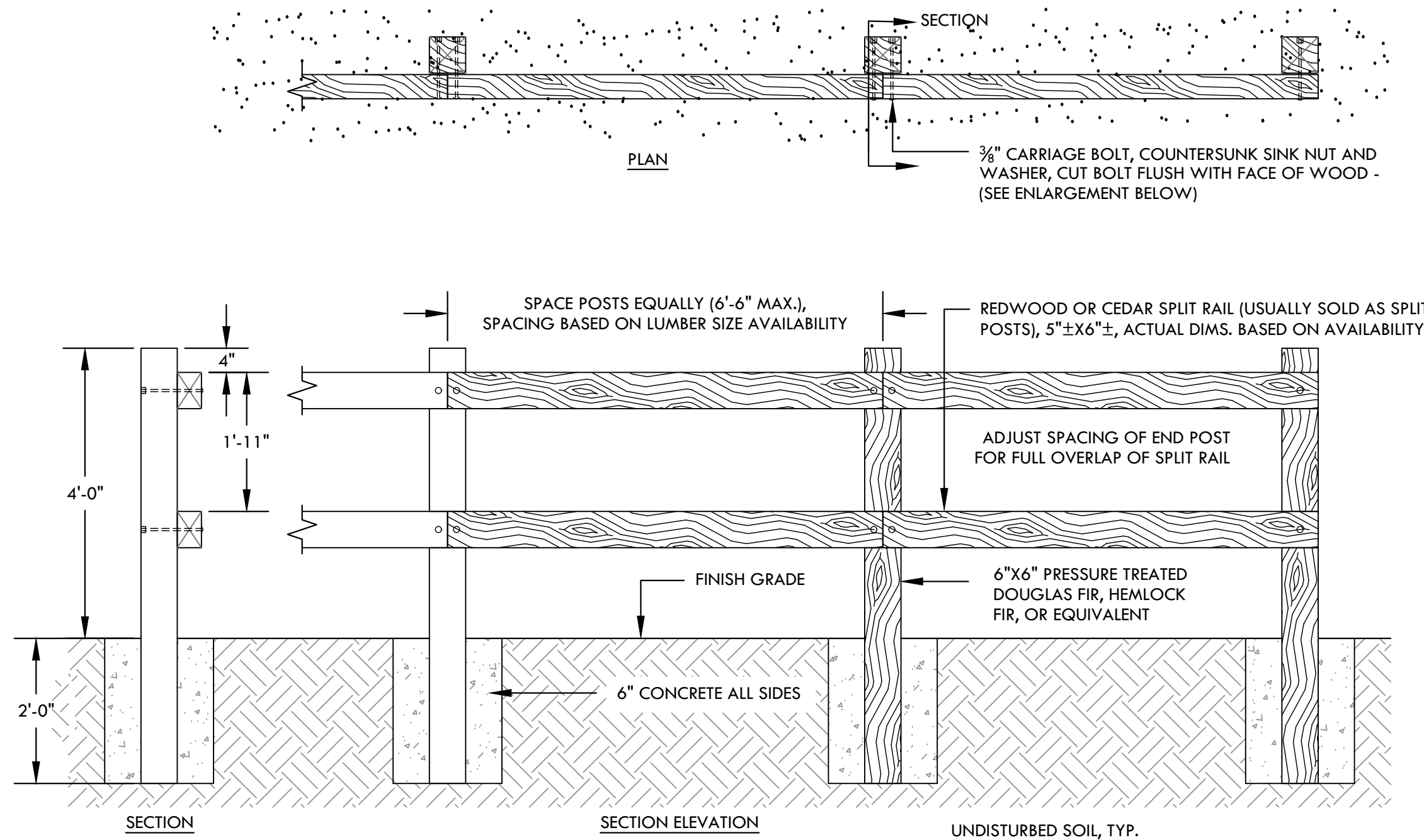
4 TYPICAL ACCESSIBLE PARKING

PER CALIFORNIA BUILDING CODE 118.501

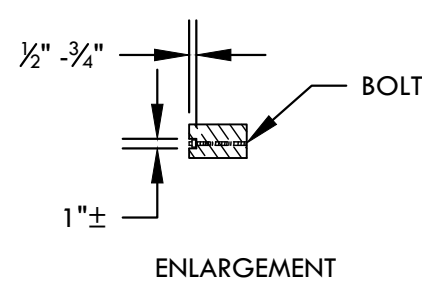


5 TYPICAL SIGN DETAILS

SCALE: AS DIMENSIONED



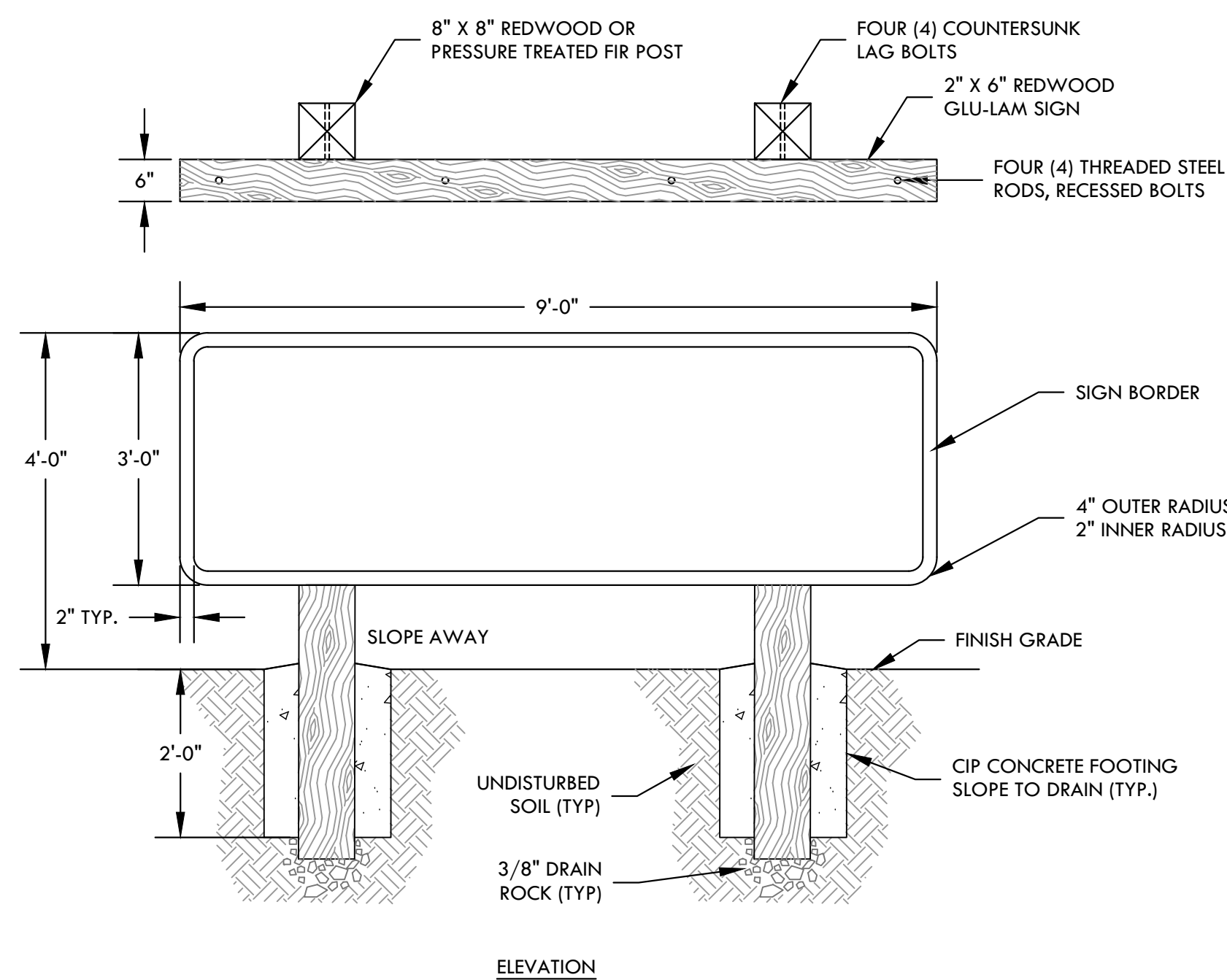
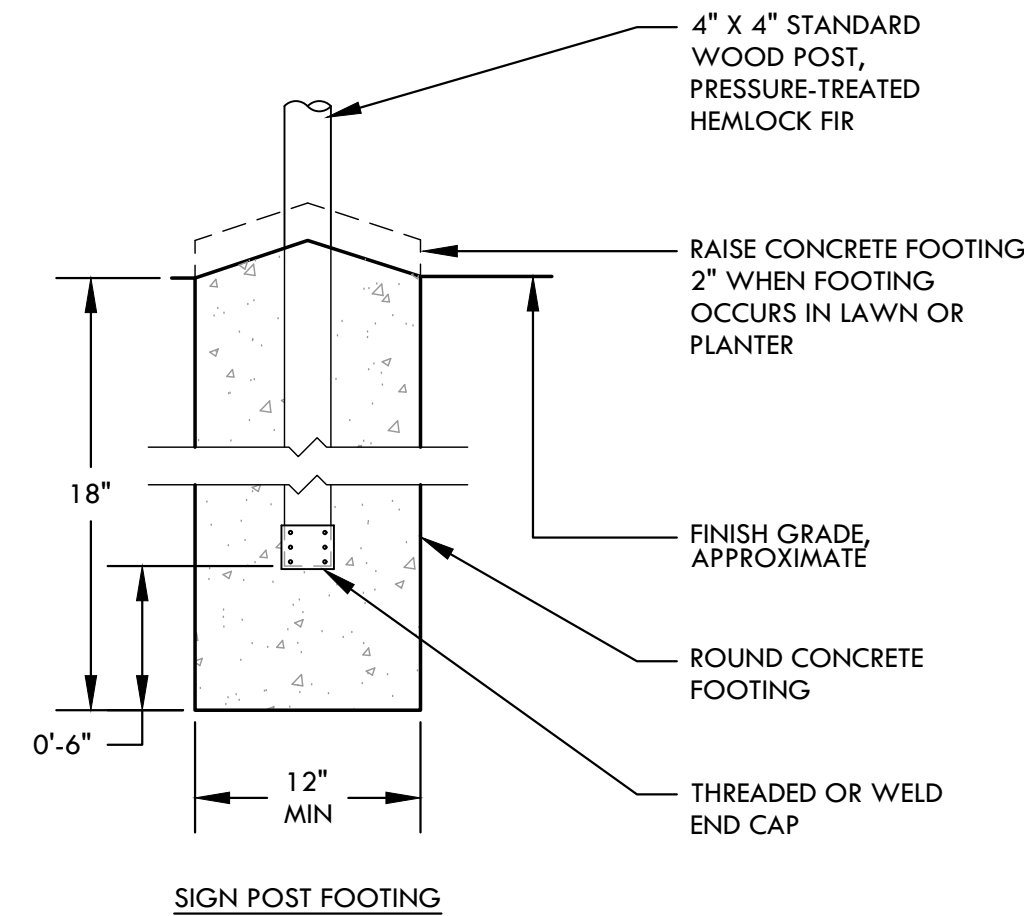
- NOTES:
- LUMBER AVAILABLE FROM BIG CREEK LUMBER (831-457-5042) OR EQUIVALENT.
 - INSTALL ALL POSTS PLUMB. LOCATE ANY ADJACENT UNDERGROUND UTILITIES PRIOR TO EXCAVATING POST HOLES TO AVOID DAMAGE.
 - SPLICE RAILS ON CENTERLINE OF POST ONLY. FACE RAILS OUTWARDS (TOWARDS ROAD OR TRAIL).
 - POST MATERIAL TO BE CONSISTENT THROUGHOUT PROJECT.



6 TYPICAL SPLIT RAIL FENCE DETAIL

SCALE: AS DIMENSIONED

- NOTES:
- SIGN POST SHALL BE INSTALLED WITH A 2' MINIMUM LATERAL OFFSET FROM THE EDGE OF SHOULDER OR EDGE OF PAVEMENT IN NO SHOULDER EXISTS.
 - SIGN POST SHALL BE STAINED BROWN BEFORE MOUNTING SIGN PLATES.



- NOTES:
- SIGN CONSTRUCTED OF 2" X 6" GLU-LAM REDWOOD. SIGN WIDTH IS 6".
 - RAISED LETTERING AND BORDER AS A RESULT OF SAND BLASTING. BORDER PAINTED WHITE.
 - LAND TRUST TO SELECT SIGN SIZE PER NEEDS OF SITE.
 - LAND TRUST TO SPECIFY TEXT FOR SIGN.
 - PROVIDE SHOP DRAWINGS FOR LAND TRUST REVIEW PRIOR TO FABRICATION OR CONSTRUCTION.

7 TYPICAL ENTRANCE SIGN DETAILS

SCALE: AS DIMENSIONED

SHEET TITLE:
STAGING AREA DETAILS

CLIENT:
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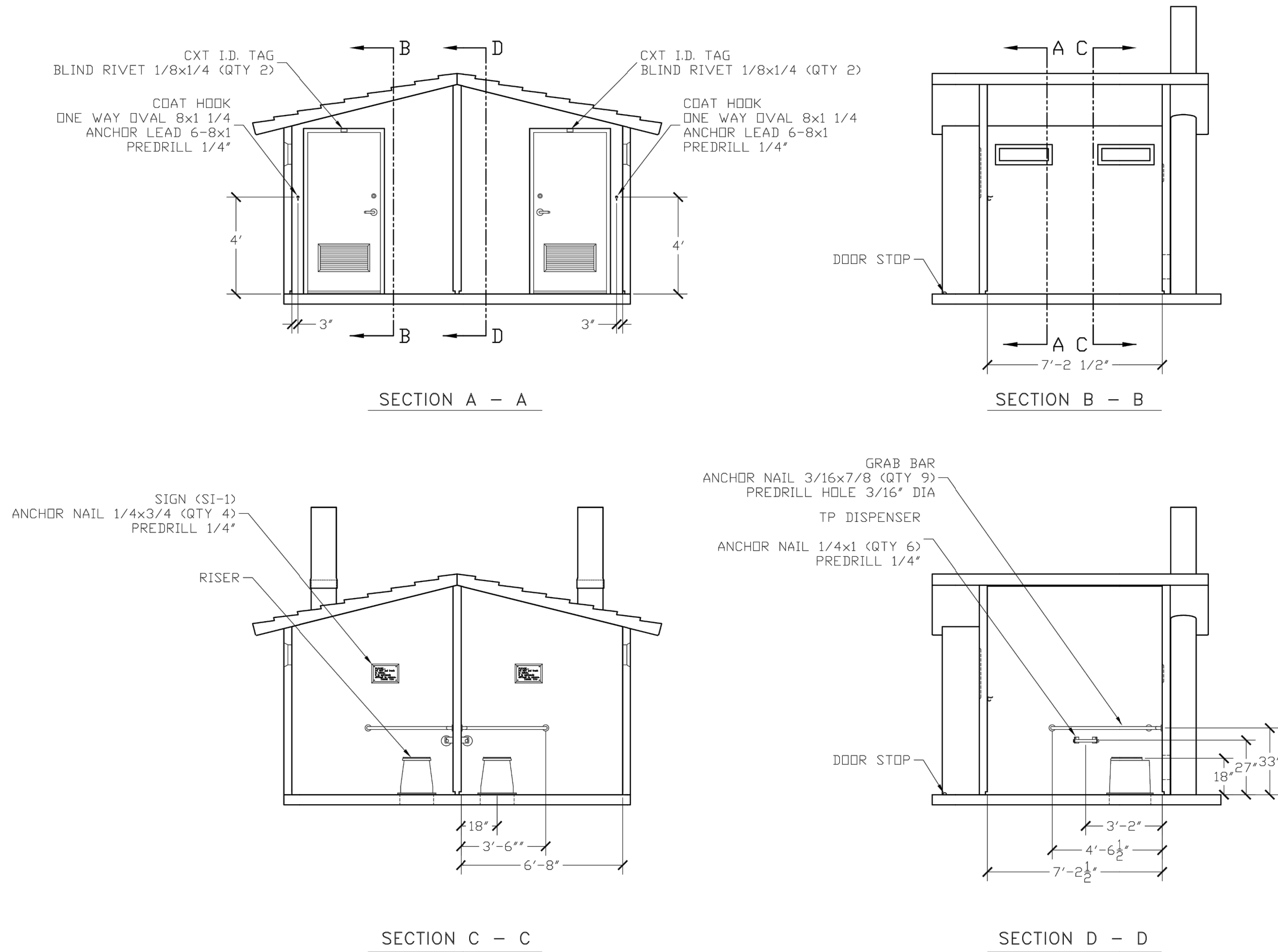
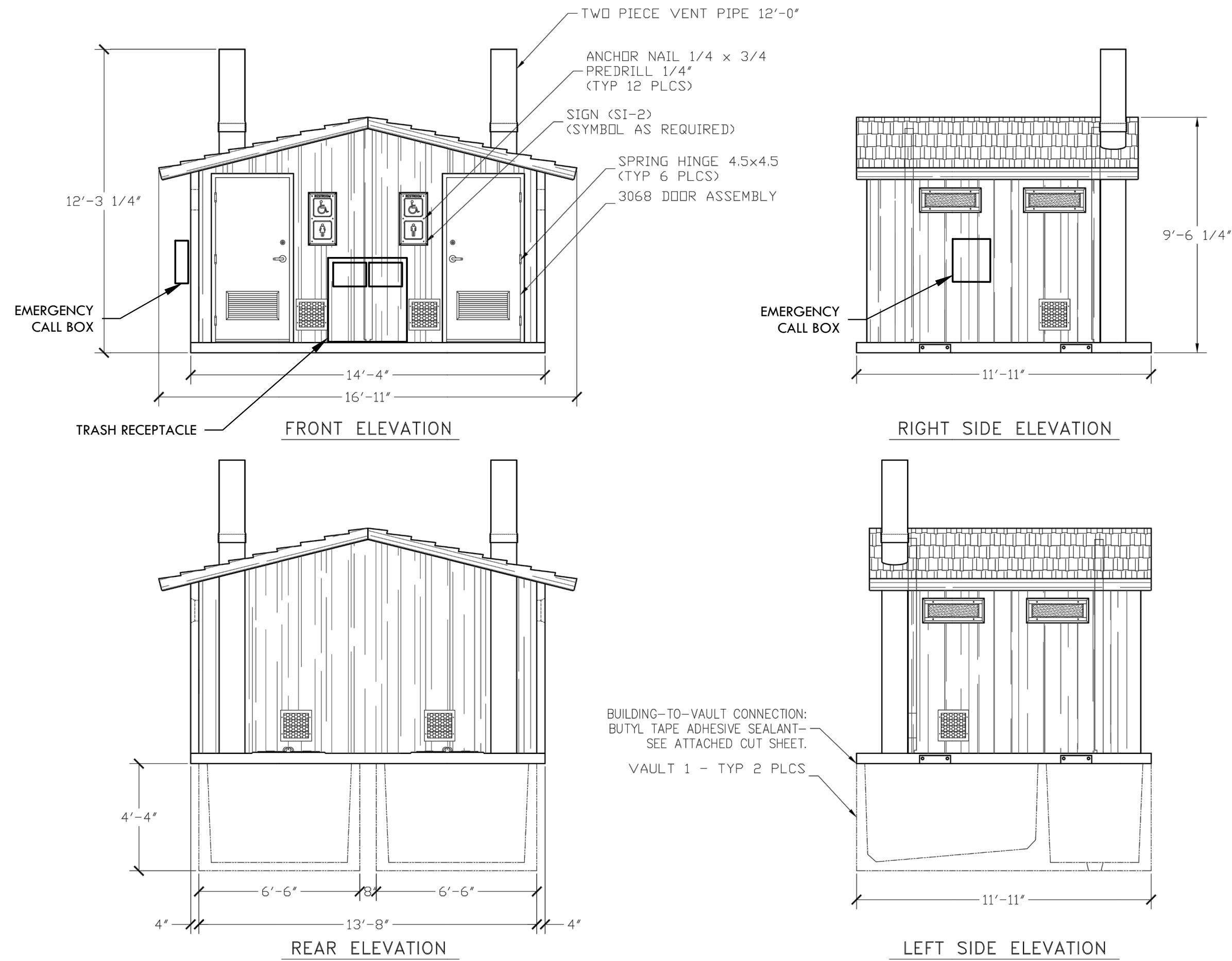


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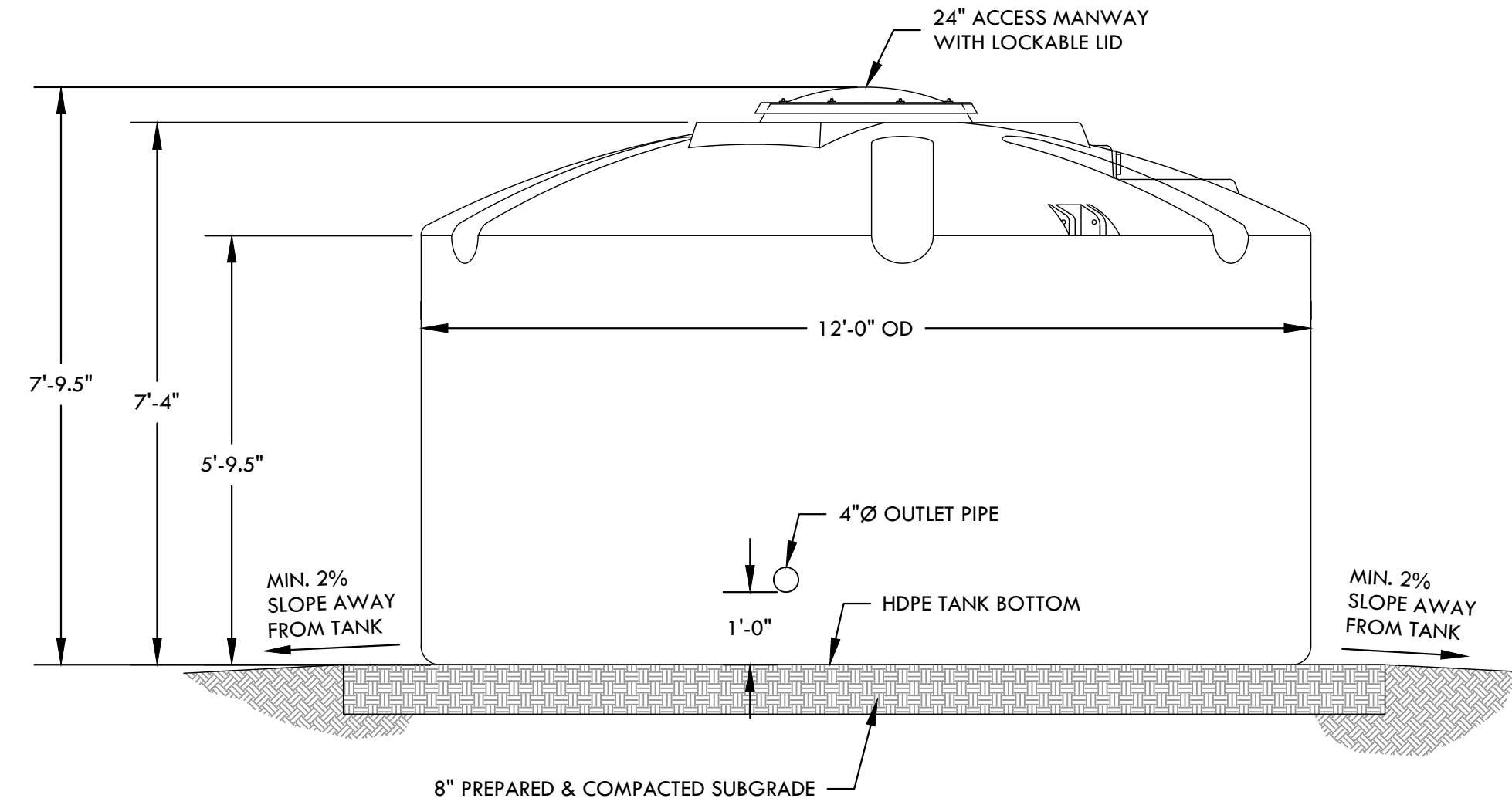
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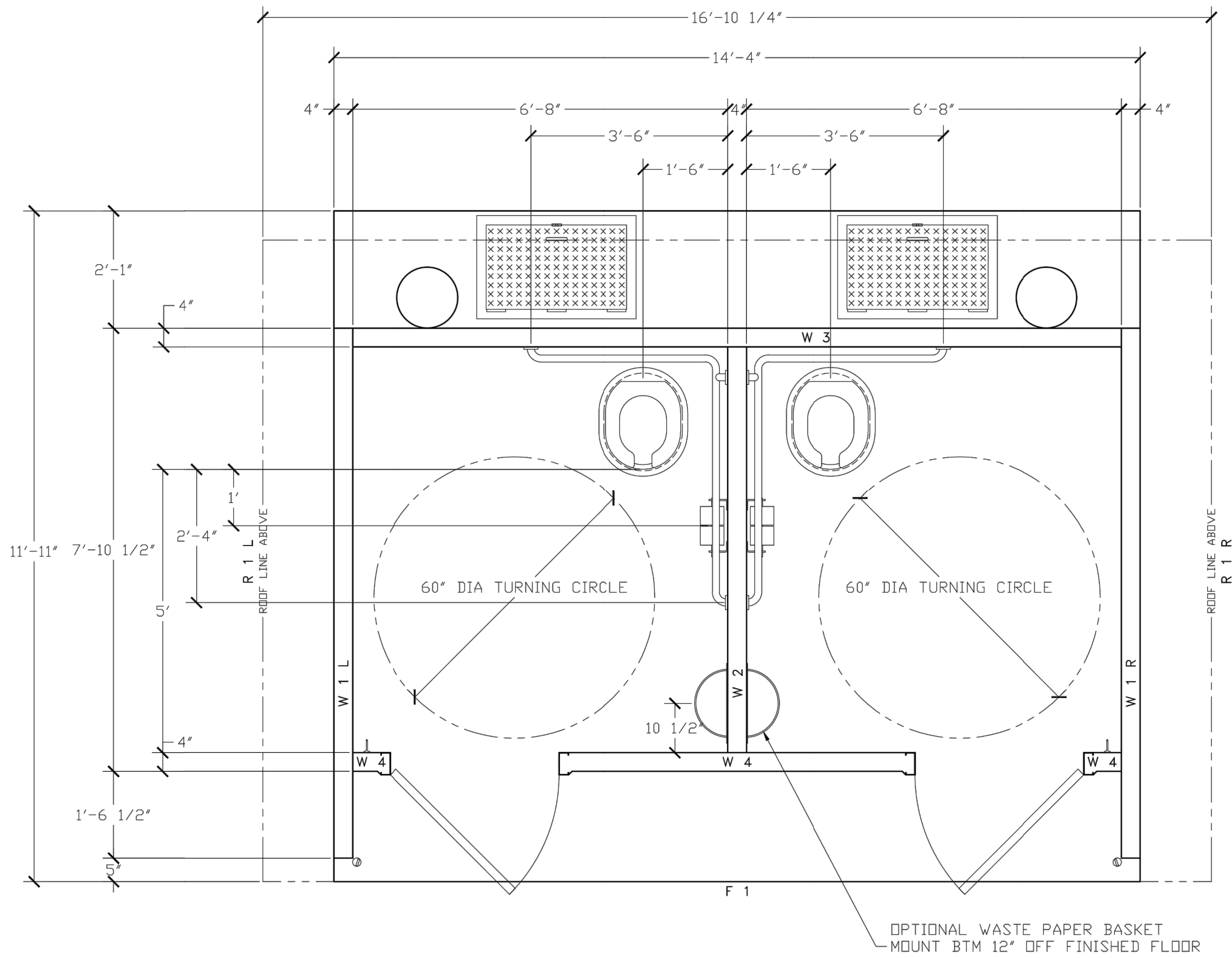
1 VAULT RESTROOM
CXT TIOGA SPECIAL DOUBLE VAULT RESTROOM



2 4,900 GALLON HDPE WATER TANK
SCALE: AS DIMENSIONED



- NOTES:
1. TANKS SHALL HAVE SCREENED 6"Ø VENT ON TOP OF TANK.
 2. TANKS WILL BE FILLED FROM A WATER TRUCK THROUGH THE ACCESS MANWAY.
 3. TANKS SHALL BE HYDRAULICALLY CONNECTED.



- NOTES:
1. VAULT RESTROOM SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
 2. VENTS ON VAULT RESTROOM SHALL BE LOCATED IN THE PREVAILING WIND DIRECTION.

SHEET TITLE:
**STAGING AREA DETAILS
CONTINUED**

CLIENT:
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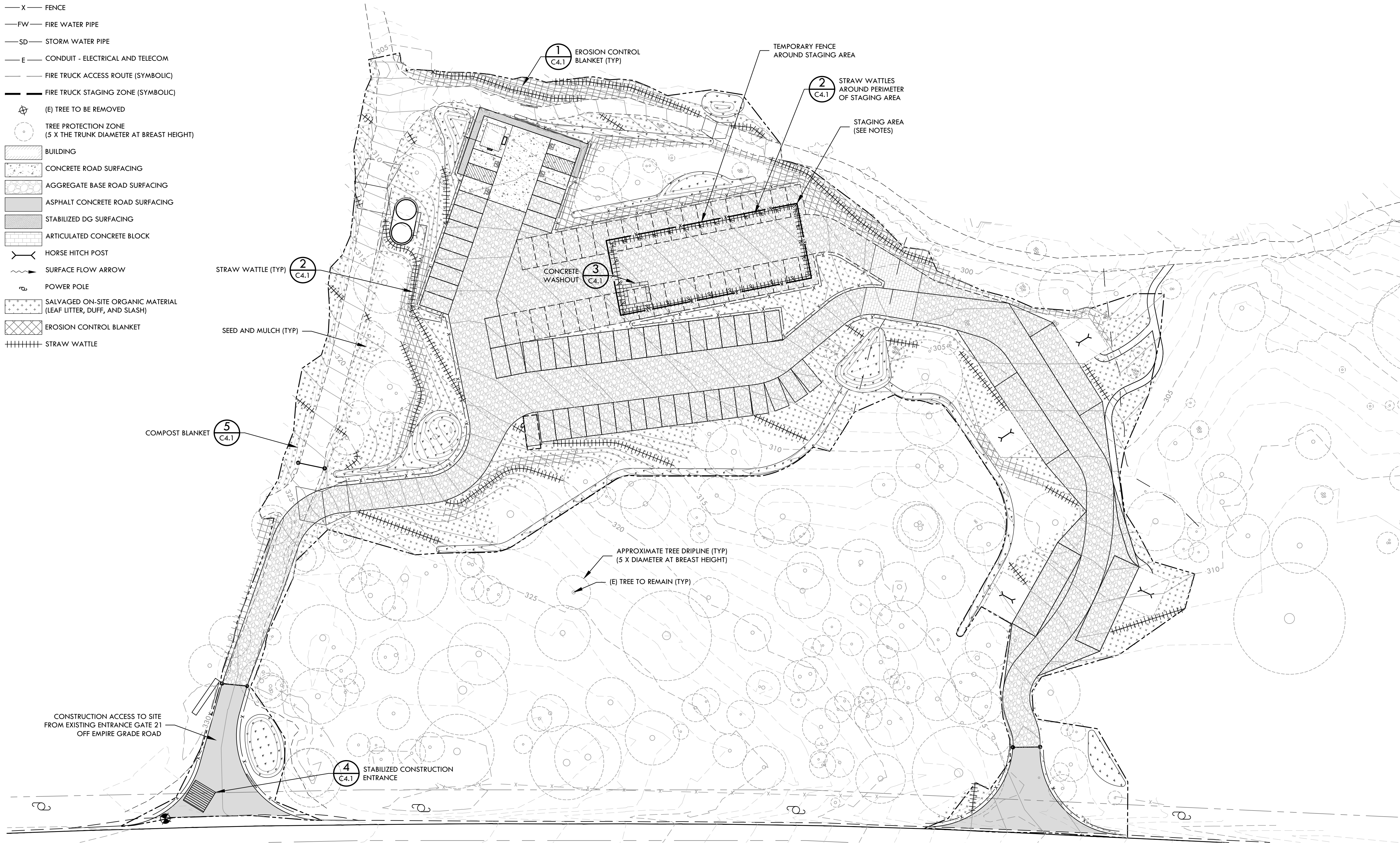
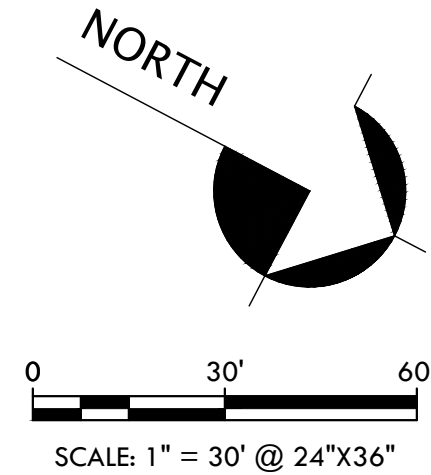
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SHEET:

C3.2

- LEGEND:
- (E) CONTOUR
 - (E) DIRT ROAD/TRAIL EDGE
 - (E) ASPHALT ROAD EDGE
 - X (E) FENCE
 - (E) DRAINAGE PATH
 - LIMIT OF DISTURBANCE
 - EDGE OF ROADWAY PHASE 1
 - EDGE OF ROADWAY PHASE 2
 - X FENCE
 - FW FIRE WATER PIPE
 - SD STORM WATER PIPE
 - E CONDUIT - ELECTRICAL AND TELECOM
 - FIRE TRUCK ACCESS ROUTE (SYMBOLIC)
 - FIRE TRUCK STAGING ZONE (SYMBOLIC)
 - (E) TREE TO BE REMOVED
 - TREE PROTECTION ZONE (5 X THE TRUNK DIAMETER AT BREAST HEIGHT)
 - BUILDING
 - CONCRETE ROAD SURFACING
 - AGGREGATE BASE ROAD SURFACING
 - ASPHALT CONCRETE ROAD SURFACING
 - STABILIZED DG SURFACING
 - ARTICULATED CONCRETE BLOCK
 - HORSE HITCH POST
 - SURFACE FLOW ARROW
 - POWER POLE
 - SALVAGED ON-SITE ORGANIC MATERIAL (LEAF LITTER, DUFF, AND SLASH)
 - EROSION CONTROL BLANKET
 - STRAW WATTLE

- STAGING AREA NOTES:
- PHASE 1 STAGING AREA TO BE LOCATED IN PHASE 2 PARKING SPACES AND STAGE 2 STAGING AREA TO BE LOCATED IN PHASE 1 PARKING SPACES.
 - EXACT SIZE AND LOCATION OF THE STAGING AREA TO BE APPROVED BY LAND TRUST'S REPRESENTATIVE.
 - TEMPORARY STAGING AREA SHALL BE RESTORED TO PRE-PROJECT CONDITION.
 - ANY EXCESS SOIL RESULTING FROM EXCAVATIONS SHALL BE PLACED IN THE TEMPORARY STAGING AREA.
 - EXACT LOCATION OF SOIL PLACEMENT TO BE APPROVED BY LAND TRUST'S REPRESENTATIVE.

- LANDSCAPING NOTES:
- NO LANDSCAPING IS PROPOSED AT THE SAN VICENTE REDWOODS STAGING AREA. EXISTING VEGETATION NOT IMPACTED BY CONSTRUCTION IS TO REMAIN.
 - TREES TO REMAIN AND THEIR APPROXIMATE DRIPLINES (5 X DIAMETER AT BREAST HEIGHT) ARE SHOWN ON THE PLAN.
 - SEE RE-VEGETATION NOTES ON SHEET C4.1.



1 EROSION CONTROL AND LANDSCAPE PLAN - STAGING AREA

SCALE: 1" = 30' @ 24"x36"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

SHEET TITLE:

EROSION CONTROL AND LANDSCAPE PLAN - STAGING AREA

CLIENT:

LAND TRUST OF SANTA CRUZ COUNTY

ATTN: BRYAN LARGAY

617 WATER STREET

SANTA CRUZ, CALIFORNIA, 95060

PROJECT TITLE:

SAN VICENTE REDWOODS

PROPOSED TRAIL NETWORK AND STAGING AREA

CEMEX PROPERTY, EMPIRE GRADE

SANTA CRUZ COUNTY, CALIFORNIA

FALL CREEK ENGINEERING, INC.

Consulting Engineers

Civil • Environmental • Water Resources

1525 SEABRIGHT AVE.

SANTA CRUZ, CA 95062

TEL (831) 426-9054



DRAWN BY: SLS

CHECKED BY: RLC

DATE: AUGUST 2018

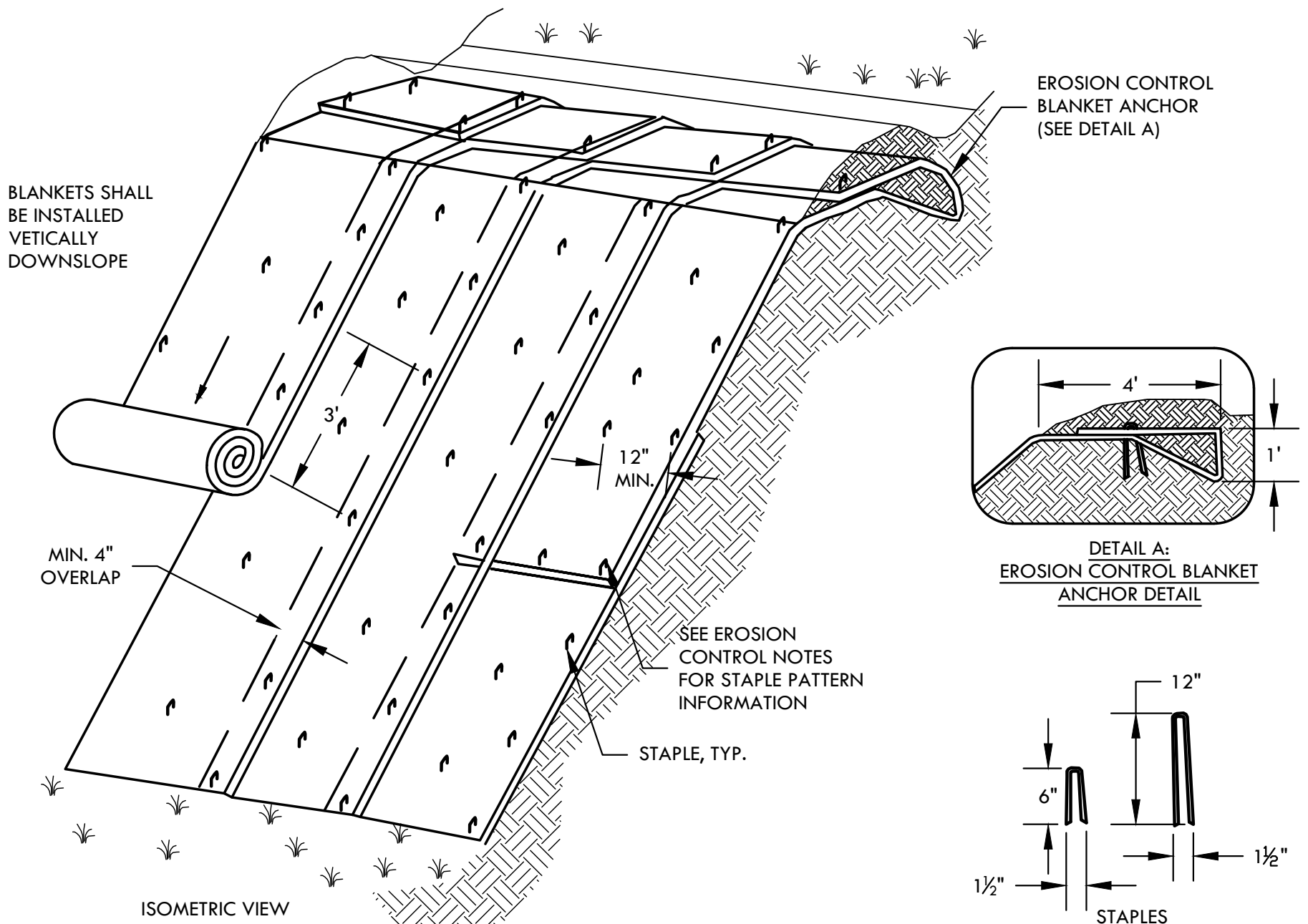
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SCALE: AS SHOWN

SHEET:

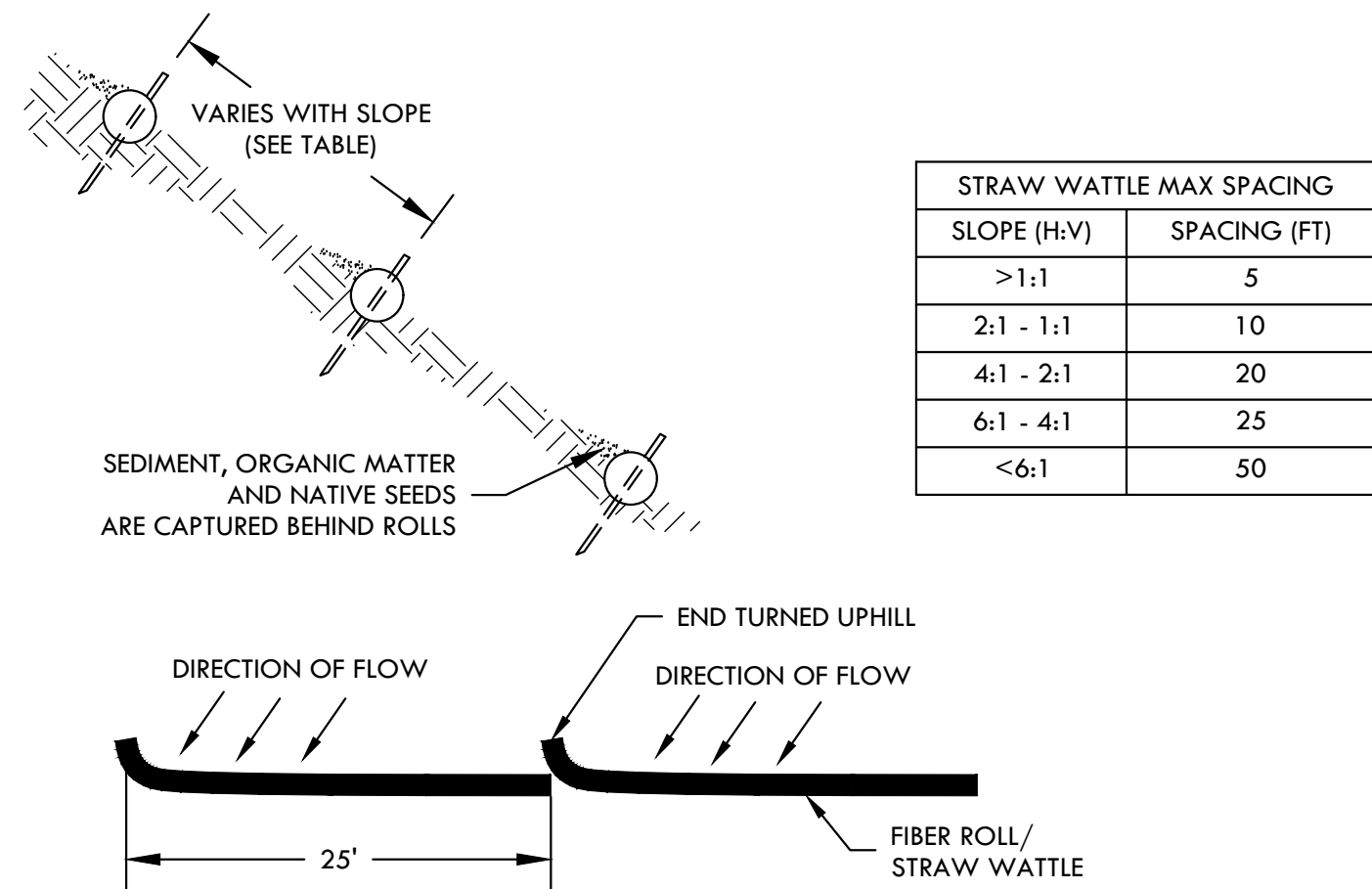
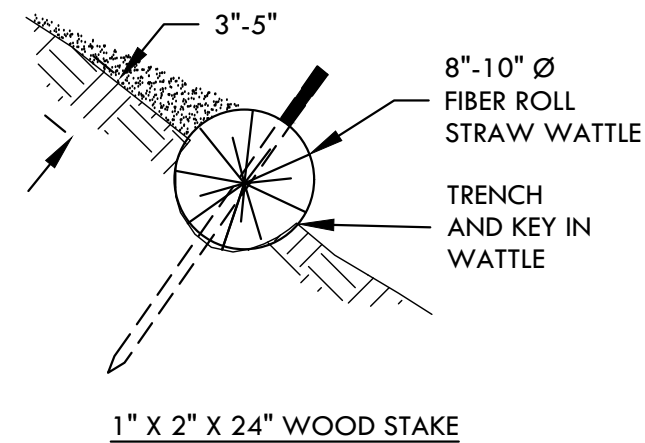
C4.0

16 OF 17



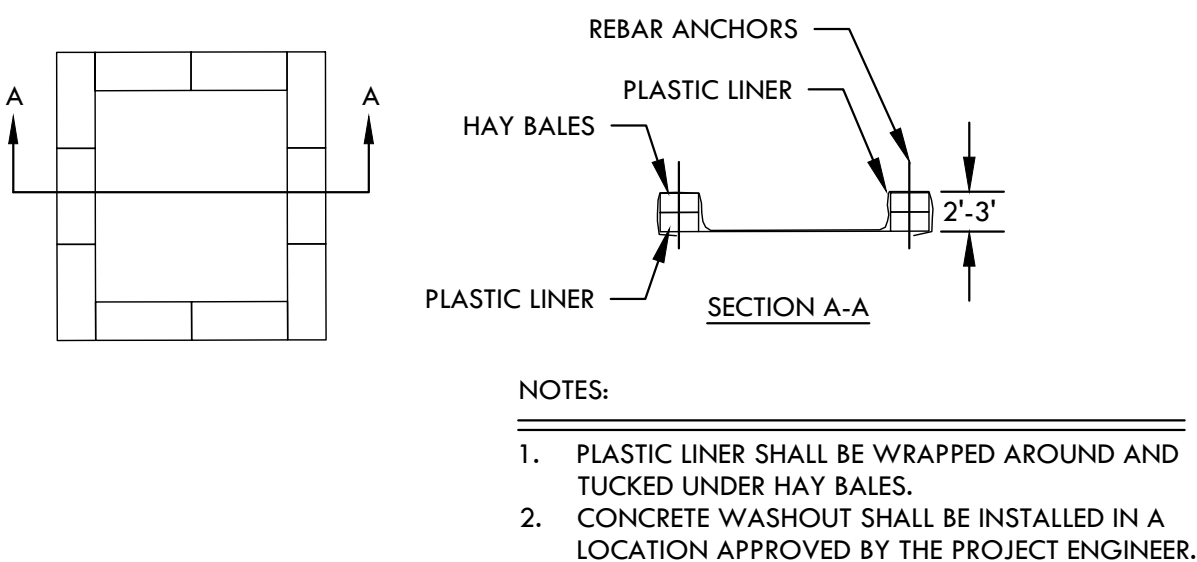
1 EROSION CONTROL BLANKET

SCALE: AS DIMENSIONED



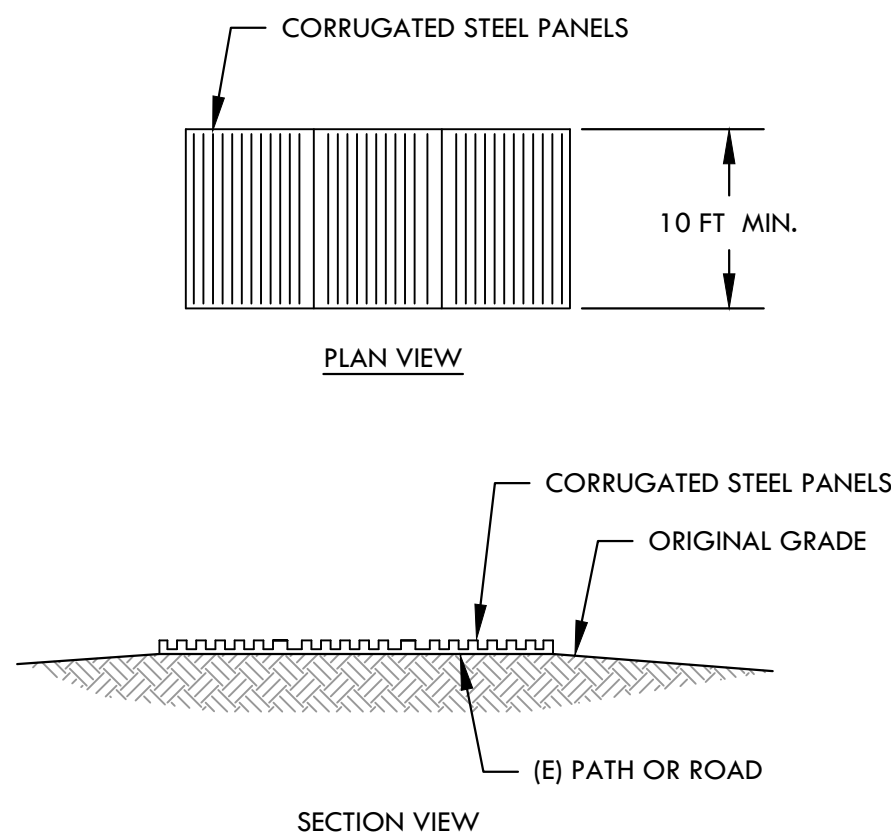
2 STRAW WATTLES

SCALE: AS DIMENSIONED



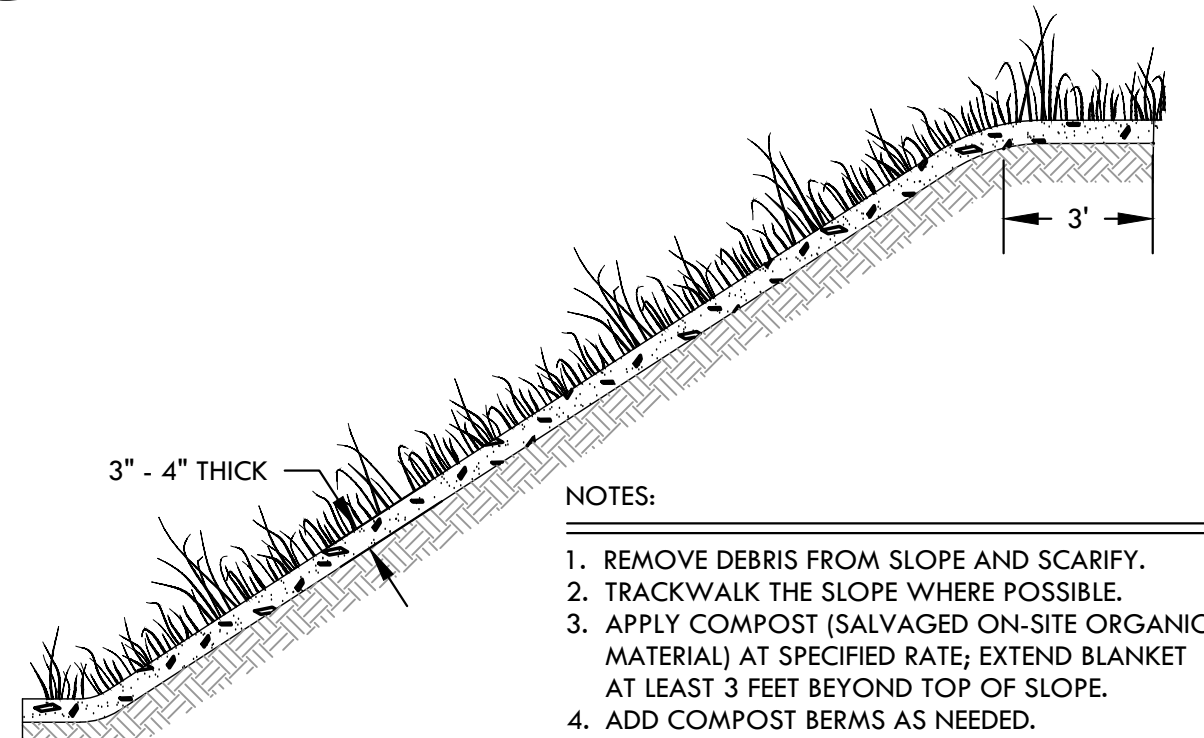
3 CONCRETE WASHOUT

SCALE: AS DIMENSIONED



4 STABILIZED CONSTRUCTION ENTRANCE

SCALE: AS DIMENSIONED



5 TYPICAL COMPOST BLANKET

SCALE: AS DIMENSIONED

EROSION CONTROL NOTES:

1. **GENERAL.** THE CONTRACTOR SHALL INSTALL, MAINTAIN AND INSPECT TEMPORARY EROSION CONTROL AND TEMPORARY STORMWATER CONTROL MEASURES TO CONTROL SEDIMENT AND RUNOFF IN ACCORDANCE WITH THESE PLANS AND THE COUNTY OF SANTA CRUZ COUNTY CODE AND DESIGN CRITERIA AND THE CALIFORNIA BUILDING CODE AS IT APPLIES.

1.1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY EROSION AND SEDIMENT CONTROL BMP INSTALLATION AND MAINTENANCE.

1.2. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IN ALL AREAS WHERE SOIL IS DISTURBED.

1.3. EROSION CONTROL MEASURES SHALL BE IN PLACE AT THE END OF EACH DAY'S WORK.

1.4. EROSION IS TO BE CONTROLLED AT ALL TIMES ALTHOUGH SPECIFIC MEASURES DESCRIBED ARE TO BE IMPLEMENTED AT ANY TIME RAIN IS FORECASTED.

1.5. ALL DISTURBED AREAS NOT PERMANENTLY SURFACED (PERMANENTLY SURFACED AREAS INCLUDE TRAIL BEDS CONSTRUCTED WITH COMPACTED EARTH) SHALL BE COVERED WITH EROSION CONTROL MEASURES AT THE COMPLETION OF THE PROJECT. BEDROCK CUT SLOPES STEEPER THAN 1:1 DO NOT REQUIRE EROSION CONTROL MEASURES.

1.6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ADDITIONAL MEASURES, NECESSARY TO CONTROL SITE EROSION AND PREVENT SEDIMENT TRANSPORT OFF-SITE ARE IMPLEMENTED.

1.7. THE COUNTY INSPECTOR, SUPERVISING PROJECT ENGINEER, OR OWNERS REPRESENTATIVE, SHALL STOP OPERATIONS DURING PERIODS OF INCLEMENT WEATHER IF IT IS DETERMINED THAT EROSION PROBLEMS ARE NOT BEING CONTROLLED ADEQUATELY.

2. **WINTER/WET SEASON OPERATIONS** - TRAIL CONSTRUCTION IS ANTICIPATED TO OCCUR DURING THE WINTER AND SHOULDER SEASONS AS SOIL MOISTURE RESULTING FROM RAINFALL HELPS WITH THE TRAIL CONSTRUCTION AND COMPACTION. TRAIL CONSTRUCTION SHALL NOT OCCUR DURING ACTUAL RAINFALL, AFTER PERIODS OF HEAVY RAINFALL, OR DURING PERIODS OF GROUND SATURATION/EXCESSIVE RUNOFF/GROUND SEEPAGE.

2.1. TRAIL CONSTRUCTION ACTIVITIES DURING THE WET SEASON SHALL FOLLOW THE FOLLOWING GUIDELINES:

2.1.1. DAILY TRAIL CONSTRUCTION LENGTH SHALL BE LIMITED TO THE AMOUNT OF EROSION CONTROL MATERIAL ON SITE AND THE THE CONTRACTOR'S ABILITY TO INSTALL EROSION CONTROL MATERIAL AT THE END OF EACH DAY.

2.1.2. ALL TRAIL TREAD SHALL BE COMPACTED/STABILIZED AND THE TRAIL SHALL INCLUDE COMPLETED DRAINAGE DIPS, KNICKS, AND GRADE REVERSALS.

2.1.3. ALL OTHER BARE SOIL SHALL BE COVERED WITH EROSION CONTROL MATERIALS AT THE END OF EACH DAY AND STABILIZED TO PREVENT SOIL FROM LEAVING THE CONSTRUCTION AREA.

2.2. DRAINAGE CROSSING CONSTRUCTION ACTIVITIES DURING THE WET SEASON SHALL FOLLOW THE FOLLOWING GUIDELINES:

2.2.1. DRAINAGE CROSSING CONSTRUCTION SHALL BE LIMITED TO THE AMOUNT OF EROSION CONTROL MATERIAL ON SITE AND THE THE CONTRACTOR'S ABILITY TO INSTALL EROSION CONTROL MATERIAL AT THE END OF EACH DAY.

2.2.2. DRAINAGE CROSSING CONSTRUCTION SHALL NOT TAKE PLACE IN EPHEMERAL CHANNELS WHILE WATER IS FLOWING.

2.2.3. ALL APPROACHES TO DRAINAGE CROSSINGS SHALL BE COMPACTED/STABILIZED AND THE PORTION OF TRAIL LEADING TO THE DRAINAGE CROSSING SHALL INCLUDE COMPLETED DRAINAGE DIPS, KNICKS, AND GRADE REVERSALS.

2.2.4. ALL OTHER BARE SOIL SHALL BE COVERED WITH EROSION CONTROL MATERIALS AT THE END OF EACH DAY AND STABILIZED TO PREVENT SOIL FROM LEAVING THE CONSTRUCTION AREA. WATTLES SHALL BE INSTALLED AROUND ANY CROSSING CONSTRUCTION AREAS TO PREVENT SOIL FROM LEAVING THE CONSTRUCTION AREA AND/OR ENTERING THE DRAINAGE.

3. **SALVAGED ON-SITE ORGANIC MATERIAL.** ALL AREAS ON- AND OFF-SITE EXPOSED DURING CONSTRUCTION ACTIVITIES, IF NOT PERMANENTLY SURFACED (PERMANENTLY SURFACED AREAS INCLUDE TRAIL BEDS CONSTRUCTED WITH COMPACTED EARTH), SHALL BE PROTECTED BY COVERING WITH SALVAGED ON-SITE ORGANIC MATERIAL, INCLUDING LEAF LITTER, DUFF, AND SLASH TO A MINIMUM 85% COVERAGE.

3.1. LOCAL LEAF LITTER, DUFF, AND SLASH SHALL BE SALVAGED DURING SITE CLEARING AND GRUBBING OPERATIONS AND STOCKPILED ON SITE FOR USE AS EROSION CONTROL MATERIALS.

3.2. ALL EXCAVATED MATERIAL SHALL BE REMOVED TO AN APPROVED DISPOSAL SITE OR DISPOSED OF ON-SITE IN A MANNER THAT WILL NOT CAUSE EROSION.

3.3. ANY SOIL MATERIAL STOCKPILED ON-SITE SHALL BE COVERED WITH PLASTIC, ESPECIALLY DURING THE WINTER MONTHS OR DURING PERIODS OF RAIN. SALVAGED ON-SITE ORGANIC MATERIAL, INCLUDING LEAF LITTER, DUFF, AND SLASH SHALL BE STOCKPILE ON-SITE AND SHALL NOT BE COVERED.

3.3. EXPOSED SOIL ON SLOPES LESS THAN OR EQUAL TO 10% SHALL BE COVERED WITH 3 - 4 INCHES OF LEAF LITTER AND/OR DUFF (COMPOST BLANKET) TO A MINIMUM 85% COVERAGE.

3.4. EXPOSED SOIL ON SLOPES BETWEEN 10% AND 30% SHALL BE COVERED WITH 3 - 4 INCHES OF LEAF LITTER AND/OR DUFF (COMPOST BLANKET) TO A MINIMUM 85% COVERAGE, WITH SLASH MATERIAL INCORPORATED TO ANCHOR AND HOLD IN PLACE THE ORGANIC MATERIAL.

3.5. EXPOSED SOIL ON SLOPES GREATER THAN 30% SHALL BE COVERED WITH 3 - 4 INCHES OF LEAF LITTER, DUFF (COMPOST BLANKET) TO A MINIMUM 85% COVERAGE, WITH SLASH MATERIAL INCORPORATED TO ANCHOR AND HOLD IN PLACE THE ORGANIC MATERIAL, AND COMPOST BERMS. COMPOST BERMS SHALL BE CONSTRUCTED OF SALVAGED ON-SITE ORGANIC MATERIAL, INSTALLED PERPENDICULAR TO THE SLOPE SO THAT SHEET FLOW RUNOFF MAY BE SLOWED, AND SEDIMENT RETAINED. THE BASE OF THE COMPOST BERM SHALL BE TWICE THE HEIGHT OF THE BERM. COMPOST BERMS SHALL BE INSTALLED AT THE BOTTOM OF THE SLOPE AND AT APPROPRIATE INTERVALS ALONG THE SLOPE TO CAPTURE AND RETAIN SEDIMENT.

3.6. THE SALVAGED ON-SITE ORGANIC MATERIAL SHALL BE EVENLY DISTRIBUTED BY HAND OR MACHINE TO THE DESIRED DEPTH AND SHOULD COVER THE EXPOSED AREA TO A UNIFORM DEPTH.

3.7. AN APPLICATION RATE OF 2,000 POUNDS PER ACRE SHOULD BE USED.

3.8. THERE SHOULD BE A MINIMUM OF 3 - 4 INCHES OF SALVAGED ON-SITE ORGANIC MATERIAL OVER THE SOIL AND NO BARE SOIL SHOULD BE VISIBLE.

3.9. RUNOFF FROM THE SITE SHALL BE DETAINED OR FILTERED BY COMPOST BERMS, VEGETATED FILTER STRIPS, AND/OR OTHER METHODS TO PREVENT THE ESCAPE OF SEDIMENT FROM THE SITE. THESE DRAINAGE CONTROLS SHALL BE MAINTAINED BY THE CONTRACTOR AND/OR PROPERTY OWNER AS NECESSARY TO ACHIEVE THEIR PURPOSE THROUGHOUT THE LIFE OF THE PROJECT.

3.10. AREAS COVERED WITH SALVAGED ON-SITE ORGANIC MATERIAL SHALL BE MONITORED FOR STABILITY. IF MATERIAL IS OBLIVIOUS OR EROSION IS EVIDENT, THEN ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED. ADDITIONAL EROSION CONTROL MEASURES MAY INCLUDE EROSION CONTROL BLANKETS AND/OR STRAW WATTLES. EROSION CONTROL BLANKETS SHALL BE INSTALLED FOLLOWING THE DIRECTIONS IN THE EROSION CONTROL BLANKET SECTION OF THESE NOTES. ADDITIONAL LEAF LITTER AND/OR DUFF SHALL BE PLACED ON TOP OF THE EROSION CONTROL BLANKET TO MAINTAIN THE NATURAL AESTHETIC OF THE SITE. STRAW WATTLES SHALL BE INSTALLED FOLLOWING THE DIRECTIONS IN THE EROSION CONTROL BLANKET SECTION OF THESE NOTES.

4. RE-VEGETATION.

4.1. DURING WINTER CONSTRUCTION, ON-SITE PLANTS WITH SUITABLE SOIL MOISTURE WITHIN AREAS OF CONSTRUCTION SHALL BE SALVAGED AT THE START OF CONSTRUCTION AND REPLANTED FOLLOWING CONSTRUCTION AT THE DISCRETION OF THE PROPERTY OWNER.

4.2. ALL PLANTS SHALL CONFORM TO THE EXISTING SITE ECOLOGY. NO NEW SPECIES SHALL BE INTRODUCED.

4.3. RE-VEGETATION WILL OCCUR BY RECRUITMENT FROM SEED DISPERSAL AND VEGETATIVE GROWTH OF PRESERVED ON-SITE VEGETATION, AND BY THE GERMINATION OF THE SEED BANK ASSOCIATED WITH SALVAGED ON-SITE ORGANIC MATERIAL. MONITORING AND MANAGEMENT WILL PREVENT THE ESTABLISHMENT OF INVASIVE PLANTS.

5. **STRAW WATTLE.** STRAW WATTLES (OR FIBER ROLLS) SHALL BE INSTALLED ALONG THE CONTOUR OF THE SLOPE TO SLOW RUNOFF VELOCITY AND TRAP SEDIMENT.

5.1. STRAW WATTLES SHALL BE INSTALLED WHEREVER THE DISTURBED SLOPE IS ADJACENT TO A STREAM OR DRAINAGE COURSE

5.2. TRENCH DEPTH SHALL BE ¼ TO ½ OF THE THICKNESS OF THE WATTLE, AND THE WIDTH SHALL EQUAL THE WATTLE DIAMETER, IN ORDER TO PROVIDE AREA TO BACKFILL THE TRENCH.

5.3. WOOD STAKES SHALL BE INSTALLED EVERY FOUR FEET THROUGH THE WATTLE AND THE END SHALL BE TURNED UP HILL TO PREVENT RUNOFF FORM GOING AROUND THE WATTLE.

5.4. ALL STRAW WATTLES SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.

6. **EROSION CONTROL BLANKET.** THE EROSION CONTROL BLANKET SHALL BE CONSTRUCTED OF JUTE FIBERS, CURLED WOOD FIBERS, STRAW, COCONUT FIBER, OR A COMBINATION OF THESE MATERIALS. NO PLASTIC MATERIAL WILL BE ACCEPTED.

6.1. CONSTRUCTION GUIDELINES

6.1.1. GRADE AND SHAPE AREA OF INSTALLATION

6.1.2. REMOVE ALL ROCK, CLODS, AND VEGETATIVE OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED BLANKET WILL HAVE DIRECT CONTACT WITH THE SOIL.

6.1.3. LOOSEN 2-3 INCHES OF TOPSOIL ABOVE FINAL GRADE

6.1.4. U-SHAPED WIRE STAPLES, METAL GEOTEXTILE STAKE PINS OR TRIANGULAR WOODEN STAKES CAN BE USED TO ANCHOR MATS TO THE GROUND SURFACE. WIRE STAPLES SHOULD BE A MINIMUM OF 11 GAUGE. METAL STAKE PINS SHOULD BE 3/16 INCH DIAMETER STEEL WITH A 1 ½ INCH STEEL WASHER AT THE HEAD OF THE PIN. WIRE STAPLES AND METAL STAKES SHOULD BE DRIVEN FLUSH TO THE SOIL SURFACE. ALL ANCHORS SHOULD BE 6-8 INCHES LONG AND HAVE SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. LONGER ANCHORS MAY BE REQUIRED FOR LOOSE SOILS.

6.2. INSTALLATION ON SLOPE:

6.2.1. BEGIN AT THE TOP OF THE SLOPE AND ANCHOR THE BLANKET IN A 6 INCH DEEP BY 6 INCH WIDE TRENCH. BACKFILL TRENCH AND TAMP EARTH FIRMLY.

6.2.2. UNROLL BLANKET DOWNSLOPE IN THE DIRECTION OF WATER FLOW. BLANKET SHOULD BE UNROLLED SLOWLY IN A CONTROLLED MANNER TO ACHIEVE DIRECT CONTACT WITH THE SOIL.

6.2.3. THE EDGE OF ADJACENT PARALLEL ROLLS MUST BE OVERLAPPED 2-3 INCHES AND BE STAPLED EVERY 3 FEET.

6.2.4. WHEN BLANKETS MUST BE SPICED, PLACE BLANKET END OVER END (SHINGLE STYLE) WITH 6 INCH OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12 INCHES APART.

6.2.5. LAY BLANKET LOOSELY AND MAINTAIN DIRECT CONTACT WITH THE SOIL, DO NOT STRETCH.

6.2.6. BLANKETS SHALL BE STAPLED SUFFICIENTLY TO ANCHOR BLANKET AND MAINTAIN CONTACT WITH THE SOIL. STAPLES SHALL BE PLACED DOWN THE CENTER AND STAGGERED WITH THE STAPLES PLACED ALONG THE EDGES. STEEP SLOPES, 1:1 TO 2:1 REQUIRE 2 STAPLES PER SQUARE YARD. MODERATE SLOPES, 2:1 TO 3:1, REQUIRE 1-2 STAPLES PER SQUARE YARD (1 STAPLE 3 O.C.). GENTLE SLOPES REQUIRE 1 STAPLE PER SQUARE YARD.

7. **CONCRETE WASHOUT.** TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE LOCATED A MINIMUM OF 50 FEET FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES, AND WATERCOURSES. THE CONCRETE WASHOUT FACILITY SHALL BE BELOW GRADE AND CONSTRUCTED WITH A MINIMUM LENGTH AND MINIMUM WIDTH OF 10 FEET. TEMPORARY CONCRETE FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. THE WASHOUT SHALL HAVE A 10 MIL POLYETHYLENE PLASTIC LINER. WHEN CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE AND MATERIALS FOR THE WASHOUT SHALL BE REMOVED AND DISPOSED OF. HOLES, DEPRESSIONS, OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE CONCRETE WASHOUT SHOULD BE BACKFILLED AND REPAIRED.

8. **STABILIZED CONSTRUCTION ENTRANCE** SHALL BE LOCATED ON DIRT ROAD JUST PRIOR TO PAVED SURFACE. THE INTENT OF THE STABILIZED CONSTRUCTION ENTRANCE IS TO PREVENT SEDIMENT/ SOIL FROM TRACKING ONTO PAVED ROADS. CONTRACTOR IS RESPONSIBLE FOR LOCATING STABILIZED CONSTRUCTION ENTRANCE APPROPRIATELY.

9. OTHER PROVISIONS

9.1. IF CONSTRUCTION OCCURS BETWEEN OCTOBER 1ST AND APRIL 15TH, THE SITE SHALL BE WINTERIZED AS REQUIRED BY THE SANTA CRUZ COUNTY CODE OF ORDINANCES. BETWEEN OCTOBER 1ST AND APRIL 15TH, ALL EXPOSED SOIL NOT INVOLVED IN IMMEDIATE CONSTRUCTION ACTIVITY SHALL BE PROTECTED FROM EROSION AT ALL TIMES. AFTER APRIL 15TH, EROSION CONTROL MEASURES SHALL BE IN PLACE DURING INCLEMENT WEATHER.

9.2. EROSION CONTROL MEASURES SHALL BE KEPT IN PLACE BY THE CONTRACTOR UNTIL NATIVE VEGETATION HAS BEEN ESTABLISHED AND PROVIDES NECESSARY SLOPE COVER (MINIMUM 70% COVER).

Attachment 4

Air Quality/Greenhouse Gas Emissions Modeling Data

CalEEMod Inputs (Operation)

Name: San Vicente Redwoods State Park
County/Air Basin: Unincorporated Santa Cruz County
Climate Zone: 5
Land Use Setting: Urban
Operational Year: 2025
Utility Company: Pacific Gas and Electric

Total Project Site Acreage:	8,532	acres
Acreage to be Distributed:	4.70	acres

Size	
Park	8,532 Acres
Staging Area	4.7 Acres
Trails	38 Miles
Initial	3.5 Miles
Future	34 Miles
Parking	98 Space

CalEEMod Land Use Inputs

Land Use	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Square Feet
Staging Area	Recreation	City Park	3.82	acre	3.82	166,399
Parking	Parking	Parking Lot	98.00	Space	0.88	39,200
					4.70	205,599

Trip Generation

		Existing		Existing Plus Project		Cumulative		Net Increase (ADT)
Roadway Segment	Type	Existing Conditions	Initial	Future	Without Project	With Project (Initial)	With Project (Future)	
Empire Grade	Weekday ADT	550	566	610	605	621	665	50
	Weekend ADT	630	694	910	693	757	973	280
Felton Empire Road	Weekday ADT	2350	2358	2380	2585	2593	2615	30
	Weekend ADT	2,340	2372	2480	2574	2610	2714	140
Total								510
CalEEMod Trip Generation								
Total Trip Generation		Rate						
Weekday	90	23.56		trips/acre				
Weekend	420	109.95		trips/acre				

Matt MacDonald. San Vicente Redwoods Public Access Plan Draft Report. September 20, 2017.

Solid Waste

Park Solid Waste	0.33	TPY
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*Based on CalEEMod Defaults

Architectural Coating

Exterior Paint VOC content:	150
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*Provided by the Applicant.

Non-Residential Structures	Land Use Square Feet	CalEEMod Application Factor	Total Paintable Surface Area ²	Paintable Interior Area ¹	Paintable Exterior Area ¹
Parking	39,200	0.06	2,352	0	2,352

Notes:

¹ *CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively. Architectural coatings for the parking lot is based on CalEEMod methodology applied to a stadium (i.e., striping), in which 6% of surface area is painted.

²

** Applied CalEEMod Methodology in calculating total. The program assumes the total surface for painting equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage defined by the user. The default values based on SCAQMD methods used in their coating rules are 75% for the interior surfaces and 25% for the exterior shell

Greenhouse Gas Emissions Summary - Operation

Proposed Project - 2025 GHG Emissions

	MT/yr	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Area Sources		0	2.53E-03	2.53E-03	1.00E-05	0	2.69E-03	0%
Total Energy Use		0	0	0	0.00E+00	0.00E+00	0	0%
Mobile Sources		0	113.05	113.05	4.73E-03	0	113.17	100%
Waste Generation		0.067	0	0.067	3.96E-03	0	0.166	0%
Water/Wastewater		0	0	0	0.00E+00	0.00E+00	0	0%
Total		0	113	113	0	0	113	100%

Criteria Air Pollutant Emissions Summary - Operations

Winter Emissions

	lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area Sources		0.0279	9.00E-05	1.04E-02	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05
Energy Use		0.00E+00	0	0	0.00E+00		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Mobile Sources		0.5673	0.8726	6.7758	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104
Total		0.60	0.87	6.79	0.02	1.87	0.01	1.89	0.50	0.01	0.51

Summer Emissions

	lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area Sources		0.0279	9.00E-05	1.04E-02	0		4.00E-05	4.00E-05		4.00E-05	4.00E-05
Energy Use		0.00E+00	0	0	0.00E+00		0.00E+00	0.00E+00		0.00E+00	0.00E+00
Mobile Sources		6.21E-01	7.46E-01	6.3504	1.64E-02	1.87E+00	1.44E-02	1.89E+00	4.97E-01	1.33E-02	5.10E-01
Total		0.65	0.75	6.36	0.02	1.87	0.01	1.89	0.50	0.01	0.51

Max Daily

	lbs/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area Sources		0.0279	0.00009	0.0104	0	0	0.00004	0.00004	0	0.00004	0.00004
Energy Use		0	0	0	0	0	0	0	0	0	0
Mobile Sources		0.6209	0.8726	6.7758	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104
Total		0.6488	0.8727	6.7862	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104
MBUAPCD Threshold (lbs/day)		137	137	550	150	NA	NA	82	NA	NA	NA
Exceeds Threshold		No	No	No	No	NA	NA	No	NA	NA	NA

San Vicente Redwoods State Park - Santa Cruz County, Annual

San Vicente Redwoods State Park
Santa Cruz County, Annual

1.0 Project Characteristics**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	98.00	Space	0.88	39,200.00	0
City Park	3.82	Acre	3.82	166,399.20	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	1.8	Precipitation Freq (Days)	61
Climate Zone	5			Operational Year	2025
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Vehicle Trips - See CalEEMod Assumptions

Water And Wastewater - See CalEEMod Assumptions File

Water Mitigation -

Fleet Mix - See CalEEMod Assumptions

Energy Use - No Lighting/Minimal emissions source

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	0.35	0.00
tblFleetMix	HHD	0.01	2.2590e-003
tblFleetMix	LDA	0.59	0.69
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.21	0.24
tblFleetMix	LHD1	0.02	3.1490e-003
tblFleetMix	LHD2	4.5520e-003	8.0900e-004
tblFleetMix	MCY	5.4300e-003	7.0070e-003
tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	9.1400e-004	0.00
tblFleetMix	MHD	0.02	3.7840e-003
tblFleetMix	OBUS	1.2290e-003	0.00
tblFleetMix	SBUS	9.8600e-004	0.00
tblFleetMix	UBUS	2.3510e-003	0.00
tblVehicleTrips	ST_TR	22.75	109.95
tblVehicleTrips	SU_TR	16.74	109.95
tblVehicleTrips	WD_TR	1.89	23.56
tblWater	OutdoorWaterUseRate	4,551,458.76	0.00

2.0 Emissions Summary

2.2 Overall Operational
Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0455	0.0655	0.5092	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0000	113.0520	113.0520	4.7300e-003	0.0000	113.1701
Waste						0.0000	0.0000		0.0000	0.0000	0.0670	0.0000	0.0670	3.9600e-003	0.0000	0.1660
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0505	0.0655	0.5105	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0670	113.0545	113.1215	8.7000e-003	0.0000	113.3388

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0455	0.0655	0.5092	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0000	113.0520	113.0520	4.7300e-003	0.0000	113.1701
Waste						0.0000	0.0000		0.0000	0.0000	0.0670	0.0000	0.0670	3.9600e-003	0.0000	0.1660
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0505	0.0655	0.5105	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0670	113.0545	113.1215	8.7000e-003	0.0000	113.3388

[illegible]

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0455	0.0655	0.5092	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0000	113.0520	113.0520	4.7300e-003	0.0000	113.1701
Unmitigated	0.0455	0.0655	0.5092	1.2500e-003	0.1442	1.1500e-003	0.1454	0.0384	1.0600e-003	0.0394	0.0000	113.0520	113.0520	4.7300e-003	0.0000	113.1701

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	90.00	420.01	420.01	393,427	393,427
Parking Lot	0.00	0.00	0.00		
Total	90.00	420.01	420.01	393,427	393,427

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.689160	0.031366	0.242467	0.020000	0.003149	0.000809	0.003784	0.002259	0.000000	0.000000	0.007007	0.000000	0.000000
Parking Lot	0.586012	0.026671	0.206176	0.113932	0.017728	0.004552	0.021301	0.012716	0.001229	0.002351	0.005430	0.000986	0.000914

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

[illegible]

Unmitigated

[illegible]

Mitigated

[illegible]

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003
Unmitigated	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003
Total	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	8.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003
Total	5.0400e-003	1.0000e-005	1.3000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5300e-003	2.5300e-003	1.0000e-005	0.0000	2.6900e-003

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0670	3.9600e-003	0.0000	0.1660
Unmitigated	0.0670	3.9600e-003	0.0000	0.1660

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.33	0.0670	3.9600e-003	0.0000	0.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		0.0670	3.9600e-003	0.0000	0.1660

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.33	0.0670	3.9600e-003	0.0000	0.1660
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		0.0670	3.9600e-003	0.0000	0.1660

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

San Vicente Redwoods State Park - Santa Cruz County, Summer

San Vicente Redwoods State Park

Santa Cruz County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	98.00	Space	0.88	39,200.00	0
City Park	3.82	Acre	3.82	166,399.20	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	1.8	Precipitation Freq (Days)	61
Climate Zone	5			Operational Year	2025
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Vehicle Trips - See CalEEMod Assumptions

Water And Wastewater - See CalEEMod Assumptions File

Water Mitigation -

Fleet Mix - See CalEEMod Assumptions

Energy Use - No Lighting/Minimal emissions source

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	0.35	0.00
tblFleetMix	HHD	0.01	2.2590e-003
tblFleetMix	LDA	0.59	0.69
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.21	0.24
tblFleetMix	LHD1	0.02	3.1490e-003
tblFleetMix	LHD2	4.5520e-003	8.0900e-004
tblFleetMix	MCY	5.4300e-003	7.0070e-003
tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	9.1400e-004	0.00
tblFleetMix	MHD	0.02	3.7840e-003
tblFleetMix	OBUS	1.2290e-003	0.00
tblFleetMix	SBUS	9.8600e-004	0.00
tblFleetMix	UBUS	2.3510e-003	0.00
tblVehicleTrips	ST_TR	22.75	109.95
tblVehicleTrips	SU_TR	16.74	109.95
tblVehicleTrips	WD_TR	1.89	23.56
tblWater	OutdoorWaterUseRate	4,551,458.76	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.6209	0.7464	6.3504	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2178	1,634.2178	0.0655		1,635.8545
Total	0.6488	0.7465	6.3607	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2401	1,634.2401	0.0655	0.0000	1,635.8782

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.6209	0.7464	6.3504	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2178	1,634.2178	0.0655		1,635.8545
Total	0.6488	0.7465	6.3607	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2401	1,634.2401	0.0655	0.0000	1,635.8782

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.6209	0.7464	6.3504	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2178	1,634.2178	0.0655		1,635.8545
Unmitigated	0.6209	0.7464	6.3504	0.0164	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,634.2178	1,634.2178	0.0655		1,635.8545

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	90.00	420.01	420.01	393,427	393,427
Parking Lot	0.00	0.00	0.00		
Total	90.00	420.01	420.01	393,427	393,427

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.689160	0.031366	0.242467	0.020000	0.003149	0.000809	0.003784	0.002259	0.000000	0.000000	0.007007	0.000000	0.000000
Parking Lot	0.586012	0.026671	0.206176	0.113932	0.017728	0.004552	0.021301	0.012716	0.001229	0.002351	0.005430	0.000986	0.000914

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Unmitigated	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Total	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Total	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

San Vicente Redwoods State Park - Santa Cruz County, Winter

San Vicente Redwoods State Park
Santa Cruz County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	98.00	Space	0.88	39,200.00	0
City Park	3.82	Acre	3.82	166,399.20	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	1.8	Precipitation Freq (Days)	61
Climate Zone	5			Operational Year	2025
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Vehicle Trips - See CalEEMod Assumptions

Water And Wastewater - See CalEEMod Assumptions File

Water Mitigation -

Fleet Mix - See CalEEMod Assumptions

Energy Use - No Lighting/Minimal emissions source

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	0.35	0.00
tblFleetMix	HHD	0.01	2.2590e-003
tblFleetMix	LDA	0.59	0.69
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.21	0.24
tblFleetMix	LHD1	0.02	3.1490e-003
tblFleetMix	LHD2	4.5520e-003	8.0900e-004
tblFleetMix	MCY	5.4300e-003	7.0070e-003
tblFleetMix	MDV	0.11	0.02
tblFleetMix	MH	9.1400e-004	0.00
tblFleetMix	MHD	0.02	3.7840e-003
tblFleetMix	OBUS	1.2290e-003	0.00
tblFleetMix	SBUS	9.8600e-004	0.00
tblFleetMix	UBUS	2.3510e-003	0.00
tblVehicleTrips	ST_TR	22.75	109.95
tblVehicleTrips	SU_TR	16.74	109.95
tblVehicleTrips	WD_TR	1.89	23.56
tblWater	OutdoorWaterUseRate	4,551,458.76	0.00

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.5673	0.8726	6.7758	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.4812	1,560.4812	0.0669		1,562.1533
Total	0.5952	0.8727	6.7862	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.5035	1,560.5035	0.0669	0.0000	1,562.1770

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.5673	0.8726	6.7758	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.4812	1,560.4812	0.0669		1,562.1533
Total	0.5952	0.8727	6.7862	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.5035	1,560.5035	0.0669	0.0000	1,562.1770

[illegible]

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5673	0.8726	6.7758	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.4812	1,560.4812	0.0669		1,562.1533
Unmitigated	0.5673	0.8726	6.7758	0.0157	1.8739	0.0144	1.8883	0.4971	0.0133	0.5104		1,560.4812	1,560.4812	0.0669		1,562.1533

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	90.00	420.01	420.01	393,427	393,427
Parking Lot	0.00	0.00	0.00		
Total	90.00	420.01	420.01	393,427	393,427

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.689160	0.031366	0.242467	0.020000	0.003149	0.000809	0.003784	0.002259	0.000000	0.000000	0.007007	0.000000	0.000000
Parking Lot	0.586012	0.026671	0.206176	0.113932	0.017728	0.004552	0.021301	0.012716	0.001229	0.002351	0.005430	0.000986	0.000914

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Unmitigated	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Total	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.4800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0225					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.5000e-004	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237
Total	0.0279	9.0000e-005	0.0104	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0223	0.0223	6.0000e-005		0.0237

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Attachment 5

Biological Resources Assessment



COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

KATHLEEN MOLLOY, PLANNING DIRECTOR

Bryan Largay
Land Trust of Santa Cruz County
617 Water Street
Santa Cruz, CA 95060

July 16, 2018

Subject: San Vicente Woods Biological Report, Application REV181099

Dear Mr. Largay:

The review of the Biological Resource Assessment, prepared by WRA, Inc., dated June 2018, has been completed. The subject report evaluates the potential impacts to known biological resources resulting from the development of a parking area and recreational trails in the Santa Cruz mountains along the north coast of unincorporated Santa Cruz County.

After a thorough review of the reports submitted and the resources on site, the County accepts the report and finds the proposed recommendations adequate to ensure no significant impacts to biological resources occur as a result of this project, with the exception of modifications to two recommendations.

Biology Minimization Measure 3C recommends that when a special status plant species cannot be avoided, the approved biologist shall develop appropriate mitigation measures based upon the species present, and references minimization approaches recommended by the CNPS. The initial study will be revised to require that if a species cannot be avoided, the impact shall be mitigated through some combination of propagation from local seed and habitat enhancement.

Construction Protocol BR 3.9 allows for the deconstruction of woodrats nests. The mitigation in the initial study shall be revised to include the following measures, based on the recommendations of the report and personal communication with Suzanne Deleon, Biologist for the California Department of Fish and Wildlife (CDFW) (April 29, 2009) in the event that a nest must be relocated:

1. Prior to nest disturbance, the biologist shall obtain from CDFW a scientific collection permit for the trapping of the dusky-footed wood rats.
2. Nests shall be disturbed/dismantled only during the non-breeding season, between October 1 and December 31.
3. At least two weeks prior to construction, the qualified biologist shall survey the project disturbance area to confirm the wood rat nest location and locate any other nests that may have been built in the project vicinity that may be affected by the proposed development.

4. Prior to nest disturbance, wood rats shall be trapped at dusk of the night set for relocation of the nest(s).
5. Any existing nest that may be disturbed by construction activities shall be mostly dismantled and the material spread in the vicinity of identified nest relocation site(s).
6. In order to avoid the potential health effects associated with handling rodents and their milieu, all workers involved in the handling of the wood rats or the nest materials should wear protective gear to prevent inhalation of contaminant particulates, contact with conjunctiva (eyes), and protection against flea bites; a respirator, eye protection and skin protection should all be used.
7. Dismantling shall be done by hand, allowing any animals not trapped to escape either along existing woodrat trails or toward other available habitat.
8. If a litter of young is found or suspected, nest material shall be replaced, and the nest left alone for 2-3 weeks before a recheck to verify that young are capable of independent survival before proceeding with nest dismantling.
9. Woody debris shall be collected from the area and relocated nests shall be partially constructed in an area determined by the qualified biologist to be both suitable for the wood rats and far enough away from the construction activities that they will not be impacted.
10. Rats that were collected at dusk shall be released hours before dawn near the newly constructed nests to allow time for rats to find refuge.
11. Once construction is complete, the biologist shall survey the nest area to note whether the new nests are in use, the wood rats have built new nests, or the nest area has been completely abandoned. This information shall be reported in a letter report to the Environmental Planning Section of the Planning Department, and the local CDFW biologist.

If you have any questions regarding this letter, please call me at 831-454-3201.

Sincerely,


Matthew Johnston
Principal Planner

Biological Resources Assessment Draft San Vicente Redwoods Public Access Plan

SANTA CRUZ COUNTY, CALIFORNIA

Prepared For:

Land Trust of Santa Cruz County
617 Water Street
Santa Cruz, California 95060
Contact: Bryan Largay
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Contact: Matt Richmond
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Date: June, 2018

WRA Project No.: 22287



TABLE OF CONTENTS

EXECUTIVE SUMMARY	v
1.0 INTRODUCTION.....	1
2.0 REGULATORY BACKGROUND	1
2.1 Sensitive Biological Communities	1
2.1.1 Clean Water Act Section 404	2
2.1.2 Clean Water Act Section 401 and Porter-Cologne Water Quality Control Act	2
2.1.3 California Fish and Game Code Section 1600	2
2.1.4 Essential Fish Habitat	3
2.1.5 CDFW Sensitive Terrestrial Communities	3
2.1.6 Sensitive Communities Identified by Santa Cruz County Code	3
2.1.7 Environmentally Sensitive Habitats Identified by the Santa Cruz County Local Coastal Program	5
2.2 Special-Status Species.....	5
2.2.1 Special-Status Plants and Wildlife	5
2.2.2 Critical Habitat	6
2.3 Protected Trees	7
3.0 METHODS	7
3.1 Biological Communities	8
3.1.1 Non-Sensitive Biological Communities	8
3.1.2 Sensitive Biological Communities	8
3.2 Special-Status Species.....	10
3.2.1 Literature Review	10
3.2.2 Site Assessment	10
3.2.3 Special-Status Species Surveys	11
3.2.4 Critical Habitat	13
3.4 Protected Trees	13
4.0 ENVIRONMENTAL SETTING	13
5.0 RESULTS	14
5.1 Biological Communities	14
5.1.1 Non-Sensitive Biological Communities	17
5.1.2 Sensitive Biological Communities	17
5.2 Special-Status Species.....	21
5.2.1 Special-Status Plants	21
5.2.2 Special-Status Wildlife	25
5.2.3 Critical Habitat	33
5.3 Protected Trees	33
6.0 PROJECT DESCRIPTION	33
7.0 POTENTIAL IMPACTS, MINIMIZATION, AND AVOIDANCE MEASURES	35
7.1 Sensitive Biological Communities	36
7.1.1 Sensitive Terrestrial Communities	36
7.1.2 Sensitive Aquatic Communities	38
7.2 Special-Status Plant and Wildlife Species.....	40
7.2.1 Special-Status Plants	40
7.2.2 Special-Status Wildlife	41
7.3 Protected Trees	47

8.0 CONCLUSION	47
9.0 REFERENCES	48

LIST OF TABLES

Table 1. Description of California Rare Plant Ranks and Threat Codes.....	6
Table 2. Coarse-Scale Biological Communities Mapped within the Larger San Vicente Redwoods Property by ESA (2012)	15
Table 3. Biological Communities Observed by WRA within the Project Area.....	16
Table 4. Trail Dimensions by Type	35

LIST OF APPENDICES

Appendix A – Project Figures

- Figure 1. Location Map
- Figure 2. Project Area Overview
- Figure 3. Biological Communities Documented within the Greater San Vicente
Property
- Figure 4. Wetlands Documented within the Project Area
- Figure 5. Regulated Stream Crossings within the Project Area
- Figure 6. Special-Status Plants Documented within a 5-Mile Radius of the
Project Area
- Figure 7. Special-Status Plants Documented within the Project Area
- Figure 8. Special-Status Wildlife Documented within a 5-Mile Radius of the
Project Area
- Figure 9. Special-Status Wildlife Documented within the Project Area

Appendix B – List of Observed Plant and Wildlife Species

Appendix C – Potential for Special-Status Species to Occur in the Project Area

Appendix D – Site Photographs

LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CCA	California Coastal Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game (currently the CDFW)
CDFW	California Department of Fish and Wildlife (formerly the CDFG)
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFG	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California Red-Legged Frog
CSRL	California Soil Resource Lab
DBH	Diameter at Breast Height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
ESU	Ecologically Significant Unit
Inventory	CNPS Inventory of Rare and Endangered Plants
LCP	Local Coastal Program
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
OWHM	Ordinary High Water Mark
PCE	Primary Constituent Element
PFCM	Pacific Fisheries Management Council
Rank	California Rare Plant Rank
RWQCB	Regional Water Quality Control Board
USFWS	U.S. Fish and Wildlife Service
WBWG	Western Bat Working Group
WRA	WRA, Inc.

EXECUTIVE SUMMARY

This report provides an analysis of natural community and special-status species issues for the proposed trail alignment associated with the Draft San Vicente Redwoods Public Access Plan (Draft Public Access Plan; PlaceWorks 2018) located in unincorporated Santa Cruz County, California. In December 2015, January, February, June, August, and October 2016, and May, June, and August 2017 WRA, Inc. (WRA) conducted a biological resources assessment within the Project Area for the proposed trail network. WRA observed 13 biological communities, 242 plant taxa and 18 wildlife taxa. Eleven sensitive biological communities were identified, including three sensitive aquatic communities. One special-status plant species and three special-status wildlife were determined to be present based on direct observations made by WRA or documented historical occurrences from the site. An additional 18 special-status plant species known from the region were originally determined to have potential to occur within the trail alignment. However, these plants were not observed within the trail alignment during seasonally timed rare plant surveys in 2016 and 2017, and it was subsequently determined that these species have low potential to occur within the proposed trail alignment, although they may have potential occur elsewhere on the property. An additional 13 special-status wildlife species known from the region were determined to have a moderate to high potential to occur within the proposed trail alignment or the immediate vicinity based on the presence of suitable habitat conditions and the proximity of known occurrences within the vicinity of the Project Area.

Although the proposed Project covers a large amount of land, the proposed Project itself is relatively minimal in nature. As a result of the intensive conservation and planning analyses conducted by the Project team, the proposed trail alignment and staging area have been designed to minimize impacts on the land and the sensitive resources found there. The proposed trail design has incorporated the best available design practices for trail construction and maintenance, reducing the potential for long-term adverse impacts related to erosion, sedimentation, and other issues that can arise from poor trail design. The trail network was designed to occupy only a small fraction of the land within the larger San Vicente Redwoods property, thereby providing ample untouched lands for plant and wildlife conservation. Moreover, the minimal nature of the proposed trail network and the activities that will be allowed there are by their very nature compatible with wildland conservation. With the implementation of the avoidance and minimization measures built into the project, WRA believes that all potential adverse impacts associated with the proposed Project can be reduced to a less-than-significant level.

1.0 INTRODUCTION

On multiple dates in December 2015, January, February, June, August, and October 2016, and May, June, and August 2017, WRA, Inc. (WRA) performed an assessment of biological resources for a proposed trail network within the approximately 8,532-acre San Vicente Redwoods property. The trail network is described in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018). The site is composed of two properties located in unincorporated Santa Cruz County, California (Figure 1). For the purpose of this report, the “main parcel” refers to the approximately 8,159-acre property located off of Empire Grade Road, and the “Laguna parcel” refers to the approximately 373-acre property located adjacent to the Bonny Doon Ecological Reserve. The “Project Area” refers to the alignment for the proposed trail network on both properties and an associated parking and staging area on the main parcel, adjacent to Empire Grade Road. The Project Area includes an approximately 50-foot buffer on either side of the trail alignment and around the parking and staging area (Figure 2).

The purpose of the assessment was to gather information necessary to complete a review of biological resources under the California Environmental Quality Act (CEQA) for the proposed trail network. This report describes the results of the site visit, which assessed the Project Area for the (1) potential to support special-status species and (2) presence of other sensitive biological resources protected by local, state, and federal laws and regulations. Special-status species observed during the site visit were documented and are discussed herein. Specific findings on the habitat suitability or presence of special-status species or sensitive habitats may require that protocol-level surveys be conducted. This report also contains an evaluation of potential impacts to special-status species and sensitive biological communities that may occur as a result of the proposed Project, including potential mitigation measures to compensate for any such impacts.

A biological resources assessment provides general information on the potential presence of sensitive species and habitats. The biological resources assessment is not an official protocol-level survey for listed species which may be required for Project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on site conditions that were observed on the dates of the site visits.

Note to the Reader: All Figures referenced in the text are included in Appendix A.

2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological assessment, including applicable laws and regulations that were applied to the field investigations and analysis of potential Project impacts.

2.1 Sensitive Biological Communities

Sensitive biological communities include habitats that fulfill special functions or have special values, such as wetlands, streams, riparian habitat, and sensitive terrestrial communities. These habitats are protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, the California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game [CDFG]) Streambed Alteration Program, and the CEQA; and/or local ordinances or policies such as Special Habitat Management Areas or General Plan Elements. Where these communities occur within the Coastal Zone, they may also be regulated under the California Coastal Act (CCA), as administered by the Santa Cruz County Local Coastal Program (LCP).

2.1.1 Clean Water Act Section 404

The U.S. Army Corps of Engineers (Corps) regulates “Waters of the United States” under Section 404 of the Clean Water Act. Waters of the U.S. are defined in the Code of Federal Regulations (CFR) as waters susceptible to use in commerce, including interstate waters and wetlands, all other waters (intrastate waterbodies, including wetlands), and their tributaries (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Areas that are inundated at a sufficient depth and for a sufficient duration to exclude growth of hydrophytic vegetation are subject to Section 404 jurisdiction as “other waters” and are often characterized by an ordinary high water mark (OHWM). Other waters, for example, generally include lakes, rivers, and streams. The placement of fill material into Waters of the U.S generally requires an individual or nationwide permit from the Corps under Section 404 of the Clean Water Act. The Project Area is within the jurisdiction of the Corps’ San Francisco District.

2.1.2 Clean Water Act Section 401 and Porter-Cologne Water Quality Control Act

The term “Waters of the State” is defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope and has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes “isolated” wetlands and waters that may not be regulated by the Corps under Section 404. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a Corps permit, or fall under other federal jurisdiction, and have the potential to impact Waters of the State, are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to Waters of the State, the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements. The Project Area is within the jurisdiction of the Central Coast RWQCB.

2.1.3 California Fish and Game Code Section 1600

Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of California Fish and Game Code (CFG). Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW. The Project Area is within the jurisdiction of the CDFW’s Bay Delta Region.

2.1.4 Essential Fish Habitat

Essential Fish Habitat (EFH) is regulated through the National Marine Fisheries Service (NMFS), a division of the National Oceanic and Atmospheric Administration. Protection of EFH is mandated through changes implemented in 1996 to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to protect the loss of habitat necessary to maintain sustainable fisheries in the United States. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" [16 USC 1802(10)]. The NMFS further defines Pacific coast salmon fishery essential fish habitat as "waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem" (Pacific Fisheries Management Council [PFMC] 1999). California salmonid species covered by this Fisheries Management Plan include Chinook salmon (*Oncorhynchus tshawytscha*) and Coho salmon (*O. kisutch*), and the EFH "must include all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon" in California (PFMC 1999). Under regulatory guidelines issued by the NMFS, any federal agency that authorizes, funds, or undertakes action that may affect EFH is required to consult with the NMFS (50 CFR 600.920).

The Project Area is located outside of viable areas to Chinook salmon and Coho salmon (as described in more detail in Section 4.2.2) and Project activities will be minimized to prevent downstream impacts to EFH (as described in Section 6.1.2). Therefore, while EFH was evaluated for the regulatory context of this Project; no further discussion of EFH is warranted.

2.1.5 CDFW Sensitive Terrestrial Communities

Sensitive terrestrial biological communities include terrestrial habitats that fulfill special functions or have special values. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2016a). Sensitive plant communities are also identified by CDFW (CNPS 2016a, CDFW 2016b). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G; referred to herein as the "Global Rank") or statewide (S; referred to herein as the "State Rank") as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified by the CDFW must be considered and evaluated under the CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances (see sections 2.1.6 and 2.1.7).

2.1.6 Sensitive Communities Identified by Santa Cruz County Code

Chapter 16 of the Santa Cruz County Code pertains to the protection of natural resources, and includes sections relating to topics such as grading regulations, erosion control, and water quality control, among others. The sections of Chapter 16 which are relevant to the Project are summarized as follows:

Riparian Corridor and Wetlands Protection

County approval is required for projects that may result in impacts to "riparian corridors." In Chapter 16.30, a riparian corridor is defined as:

- (1) *Lands within a stream channel, including the stream and the area between the mean rainy season (bankfull) flowlines;*

- (2) *Lands extending 50 feet (measured horizontally) out from each side of a perennial stream. Distance shall be measured from the mean rainy season (bankfull) flowline;*
- (3) *Lands extending 30 feet (measured horizontally) out from each side of an intermittent stream. Distance shall be measured from the mean rainy season (bankfull) flowline;*
- (4) *Lands extending 100 feet (measured horizontally) from the high water mark of a lake, wetland, estuary, lagoon or natural body of standing water;*
- (5) *Lands within an arroyo located within the urban services line, or the rural services line;*
- (6) *Lands containing a riparian woodland.*

Sensitive Habitat Protection

County approval is required for projects that may result in impacts to “sensitive habitat.” Chapter 16.32 includes the following definition of a “sensitive habitat”:

- (1) *Areas of special biological significance as identified by the State Water Resources Control Board.*
- (2) *Areas which provide habitat for locally unique biotic species/communities including but not limited to: oak woodlands, coastal scrub, maritime chaparral, native rhododendrons and associated Elkgrass, indigenous Ponderosa Pine, indigenous Monterey Pine, mapped grassland in the Coastal Zone and sand parkland; and special forests including San Andreas Oak Woodlands, indigenous Ponderosa Pine, indigenous Monterey Pine and ancient forests.*
- (3) *Areas adjacent to essential habitats of rare, endangered or threatened species as defined in subsections (5) and (6) of this definition.*
- (4) *Areas which provide habitat for species of special concern as listed by the California Department of Fish and Game in the special animals list, natural diversity database.*
- (5) *Areas which provide habitat for rare or endangered species which meet the definition of Section 15380 of the California Environmental Quality Act guidelines.*
- (6) *Areas which provide habitat for rare, endangered or threatened species as designated by the State Fish and Game Commission, United States Fish and Wildlife Service or California Native Plant Society.*
- (7) *Nearshore reefs, rocky intertidal areas, sea caves, islets, offshore rocks, kelp beds, marine mammal hauling grounds, sandy beaches, shorebird roosting, resting and nesting areas, cliff nesting areas and marine, wildlife or educational/research reserves.*
- (8) *Dune plant habitats.*
- (9) *All lakes, wetlands, estuaries, lagoons, streams and rivers.*

(10) *Riparian corridors.*

County code allows for limited uses within these sensitive habitats, including nature study and research and hunting, fishing, and equestrian trails that have no adverse impact on the species or habitat. Although no hunting or fishing will be allowed on the site, the proposed use of the site for pedestrian, bicycle, and equestrian trails is in line with the spirit of the County code.

Development within any sensitive habitat area is subject to the following conditions:

- *All development shall mitigate significant environmental impacts, as determined by the Environmental Coordinator.*
- *Dedication of an open space or conservation easement or an equivalent measure shall be required as necessary to protect the portion of a sensitive habitat which is undisturbed by the proposed development activity or to protect a sensitive habitat on an adjacent parcel.*
- *Restoration of any area which is a degraded sensitive habitat or has caused or is causing the degradation of a sensitive habitat shall be required; provided, that any restoration required shall be commensurate with the scale of the proposed development.*

2.1.7 Environmentally Sensitive Habitats Identified by the Santa Cruz County Local Coastal Program

The County of Santa Cruz Local Coastal Program (LCP; County of Santa Cruz 1994) defines Environmentally Sensitive Habitats protected under the California Coastal Act in the unincorporated portions of Santa Cruz County. In addition to areas shown on County General Plan and LCP Resources and Constraints Maps, the LCP considers all of the habitats listed above in Section 2.1.6 as Environmentally Sensitive Habitats for purposes of the California Coastal Act. The LCP also identifies a number of specific special-status plant and wildlife species, the habitat for which constitutes Environmentally Sensitive Habitat.

The LCP regulates development and other activities within and adjacent to Environmentally Sensitive Habitats and defines required buffers or setbacks from such habitats. The LCP defines allowed uses within Environmentally Sensitive Habitats and their buffers and specifically identifies “non-motorized recreation and pedestrian trails” as an allowed use compatible with riparian habitat. Because the Santa Cruz County LCP is contained within their General Plan, many of the LCP protections over Environmentally Sensitive Habitats within the Coastal Zone are aligned with the County Code regarding sensitive biological resources and implementation of the LCP is through the Riparian Corridor and Wetlands Protection Ordinance (16.30) and the Sensitive Habitat Ordinance (16.32) (see Section 2.1.6).

2.2 Special-Status Species

2.2.1 Special-Status Plants and Wildlife

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA). These acts afford protection to both listed species and those that are formal candidates for listing. In addition, CDFW Species of Special Concern, CDFW California Fully Protected species, USFWS Birds of Conservation Concern, and CDFW Special-Status Invertebrates are all considered special-status

species. Although these aforementioned species generally have no special legal status, they are given special consideration under the CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity. Bats listed as a “High Priority” or “Medium Priority” species for conservation by the WBWG are typically considered special-status and are considered under the CEQA. In addition to regulations for special-status species, most birds in the United States, including non-special-status native species, are protected by the Migratory Bird Treaty Act of 1918 (MBTA) and the CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws, destroying active bird nests, eggs, and/or young is illegal.

Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank; formerly known as CNPS “Lists”) of 1 and 2 are also considered special-status plant species and must be considered under the CEQA. Rank 3 and Rank 4 species are afforded little or no protection under the CEQA, but are included in this analysis for completeness.

Table 1. Description of California Rare Plant Ranks and Threat Codes

California Rare Plant Ranks	
Rank 1A	Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	Rare, threatened, or endangered in California and elsewhere
Rank 2A	Presumed extirpated in California, but more common elsewhere
Rank 2B	Rare, threatened, or endangered in California, but more common elsewhere
Rank 3	Plants about which more information is needed - A review list
Rank 4	Plants of limited distribution - A watch list
Threat Ranks	
0.1	Seriously threatened in California
0.2	Moderately threatened in California
0.3	Not very threatened in California

2.2.2 Critical Habitat

Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the USFWS to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species. In consultation for those species with critical habitat, federal agencies must also ensure that their activities or projects do not adversely modify critical habitat to the point that it will no longer aid in the species’ recovery. In many cases, this level of protection is similar to that already provided to species by the ESA jeopardy standard. However, areas that are currently unoccupied by the species but which are needed for the species’ recovery are protected by the prohibition against adverse modification of critical habitat.

2.3 Protected Trees

Chapter 16 of the Santa Cruz County Municipal Code outlines policies for the protection of significant trees within the unincorporated portions of the County. County approval is required for projects that may result in impacts to “significant trees.” Per Chapter 16.34, a permit is needed for trees within the Coastal Zone that meet Definitions 1 or 2, below. A permit is also needed for trees within Sensitive Habitat (Definition 3).

1. *Within the Urban Services Line or Rural Services Line, any tree which is equal to or greater than 20 inches d.b.h. (approximately 5 feet in circumference); any sprout clump of five or more stems each of which is greater than 12 inches d.b.h. (approximately 3 feet in circumference); or any group consisting of five or more trees on one parcel, each of which is greater than 12 inches d.b.h. (approximately 3 feet in circumference).*
2. *Outside the Urban Services Line or Rural Services line, where visible from a scenic road, any beach, or within a designated scenic resource area, any tree which is equal to or greater than 40 inches d.b.h. (approximately 10 feet in circumference); any sprout clump of five or more stems, each of which is greater than 20 inches d.b.h. (approximately 5 feet in circumference); or, any group consisting of ten or more trees on one parcel, each greater than 20 inches d.b.h. (approximately 5 feet in circumference).*
3. *Any tree located in a sensitive habitat as defined in Chapter 16.32. Also see Section 16.34.090(c), exemption of projects with other permits.*

The following work is exempted from all provisions of Chapter 16.34 :

- (A) *Timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practices Act of 1973 (commencing with Section 4511).*
- (B) *Any activity done pursuant to a valid timber harvest permit, or a notice of timber harvesting, approved pursuant to Chapter 16.52 SCCC.*
- (C) *Any tree removal authorized pursuant to a valid discretionary permit approved pursuant to Chapter 13.10 (Zoning Regulations), Chapter 13.20 (Coastal Zone Regulations), Chapter 14.01 (Subdivision Regulations), Chapter 16.20 (Grading Regulations), Chapter 16.22 (Erosion Control), Chapter 16.30 (Riparian Corridor and Wetlands Protection), Chapter 16.32 (Sensitive Habitat Protection), or Chapter 16.54 SCCC (Mining Regulations).*
- (D) *Removal of tree crops pursuant to agricultural operations. [Ord. 3443 § 1, 1983; Ord. 3341 § 1, 1982].*

3.0 METHODS

On December 16-17, 2015; January 20-22, February 10-12, June 15-16, August 15-17, August 24-25, and October 21, 2016; and May 30-June 1, and August 8-9, 2017 the Project Area was traversed on foot to determine (1) plant communities present within the Project Area, (2) whether existing conditions may provide suitable habitat for any special-status plant or wildlife species, and (3) whether sensitive habitats are present. In addition, these surveys included a comprehensive mapping of San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)

middens and seasonally timed surveys for special-status plants. The Project Area for the assessment was defined to include the proposed trail alignment plus an approximately 50-foot buffer on both sides, as well as the proposed parking area adjacent to Empire Grade Road and a 50-foot buffer (Figure 2).

All plant and wildlife species encountered were recorded and are listed in Appendix B. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2017), except where noted. Because of recent changes in classification for many of the taxa treated by Baldwin et al. and the Jepson Flora Project, relevant synonyms are provided in brackets. For cases in which regulatory agencies, CNPS, or other entities base rarity on older taxonomic treatments, precedence was given to the treatment used by those entities.

3.1 Biological Communities

Prior to the site visit, an online soil survey of the Project Area (California Soil Resource Lab 2016) was examined to determine whether any unique soil types that could support sensitive plant communities and/or aquatic features are present in the Project Area. In addition, aerial imagery (Google Earth) of the Project Area was reviewed to determine where sensitive landscape features may occur. Biological communities present in the Project Area were classified based on existing plant community descriptions described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and *A Manual of California Vegetation, Online Edition* (CNPS 2016a). However, in some cases it was necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature.

Mapping of plant communities relied on a high-level analysis of the site based on data from CalVeg (U.S. Forest Service 2009) which were augmented by local experts and the Land Trust of Santa Cruz County to document important local habitats such as sandhills, sandhill parklands, and stands of the Federal Endangered Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*) and to reflect the boundaries of urban and cultivated lands (ESA 2012). WRA did not refine the mapping of biological communities; however, WRA did note the occurrence of any sensitive biological communities within the Project Area (see Section 3.1.2). Sensitive biological communities with discrete boundaries (e.g., wetlands and streams) were mapped in the field; however, sensitive communities lacking discrete boundaries (e.g., forest types) were not mapped. Instead, the assessment focused on developing avoidance and minimization measures to prevent adverse impacts to such communities. Biological communities observed within the Project Area were classified as sensitive or non-sensitive as defined by the CEQA and other applicable laws and regulations (see below).

3.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities are those communities that are not afforded special protection under the CEQA or other state, federal, or local laws, regulations or ordinances. These communities may, however, provide suitable habitat for some special-status plant or wildlife species and are identified or described in Section 4.1.1 below.

3.1.2 Sensitive Biological Communities

Sensitive biological communities are defined as those communities that are given special protection under the CEQA or other applicable federal, state, or local laws, regulations or ordinances. Applicable laws and ordinances are discussed above in Section 2.0. Special methods used to identify sensitive biological communities are discussed below.

Wetlands and Non-Wetland Waters

The Project Area was surveyed to determine whether any wetlands and waters potentially subject to jurisdiction by the Corps, RWQCB, or CDFW are present. The assessment was based primarily on the presence of wetland plant indicators, but may also include any observed indicators of wetland hydrology or wetland soils. Potential wetland areas were identified as areas dominated by plant species with a wetland indicator status¹ of OBL, FACW, or FAC as given on the National Wetlands Plant List (Lichvar et al. 2016). Evidence of wetland hydrology can include direct evidence (primary indicators), such as visible inundation or saturation, algal mats, and oxidized root channels, or indirect (secondary) indicators, such as a water table within two feet of the soil surface during the dry season. Some indicators of wetland soils include dark colored soils, soils with a sulfidic odor, and soils that contain redoximorphic features as defined by the Corps Manual (Environmental Laboratory 1987) and Field Indicators of Hydric Soils in the United States (Natural Resources Conservation Service 2010).

Coastal Act/Local Coastal Program Wetlands

Whereas wetlands regulated under the Clean Water Act or the Porter-Cologne Act are identified based on the presence of three parameters (hydrophytic vegetation, hydric soils, and wetland hydrology), the Coastal Act defines wetlands as those areas meeting any one or more of the three wetland parameters. As such, WRA used the Coastal Act wetland definition to identify potentially jurisdictional wetlands within the portion of the Project Area that occurs within the Coastal Zone. Areas which were dominated by FACW- or OBL-rated vegetation or which contained hydric soils or displayed evidence of wetland hydrology were always treated as wetlands for the purposes of the Coastal Act. Areas which were dominated by FAC-rated vegetation and which were located in a suitable topographic position to support wetland hydrology were also always treated as wetlands for the purposes of the Coastal Act. Because FAC-rated vegetation is by definition equally likely to occur in wetlands and uplands (Lichvar et al. 2016), WRA biologists examined areas dominated by FAC-rated vegetation but which were not located in a typical wetland topographic position on a case by case basis. In those situations, WRA biologists looked for evidence that the vegetation was being supported by wetland hydrology (e.g., the presence of hydric soils, evidence of wetland hydrology, or suitable topographic position) before determining that the area should be considered a wetland for the purposes of the Coastal Act.

Sensitive Terrestrial Biological Communities

Prior to the site visit, aerial photographs, local soil maps, and *A Manual of California Vegetation, Online Edition* (CNPS 2016a) were reviewed to assess the potential for sensitive biological communities to occur in the Project Area. During the site visits, the Project Area was evaluated for the presence of sensitive terrestrial biological communities, including sensitive plant communities recognized by the CDFW and sensitive habitats identified in the General Plan/Local Coastal Program and the Santa Cruz County Code. Communities were identified based on descriptions and membership rules developed by the CDFW and the CNPS (Sawyer et al. 2009 and subsequent online updates). All alliances observed within the Project Area with a State Ranking ("S") of 1 through 3 were considered sensitive biological communities and are described in Section 4.1.2, below. Due to the scale of the Project Area, both its narrow width and its long length, and given the comparatively coarse scale at which vegetation alliances are mapped, it

¹ OBL = Obligate, always found in wetlands (> 99% frequency of occurrence); FACW = Facultative wetland, usually found in wetlands (67-99% frequency of occurrence); FAC = Facultative, equal occurrence in wetland or non-wetlands (34-66% frequency of occurrence).

was not practical or feasible to map discrete boundaries between sensitive terrestrial communities in the Project Area. Instead, the presence of these communities was noted, and potential impacts to such communities were assessed collectively at a programmatic level.

3.2 Special-Status Species

3.2.1 Literature Review

Potential occurrence of special-status species in the Project Area was evaluated by first determining which special-status species occur in the vicinity of the Project Area through a literature and database search. Database searches for known occurrences of special-status species focused on the Davenport 7.5-minute U.S. Geological Survey (USGS) quadrangle and the six surrounding quadrangles (Año Nuevo, Franklin Point, Big Basin, Castle Rock Ridge, Felton, and Santa Cruz). The following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the Project Area:

- CNDDDB records (CDFW 2016a)
- USFWS quadrangle species lists (USFWS 2016a)
- CNPS Inventory records (CNPS 2016b)
- CDFG publication “California’s Wildlife, Volumes I-III” (Zeiner et al. 1990)
- CDFG publication “California Bird Species of Special Concern” (Shuford and Gardali 2008)
- CDFG publication “An Annotated Checklist of Amphibian and Reptile Species of California and Adjacent Waters” (Jennings 2004)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- University of California at Davis California Fish Data and Management Software (PISCES 2016)
- National Marine Fisheries Service Distribution Maps for California Salmonid Species (NMFS 2013)

In addition to these resources, WRA received additional unpublished information regarding the presence of local special-status plant occurrences, including for Rank 4 species which are not tracked in the CNDDDB (Nadia Hamey, Big Creek forester, personal communication to Matthew Richmond, April 6, 2016).

3.2.2 Site Assessment

Multiple site visits were made to the Project Area to search for suitable habitats for special-status species. Surveys covered the trail network and parking area, including approximately 50 feet on either side of the proposed trail alignment (25 feet on either side of the alignment for wood rat nest mapping) as well as 50-feet around the parking area. Habitat conditions within these areas were used to evaluate the potential for special-status species to occur there. The potential for each special-status species to occur in the Project Area was evaluated according to the following criteria:

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Present. Species is observed on the site or has been recorded (e.g., CNDDDB, other reports) on the site recently.

Not Observed. Species is identifiable year-round but was not observed during surveys or the survey occurred when the species should have been apparent and identifiable but the species was not observed. These species are assumed to not be present.

The site assessment is intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity in order to determine its potential to occur in the Project Area. The site visit does not constitute a protocol-level survey and is not intended to determine the actual presence or absence of a species; however, if a special-status species is observed during the site visit, its presence was recorded and is discussed in the following sections.

In cases where little information is known about species occurrences and habitat requirements, the species evaluation was based on best professional judgment of WRA biologists with experience working with the species and habitats. If necessary, recognized experts in individual species biology were contacted to obtain the most up-to-date information regarding species biology and ecology.

All special-status species observed during the site visit were documented and are discussed below in Section 4.2. For some species, a site assessment at the level conducted for this report may not be sufficient to determine the presence or absence of a species to the specifications of regulatory agencies. In these cases, a species may be assumed to be present or further protocol-level special-status species surveys may be necessary. In some cases, focused surveys may be sufficient to determine the presence or absence of a species for the purposes of the CEQA. WRA conducted seasonally-timed, focused surveys for special-special status plants documented from the region and focused surveys for San Francisco dusky-footed woodrat. The methods for these surveys are described in the following sections. Special-status species for which further focused or protocol-level surveys may be necessary are described below in Section 6.0.

3.2.3 Special-Status Species Surveys

Special-Status Plants

Surveys for special-status plants were conducted on the dates listed below; surveys were stratified such that each portion of the alignment was subjected to early- (December-February), mid- (May-June), and late-season (August-October) surveys.

Special-Status Plant Survey Dates:

<u>2015</u>	<u>2016</u>	<u>2017</u>
December 16-17	January 20-22	May 30-June 1
	February 10-12	August 8-9
	June 15-16	
	August 15-17, 24-25	
	October 21	

Surveys were conducted by WRA botanists familiar with the plants and vegetation of the Santa Cruz Mountains. Surveys covered the trail segments shown on Figure 2, including an approximately 50-foot buffer on all sides. Surveys were also conducted in the proposed parking and staging area adjacent to Empire Grade Road, including an approximately 50-foot buffer. All areas were traversed on foot and all species encountered were identified to the taxonomic level necessary to determine rarity. Occurrences of rare plants were captured as GPS points (for single plants or closely spaced, small groups of plants) and polygons (for larger or more widely spaced groups of plants).

Anderson's manzanita (*Arctostaphylos andersonii*; CNPS Rank 1B.2) was the only special-status plant observed within the Project Area. To calculate potential impacts to Anderson's manzanita associated with the proposed Project, WRA overlaid Anderson's manzanita point and polygon occurrences over a map of the proposed trail alignment; to give them dimensions, individual manzanita points were assigned an average 5-foot radius based on the average plant size observed in the field. All occurrences of Anderson's manzanita that intersected a 7-foot band representing the width of trail construction (5 feet of trail tread plus 1 foot of vegetation clearance on either side) running down the centerline of the trail alignment were considered to be directly impacted. Such impacts are theoretical given that there is flexibility to move the trail anywhere within the 100-foot-wide band surveyed for this report; however, it gives an indication of the maximum number of individuals that could be impacted.

Special-Status Wildlife

WRA wildlife biologists conducted a general assessment of habitat quality within the Project Area on December 16-17, 2015 and January 20-22 and February 10-12, 2016. Wildlife biologists walked the entirety of the proposed alignment, including an approximately 50-foot buffer on either side of the alignment, to note habitat conditions and document unique features for wildlife.

Concurrent with this assessment, biologists mapped all active San Francisco dusky-footed woodrat middens observed within the Project Area. WRA biologists familiar with the identification of woodrat middens and the biology of the species conducted the surveys. Surveys covered the trail alignments shown on Figure 2; all areas were traversed on foot and woodrat middens located within approximately 25 feet of the proposed trail alignment were mapped using handheld GPS units with sub-meter accuracy. Woodrat middens within the proposed parking area adjacent to Empire Grade Road, including a 50-foot buffer, were also mapped following the same approach. To estimate potential direct impacts to woodrat nests, each nest, or group of nests, was mapped using handheld GPS equipment, and all nests that intersect with a 7-foot band (5 feet of trail tread plus 1 foot of vegetation clearance on either side) running down the centerline of the trail alignment were considered to be directly impacted. Such impacts are theoretical in that there is flexibility to move the trail anywhere within the 50-foot-wide band surveyed for this report.

Within the Project Area, WRA biologists mapped locations of large old-growth trees with unique habitat features that may support special-status wildlife species such as roosting bats. Noted as "wildlife trees", these features had various combinations of exposed snags, open cavities, exfoliating bark, or unique crown formations that may provide good thermal properties for roosting or unique nesting habitat. In addition to WRA's observations, locations of old-growth Douglas fir and redwood trees and stands of old-growth that should be evaluated for the potential to support marbled murrelet have been historically mapped at the site by multiple groups and are shown on the associated special-status wildlife Figures in Appendix A (see ESA 2012 for additional information).

3.2.4 Critical Habitat

To determine whether Critical Habitat for listed plant or wildlife species has been designated within the Project Area, WRA reviewed the USFWS online Critical Habitat mapping tool (USFWS 2016b). For cases in which Critical Habitat has been designated at the site, WRA biologists assessed the area to determine whether it contained the primary constituent elements (PCEs) required by the species in question.

3.4 Protected Trees

WRA did not conduct a tree survey or any other type of assessment to determine whether protected trees occur within the Project Area. In the staging area, native trees were identified by registered professional forester Nadia Hamey and mapped by Fall Creek Engineers. Staging area construction is anticipated to result in the removal of the following native trees with diameter at breast height (DBH) greater than 12 inches: 11 oak trees (including coast live oak, canyon live oak, tanoak): 4 @ 12 inch DBH, 13 inch DBH, 15 inch DBH, 20 inch DBH, 2 @ 18 inch DBH, 19 inch DBH, 36 inch DBH, one Douglas fir: 30 inch DBH and, four madrone: 12 inch DBH, 13 inch DBH, 16 inch DBH, 17 inch DBH.

4.0 ENVIRONMENTAL SETTING

The larger San Vicente Redwoods property (i.e., the main parcel) is located in the heart of the Santa Cruz Mountains, situated among a number of other large, protected properties with very limited development. Rural residences occur in small communities adjacent to the site along Empire Grade Road and Pine Flat Road. The Project Area occurs within the North Coast Watersheds, an important area for multi-species benefits conservation identified in the Land Trust of Santa Cruz County's *A Conservation Blueprint* (Mackenzie et al. 2011). The San Vicente Redwoods property is contiguous with a large amount of protected lands including Cal Poly's Swanton Ranch, the Coast Dairies, Bonny Doon Ecological Preserve, Wilder Ranch State Park, and UC Santa Cruz's Natural Reserve (ESA 2012).

The majority of the main parcel and adjacent lands are characterized by dense redwood, coast/canyon live oak, and tanoak forest, with smaller areas of scrub and chaparral habitat. Elevations within the main parcel range from approximately 500 to 2,500 feet above sea level. The Project Area within the main parcel contains a number of east-west trending ridges extending from Empire Grade, transitioning into a north-south trending ridge that dips down into Cotoni Coast Dairies at the southern end of the main parcel. The southern portion of the Project Area burned in 2009, resulting in a mosaic of chaparral and forest regrowth and standing dead trees which provide high value for wildlife. The largest creek on the main parcel is San Vicente Creek, a perennial stream with its headwaters near Empire Grade.

The Laguna parcel is located to the southeast of the main parcel, adjacent to the Bonny Doon Ecological Reserve, home to a number of sensitive plant species adapted to the sandy soils that occur there. The Laguna parcel occurs on a different soil type and supports some sandhills or sand parkland habitat similar to that found on the adjacent Bonny Doon Ecological Reserve, however, the trail network avoids this area. On the Laguna parcel, the Project Area follows a more gentle south-westerly slope along the riparian corridor along Laguna Creek, a perennial creek with its headwaters near Empire Grade. Elevations within the Laguna parcel range from approximately 750 to 1,600 feet above sea level.

Both parcels were historically used for timber harvesting and contain dirt logging roads. Some active logging operations also occur on the main parcel. The main parcel contains portions of a utility road for high-tension electric transmission lines (referred to herein as the “powerline road”). The main parcel also contains a former quarry pit and a private inholding. Otherwise, both parcels are undeveloped and provide ample opportunity for both public access and wildland conservation.

5.0 RESULTS

The following sections present the results and discussion of the biological assessment within the Project Area. Figures showing the results of the assessment area included as Appendix A. Lists of all plant and wildlife species observed within the Project Area are included as Appendix B. An analysis of the potential for special-status plant species to occur within the Project Area is included as Appendix C. Photographs of the Project Area are included as Appendix D.

5.1 Biological Communities

Biological communities documented by ESA (2012) within the larger San Vicente Redwoods property are listed in Table 2 and are shown on Figure 3. These communities span a range of classification types ranging from high-level communities (*sensu* Holland 1986) to more refined vegetation alliances (*sensu* USFS 2009, Sawyer et al. 2009). Many of these communities, or elements of them, are present within the Project Area. Specific vegetation alliances and other biological communities observed by WRA within the Project Area are listed in Table 3. Descriptions of each community observed are provided in the following sections.

In general, the Project Area is dominated by a mix of redwood- and Douglas fir-dominated communities, with inclusions of other conifer and hardwood stands and patches of manzanita chaparral. Although some old-growth trees are present, most areas are dominated by second- or third-growth stands. Some stands appear to be relatively young, with a diverse understory. Other stands are well established and lack substantial understory vegetation. In many areas, it is clear that plant communities are transitioning from species that occur under open, sunny growing conditions to species that occur under dense, closed-canopy conditions. At the southern end of the Project Area within the main parcel, a large tract of forest was burned during 2009 and is currently dominated by a mix of chaparral and forest regrowth. A portion of the Laguna Parcel appears to have been burned in the 2008 Martin fire that affected the Bonny Doon Ecological Reserve; however, the portion of the Project Area that occurs on the Laguna Parcel is located away from the burned area. Limited riparian vegetation was observed in association with ephemeral and intermittent streams observed within the Project Area; often the vegetation adjacent to streams was indiscernible from adjacent upland vegetation. Larger intermittent and perennial streams contained more well-developed riparian vegetation.

In some portions of the Project Area (e.g., along Empire Grade Road and Warrenella Road), a shaded fuel break (*sensu* Agee et al. 2000) has been implemented. In these areas, all non-sensitive understory vegetation is removed and some overstory trees may be thinned. Shaded fuel breaks are thought to reduce fire fuel loads while maintaining habitat for species that prefer cover such as mountain lions. Shaded fuel breaks may also provide other habitat benefits, such as opening habitat for plant species that prefer light shade to open sun such as Anderson's manzanita. Within the Project Area, Anderson's manzanita was flagged and protected from removal. In these areas, Anderson's manzanita may benefit from the removal of dense understory brush and young saplings that can outcompete the species for sunlight and other resources.

Table 2. Coarse-Scale Biological Communities Mapped within the Larger San Vicente Redwoods Property by ESA (2012)

Community Name	Scientific Name ¹
Redwood	<i>Sequoia sempervirens</i> Alliance
Redwood-Douglas Fir	<i>Sequoia sempervirens</i> - <i>Pseudotsuga menziesii</i> Alliance
Pacific Douglas Fir	<i>Pseudotsuga menziesii</i> Alliance
Santa Cruz Cypress	<i>Callitropsis</i> [<i>Cupressus</i>] <i>abramsiana</i> Alliance
Maritime Chaparral	Multiple
Coast Live Oak	<i>Quercus agrifolia</i> Alliance
Knobcone Pine	<i>Pinus attenuata</i> Alliance
Coastal Scrub	Multiple
Grasslands	Multiple
Sandhills	n/a
Cultivated	n/a
Barren/Rock	n/a
Urban	n/a
Water	n/a

¹Scientific names from USFS (2009).

Table 3. Biological Communities Observed by WRA within the Project Area

Common Name	Scientific Name ¹	State Rank	Sensitive?
Tree-Dominated Communities			
Madrone Forest	<i>Arbutus menziesii</i> Forest Alliance	S3.2	Yes
Tanoak Forest	<i>Notholithocarpus densiflorus</i> Forest Alliance	S3.2	Yes
Coulter Pine Woodland (planted)	<i>Pinus coulteri</i> Woodland Alliance	S4	No
Douglas Fir Forest	<i>Pseudotsuga menziesii</i> Forest Alliance	S4	No
Coast Live Oak Woodland	<i>Quercus agrifolia</i> Woodland Alliance	S4	Yes
Canyon Live Oak Forest	<i>Quercus chrysolepis</i> Forest Alliance	S5	Yes
Redwood Forest	<i>Sequoia sempervirens</i> Forest Alliance	S3.2	Yes
California Bay Forest	<i>Umbellularia californica</i> Forest Alliance	S3	Yes
Shrub-Dominated Communities			
Anderson's Manzanita Chaparral ²	<i>Arctostaphylos andersonii</i> Shrubland Alliance ²	n/a	Yes
Brittle Leaf Manzanita Chaparral	<i>Arctostaphylos crustacea</i> Shrubland Alliance	S2	Yes
Aquatic Habitats			
Seasonal Wetland	n/a	n/a	Yes
Shrub-Scrub Wetland	n/a	n/a	Yes
Ephemeral/Intermittent Streams	n/a	n/a	Yes
Developed/Disturbed Areas			
Developed/Disturbed	n/a	n/a	No

¹Scientific names from CNPS (2016).²Community not described by CNPS (2016).

5.1.1 Non-Sensitive Biological Communities

Non-sensitive biological communities observed within the Project Area include Coulter pine woodland, Douglas fir forest, and developed/disturbed areas. These communities and habitats are described below.

Coulter Pine Woodland (*Pinus coulteri* Woodland Alliance); Rank G4 S4. Coulter pine woodlands typically occur on steep upper slopes and ridges on dry soils. Coulter pine is the dominant tree, with other species such as canyon live oak (*Quercus chrysolepis*) or black oak (*Q. kelloggii*) as subdominants. This community typically occurs from 2,250 to 6,500 feet in elevation and occurs from the San Francisco Bay south into Baja California (Sawyer et al. 2009). No natural stands are known to occur within Santa Cruz County (CNPS 2016a).

Within the Project Area, Coulter pine occurs as planted stands, primarily adjacent to Empire Grade Road and in other locations on the main parcel. The high density of these planted stands has resulted in a dense overstory canopy and a thick layer of pine needles on the forest floor. Understory vegetation is generally lacking in these areas due to the dark conditions resulting from the dense overstory canopy and the smothering effect of the thick layer of pine needles on the forest floor. Areas of planted Coulter pine woodland within the Project Area offer high potential for restoration particularly for Anderson's manzanita.

Douglas Fir Forest (*Pseudotsuga menziesii* Forest Alliance); Rank G5 S4. Douglas fir forests occur in a broad range of topographic positions and aspects and on a variety of substrates extending from the Pacific Northwest south to southern California (Sawyer et al. 2009). The community typically occurs from 2,250 to 5,000 feet in elevation (CNPS 2016a). Due to the wide distribution of this community, co-dominant and non-dominant understory species vary widely.

Within the Project Area, Douglas fir forest occurs as both single-species stands and mixed with other conifers and hardwoods on both the main parcel and the Laguna parcel. In many parts of the Project Area, Douglas fir occurs as a co-dominant with tanoak (*Notholithocarpus densiflorus*) in what has been described as a Douglas fir-tanoak forest (*Pseudotsuga menziesii*-*Notholithocarpus densiflorus* Forest Alliance; Rank G4 S4), also a non-sensitive community (State Rank S4). In most portions of the Project Area, Douglas fir forest and Douglas fir-tanoak forest occurs in dense stands with limited understory development. In younger stands, the understory is dominated by tanoak and madrone (*Arbutus menziesii*) saplings.

Developed/Disturbed Areas; No Rank. Developed and/or disturbed areas are not described in the literature, but include areas that have been significantly modified by human activity. Within the Project Area, disturbed areas are primarily limited to dirt roads and logging landings. Some of the roads are actively used for utility maintenance and by local residents with properties adjacent to the San Vicente Redwoods property; however, most roads within the Project Area are former logging roads that have been decommissioned. These areas generally lack natural vegetation or are dominated by early seral species, many of which are weedy non-natives. Developed and/or disturbed areas are not considered sensitive under the CEQA.

5.1.2 Sensitive Biological Communities

Sensitive biological communities observed within the Project Area include eight terrestrial communities (madrone forest, tanoak forest, redwood forest, coast live oak woodland, canyon live oak forest, California bay forest, Anderson's manzanita chaparral, and brittle leaf manzanita chaparral) and three aquatic communities (seasonal wetlands, shrub-scrub wetlands, and

streams). These communities and habitats would be considered sensitive under the CEQA and some may also be protected under other federal, state, or local laws (e.g., wetlands and streams).

Sensitive Terrestrial Communities

Madrone Forest (*Arbutus menziesii* Forest Alliance); Rank G4 S3.2. Madrone forests form a network of small stands extending along the west coast from British Columbia to the California border with Mexico (CNPS 2016a). These forests are located within a range of topographic positions and on a variety of soil types (Sawyer et al. 2009).

Within the Project Area, madrone forest occurs as small patches within a larger matrix of mixed coniferous forest primarily on the main parcel. Although only a few areas might be considered true madrone forest, the species occurs in large numbers throughout the Project Area and provides a valuable food source for birds and small mammals. During surveys conducted in early 2016, large numbers of migrating American robins (*Turdus migratorius*) were observed foraging among stands of fruiting madrone. The species responds well to fire, resprouting from burned stumps. This community would be considered sensitive under the CEQA.

Tanoak Forest (*Notholithocarpus densiflorus* Forest Alliance); Rank G4 S3.2. Tanoak forests occur primarily in hilly to mountainous regions from Oregon to Point Conception in southern California (CNPS 2016a). Tanoak forests occur on a range of topographic positions and aspects; however, they are generally restricted to areas with deep, well-drained soil (Sawyer et al. 2009). Tanoak seedlings and saplings are adapted to growth in densely forested areas with low light levels under the canopy (CNPS 2016a). The species responds well to fire, resprouting from burned stumps. Tanoaks produce large seed crops every other year, with mast years in 6-year cycles (CNPS 2016a).

Within the Project Area, tanoak occurs as a dominant understory species in redwood and Douglas fir forests and is the dominant overstory tree in many areas on both the main parcel and the Laguna parcel. Where tanoak is the dominant overstory tree, a dense layer of leaf litter accumulates, preventing the germination and establishment of many understory herbs and shrubs, creating a relatively sparse, low-diversity understory. The widespread distribution of this species within the larger San Vicente Redwoods property undoubtedly provides a valuable food source for many mammals. This community would be considered sensitive under the CEQA.

Coast Live Oak Woodland (*Quercus agrifolia* Woodland Alliance); Rank G5 S4. Coast live oak woodland is known from the outer and inner Coast Ranges and Transverse Ranges, and along the coast from northern Mendocino County south to San Diego County. This community is typically located on terraces, canyon bottoms, slopes, and flats underlain by deep, well-drained sandy or loam substrates with high organic content (Sawyer et al. 2009).

Within the Project Area, coast live oak woodland occurs in limited stands within pockets of other forest types, primarily on the main parcel. Coast live oak appears to co-occur with Canyon live oak (*Quercus chrysolepis*) and potentially with Shreve oak (*Quercus parvula* var. *shrevei*). However, due to the tall size of the trees, WRA biologists were limited to identifying trees using leaves and acorns that were fallen on the ground. Due to the co-occurrence of multiple oak species and potential hybridization, it was difficult to discern the relative dominance of each oak species. In addition, many of the oaks observed by WRA biologists displayed characteristics from multiple species, suggesting that the oaks may be hybridizing. Although coast live oak forest is not considered a sensitive community by the CDFW, it is considered sensitive by Santa Cruz County and would be considered sensitive under the CEQA.

Canyon Live Oak Forest (*Quercus chrysolepis* Forest Alliance); Rank G5 S5. Canyon live oak forest is known to occur throughout California, with the exception of the Modoc Plateau, the Central Valley, and parts of the desert region (CNPS 2016a). The community is known to occur in a wide range of topographic positions, from stream benches and canyon bottoms to steep, rocky slopes on infertile soils (CNPS 2016a). Due to the large range of this community, co-dominant species vary widely based on location within the State.

Within the Project Area, canyon live oak forest occurs in limited stands within pockets of other forest types, primarily on the main parcel. As noted for coast live oak woodland, canyon live oak appears to co-occur with other oaks such as coast live oak or Shreve oak. However, due to the difficulty in reaching fresh leaves and acorns and potential issues with hybridization, it was difficult to discern the relative dominance of each oak species. Although canyon live oak forest is not considered a sensitive community by the CDFW, it is considered sensitive by Santa Cruz County and would be considered sensitive under the CEQA.

Redwood Forest (*Sequoia sempervirens* Forest Alliance); Rank G3 S3.2. Redwood forests are known from extensive, nearly contiguous, stands in the North Coast Ranges and isolated stands in the Central Coast Ranges, from Del Norte County to Santa Barbara County (Sawyer et al. 2009). These forests are typically located on stream terraces, benches, coastal slopes, and canyon bottoms underlain by deep, well-drained loams (Sawyer et al. 2009). The species responds well to fire, resprouting from burned stumps (CNPS 2016a).

Within the Project Area, redwood forest forms the dominant plant community, often co-occurring with subdominant trees such as Douglas fir and tanoak on both the main parcel and the Laguna parcel. The dense overstory canopy of the redwood forest prevents the establishment of a diverse understory community; however, in many areas, the understory is dominated by tanoak saplings and young trees. Although most of the redwoods within the Project Area are second or third growth, some trees are considered old-growth, and many of the second or third growth trees are relatively large and provide valuable wildlife habitat. This community would be considered sensitive under the CEQA.

California Bay Forest (*Umbellularia californica* Forest Alliance); Rank G4 S3. California bay forests are known from the inner and outer Coast Ranges, Transverse Ranges, and Sierra Nevada Foothills from Del Norte County south to San Diego County (Sawyer et al. 2009). This community is typically located on terraces, canyon bottoms, north-facing slopes, and rock outcrops underlain by shallow to deep sand to loam substrates (Sawyer et al. 2009). The species responds well to fire, resprouting from burned stumps (CNPS 2016a).

Within the Project Area, California bay primarily occurs as a subdominant species within other forest types, primarily on the main parcel. Although it does not occur in as high of numbers as species such as tanoak or madrone, California bay is likely an important food source for wildlife within the Project Area. This community would be considered sensitive under the CEQA.

Anderson's Manzanita Chaparral (*Arctostaphylos andersonii* Shrubland Alliance); No Rank. Anderson's manzanita chaparral has not been described in the literature; however, given the widespread distribution of this species within the Project Area and its occurrence in many areas as large, single-species stands, WRA believes that it deserves consideration as its own plant community. Although this community has not been described and does not have an official global or state ranking, the dominant species in this community, Anderson's manzanita, has a California Rare Plant Rank of 1B.2, and therefore, the community should be considered sensitive under the CEQA. As a species, Anderson's manzanita is restricted to the Southern Santa Cruz Mountains (Kauffmann et al. 2015).

Within the Project Area, Anderson's manzanita occurs both as scattered individuals or small groups of individuals and as large, single-species stands, primarily on the main parcel, but also on the Laguna parcel. Because the dominant species in this community is a special-status plant, occurrences of this community were mapped during rare plant surveys. Collectively, these occurrences were estimated to occupy approximately 7.75 acres within the Project Area; this likely represents a small fraction of the total occurrences on the greater San Vicente Redwoods site.

The species is adapted to lightly shaded to open, sunny conditions and is best represented in forest openings and along road cuts within the forest. Where this species occurs under dense overstory canopy, it is experiencing significant mortality; in these areas, it is clear that the species became established under more open, sunny conditions following a timber harvest but is currently dying off due to the subsequent reestablishment of the overstory canopy. In the presence of fire suppression, active management may be required to maintain suitable open habitat for this species. This community would be considered sensitive under the CEQA.

Brittle Leaf Manzanita Chaparral (*Arctostaphylos crustacea* Shrubland Alliance); Rank G2 S2. Although brittle leaf manzanita is not considered a special-status species, as a community it has limited distribution and is therefore considered sensitive. The community occurs in the Coast Ranges, from the San Francisco Bay Area south to near Point Conception, and on the Catalina Islands (CNPS 2016a). Brittle leaf manzanita chaparral occurs in uplands near the coast and in adjacent areas subject to the maritime climate, primarily on nutrient-poor soils derived from sandstone, shale, and granite (CNPS 2016a).

Within the Project Area, this community is composed of the *crinita* subspecies. This community occurs in mixed conifer forest, as well as in open areas on ridges and other high points, primarily on the main parcel, but also on the Laguna parcel. The community typically occurs as small patches with a limited number of individuals; however, in some areas, this community occurs as large, single-species stands. This community would be considered sensitive under the CEQA.

Sensitive Aquatic Communities

The Project Area generally contains steep topography and well-drained soils. The proposed trail alignment occurs primarily on side slopes and ridges, avoiding low spots where water may collect and create wetland conditions. As such, the Project Area contained a relatively limited amount of sensitive aquatic resources. These resources were primarily limited to seasonal to perennial wetlands associated with seeps and compacted portions of old logging roads, as well as stream crossings and associated riparian wetlands. Wetlands, including both three-parameter Corps/RWQCB wetlands and one-parameter Coastal Act Wetlands, documented within or adjacent to the Project Area are shown on Figure 4. Locations where the proposed trail alignment crosses drainages or streams potentially subject to regulatory authority by one or more agency are shown on Figure 5. These features are protected by local, state, and federal laws and would be considered sensitive under the CEQA.

Seeps and Seasonal Wetlands; No Rank. Seeps and seasonal wetlands occur throughout the state in a wide range of topographic settings. As such, vegetation associated with seeps and seasonal wetlands varies greatly across the state. Outside of the Coastal Zone, seeps and seasonal wetlands are mapped following guidance from the U.S. Army Corps of Engineers which requires the presence of three parameters: wetland vegetation, wetland soils, and wetland hydrology. Within the Coastal Zone, wetlands are mapped based on the presence of a single parameter (wetland vegetation, wetland soils, or wetland hydrology; see Section 3.1.2).

A limited number of seeps and seasonal wetlands were observed within the Project Area. These features included hillside and roadside seeps dominated by golden chain fern (*Woodwardia fimbriata*) and a variety of sedge (*Carex* sp.) and rush (*Juncus* sp.) species, as well as compacted portions of old logging roads dominated by sedges and rushes.

Shrub-Scrub Wetlands, No Rank. The Project Area contained a limited number of shrub-scrub wetlands located at stream or drainage crossings. These areas were dominated by wetland- and riparian-associated shrubs such as western azalea (*Rhododendron occidentale*), ocean spray (*Holodiscus discolor*), or hazelnut (*Corylus cornuta*). In many cases, these wetlands lacked strong indicators of wetland hydrology or hydric soils and were considered wetlands only for the purposes of the Coastal Act. In other cases, all three parameters were present and the wetlands were mapped as wetlands for the purposes of the Clean Water Act and other laws. These tended to be larger, more well-developed wetlands associated with streams. These wetlands often had a strong understory dominated by species such as slough sedge (*Carex obnupta*), California spikenard (*Aralia californica*), and golden chain fern.

Ephemeral, Intermittent, and Perennial Streams; No Rank. The Project Area contains a number of ephemeral drainages and intermittent to perennial streams. The headwaters of these streams are typically shallow swales which convey water after major storms, but are differentiated from jurisdictional streams which convey water with greater regularity and for longer duration by the lack of a clear bed and bank, lack of an ordinary high water mark, and lack of any riparian vegetation that is discernably different from the adjacent vegetation. Larger intermittent and perennial streams occur lower in the watershed, and Laguna Creek, a perennial stream, features prominently in the Project Area for the Laguna parcel. These streams often contained more well-developed riparian vegetation.

The Project Area includes 64 crossings of ephemeral drainages and intermittent to perennial streams that would be considered jurisdictional by the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Wildlife. These crossings are shown on Figure 5. Streams within the Project Area are protected under State and Federal laws and would be considered sensitive under the CEQA.

5.2 Special-Status Species

5.2.1 Special-Status Plants

Based upon a review of the resources and databases given in Section 3.2.1, it was determined that 69 special-status plant species have been documented from the vicinity of the Project Area, exclusive of mosses and lichens. Figure 6 shows special-status plant species that have been documented in the CNDDDB within 5 miles of the Project Area (CDFW 2016a). Appendix C summarizes the potential for occurrence for each special-status plant species documented from the vicinity of the Project Area.

One special-status plant species was observed in the Project Area during the assessment site visits: Anderson's manzanita (*Arctostaphylos andersonii*; Rank 1B.2). Other special-status plants, such as Point Reyes horkelia (*H. marinensis*; Rank 1B.2), are known to occur on the greater San Vicente Redwoods Property, but were not observed within the Project Area. Figure 7 shows the special-status plant species that were observed within the Project Area during surveys conducted for this report.

In addition to the two special-status plant species known to occur within the Project Area, 24 additional special-status plant species were originally determined to have a moderate to high

potential to occur in the Project Area based on the presence of potentially suitable habitat and known occurrences of the plants from the immediate vicinity, including reports of some species from within the larger San Vicente Redwoods property:

- Schreiber's manzanita (*Arctostaphylos glutinosa*; Rank 1B.2)
- Ohlone manzanita (*A. ohloneana*; Rank 1B.1)
- Pajaro manzanita (*A. pajaroensis*; Rank 1B.1)
- Kings Mountain manzanita (*A. regismontana*; Rank 1B.2)
- Bonny Doon manzanita (*Arctostaphylos silvicola*; Rank 1B.2)
- Brewer's red maids (*Calandrinia breweri*; Rank 4.2)
- Santa Cruz Mountains pussypaws (*Calyptridium parryi* var. *hesseae*; Rank 1B.1)
- Bristly sedge (*Carex comosa*; Rank 2B.1)
- Deceiving sedge (*Carex saliniformis*; Rank 1B.2)
- Robust spineflower (*Chorizanthe robusta* var. *robusta*; FE, Rank 1B.1)
- Mountain lady's-slipper (*Cypripedium montanum*; Rank: 4.2)
- California bottle-brush grass (*Elymus californicus*, CNPS Rank 4.3)
- Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*; FE, SE, Rank 1B.2)
- Butano Ridge cypress (*Hesperocyparis abramsiana* var. *butanoensis*; FE, SE, Rank 1B.2)
- Point Reyes horkelia (*Horkelia marinensis*; Rank 1B.2)
- Arcuate bush-mallow (*Malacothamnus arcuatus*; Rank 1B.2)
- Santa Cruz County monkeyflower (*Mimulus rattanii* ssp. *decurtatus*; Rank 4.2)
- Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*; Rank 1B.2)
- Dudley's lousewort (*Pedicularis dudleyi*; State Rare, Rank 1B.2)
- Santa Cruz Mountains beard tongue (*Penstemon rattanii* var. *kleei*; Rank 1B.2)
- White-flowered rein orchid (*Piperia candida*; Rank 1B.2)
- Pine rose (*Rosa pinetorum*; Rank 1B.2)
- Hoffmann's sanicle (*Sanicula hoffmannii*; Rank 4.3)
- Rayless ragwort (*Senecio aphanactis*; Rank 2B.2)
- San Francisco campion (*Silene verecunda* ssp. *verecunda*; Rank 1B.2)
- Santa Cruz microseris (*Stebbinsoseris decipiens*; Rank 1B.2)

None of these species were observed during seasonally-timed, focused surveys along the entirety of the proposed alignment and parking and staging areas. The lack of additional special-status plant observations was largely attributed to the dense, closed canopy conditions and deep tanoak leaf litter that dominate a large percentage of the Project Area. Based on the lack of observations, it was determined that these species are unlikely to occur within the Project Area and no additional surveys are recommended. Details about these species are included in Appendix C.

The remaining 43 species documented from the vicinity of the Project Area were determined to be unlikely to occur based on a lack of suitable habitat conditions. In general, these are plants that occur along the immediate coast or that occur in open, sunny habitats such as grasslands, which are generally lacking within the Project Area. Many of these species are also known to occur on specific soil types which are not present within the Project Area such as serpentine soils or Zayante sands (Zayante sands are mapped at the western edge of the larger San Vicente Redwoods property, but do not occur near the Project Area). Finally, many of these species occur in perennially wet marsh or swamp habitats which generally do not occur within the Project Area. These species may have potential to occur within other portions of the larger San Vicente Redwoods property; however, they are unlikely to occur within the Project Area.

Special-status plant species that are present within in the Project Area are discussed below, as are federally listed plant species that were not observed and determined to be not present.

Special-Status Plant Species Present within the Project Area

Anderson's manzanita (*Arctostaphylos andersonii*). Rank 1B.2. Anderson's manzanita is a perennial shrub that occurs in the Santa Cruz Mountains in chaparral and at the openings and edges of broadleaf upland forest and North Coast coniferous forest habitats at elevations from 60 to 760 meters (Baldwin et al. 2012; Kauffmann et al 2015). The species blooms between November and May (CNPS 2016b). During surveys conducted for this report, numerous occurrences of this species were observed within the Project Area, both on the main parcel and the Laguna parcel (Figure 7). In many cases, the species occurs as scattered individuals or small clusters of individuals. However, in some areas, the species occurs as large, single-species stands. In open areas, the shrub is generally healthy in appearance; however, where the species occurs under closed canopy conditions, it is in decline. Many dead or dying individuals were observed within heavily forested portions of the Project Area. It is clear that many occurrences of this species became established under more open, sunny conditions such as after a timber harvest and are now in decline as the forest returns.

Federally Listed Plants that Occur in the Region but are Unlikely to Occur in the Project Area

Marsh sandwort (*Arenaria paludicola*); Federal Endangered, State Endangered, Rank 1B.1. Marsh sandwort is a stoloniferous herb in the pink family (Caryophyllaceae) that blooms from May to August (CNPS 2016b). This species occurs in sandy openings in freshwater or brackish marshes and swamps from 10 to 558 feet in elevation and is known from seven USGS 7.5-minute quadrangles in Los Angeles and San Luis Obispo counties (CDFW 2016a, CNPS 2016b). The species is believed extirpated from San Bernardino, Santa Cruz, and San Francisco counties, and Washington State. This species was determined to be unlikely to occur within the Project Area due to a lack of extant populations within the region and a lack of suitable marsh or swamp habitat within the Project Area.

Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*); Federal Endangered, Rank 1B.1. Ben Lomond spineflower is an annual herb in the buckwheat family (Polygonaceae) that blooms from April to July (CNPS 2016b). The species occurs in maritime ponderosa pine sandhills habitat in six USGS 7.5-minute quadrangles Santa Cruz County (CDFW 2016a, CNPS 2016b). The species is thought to be threatened by sand mining, development, and non-native plants (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable habitat. Suitable habitat for this species may be present within the larger San Vicente Redwoods property, but is not found within the Project Area.

Scotts Valley spineflower (*Chorizanthe robusta* var. *hartwegii*); Federal Endangered, Rank 1B.1. Scotts Valley spineflower is an annual herb in the buckwheat family (Polygonaceae) that blooms from April to July (CNPS 2016b). This variety occurs in meadows and seeps with sandy soils and in valley and foothill grassland on mudstone and Purisima outcrops from 755 to 804 feet in elevation (CDFW 2016a, CNPS 2016b). The species is a California endemic documented from only two USGS 7.5-minute quadrangles in Santa Cruz County (CNPS 2016b). Development and vehicles threaten the variety (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable meadows, seeps, or grasslands.

Robust spineflower (*Chorizanthe robusta* var. *robusta*); Federal Endangered, Rank 1B.1. Robust spineflower is a summer-flowering annual herb in the buckwheat family (Polygonaceae) found on sandy soils in chaparral, coastal dune, coastal scrub, sandy coastal prairie sites, and openings in cismontane woodland communities with coarse soils and relatively sparse ground cover (CDFW 2016a, CNPS 2016b). This species requires sand- or gravel-based soils and is

found at elevations from 10 to 1000 feet. Its blooming period is from April to September, although in years with late fall rains, fruiting structures may be obvious as late as November. It is found in Monterey, Santa Cruz, San Francisco, and San Mateo counties, and is thought to be extirpated in its historic range in Santa Clara and Alameda counties. The species is threatened by development, recreation, mining, and non-native plants (CNPS 2016b). Within the Project Area, this species was originally determined to have potential to occur in openings such as at road crossings. However, this species was not observed during seasonally-timed surveys and it is assumed to be not present.

Santa Cruz wallflower (*Erysimum teretifolium*); Federal Endangered, State Endangered, Rank 1B.1. Santa Cruz wallflower is a perennial herb in the mustard family (Brassicaceae) that blooms from March to July (CNPS 2016b). This species occurs on inland marine sands (Zayante sands) in chaparral and lower montane coniferous forest from 394 to 2001 feet in elevation (CDFW 2016a, CNPS 2016b). The range of this California endemic spans three USGS 7.5-minute quadrangles in Santa Cruz County (CNPS 2016b). Development, sand mining, and vandalism pose serious threats to the species (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable substrate (Zayante sands). Although potentially suitable substrate may be present within the larger San Vicente Redwoods property, it is unlikely to occur within the Project Area.

Santa Cruz cypress (*Hesperocyparis abramsiana* var. *abramsiana*); Federal Endangered, State Endangered, Rank 1B.1. Santa Cruz cypress is an evergreen, coniferous tree in the cypress family (Cupressaceae) with an elevational range of approximately 920 to 2650 feet (CNPS 2016b). This species is not a flowering plant and does not bloom, but produces male and female cones on the same plant and remnants, early cones, and/or open cones of one or both sexes should be visible on reproductive individuals year-round (i.e., the species is identifiable year-round). Santa Cruz cypress occurs in closed-cone coniferous forests, chaparral, and lower montane coniferous forests in areas underlain with sandstone-derived or granitic soils (CDFW 2016a, CNPS 2016b). The species is endemic to California and is known from less than ten natural populations in four USGS quadrangles in San Mateo and Santa Cruz counties (CNPS 2016b). This species may be threatened by development, agriculture, alteration of fire regimes, and introgression from the closely related species Monterey cypress (*H. macrocarpa*) (CNPS 2016b), which is planted as a common ornamental tree in the area. Although this species has been documented from the immediate vicinity of the Project Area along Empire Grade Road, WRA received anecdotal evidence that the population has been extirpated (Nadia Hamey, Big Creek forester, personal communication to Matthew Richmond, April 6, 2016). Moreover, this species is identifiable year-round, but was not observed during surveys within the Project Area. As such, this species was determined to be not present within the Project Area.

Butano Ridge cypress (*Hesperocyparis abramsiana* var. *butanoensis*); Federal Endangered, State Endangered, Rank 1B.1. Butano Ridge cypress is an evergreen, coniferous tree in the cypress family (Cupressaceae) with an elevational range of approximately 920 to 2650 feet (CNPS 2016b). This species is not a flowering plant and does not bloom, but produces male and female cones on the same plant and remnants, early cones, and/or open cones of one or both sexes should be visible on reproductive individuals year-round (i.e., the species is identifiable year-round). Butano Ridge cypress occurs in closed-cone coniferous forests, chaparral, and lower montane coniferous forests in areas underlain with sandstone-derived soils (CDFW 2016a, CNPS 2016b). The species is endemic to California and is known from Butano Ridge (CNPS 2016b), located over 8 miles from the Project Area. This species may be threatened by alteration of fire regimes and recreation (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area based on its hyperlocal occurrence on Butano Ridge. Moreover, the species is identifiable year-round, but was not observed during surveys within the Project Area. As such, this species was determined to be not present within the Project Area.

Santa Cruz tarplant (*Holocarpha macradenia*); Federal Threatened, State Endangered, Rank 1B.1. Santa Cruz tarplant is an annual herb from the sunflower family (Asteraceae) that blooms from June to October (CNPS 2016b). The species is found on grassy coastal terraces at elevations ranging from 33 to 726 feet (CDFW 2016a, CNPS 2016b). Suitable habitats include coastal prairie, coastal scrub, and valley and foothill grasslands (CDFW 2016a, CNPS 2016b). This species often occurs on moderately disturbed, sandy or clay soils (CNPS 2009). However, specific microhabitat preferences for this plant are not well known and some populations described in the CNDDDB occur on loamy soils (CDFW 2016a). The only remaining natural occurrences are known from Santa Cruz and Monterey counties, and the species has been largely extirpated from Marin, Contra Costa, and Alameda counties (CNPS 2016b). Extant populations in Solano County are recent re-introductions; most re-introduced populations have failed (CNPS 2016b). This species is severely threatened by urbanization, agriculture, and non-native plants and also depends on appropriate ecological disturbance for persistence in an area, which may be lacking from many areas (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a lack of suitable coastal terrace, coastal prairie, coastal scrub, and valley and foothill grassland habitats.

White-rayed pentachaeta (*Pentachaeta bellidiflora*); Federal Endangered, State Endangered, Rank 1B.1. White-rayed pentachaeta is an annual herb in the sunflower family (Asteraceae) that blooms from March to May (CNPS 2016b). The species occurs in cismontane woodlands and valley and foothill grassland habitats at elevations of approximately 115 - 2050 feet (CDFW 2016a, CNPS 2016b). When occurring in grassy habitats, this species is often found on serpentine-derived substrates (CNPS 2016b). Within other habitats, this species occurs on dry, rocky slopes (CDFW 2016a). White-rayed pentachaeta was known from 12 USGS 7.5-minute quadrangles in Marin, Santa Cruz, and San Mateo counties, but is now presumed extirpated from all historical locations except those in the Woodside quadrangle in San Mateo County. All of the previously known occurrences were lost to development, making this a major threat for the species. This species was determined to be unlikely to occur within the Project Area to a lack of suitable grassland habitat and dry, rocky openings within woodland habitat, in addition to being considered extirpated from the region.

Scotts Valley polygonum (*Polygonum hickmanii*); Federal Endangered, State Endangered, Rank 1B.1. Scotts Valley polygonum is an annual herb in the knotweed family (Polygonaceae) that blooms from May to August (CNPS 2016b). This species occurs on mudstone- and sandstone-derived substrates in valley and foothill grassland habitats from 689 to 820 feet in elevation. This California endemic is only known from two occurrences in Scotts Valley (CDFW 2016a). The species is threatened by development and invasive plants (CNPS 2016b). This species was determined to be unlikely to occur within the Project Area due to a general lack of grassland habitat.

5.2.2 Special-Status Wildlife

Seventy-seven special-status wildlife species have been recorded in the vicinity or have ranges that overlap with the Project Area based on a review of the resources outlined in Section 3.2.1. Figure 8 shows special-status wildlife species documented within 5 miles of the Project Area (CDFW 2016a). Appendix C summarizes the potential for each of these species to occur in the Project Area. Three special-status wildlife species were observed in the Project Area during the site assessment: oak titmouse (*Baeolophus inornatus*; USFWS Bird of Conservation Concern), San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*; CDFW Species of Special Concern), and California red-legged frog (*Rana draytonii*; Federal Threatened, CDFW Special of Special Concern). In addition to these three species, six special-status wildlife species were determined to have a high potential to occur in the Project Area, seven special-status wildlife species were determined to have a moderate potential to occur, and it was determined that the

Project Area contains designated Critical Habitat for California red-legged frog (*Rana draytonii*). The remaining 61 species documented from within the vicinity of the Project Area were determined to be unlikely or have no potential to occur. Special-status wildlife species observed during WRA's site visits and significant wildlife life habitat features (i.e., large, complex old-growth trees) that may support special-status species are shown on Figure 9.

Special-Status Wildlife Present within the Project Area

Oak titmouse (*Baeolophus inornatus*); USFWS Bird of Conservation Concern. This relatively common species is a year-round resident throughout much of California, including most of the coastal slope, the Central Valley, and the western Sierra Nevada foothills. In addition, the species may also occur in residential settings where landscaping provides foraging and nesting habitat. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas (Cicero 2000). Oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, although they may partially excavate their own cavities (Cicero 2000). Seeds and arboreal invertebrates comprise the bird's diet. This species was observed foraging within various forest and edge habitat throughout the Project Area. Impacts to this species may be considered significant under the CEQA.

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*); CDFW Species of Special Concern. This subspecies of the dusky-footed woodrat occurs in the Coast Ranges between San Francisco Bay and the Salinas River (Matocq 2003). Occupied habitats are variable and include forest, woodland, and chaparral habitats, including riparian areas. Woodrats feed on woody plants, but will also consume fungi, grasses, flowers, and acorns. Foraging occurs on the ground and in bushes and trees. This species constructs robust stick houses/structures, also referred to as middens, in areas with moderate cover and an understory containing woody debris. Breeding takes place from December to September. Individuals are active year-round and are generally nocturnal.

This species was observed within the Project Area and large stick houses (i.e., middens) were found to be prolific throughout the Project Area, but concentrated in the northern portion of the main parcel. Middens were commonly found in every terrestrial/upland biological community within the Project Area, and were frequently encountered in high density. Surveyors mapped 1,815 middens within 25-feet on either side of the proposed trail alignment and within the proposed parking area and an associated 25-foot buffer (Figure 9). Based on the representative densities of woodrat middens within the Project Area (approximately 8.7 middens per acre), it is estimated that the greater San Vicente Redwoods site may harbor as many as 74,000 woodrat nests. Based on a 5-foot wide trail and 1 foot of vegetation clearance on either side (7 feet total disturbance), it is estimated that up to 144 woodrat middens could be directly impacted by trail construction. However, such impacts are theoretical given that there is flexibility to move the trail anywhere within the 50-foot-wide band surveyed for this report. Impacts to dusky-footed woodrat species must be considered under the CEQA; however, given the large number of middens potentially present at the site and the minor number of middens that would be directly impacted by trail construction, such impacts would clearly not threaten the existence of the species at the site and therefore should not be considered significant under the CEQA.

California red-legged frog (*Rana draytonii*); Federal Threatened, CDFW Species of Special Concern. The California red-legged frog (CLRf) is dependent on suitable aquatic, estivation, and upland habitats. During the rainy season, starting with the first rainfall in late fall, red-legged frogs disperse away from their estivation sites to seek suitable breeding habitat. Dispersal is more prevalent during wet weather such as during rain or heavy fog. Aquatic and breeding habitats are characterized by dense, shrubby, riparian vegetation and deep, still or slow-moving

water. Breeding occurs between late November and late April. California red-legged frogs estivate (a period of inactivity similar to hibernation) during the dry months in small mammal burrows, moist leaf litter, incised stream channels, and large cracks in the bottom of dried ponds.

This species has been documented to occur within the larger San Vicente Redwoods property, and the Project Area contains Critical Habitat for the species (Unit SCZ-1; see Section 4.2.3 for a discussion of CRLF Critical Habitat). A CRLF occurrence from 1997 is located adjacent to the Project Area, and there are many additional documented occurrences within 2 miles of the Project Area (CDFW 2016a). Although no suitable breeding habitat was observed (i.e., no slow or standing water with adequate depth to support breeding), the Project Area provides potential dispersal and aquatic non-breeding habitat that may support the species. During a June 2017 site visit WRA biologists observed an adult CRLF in a shallow pool along an existing road within the proposed alignment (Figure 9). The Project Area is located within dispersal distance of known occurrences. Although the species is unlikely to breed within the Project Area, it may occur seasonally, during dispersal events.

Special-Status Wildlife with High Potential to Occur within the Project Area

Townsend's big-eared bat, (*Corynorhinus townsendii townsendii*); State Candidate, CDFW Species of Special Concern, BWBG High Priority. This species ranges throughout western North America, from British Columbia to central Mexico. Its local distribution is strongly associated with the presence of caves, but roosting also occurs within human-made structures, including mines and buildings. While many bats species wedge themselves into tight cracks and crevices, big-eared bats hang from walls and ceilings in the open. Males roost singly during the spring and summer months whereas females aggregate at maternity roosts to give birth in the spring. Females roost with their young until late summer or early fall, until the young become independent, flying and foraging on their own. In central and southern California, hibernation roosts tend to be composed of small aggregations of individuals (Pierson and Rainey 1998). Foraging typically occurs along edge habitats near streams and wooded areas, where moths are the primary prey (BWBG 2015). This species has been documented roosting within cave habitat in close proximity to the Project Area and there are numerous occurrences documented within 5 miles of Project Area (CDFW 2016a). Therefore, the species was determined to have a high potential to occur within the Project Area. Impacts to this species could be considered significant under the CEQA.

Marbled murrelet (*Brachyramphus marmoratus*); Federal Threatened, State Endangered. The marbled murrelet is a small seabird that breeds up to 30 miles inland from the coast on large limbs of redwood and Douglas fir trees. At sea, it feeds on small fish near the shore and travels from nesting sites to feed at the coast at dawn and dusk during the breeding season. Breeding requirements for this species are not well documented in the southern portion of its range; however, it appears that dense, humid coastal forests of old-growth trees are necessary for breeding. The breeding range of the marbled murrelet in California is considered to be split, with the majority of the population breeding within the extreme northwest portion of its range (i.e., Oregon border south to Eureka) and a smaller population breeding south of San Francisco (Pillar Point south to Santa Cruz) (Small 1994).

There are numerous occurrences of this species documented throughout the Santa Cruz Mountains, the closest of which are located approximately 1 mile to the west and 1.9 miles to the east of the Project Area (CDFW 2016a). Critical Habitat for the species is also located approximately 1.2 miles south (Unit CA-15) and 2.4 miles north (Unit CA-14-b). Within the Project Area, several stands of old-growth redwood occur and provide potentially suitable nesting habitat

for the species. Several large old-growth trees with complex canopy structures have also been documented within the Project Area and are shown on Figure 9. Therefore, although the species has not been documented within the Project Area, nor does the Project Area contain Critical Habitat, the presence of trees that could support potentially suitable nesting habitat and the proximity of known occurrences and designated Critical Habitat gives this species a high potential to occur within the greater Project Area.

Vaux's swift (*Chaetura vauxi*); CDFW Species of Special Concern. The Vaux's swift is a summer resident in California, breeding on the coast from central California northward and in the Cascade and Sierra Nevada ranges. Nesting occurs in large, accessible, chimney-like tree cavities that allow birds to fly within the cavity directly to secluded nest sites. Such cavities usually occur in conifers, especially old-growth redwoods (Shuford and Gardali 2008). Chimneys and similar human-made substrates are also used for nesting. This species is highly aerial and forages widely for insects in areas of open airspace. During migration, nocturnal roosting occurs communally and favored sites may host thousands of individuals. Within the Project Area, large stands of coniferous forest with complex canopies and snags occur throughout and provide potentially suitable nesting and foraging habitat. Due to presence of available nesting and foraging habitat, this species was determined to have a high potential to occur within the Project Area.

Allen's hummingbird (*Selasphorus sasin*); USFWS Bird of Conservation Concern. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California and the Channel Islands. Breeding occurs in association with the coastal fog belt, and typical habitats used include coastal scrub, riparian habitat, woodland and forest edges, and eucalyptus and cypress groves (Mitchell 2000). The species feeds on nectar, as well as insects and spiders. Within the Project Area, mature oaks, riparian woodland, and edge habitat provide potentially suitable nesting habitat, and thus, the species was determined to have a high potential to occur.

Nuttall's woodpecker (*Picoides nuttalli*); USFWS Bird of Conservation Concern. Nuttall's woodpecker, common in much of its range, is a year-round resident throughout most of California, west of the Sierra Nevada Range. Typical habitat is oak or mixed woodland, and riparian areas (Lowther 2000). Nesting occurs in tree cavities, principally those of oaks and larger riparian trees. Nuttall's woodpecker also occurs in older residential settings and orchards where trees provide suitable foraging and nesting habitat. This species forages on a variety of arboreal invertebrates. Within the Project Area, mature oaks and riparian woodland provide potentially suitable nesting habitat, and thus, the species was determined to have a high potential to occur.

Olive-sided flycatcher (*Contopus cooperi*); USFWS Bird of Conservation Concern, CDFW Species of Special Concern. This species is found within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g., meadows, canyons, rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands (Altman and Sallabanks 2000). The species is most numerous in montane coniferous forests where tall trees overlook canyons, meadows, lakes, or other open terrain. Within the Project Area, mixed conifer, redwood, pine forest, and edge habitats may provide suitable nesting habitat for this species. The species has also been observed frequently along roads surrounding the Project Area (eBird 2016). Therefore, this species was determined to have a high potential to occur within the Project Area.

Special-Status Wildlife with Moderate Potential to Occur within the Project Area

Hoary bat (*Lasiurus cinereus*); WBWG Medium Priority. Hoary bats are highly associated with forested habitats in the western United States, particularly in the Pacific Northwest. They are

a solitary species and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, usually at the edge of a clearing. Roosts are typically located 10 to 30 feet above the ground. They have also been documented roosting in caves, beneath rock ledges, in woodpecker holes, in grey squirrel nests, under driftwood, and clinging to the side of buildings, although the latter behavior is not typical. Hoary bats are thought to be highly migratory; however, wintering sites and migratory routes have not been well documented. This species tolerates a wide range of temperatures and has been captured at air temperatures between 0 and 22 degrees Celsius. Hoary bats probably mate in the fall, with delayed implantation leading to birth in May through July. They usually emerge late in the evening to forage, typically from just over one hour after sunset to after midnight. This species reportedly has a strong preference for moths, but is also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (WBWG 2015). This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016a). Within the Project Area, mature conifer and broadleaf trees have the potential to support roosting sites. Therefore, this species was determined to have a moderate potential to occur within the Project Area.

Pallid bat (*Antrozous pallidus*); CDFW Species of Special Concern, WBWG High Priority.

Pallid bats are distributed from southern British Columbia and Montana to central Mexico and east to Texas, Oklahoma, and Kansas. This species occurs in a number of habitats ranging from rocky, arid deserts to grasslands and into higher-elevation coniferous forests. They are most abundant in the arid Sonoran life zones below 6,000 feet in elevation, but have been found at elevations of up to 10,000 feet in the Sierra Nevada. Pallid bats often roost in colonies of between 20 and several hundred individuals. Roosts are typically located in rock crevices, tree hollows, mines, caves, and a variety of human-made structures, including vacant and occupied buildings. Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and within cavities in large oak trees. Pallid bats are primarily insectivorous, feeding on large prey that is usually taken on the ground, but also sometimes in flight. Prey items include arthropods such as scorpions, ground crickets, and cicadas (WBWG 2015). This species has been documented from within 3.75 miles of the Project Area (CDFW 2016a). Cavities within large, mature trees within the Project Area may provide potential roost habitat for pallid bat. Additionally, higher-quality rock outcroppings and cave features that may have the potential to support roosting sites are known to occur within the larger San Vicente Redwoods property, in close proximity to the Project Area. Therefore, this species was determined to have a moderate potential to occur within the Project Area.

Western red bat (*Lasiurus blossevillei*); CDFW Species of Special Concern, WBWG High Priority.

This species is highly migratory and broadly distributed, ranging from southern Canada through much of the western United States. Western red bats are believed to make seasonal shifts in their distribution, although there is no evidence of mass migrations (Pierson et al. 2006). They are typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly located in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas, possibly in association with riparian habitat (particularly willows, cottonwoods, and sycamores) (Pierson et al. 2006). It is believed that males and females maintain different distributions during pupping, where females take advantage of warmer inland areas and males occur in cooler areas along the coast. The Project Area contains potentially suitable maternity roosting habitat within riparian habitats along streams. Suitable foraging habitat is supported within and adjacent to streams throughout the Project Area. Although perennial streams and associated well-developed riparian habitat are not present within the Project Area, the species may utilize the Project Area for roosting and foraging, and therefore was determined to have a moderate potential to occur.

Silver-haired bat (*Lasionycteris noctivagans*); WBWG Medium Priority. Silver-haired bats occur in temperate conifer, mixed-conifer, and deciduous forests from southern Alaska to northeastern Mexico. Females form maternity roosts almost exclusively inside hollows or under loose bark of large trees and may switch roosts multiple times (WBWG 2015). Hibernation occurs in trees, rock crevices, leaf litter, in and under buildings, and in caves and mines. Foraging occurs above the tree canopy where the silver-haired bat preys on insects. Silver-haired bats are known to migrate south in the winter, although overwintering at northern latitudes has also been documented (WBWG 2015). The Project Area may contain potentially suitable maternity roosting habitat within mixed conifer forest. Suitable foraging habitat may be supported within and adjacent to streams throughout the Project Area. Therefore, this species was determined to have a moderate potential to occur.

Fringed myotis (*Myotis thysanodes*), WBWG High Priority. The fringed myotis ranges through much of western North America from southern British Columbia, Canada, south to Chiapas, Mexico and from Santa Cruz Island in California, east to the Black Hills of South Dakota. This species is found in desert scrubland, grassland, sage-grass steppe, old-growth forest, and subalpine coniferous and mixed deciduous forests. Oak and pinyon-juniper woodlands are most commonly used. The fringed myotis roosts in colonies from 10 to 2,000 individuals, although large colonies are rare. Caves, buildings, underground mines, crevices in cliff faces, and bridges are used for maternity and night roosts, whereas hibernation has only been documented in buildings and underground mines. Tree-roosting has also been documented in Oregon, New Mexico, and California (WBWG 2015). Within the Project Area, roosting habitat may occur in the large stands of conifer and hardwood forest habitat; however, higher quality roost habitat may be found in cave and cliff habitats that occur near the San Vicente Quarry in the southern portion of the larger site. The species is likely to forage over the Project Area, and based on the proximity to roost habitat, the species was determined to have a moderate potential to occur.

Ring-tailed cat (*Bassariscus astutus*); CDFW Fully Protected Species. The ring-tailed cat is an uncommon but widespread resident of California, excluding the Central Valley, south to Mexico. This species is found in remote riparian habitats, rocky canyons, and stands of forest and shrub habitats that contain trees, brush, and rock crevices for cover. This species is also usually found within 0.6 mile of water (Zeiner et al. 1990). Hollow trees, snags, rock crevices, and other cavities are used for cover and nesting. Ring-tailed cats are primarily carnivorous and mostly nocturnal. Within the Project Area, wooded habitat of varying composition could support the species and its foraging needs. The Project Area is also surrounded by large tracts of undeveloped forest, which provides a habitat corridor for the species. Although perennial water sources were not observed within the Project Area, seasonal streams may make portions of the Project Area more suitable under during different periods of the year. Based on these conditions, it was determined that this species has a moderate potential to occur.

Purple martin (*Progne subis*); CDFW Species of Special Concern. Purple martin is an uncommon summer resident in California, occurring in woodlands and low-elevation hardwood and coniferous forests. It usually feeds on insects captured in flight 100 to 200 feet above the ground. Purple martin nests in cavities often located in tall, isolated trees or snags in open forest or woodland habitats. The Project Area contains large tracts of coniferous forest that may provide suitable nesting habitat for this species. This species has been observed east of the Project Area, in the Bonny Doon Ecological Reserve (eBird 2016). Foraging habitat is also likely to be supported above the tree canopy above Project Area. Due to the dominance of coniferous forest habitat within the Project Area, this species was determined to have a moderate potential to occur.

Mountain Lion and Wildlife Corridors

While not protected by the CESA or the ESA, the 1990 California Wildlife Protection Act prohibits sport hunting of mountain lion (*Puma concolor*) in California. These top predators serve an important ecological role within the region, and while mountain lion are primarily solitary, individuals exhibit localized approaches to foraging and spatial use (Allen et al. 2015). Mountain lion are active year-round and tend to hunt and move between the hours of dawn and dusk; however, mountain lions have been found to opportunistically hunt during daytime hours when prey is available (Allen et al. 2015). This carnivore is primarily an ambush hunter, and feeds mainly on black-tailed deer, but will also take a number of species including rabbit, rodents, turkey, and various smaller predators including coyote and raccoon. Mountain lions are capable of breeding any time of year, but kittens are typically born in June or July in dens such as a shallow cave, rock overhang, or area of dense vegetation.

Mountain lions maintain large home ranges, with females utilizing areas 3 to 12 square miles and males occupying habitats from 25 to 96 square miles (CDFW 2016a). Population densities for mountain lions have been found to vary from 0.37 individuals per 100 square kilometers in resource-limited portions of Utah up to 3.6 individuals per 100 square kilometers in coastal California (Allen et al. 2015). Whereas home range size and habitat use vary based on prey availability, illegal hunting has also been found to result in lower population densities (Allen et al. 2015).

The species is well documented within the Santa Cruz Mountains, as UC Santa Cruz and the CDFW have collaborated on tracking studies with radio-collared individuals to better understand their movement and the status of the population. Sign from this species (i.e., scrapes, tracks, and scat) was observed during WRA's fieldwork, and the Santa Cruz Puma Project has documented radio-collared individuals moving through the Project Area.

The Project Area is known to support mountain lions and is located within an area identified by the CDFW as a wildlife corridor and part of the essential connectivity for this species (CDFW 2014). Maintaining large, interconnected tracks of contiguous forest habitats allows the movement of mountain lion, their prey, and other native species. Because of the ecological importance mountain lion play within the region and the critical role wildlife corridors play in facilitating the movement of native species, wildlife corridors are considered a significant resource under the CEQA, and the potential impact of the Project on wildlife corridors is discussed in more detail in Section 6.3.7.

Federally Listed Wildlife that Occur in the Region but are Unlikely to Occur in the Project Area

Federally listed species that have been documented to occur within the vicinity or adjacent to the Project Area but which are unlikely to occur there include: least Bell's vireo (*Vireo bellii pusillus*), steelhead Central California Coast DPS (*Oncorhynchus mykiss*), and Central California Coast Ecologically Significant Unit (ESU) of Coho salmon (*Oncorhynchus kisutch*). These species are discussed below (also see Appendix C).

Least Bell's vireo (*Vireo bellii pusillus*); Federal Endangered, State Endangered, CDFW Species of Special Concern. This subspecies of Bell's vireo is a neotropical migrant and summer resident in California and northern Baja California, wintering in southern Baja California (Brown 1993). Nesting occurs in riparian areas in the vicinity of water or in dry river bottoms. Nests are often located along margins of bushes or on twigs projecting into pathways, usually on species such as willow, coyote brush, or mesquite. This vireo was once common in lowland riparian habitats throughout California but declined precipitously during the twentieth century

(USFWS 1998). By the time its federal listing in 1986, the population was restricted to an estimated 300 pairs in southern California, primarily in San Diego County (USFWS 1998). The population has increased since that time, with the number of nesting territories in the state in 2006 estimated to be approximately ten times greater than in 1986 (USFWS 2006). However, the distribution of the vireo at that time remained almost entirely within southern California (USFWS 2006). This species was determined to be unlikely to occur within the Project Area due to the absence of suitable riparian and scrub habitats required by the species for nesting. Furthermore, the species is not known to nest or occur within the Santa Cruz Mountains.

Steelhead - Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened. The Central California Coast distinct population segment (DPS) of steelhead includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending two years in freshwater, although they may stay in freshwater for up to seven years. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead includes perennial streams with cool to cold water, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas (i.e., shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. This species is known to occur within the mainstem of San Vicente Creek, up to the quarry tunnel and the lower reaches of Mill Creek; however, partial fish passage barriers, narrow, steep channels, and the ephemeral nature of the streams within the Project Area make it unlikely for this species to occur (ESA 2012; Ross Taylor and Associates 2004). Similarly, a natural fish passage barrier on Laguna Creek, downstream of the Laguna Parcel, precludes the presence of steelhead in that reach of Laguna Creek (Ross Taylor and Associates 2004). Given these reasons, it was determined that steelhead are unlikely to occur within the Project Area.

Coho Salmon - Central California Coast ESU (*Oncorhynchus kisutch*), Federal Endangered, State Endangered. The Central California Coast ESU of Coho salmon includes all naturally spawned populations of Coho salmon (and their progeny) in California streams from the Eel River to Aptos Creek, including the Russian River and its tributaries, excluding the Sacramento-San Joaquin River Basin. Coho salmon typically migrate in late fall to early winter to spawn in smaller coastal streams. Spawning migration, known as “runs”, occur throughout the year. Spawning occurs mainly between November and January, but can occur as late as March during drought conditions. Juveniles may spend several years in the freshwater habitat before migrating to the ocean. Most adult fish return “home”, maintaining fidelity to their natal stream. Preferred spawning habitat for Coho salmon is small freshwater streams with cool to cold water temperature, medium to small gravel substrate, and high dissolved oxygen levels at the head of a riffle where water changes from laminar flow to turbulent flow (providing greater dissolved oxygen). Abundant riffle areas (i.e., shallow areas with gravel substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. This species is known to occur within the mainstem of San Vicente Creek, up to the quarry tunnel and the lower reaches of Mill Creek; however, fish passage barriers, narrow, steep channels, and the ephemeral nature of the streams make the Project Area unsuitable for the species (ESA 2012). Similarly, a natural fish passage barrier on Laguna Creek prevents the occurrence of Coho salmon within the Laguna parcel (Ross Taylor and Associates 2004).

5.2.3 Critical Habitat

Based on WRA's review of the USFWS Critical Habitat Mapper (USFWS 2016b), it was determined that the Project Area contains Critical Habitat for CRLF. There are four physical and biological features, formerly referred to as PCEs, that are considered to be essential for the conservation or survival of a species. The features for the CRLF include: aquatic breeding habitat; non-breeding aquatic habitat; upland habitat; and dispersal habitat (USFWS 2010).

Aquatic breeding habitat consists of low-gradient fresh water bodies, including natural and manmade (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. It does not include deep water habitat, such as lakes and reservoirs. Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years. This is the average amount of time needed for egg, larval, and tadpole development and metamorphosis so that juveniles can become capable of surviving in upland habitats (USFWS 2010).

Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal habitat for juvenile and adult CRLF. These waterbodies include plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. The third habitat type is upland habitats, which include areas within 300 feet of aquatic and riparian habitat and are composed of grasslands, woodlands, and/or vegetation that provides shelter, forage, and predator avoidance. Upland habitat can include structural features such as boulders, rocks, and organic debris (e.g., downed trees), as well as small mammal burrows and moist leaf litter (USFWS 2010). Finally, dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites. Although California red-legged frog is highly aquatic, this species has been documented to make overland movements of several hundred meters and up to one mile during a winter/spring wet season in Northern California (Bulger et al. 2003, Fellers and Kleeman 2007) and 2,860 meters (1.8 miles) in the central California coast (Rathbun and Schneider 2001).

The Project Area does not contain aquatic breeding habitat for CRLF; however, the Project Area may provide dispersal habitat to off-site breeding features. Additionally, intermittent drainages within the Project Area may be considered seasonal aquatic non-breeding habitat by the USFWS; associated areas within 300 feet of seasonal aquatic non-breeding habitat would be considered upland foraging habitat.

5.3 Protected Trees

Although a tree survey was not conducted for this report, any tree located within one of the sensitive habitats described in Section 4.1.2 may be protected by the County. A tree removal permit may be required for the removal of such trees.

6.0 PROJECT DESCRIPTION

The Draft Public Access Plan outlines a site-wide, programmatic approach to public access for recreation at the San Vicente Redwoods. The Plan outlines goals and policies related to public access, access plans for recreation, an implementation plan, and design and maintenance guidelines. This report focuses on the trail network and attendant features described in the Draft Public Access Plan (PlaceWorks 2018), and more specifically on the trail segments shown on Figure 2.

Under the Draft Public Access Plan, a network of approximately 38 miles of trails will be constructed as part of the overall proposed Project. The trail network will include a combination of single- and multi-use trails which will allow public access for the following allowable uses:

- Hiking
- Biking
- Horse riding
- Dog walking (on-leash only)
- Picnicking and small group gatherings
- Nature observation

These uses will be allowed during daylight hours only, except on a limited basis by permit.

Prohibited uses will include:

- Smoking
- Unpermitted alcohol use
- Fire making
- Collecting
- Hunting
- Fishing
- Off-road vehicles or motorized dirt biking
- Rock climbing
- Rappelling
- Caving

Key design goals for the development of the trail network include the following:

- Provide for a variety of experiences through different habitats
- Concentrate loop trails in the northern part of the property, where they can be accessed from the Empire Grade staging area(s)
- Establish through-trails connecting the Empire Grade staging areas down to the Coast Dairies property
- Provide buffers around private property
- Accommodate other property uses, including timber harvest and research uses
- Avoid, to the extent possible: neighbor views, safety hazards, and impacts to sensitive resources including water sources, mountain lions, and cultural resources
- Allow for sustainable trail grades and orientation. Use of existing roads as recreational trails should be limited to roads identified as suitable (grades under 15 percent and without fall-line alignment) where possible, and new trail construction should emphasize narrow trails and should result in separate use trails

The Draft Public Access Plan will be implemented in two phases: an initial 10-mile set of multi-use trails easily accessible from the proposed parking and staging area adjacent to Empire Grade Road. Hiking, horse riding, and mountain biking would be allowed on the Phase I trails, with dog walking limited to a frontage trail that parallels Empire Grade Road. Implementation of the Phase I trails is expected to occur over a 1- to 3-year period. Phase II will include approximately 9-11 additional miles of trails to be implemented over a 2- to 3-year period, as well as an expansion of

the staging and parking area adjacent to Empire Grade Road. Phase III will include approximately 16-19 additional miles of trails over a 2- to 3-year period.

During the phased implementation of the Draft Public Access Plan, trail use for all phases will be approximately 35% horse/hike, 40% horse/bike, 25% hike/horse/bike with 1.5 miles of the hike/horse/bike trails allowing dog walking.

In conjunction with the construction of the Phase I trails, a staging area will be constructed along Empire Grade Road, as shown on Figure 2. The staging area will initially have space for at least 45 cars and may be expanded in later phases of the proposed Project. Staging areas may include entry gates, signage, informational kiosks, benches, picnic area/gathering area, trash and recycling receptacles, dog-courtesy stations and restrooms (composting or pump-out toilets).

Trail dimensions will be determined based on the type (or use) of trail as shown on Table 4. Additional details regarding specific design specifications or construction methods are provided in the Draft Public Access Plan. Most trail construction will occur by hand with limited use of heavy machinery or vehicles; the use of the latter would be limited to areas with existing vehicular access (e.g., on former logging roads). However, it is expected that construction of the parking area adjacent to Empire Grade Road will entail the use of standard construction machinery and equipment.

Table 4. Trail Dimensions by Type

Trail Type	Constructed Tread Width	Vegetation Clearance
Accessible Trails	5 feet +	2 feet horizontal 10 feet vertical
Multi-Use Trails	5 feet +	1 foot horizontal 10 feet vertical
Equestrian and Hiking Trails	2 to 5 feet	1 foot horizontal 10 feet vertical
Mountain Biking and Hiking Trails	2 to 4 feet	1 foot horizontal 10 feet vertical

7.0 POTENTIAL IMPACTS, MINIMIZATION, AND AVOIDANCE MEASURES

As described in Section 5.0, the proposed Project entails the construction of approximately 38 miles of recreational trails and an associated 4.7-acre parking area. To the extent feasible, trails and the parking area have been located in non-sensitive habitat and have been designed to have minimal impact on the land and the sensitive biological resources that may occur there. Although the proposed Project covers a large amount of undeveloped land in an area with a rich diversity of biological resources, the proposed Project is relatively minimal in scope and is not expected to result in significant adverse impacts to sensitive resources. The following sections discuss potential impacts to sensitive biological resources associated with the proposed trail alignment (including both initial construction and subsequent use and maintenance) and provide recommended avoidance and minimization measures. With the implementation of these measures, WRA believes that the proposed Project will not result in significant adverse impacts to the environment.

7.1 Sensitive Biological Communities

A range of sensitive terrestrial and aquatic biological communities occur within the Project Area, including: madrone forest, tanoak forest, coast live oak woodland, canyon live oak forest, redwood forest, California bay forest, Anderson's manzanita chaparral (not described in the literature), brittle leaf manzanita chaparral, seasonal wetlands, shrub-scrub wetlands, and streams (including limited riparian vegetation). The proposed trail network has the potential to impact these communities through both initial trail construction and subsequent use and maintenance.

7.1.1 Sensitive Terrestrial Communities

Biology Impact 1

The proposed trail network and staging area have the potential to directly impact sensitive terrestrial communities through removal of vegetation and grading activities during construction, as well as by subsequent damage (e.g., trampling) from pedestrians, cyclists, equestrians, or dogs. The proposed Project also has potential to indirectly impact sensitive terrestrial communities through compaction, erosion, and other disturbances caused by pedestrians, cyclists, horses, or dogs. This may include the introduction of invasive weeds or plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases) which could adversely affect susceptible species. With the implementation of the minimization measures listed below, WRA believes that the project will not result in any significant adverse impacts to sensitive terrestrial communities within the Project Area.

Biology Minimization Measure 1A

Given the widespread nature of sensitive terrestrial communities, protective fencing or flagging is not practical or feasible (fencing or flagging is recommended for occurrences of Anderson's manzanita chaparral due its dual role as a special-status plant; see Section 6.2). However, to minimize impacts to sensitive vegetation, the work area, including any staging areas, should be minimized to the fullest extent feasible and trails should be the minimum width necessary to support the proposed use (i.e., hiking, cycling, horse riding) as defined in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018).

Biology Minimization Measure 1B

To minimize inadvertent impacts to sensitive vegetation, all construction personnel should be educated on the sensitivity of the biological communities and species at the site and the importance of minimizing impacts to vegetation outside of the work area. This should occur prior to the start the construction for each phase of trail and staging area construction during a pre-construction environmental awareness training by a qualified, County-approved biologist and given to all construction personnel working on the proposed Project. A designated staff member from the contractor's crew should provide follow-up training to any employees who begin work after the initial pre-construction training.

The training should include a photograph and/or description of sensitive communities and species at the site, measures being taken to avoid or reduce impacts to the community, reporting and follow-up actions if sensitive communities are impacted, and the worker's responsibility under the applicable environmental regulation(s).

Biology Minimization Measure 1C

To minimize removal of sensitive vegetation, trails should be routed around sensitive vegetation to the fullest extent feasible. At a minimum, the full width of the trail (i.e., the full extent of

vegetation removal and ground disturbance during construction) should avoid the dripline of sensitive vegetation, with greater separation between the trail and sensitive vegetation being preferred. If trails are re-routed, they should be re-routed downslope of any sensitive vegetation to avoid causing erosion or sedimentation issues which could be detrimental to sensitive vegetation. If other considerations such as slope or soil stability make it impossible to avoid sensitive vegetation, a qualified, County-approved biologist should develop appropriate mitigation measures based on the type of sensitive vegetation, the size of the impact, and the likelihood of success with various mitigation approaches such as transplantation, propagation, or habitat enhancement. Mitigation measures for unavoidable impacts should be approved by the County prior to any removal of sensitive vegetation.

Biology Minimization Measure 1D

To avoid the introduction of invasive weeds or plant pathogens that could adversely impact sensitive vegetation, prior to arriving on the site all equipment and vehicles shall be inspected to ensure they are clean of any dirt or debris.

Biology Minimization Measure 1E

To minimize both construction-related and post-construction impacts to sensitive vegetation, trail design should incorporate the best available technology and industry-standard Best Management Practices (BMPs) to minimize the potential for detrimental impacts such as erosion or sedimentation and to minimize the need for future maintenance. Specific standards (including standard details) for trail construction are provided in the Draft San Vicente Redwoods Public Access Plan (PlaceWorks 2018).

Biology Minimization Measures 1F

To minimize effects on sensitive vegetation from erosion and sedimentation due to construction activities, all disturbed ground should be stabilized concurrent with trail construction. Stabilization methods may include: compacting the soil¹, covering disturbed soils with duff and leaf litter as well as branches removed for construction of trails, revegetation using appropriate native plant species, or use of other standard erosion control measures such as weed-free straw or hydromulch. If disturbed areas are to be revegetated, only native plants appropriate for the habitat should be used as outlined in Biology Minimization Measure 1H. If other erosion control materials are to be used, they should be certified weed-free and as otherwise specified in Biology Minimization Measures 1I.

Biology Minimization Measure 1G

To minimize the introduction of invasive plants or plant pathogens that could threaten sensitive vegetation, parking and staging areas should include signage or other materials aimed at instructing the general public on the potential threats associated with invasive plants, plant pathogens, and other pests of concern. These materials should include basic prevention methods that the general public can implement such as inspecting shoes and pet fur for weed seeds or avoiding the movement of plant material or soil from one area to another. This education signage should be in place prior to opening the trails for public access and should be maintained annually by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

¹ Although compaction may be used with any of the other soil stabilization measures, it is only suitable for use on its own on trail surfaces which typically would not be treated with other erosion control materials.

Biology Minimization Measure 1H

To minimize the introduction of invasive plant species and/or plant pathogens which could adversely impact sensitive vegetation, any restoration or landscape plantings (e.g., plantings around the proposed parking/staging area) should use native species appropriate for plant communities found at the site. To the extent feasible, plant material should be salvaged from trail construction activities at the site. If not possible, plant material should be propagated by a reputable nursery with protocols in place for minimizing the potential spread of *Phytophthora* or other plant diseases. Any propagated plant material should be sourced from as close to the site as possible, ideally from within the site itself.

Biology Minimization Measure 1I

To avoid the introduction of weed seed or plant pathogens that could adversely impact sensitive vegetation, the importation of soils for construction of the parking/staging area or other parts of the Project Area should be minimized to the fullest extent feasible. To the extent feasible, soils should be salvaged from onsite before being imported from offsite. If it is necessary to import soils, they should be certified weed-free and from a County-approved source with protocols in place for minimizing the potential spread of *Phytophthora* or other plant diseases.

Biology Minimization Measure 1J

To minimize impacts to sensitive vegetation from use of the trail network, the Trail Maintenance System should be implemented as described in Chapter 6 of the Draft San Vicente Redwoods Public Access Plan. The Trail Maintenance System includes an annual monitoring program aimed at identifying maintenance issues (e.g., erosion) and other problems (e.g., nuisance trash areas or other impacts from trail users). The Trail Maintenance System should include specific methods for routinely documenting and implementing the necessary maintenance by the Public Access Manager.

7.1.2 Sensitive Aquatic Communities

Biology Impact 2

The proposed trail network and staging area have the potential to directly affect sensitive aquatic communities that may be protected by the Clean Water Act or other Federal, State, or local laws through removal of vegetation, placement of fill, or other grading activities that could impact wetlands, the bed and bank of streams, or riparian vegetation. The proposed Project also has potential to indirectly impact sensitive aquatic communities through increased rates of erosion and sedimentation, the introduction of invasive weeds, and other disturbances from trail users or trail maintenance. The proposed trail network may entail minor impacts to vegetation within the buffers of Environmentally Sensitive Habitats protected under the County of Santa Cruz LCP; however, passive recreational trails are an allowed use within the riparian corridor. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to any wetlands, streams, or their buffers/riparian corridor.

Biology Minimization Measure 2A

To minimize adverse impacts to sensitive aquatic communities, implement Biology Minimization Measures 1A through 1J.

Biology Minimization Measure 2B

To the extent feasible, wetlands and streams should be avoided by trail and staging area construction by a minimum of 100 feet. The jurisdictional boundaries of wetlands, within the 100-foot survey buffer, should be re-flagged in the field prior to construction by a qualified, County-approved individual and trails should be routed around these areas when possible. Trails should be routed downslope of wetland areas, if possible, to avoid the potential for detrimental erosion or sedimentation. When not possible, trails should be sited to avoid altering any obvious source of wetland hydrology and should be sloped downhill crossways so no water accumulates and instead flows off immediately. This avoids concentration of stormwater into “gutters” which then have to be discharged via water bars.

Crossings of regulated streams should be appropriately located to minimize impacts to riparian vegetation and to minimize the potential for long-term impacts to the stream. Trails should be routed in areas with less riparian vegetation to minimize the need for vegetation removal in these areas. Trails should also be located in areas that will minimize the potential for detrimental erosion or sedimentation. Stream crossings should be designed to minimize trail erosion following the specific standards for trail construction provided in the Draft Public Access Plan (PlaceWorks 2018). Crossings should be designed to fre-span the channel and should ideally be anchored above the top of bank. In some locations however, hardened crossings that include work below the top of bank may be the least impactful approach.

Crossings of regulated streams that avoid work below the ordinary high water mark do not require a permit from the United States Army Corps of Engineers. However, such crossings may require notification to the California Department of Fish and Wildlife (CDFW), the Regional Water Quality Control Board (RWQCB), and the County, even if located above the top of bank. If the CDFW, RWQCB, or County issue authorizations for such work, the measures included in any such authorizations should be incorporated into the proposed Project design.

Biology Minimization Measure 2C

Where wetlands or streams cannot be avoided, appropriate approvals from the United States Army Corps of Engineers (for impacts to regulated wetlands or areas below the ordinary high water mark of regulated streams) and/or the Regional Water Quality Control Board and the California Department of Fish and Wildlife (for impacts to regulated wetlands, riparian vegetation, or areas below the top of bank of regulated streams) should be secured prior to initiating work in these areas. Additional County approvals may be required under the Riparian Corridor and Wetlands Protection Ordinance. The measures included in any such authorizations should be incorporated into the proposed Project design.

Biology Minimization Measure 2D

To prevent erosion or sedimentation during construction, appropriate Best Management Practices (BMPs) (e.g., silt fencing, wattles, sterile straw, hydromulch, geotextile fabrics, sediment traps, drainage swales, or sand bag dikes) should be installed around wetlands and streams. All materials should be certified weed-free and must be constructed of natural materials. No plastic monofilament netting may be used. The exact location and configuration of BMPs should be determined by the contractor based on specific Project site conditions and the type of work being conducted. BMPs should remain in place until all disturbed ground has been stabilized either through compaction, re-vegetation, or other methods provided for in Biology Minimization Measure 1F.

Biology Minimization Measure 2E

Any fueling or maintenance of equipment or vehicles should be conducted at a minimum of 100 feet from any wetland or stream. A spill containment kit should be maintained at any fueling or maintenance area. Any spills should be cleaned as soon as feasibly possible and all resulting materials should be disposed of properly. All construction vehicles should be inspected daily for leaks of oil, hydraulic fluid, or other potentially hazardous materials by a qualified, construction-crew member and drip pans should be placed under parked vehicles during prolonged periods of disuse (e.g., during evenings and weekends).

7.2 Special-Status Plant and Wildlife Species

7.2.1 Special-Status Plants

One special-status plant species is known to occur within the Project Area: Anderson's manzanita (Rank 1B.2). Based on the current alignment, there is potential for impacting up to 0.54 acre of Anderson's manzanita. These impacts are based on a 7-foot band of disturbance (5-foot trail tread plus 1 foot of vegetation clearance on either side) located down the centerline of the trail alignment and may not reflect actual impacts due to the potential for reducing the width of the trail in critical areas and for re-routing the trail alignment anywhere within the 100-foot-wide band surveyed for this report. It is anticipated that the flexibility built into the trail alignment will help to minimize impacts to Anderson's manzanita.

The proposed Project has the potential to impact Anderson's manzanita through both initial trail construction and subsequent use and maintenance. Suitable measures for avoiding, minimizing, or mitigating impacts to Anderson's manzanita, are provided below.

Biology Impact 3

The proposed trail network and staging area have the potential to directly impact Anderson's manzanita through direct vegetation removal and grading activities, as well as by subsequent damage (e.g., trampling) from pedestrians, cyclists, horses, or dogs. The proposed Project also has potential to indirectly impact Anderson's manzanita through compaction and other disturbances caused by pedestrians, cyclists, horses, or dogs. This may include the introduction of invasive weeds or plant diseases (e.g., sudden oak death or other *Phytophthora*-related diseases) which could adversely affect susceptible species. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to Anderson's manzanita.

Biology Minimization Measure 3A

Implement Biology Minimization Measures 1A-1J.

Biology Minimization Measure 3B

Where work will occur within 10 feet of a special-status plant to be preserved, orange construction fencing (or similar) should be installed at the edge of the work area and no work should occur beyond the fence. If such occurrences of special-status plants occur downslope from the work area, silt fencing should be installed at the edge of the work area to prevent soil or other materials from being transported downslope where they may impact special-status plants.

Biology Minimization Measure 3C

To the extent feasible and practicable, occurrences of special-status plants should be avoided by re-routing the trail alignment. At a minimum, the full width of the trail (i.e., the full extent of vegetation removal) should avoid the dripline of any special-status shrubs and should avoid special-status herbs by a minimum of 10 feet. If trails are re-routed, they should be re-routed downslope, where feasible, of any special-status plants to avoid causing erosion or sedimentation issues which could be detrimental to special-status plants. If not feasible then re-route the drainage away from the special-status plants. If other considerations such as slope or soil stability make it impossible to avoid special-status plants, a qualified, County-approved biologist should develop appropriate mitigation measures based on the species in question, the size and type of the anticipated impact, and the likelihood of success with various minimization approaches approved by the CNPS (1998) including:

- (a) Avoiding the impact altogether by not taking a certain action*
- (b) Minimizing impacts by limiting the degree or magnitude of the action*
- (c) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment*
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the Project*
- (e) Compensating for the impact by replacing or providing substitute resources or environments (for example Anderson's manzanita habitat enhancement could be used to offset impacts on-site near disturbance areas by the removal of overstory trees, including non-native trees)*

7.2.2 Special-Status Wildlife

Two special-status wildlife species were observed within the Project Area: San Francisco dusky-footed woodrat and oak titmouse. An additional 13 special-status wildlife species were determined to have moderate to high potential to occur there. The proposed Project has the potential to impact these wildlife species through both initial trail construction and subsequent use and maintenance.

Special-Status Bats

Biology Impact 4

The proposed trail network and staging area have the potential to directly impact special-status bats with the potential to occur within the Project Area through direct tree removal and grading activities. Tree removal and roost disturbance could occur during vegetation clearing associated with the establishment of parking and multi-use trail areas. Additionally, the operation of loud machinery in the immediate vicinity of a maternity roost site could impact the species by causing the parent to abandon the roost or induce elevated stress levels for the individuals occupying the maternity site. Although there are potential direct and indirect impacts to roost habitat associated with the Project, the clearing of vegetation may actually improve foraging habitat in locations that are currently too dense for bats to forage within. With the implementation of the minimization measures listed below, WRA believes that the proposed trail network will not have a significant adverse impact to any special-status bats.

Biology Minimization Measure 4A

Potentially significant impacts to roosting special-status bats may be minimized through avoiding disturbance to active roost sites. If any tree removal, regardless of size, or trimming is required, it is recommended to take place between September and October. This window falls outside of both the maternity and hibernation period for bats and avoids the breeding bird window (see Biology Minimization Measure 5A, below). Tree removal can take place during this period without a breeding bird or bat roost survey, although a tree removal permit may still be necessary.

Biology Minimization Measure 4B

If removal of large trees (diameter at breast height >12 inches) occurs during the bat roosting season (November through August), these trees should be inspected by a qualified, County-approved biologist for the presence of bat roosts. Potential bat roosts include large oak trees, riparian trees, exfoliating bark, tree cavities, and snags. If a maternity roost is detected, up to a 200-foot buffer should be placed around the maternity site until the bats are no longer utilizing the site. Non-maternity roost sites can be removed under the direction of a qualified, County-approved biologist.

Biology Minimization Measure 4C

Any large tree (diameter at breast height >12 inches) that will be removed should be left on the ground for 24 hours before being taken offsite or being chipped. This period will allow any day-roosting bats the opportunity to leave before the tree is either removed from the area or is chipped.

Biology Minimization Measure 4D

Consultation with the California Department of Fish and Wildlife (CDFW) should be initiated to determine appropriate mitigation measures if roosts are disturbed; this should be conducted by a qualified, County-approved biologist and any mitigation measures required by the CDFW should be implemented under the guidance of the same biologist.

Special-Status Birds and Other Avian Species

Biology Impact 5

Several species of special-status birds were observed or were determined to have the potential to occur within the Project Area; they include: oak titmouse, Vaux's swift, Nuttall's woodpecker, Allen's hummingbird, olive-sided flycatcher, and purple martin. (In addition to these species, marbled murrelet may also occur within the Project Area; however, impacts and minimization for this species is discussed under Biology Impact 6.)

The proposed Project will entail minor amounts of vegetation removal which has the potential to impact potential nesting and foraging habitat for avian species. The operation of construction machinery during the breeding season could also cause disturbance to breeding birds and could impact nesting activity. Indirect impacts to nesting birds may also occur as increased noise and human disturbance will occur as hikers, cyclists, horses, and dogs utilize various trail segments. Special-status and other native bird species are protected during the nesting season by the Migratory Bird Treaty Act and the California Fish and Game Code, as well as the California Environmental Quality Act. Potential significant impacts to nesting special-status birds may be minimized through avoiding disturbance to active nests through implementation of the following measures.

Biology Minimization Measure 5A

If construction, vegetation removal, or ground disturbance activities occur during the breeding season (February 1 to August 31), pre-construction breeding bird surveys should be conducted by a qualified individual within 14 days of the start of these activities to avoid disturbance of active nests, eggs, and/or young.

Biology Minimization Measure 5B

If construction, vegetation removal, or ground disturbance activities stop or lapse for a period of 14 days or more during the breeding season, a follow-up breeding bird survey should be conducted to ensure no new breeding activity has occurred within the anticipated work area. Outside of the breeding season, no pre-construction breeding bird survey would be required for construction, vegetation removal, or ground disturbance activities.

Biology Minimization Measure 5C

If nesting birds are located, an exclusion zone in which no construction activities would be allowed should be established around any active nests of any avian species protected by the Migratory Bird Treaty Act and California Fish and Game Code until a qualified, County-approved biologist has determined that all young have fledged. Suggested exclusion zone distances differ depending on species, location, and placement of nest, and should be at the discretion of the approved biologist based on the species in question, the proximity of the nest to the work area, and the type of work being conducted (e.g., use of hand tools versus gas-operated machinery).

Marbled Murrelet

Biology Impact 6

Marbled murrelet may occur within stands of old-growth forest with complex canopy such as shown on Figure 9. However, these areas have not been evaluated for their potential to support marbled murrelet following United States Fish and Wildlife Service protocols and it is unknown whether they represent potential habitat for marbled murrelet. If the species is present, the operation of construction machinery during the breeding season could result in disturbance to breeding individuals and could impact nesting activity. Additionally, although direct impacts to this species from vegetation and tree removal are unlikely, the species may still be impacted from a resulting increase in edge habitat and the presence of trash or food waste from trail users. An increase in edge habitat and/or food waste can result in an increased occurrence of corvids, including Steller's jay (*Cyanocitta stelleri*), which can increase nest predation and reduce reproductive success. This may be particularly prevalent in or around the parking lot and picnic areas where trash and food scraps are more likely to concentrate. Potential significant impacts to marbled murrelet may be minimized through the measures listed below. Informal consultation with the United States Fish and Wildlife Service (USFWS) should be initiated and any additional measures recommended by the USFWS should be implemented as part of the project.

Biology Minimization Measure 6A

During construction, all workers should ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the construction area is deposited in wildlife-proof trash containers. The trash containers should not be left open and unattended overnight.

Biology Minimization Measure 6B

Ensure the Public Access Plan includes specific measures that include the installation of animal-proof trash receptacles and describe specific methods for routine trash pickup and ongoing monitoring by the Public Access Manager to ensure that trash removal occurs at a frequency sufficient to prevent trash overflow at the receptacles.

Biology Minimization Measure 6C

Educational signage should be placed within the parking lot and at picnic areas informing the public to remove trash and food waste. Signage should provide information on the marbled murrelet and the impact that corvid and avian predators can have on nest sites. This education signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

Biology Minimization Measure 6D

Picnic locations should be located outside of old-growth stands.

San Francisco Dusky-Footed Woodrat

Biology Impact 7

The proposed trail network and staging area have the potential to directly impact San Francisco dusky-footed woodrat through mortality and destruction of their large stick nests, potentially containing young, that could occur during vegetation removal, grubbing, grading, or other ground-disturbing activities. Potential indirect impacts to woodrats may include increased predation through increased access for predators, such as raccoon or coyote. Predators may also be attracted to food waste and trash created by trail users, particularly within the picnic and parking lot areas. Multi-use trail and parking lot areas will also introduce domestic animals including dogs to the Project Area, which could disturb nests by marking their scent or direct destruction of nests in close proximity to multi-use trails. The Draft Public Access Plan (PlaceWorks 2018) limits dogs to the proposed 1.5-mile-long Northern Frontage Trail that parallels Empire Grade Road.

San Francisco dusky-footed woodrat middens are found in very high numbers throughout all portions of the Project Area. Approximately 1,815 woodrat middens were mapped within the Project Area; based on the representative densities (8.7 middens per acre) observed across the 38 miles of trail surveyed for this report, it is estimated that the greater San Vicente Redwoods property may support up to 74,000 woodrat middens. Based on the current trail alignment, it is estimated that 144 middens may be directly impacted; this represents less than 0.2% of the estimated population of the greater site.

As with all impacts to special-status species discussed in this Biological Resources Assessment, these impacts are theoretical in that they are based on a 7-foot-wide area of disturbance running down the center of the proposed trail alignment shown on Figure 2; by strategically aligning the trail within the survey corridor, these impacts may be reduced or avoided. While some direct impacts to woodrat nests may be unavoidable, this would not be considered a significant impact as the species is prolific at the site and suitable habitat is abundant within both the Project Area and the greater San Vicente Redwoods. Minimization measures listed below are recommended to reduce impacts to woodrat to a less-than-significant level.

Biology Minimization Measure 7A

Implement Biology Minimization Measures 1A, 1B, 6A, and 6B.

Biology Minimization Measure 7B

A pre-construction survey of the parking lot area should be conducted by a qualified, County-approved biologist to flag and delineate any woodrat middens within the planned disturbance footprint. During construction of the parking lot, a biological monitor should be onsite to ensure vegetation and ground disturbance with heavy equipment should not impact those delineated resources. When avoidance of woodrat middens is not possible, the qualified, County-approved biologist should dismantle the nest in accordance with Minimization Measure 7D.

Biology Minimization Measure 7C

During construction and trail installation, a qualified, County-approved biologist or trained designee from the contractor's crew should identify woodrat middens located along the trail alignment. If the latter, a qualified, County-approved biologist should provide the training prior to the start of each construction phase. To the extent feasible and practicable, the trail alignment should avoid woodrat middens by re-routing the trail alignment. The trail should avoid woodrat nests. To accomplish this, a qualified member of the contractor's crew should be trained in the identification of woodrat nests and this person should be responsible for making minor adjustments to the trail alignment during construction to avoid woodrat nests. Where is not possible to avoid all woodrat nests, impacts to woodrats and their middens implementation of Minimization Measure 7D would be required.

Biology Minimization Measure 7D

When construction of the trail alignment or the parking area will result in a direct impact to a woodrat midden, a qualified, County-approved biologist should dismantle the nest and scatter the nest material a minimum of 10 feet outside of the trail alignment or the footprint of the parking area. If young are encountered during the dismantling process, the material should be placed back on the nest and the nest should remain unmolested for three weeks in order to give the young enough time to mature and leave of their own accord. After three weeks, the nest dismantling process may resume.

Biology Minimization Measure 7E

For trail segments where dogs on leash are permitted, educational signage should be posted to inform trail users of woodrats, their middens, and the importance of keeping dogs on trails and away from the structures. This educational signage should be in place prior to opening the trails for public access and should be routinely maintained by the Public Access Manager to ensure that signage is not obstructed and is legible at all times.

California Red-Legged Frog

Biology Impact 8

The proposed trail network and staging area have the potential to directly impact California red-legged frog (CRLF) which may disperse through the Project Area. Furthermore, the Project Area contains Critical Habitat for the species. The development of stream crossings and the associated vegetation and ground clearing activities may impact or impede CRLF movement. Indirect impacts to CRLF may include increased predation through increased access for predators, such

as raccoon or coyote. Predators may also be attracted to food waste and trash created by hikers within the picnic and parking lot areas.

Impacts to CRLF and the species Critical Habitat may also occur if aquatic features are degraded through increased rates of erosion and sedimentation, the introduction of invasive weeds, and other disturbances from trail users or trail maintenance. Minimization measures listed below are recommended to prevent impacts to CRLF and to maintain the physical or biological features of the species Critical Habitat. If these measures are implemented, no take is expected to occur during the proposed Project. Consultation with the United States Fish and Wildlife Service (USFWS) may still be required due to the presence of Critical Habitat; however, the physical and biological features of the species' Critical Habitat is anticipated to remain unchanged with the Project. If consultation with the USFWS is required, and additional measures by the USFWS are warranted, those measures should be implemented with the Project in addition to those identified below.

Biology Minimization Measure 8A

Implement Biology Minimization Measures 2B through 2E.

Biology Minimization Measure 8B

For stream crossings and areas within 100 feet of wetted features, pre-construction surveys by a qualified, County-approved biologist should be performed immediately prior to the start of any ground-disturbing activities. If California red-legged frog (CRLF) are found within the Project Area, all work should cease within the immediate vicinity (approximately 25-feet around the work area) until the individual(s) have been allowed to leave the Project Area on their own. If CRLF cannot passively leave the Project Area, work should cease and the United States Fish and Wildlife Service (USFWS) should be contacted by the approved biologist to determine the appropriate course of action. The approved biologist should then implement the appropriate course of action as determined by the USFWS.

Biology Minimization Measure 8C

Because dusk and dawn are often the times when California red-legged frog (CRLF) are most active and likely to disperse, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Furthermore, no mechanized work should occur during significant rain events, defined here as 0.25 inch or greater within a 24 hour period, when CRLF are more likely to disperse and occur within the Project Area.

Wildlife Corridors

Biology Impact 9

The Project Area is located within the western portion of an important wildlife corridor, as identified by the California Department of Fish and Wildlife's (CDFW) essential connectivity network mapping project (CDFW 2014). Wildlife corridors and essential connectivity areas have been mapped by the CDFW to include the Project Area and continuing through to the north, east, and southeast (CDFW 2014). The proposed trail network and staging area have the potential to impact wildlife migration, including mountain lion, through the introduction of new human disturbance and increased noise. New scents will also occur as multi-use trails allow horses and dogs to access the area. The Project will not, however, result in the development of any physical structures or barriers that would restrict or prevent wildlife migration (i.e., no new roads, large fences, urban development, etc.). Mountain lion and other native species often utilize trail

networks, and the development of trails within the Project Area is not anticipated to result in an impact to wildlife corridors or movement.

Biology Minimization Measure 9

The proposed Project is not anticipated to impact wildlife corridors within Santa Cruz County, and therefore no additional minimization measures are recommended.

7.3 Protected Trees

Biology Impact 10

The proposed trail network and staging area have the potential to directly impact trees protected under the Santa Cruz County Tree Protection Ordinance. Protected trees include trees within any of the sensitive habitats defined by the Santa Cruz County Municipal Code (see Section 2.3).

Biology Minimization Measure 10

All tree removals should adhere to the County's tree protection ordinance. Tree removal should be conducted by a licensed arborist or a registered professional forester using industry-standard best management practices (BMPs) to prevent the spread of invasive weeds or plant pathogens and avoid damage to vegetation to be retained.

8.0 CONCLUSION

Based on the results of this Biological Resources Assessment, it was determined that the Project Area contains sensitive resources which could be adversely impacted by the proposed Project. Elements of at least eight sensitive terrestrial biological communities and three sensitive aquatic biological communities were observed within the areas designated for trail construction. One special-status plant, Anderson's manzanita, was determined to be present. Based on a lack of observations during seasonally-timed surveys, it was determined that other special-status plants are unlikely to occur within the Project Area. Two special-status wildlife species were determined to be present, San Francisco dusky-footed woodrat and oak titmouse, and another 13 special-status wildlife species were determined to have moderate to high potential to occur. Additionally, the Project Area contains designated Critical Habitat for CRLF.

Although the proposed Project covers a large amount of wild lands containing a high diversity of biological resources, the proposed Project is relatively minimal in scope and is not expected to result in significant adverse impacts to sensitive resources. Due to the significant efforts that have gone into understanding ecology of the property (ESA 2012) and developing the proposed trail network (PlaceWorks 2018), areas with the most sensitive resources have been avoided and large tracts of wild land will remain off limits to public access. When implemented appropriately, the proposed trail network and the associated recreational, research, and educational activities are compatible with the conservation and long-term maintenance of sensitive biological resources. To this effect, the alignment of the trail and the specific construction methods proposed will largely avoid sensitive resources and will reduce the potential for long-term adverse impacts. With the implementation of the minimization measures included in Section 6.0, as well as the detailed management actions listed in the Draft Public Access Plan, it is anticipated that any potential impacts to sensitive biological resources associated with the Project will be reduced to a less-than-significant level.

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APPENDIX A
PROJECT FIGURES

- Figure 1. Location Map
- Figure 2. Project Area Overview
- Figure 3. Biological Communities Documented within the Greater San Vicente Redwoods Property
- Figure 4. Wetlands Documented within the Project Area
- Figure 5. Regulated Stream Crossings within the Project Area
- Figure 6. Special-Status Plants Documented within a 5-Mile Radius of the Project Area
- Figure 7. Special-Status Plants Documented within the Project Area
- Figure 8. Special-Status Wildlife Documented within a 5-Mile Radius of the Project Area
- Figure 9. Special-Status Wildlife Documented within the Project Area

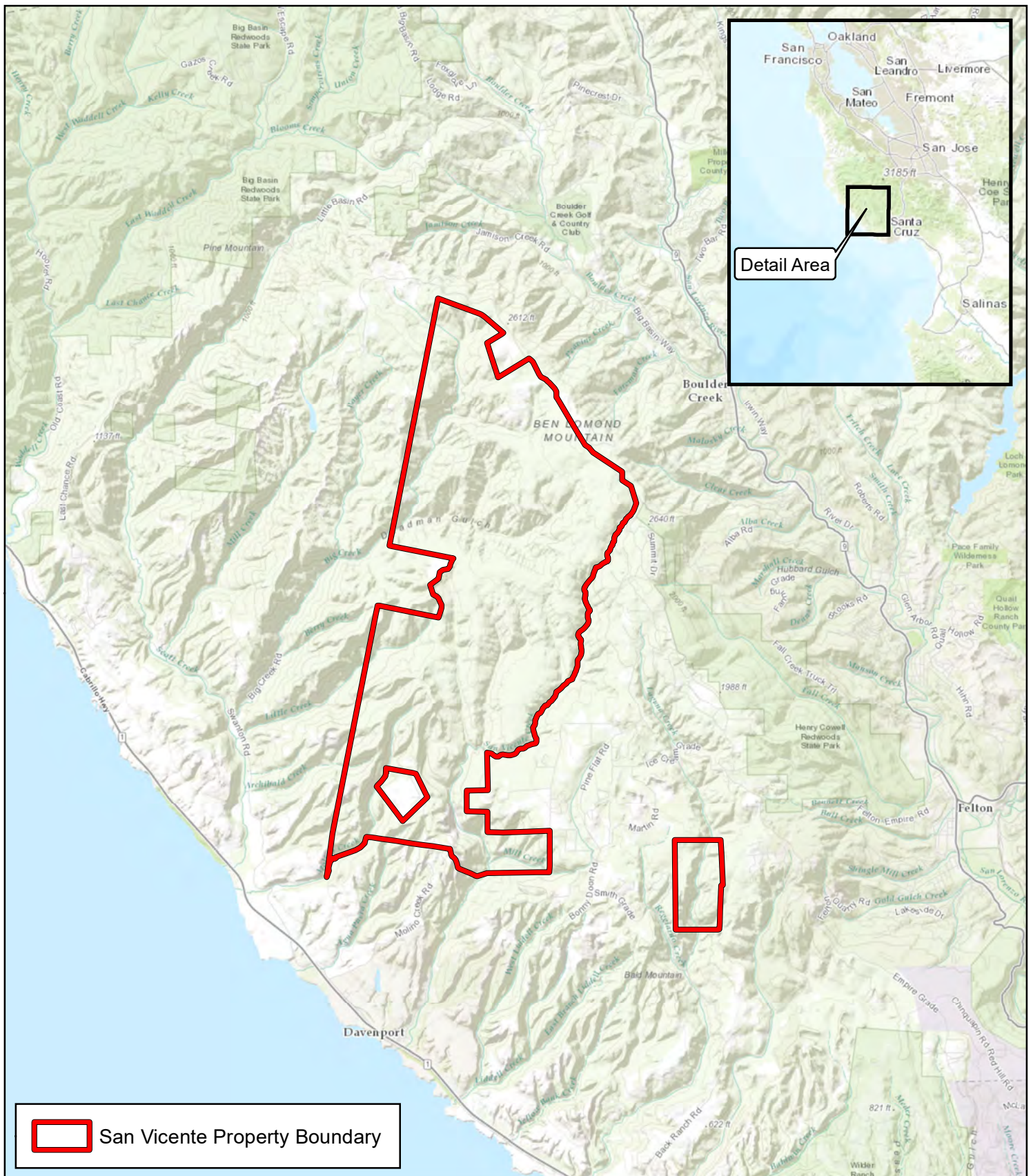


Figure 1. Location Map

San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California



0 0.5 1 2
Miles

Map Prepared Date: 11/8/2016
Map Prepared By: sgillespie
Base Source: Esri World Topo
Data Source(s): WRA

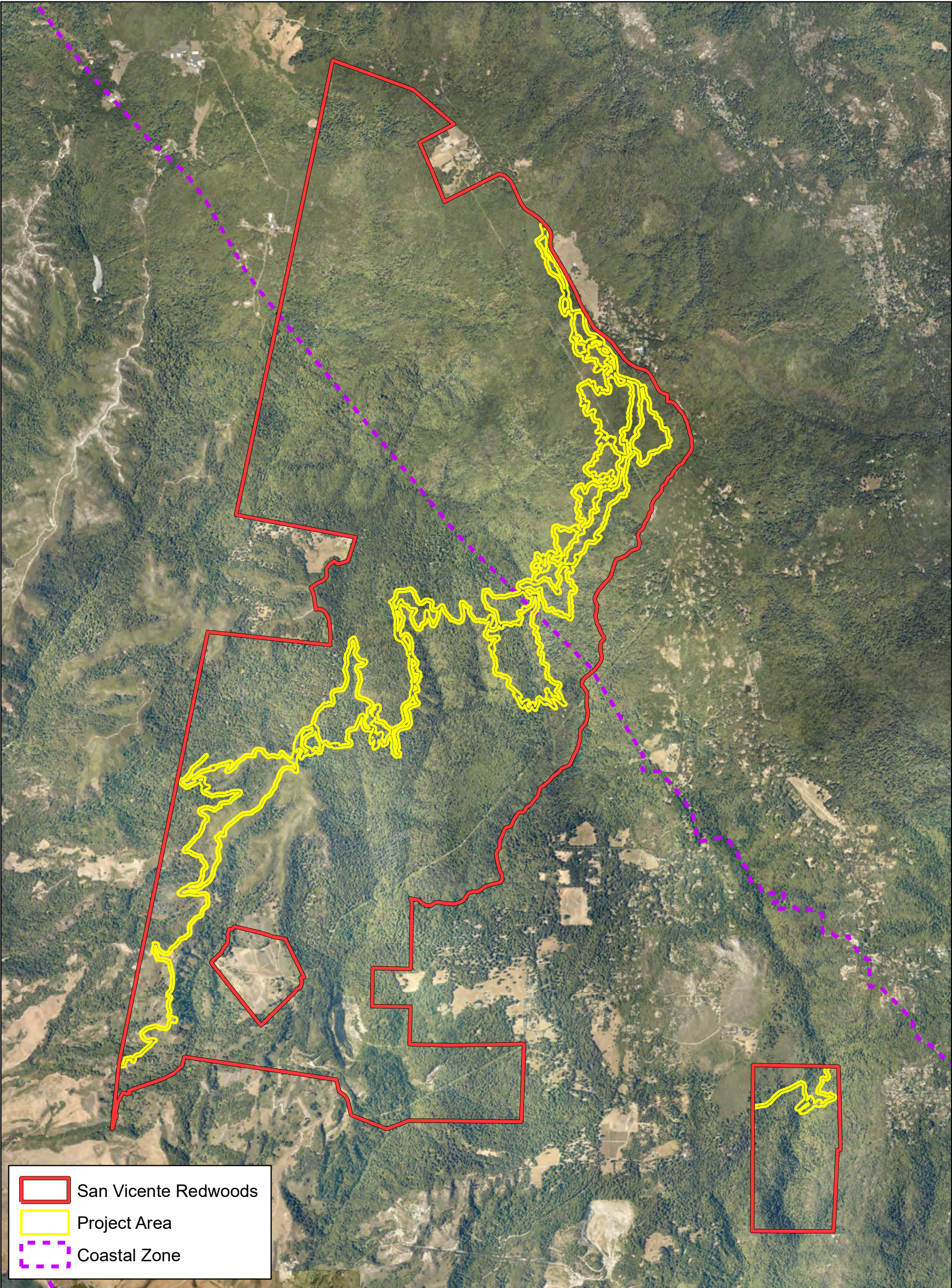
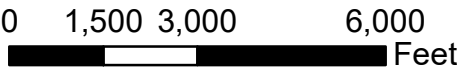


Figure 2. Overview of Project Area

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California



Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

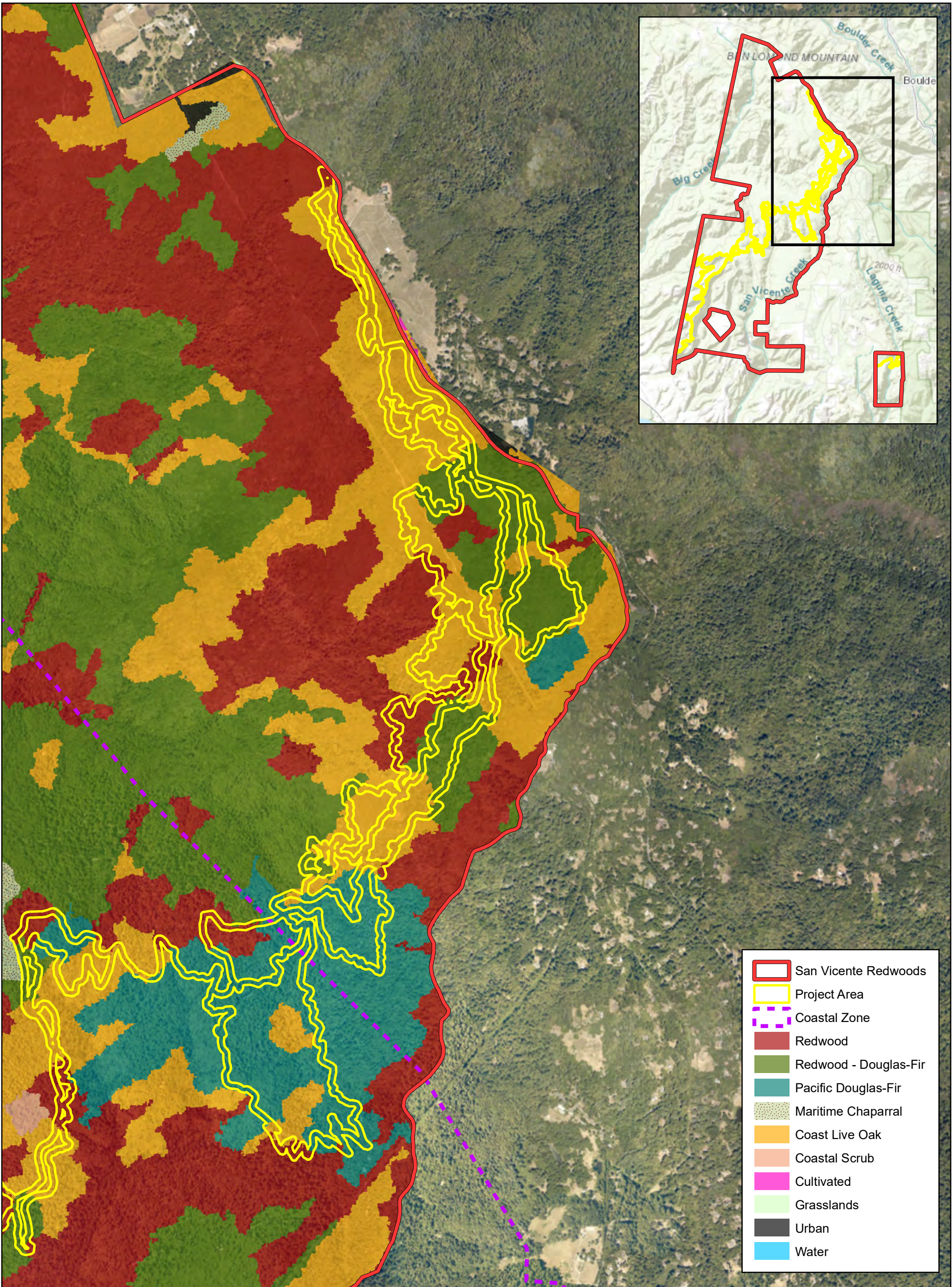


Figure 3A. Biological Communities North

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

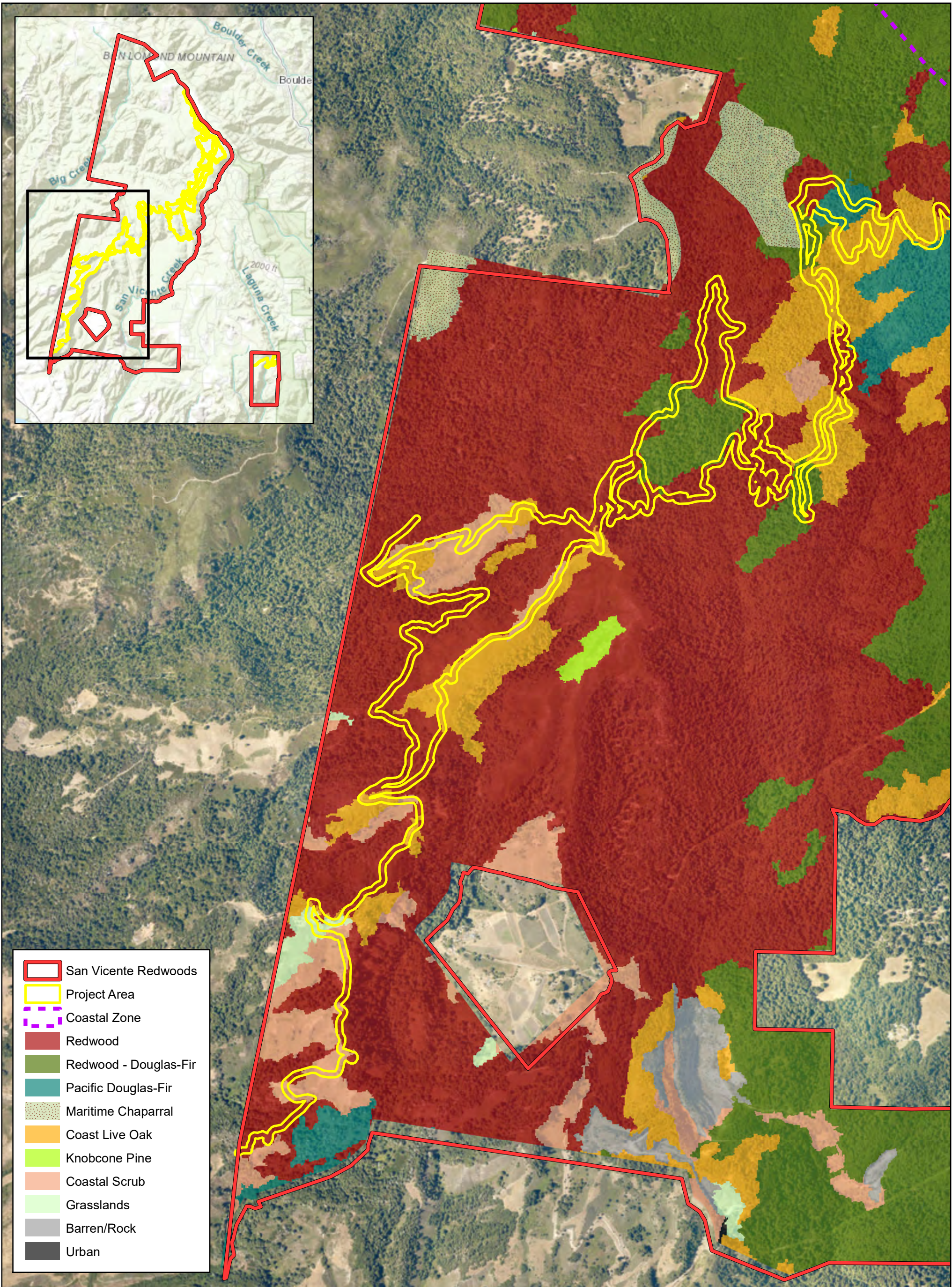


Figure 3B. Biological Communities South

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

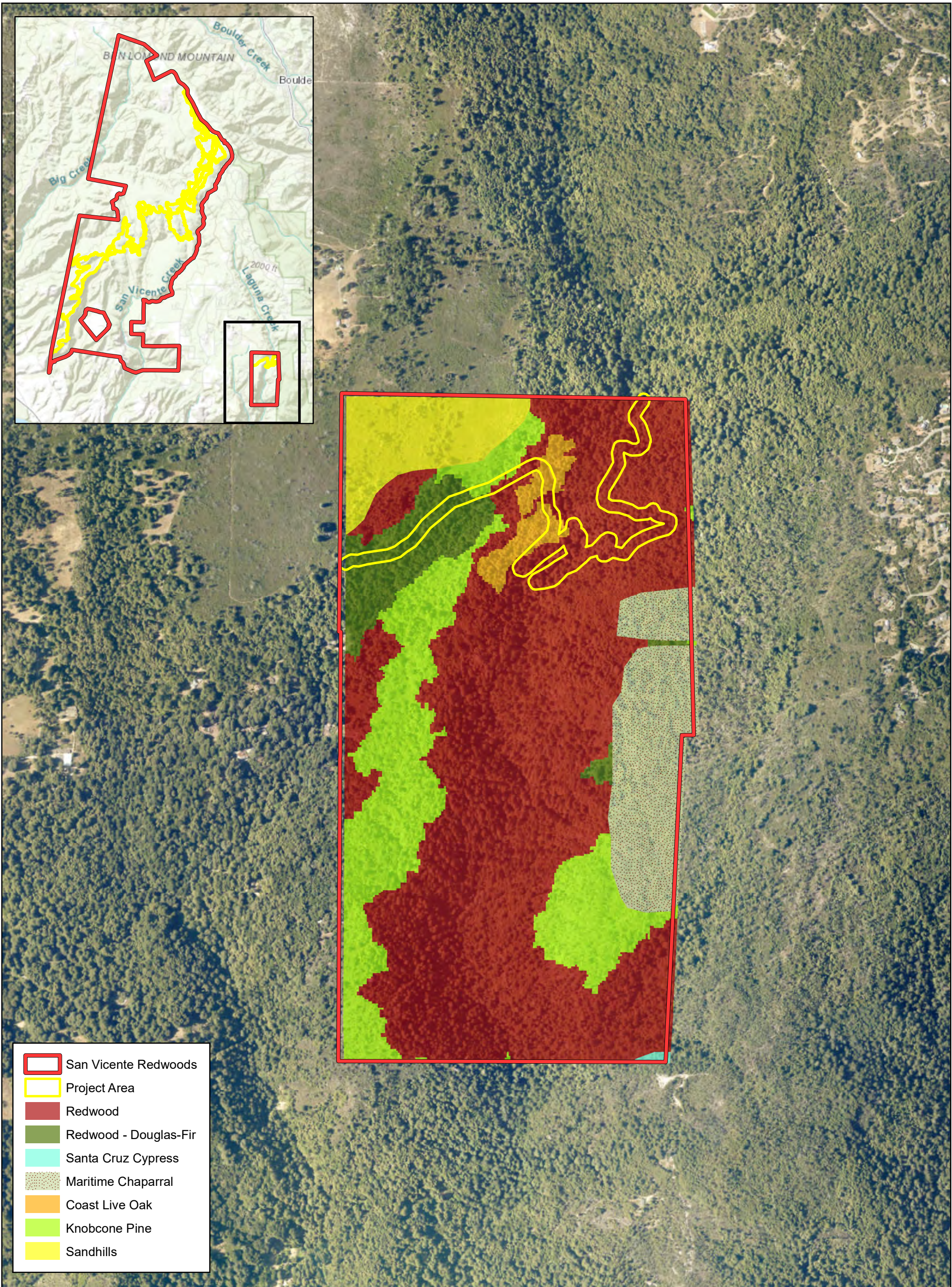


Figure 3C. Biological Communities Laguna Parcel

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San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

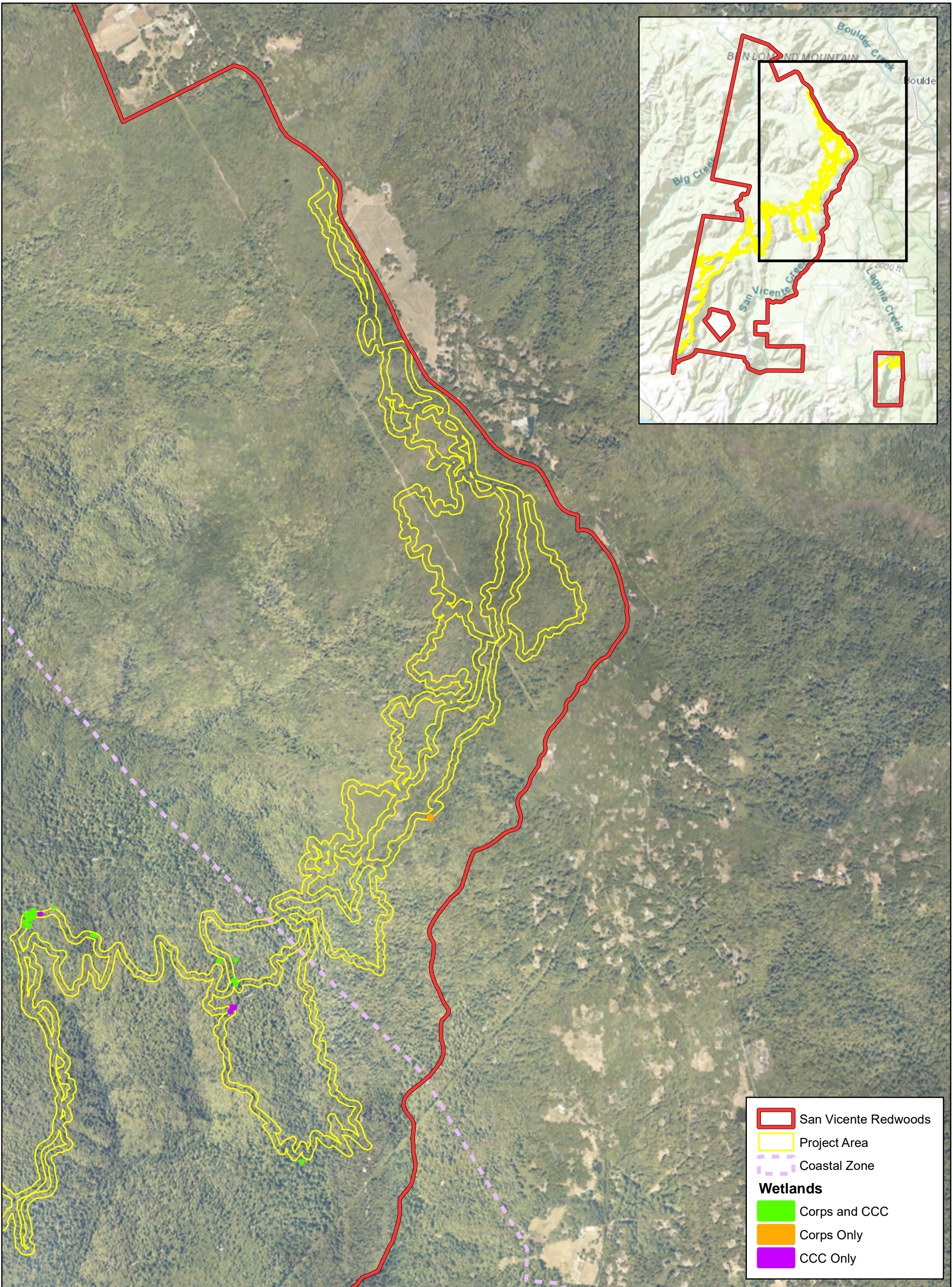


Figure 4A. Wetlands North

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

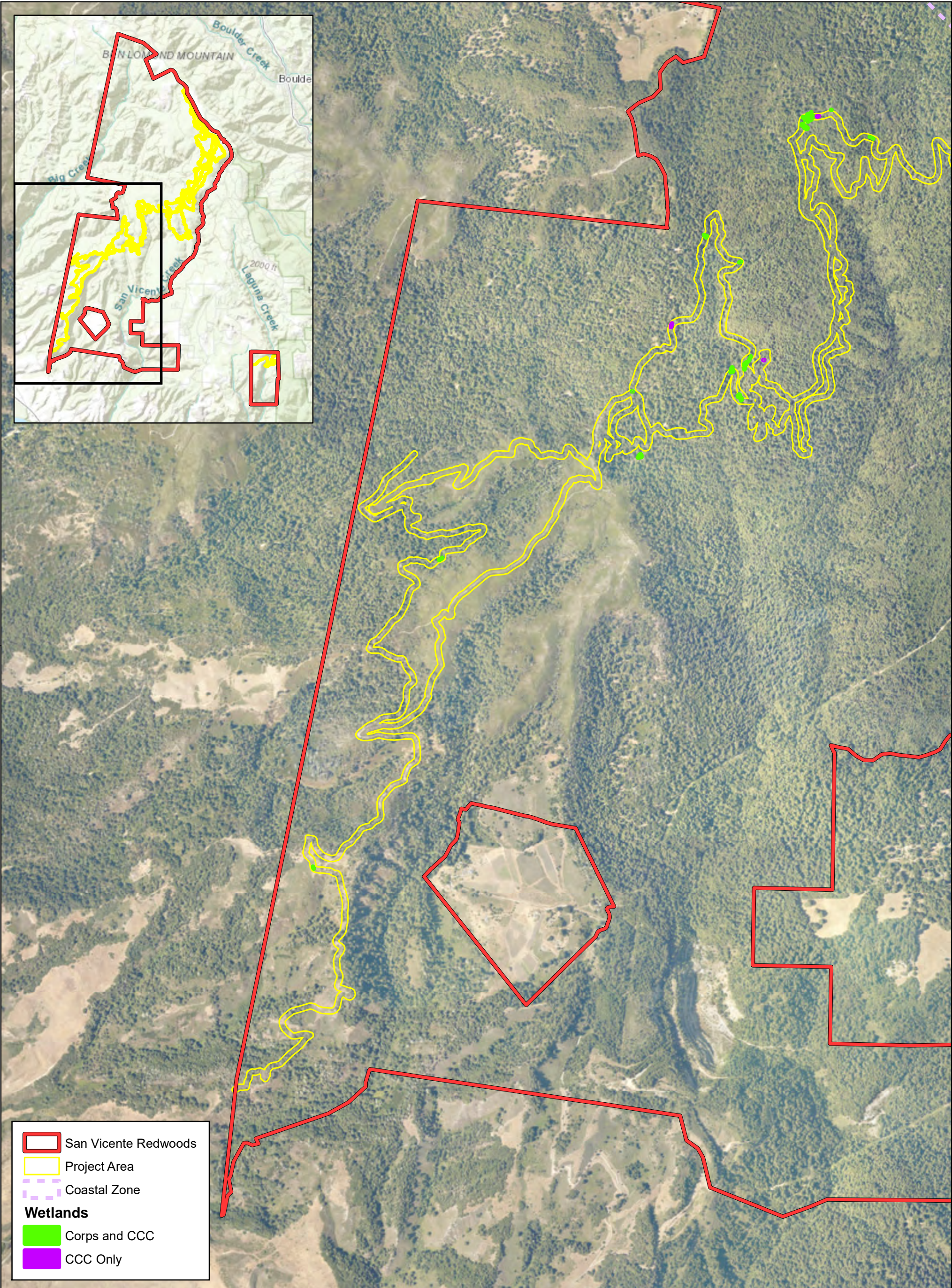


Figure 4B. Wetlands South

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

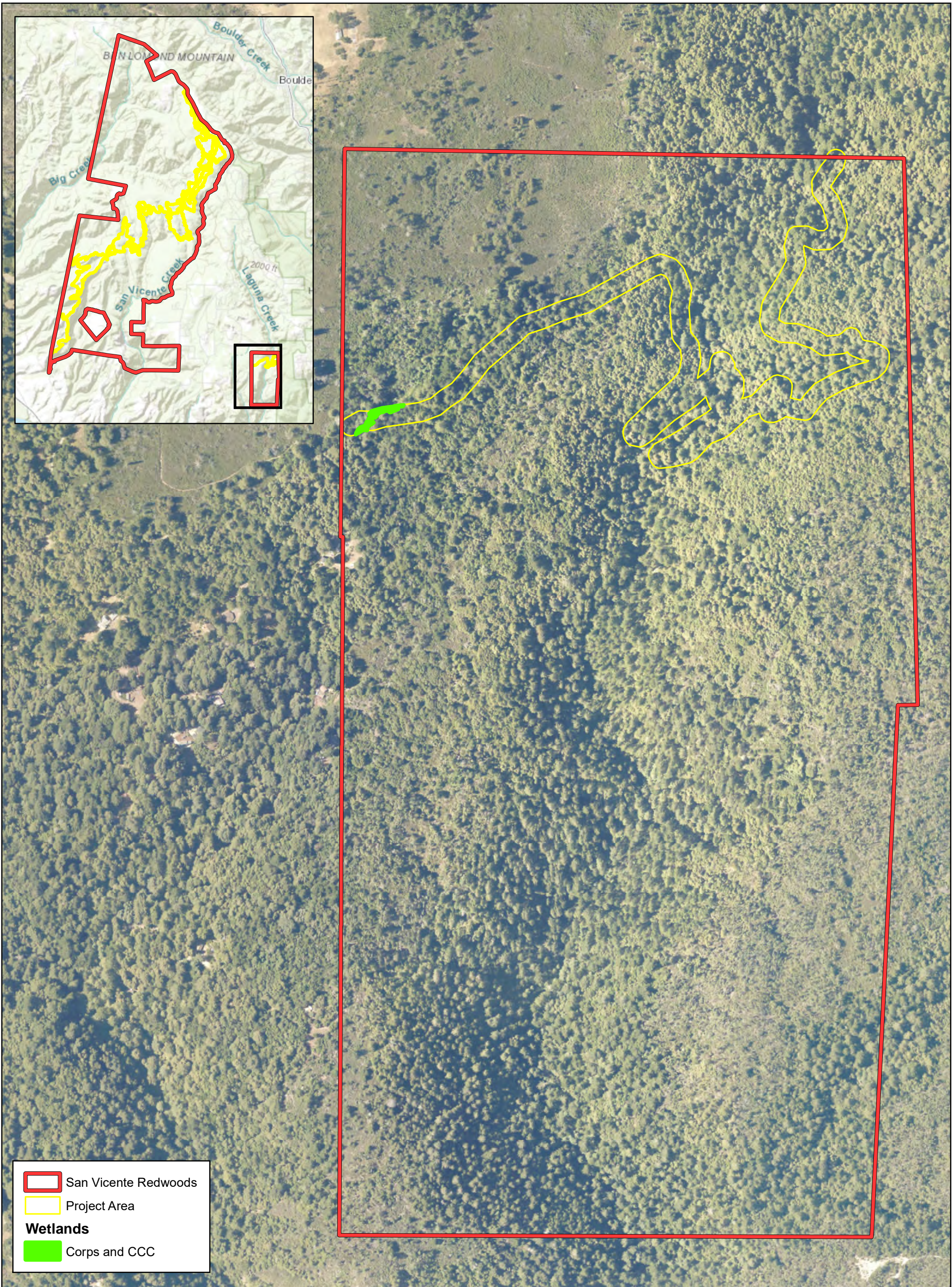


Figure 4C. Wetlands Laguna Parcel

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 250 500 1,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
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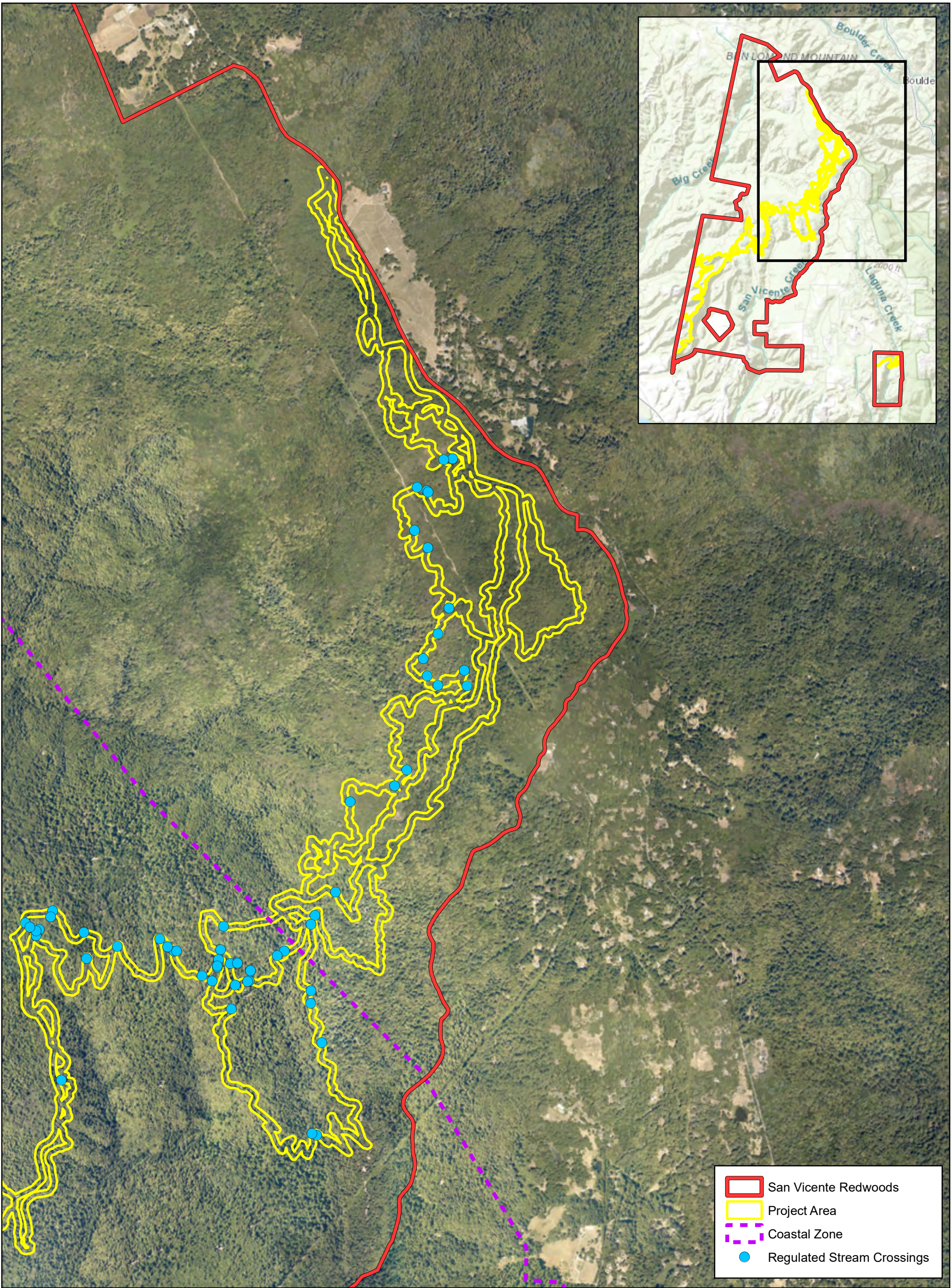
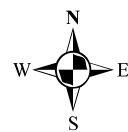


Figure 5A.Regulated Stream Crossings North

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

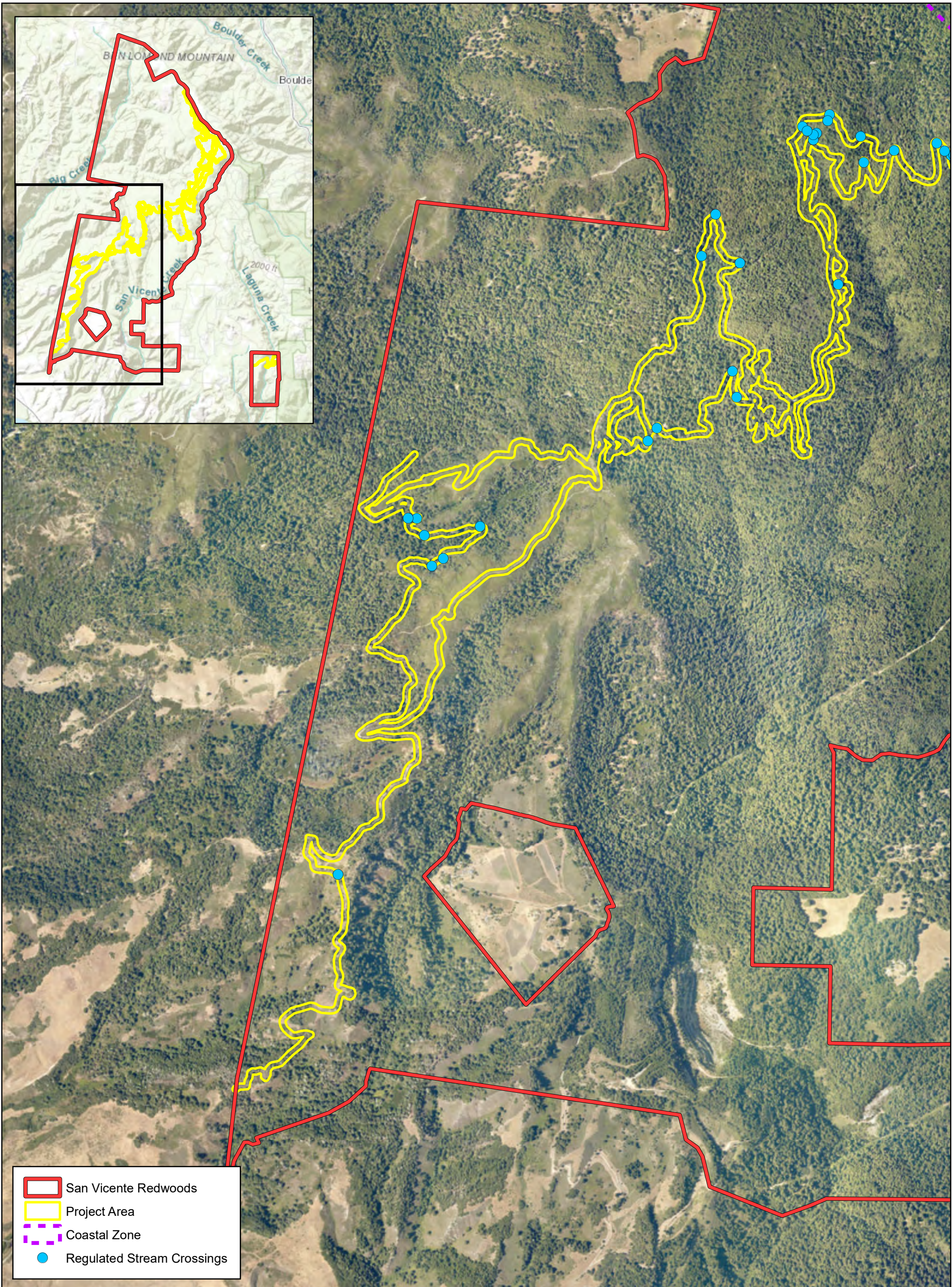


Figure 5B. Regulated Stream Crossings South

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

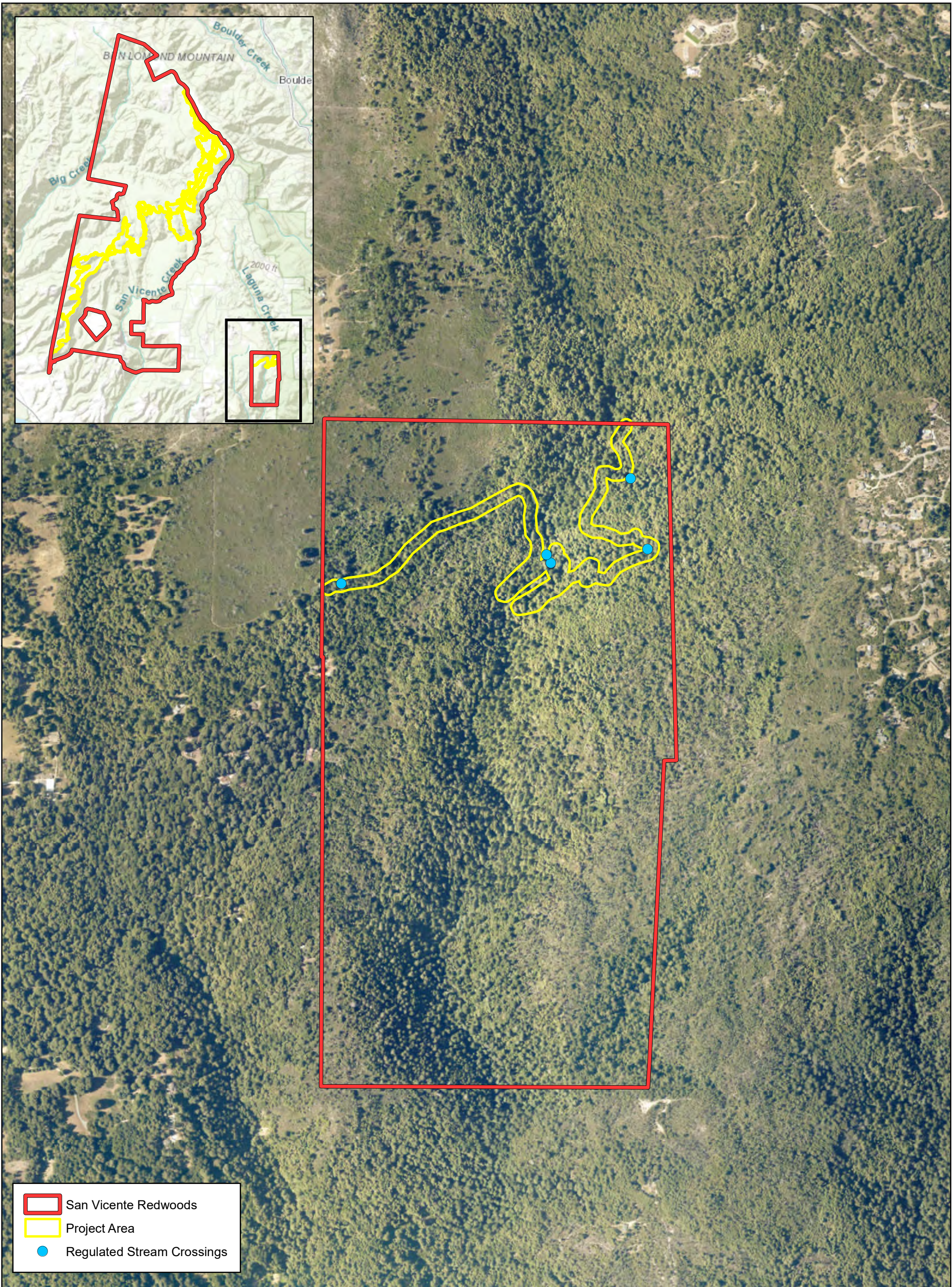


Figure 5C. Regulated Stream Crossings Laguna Parcel

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

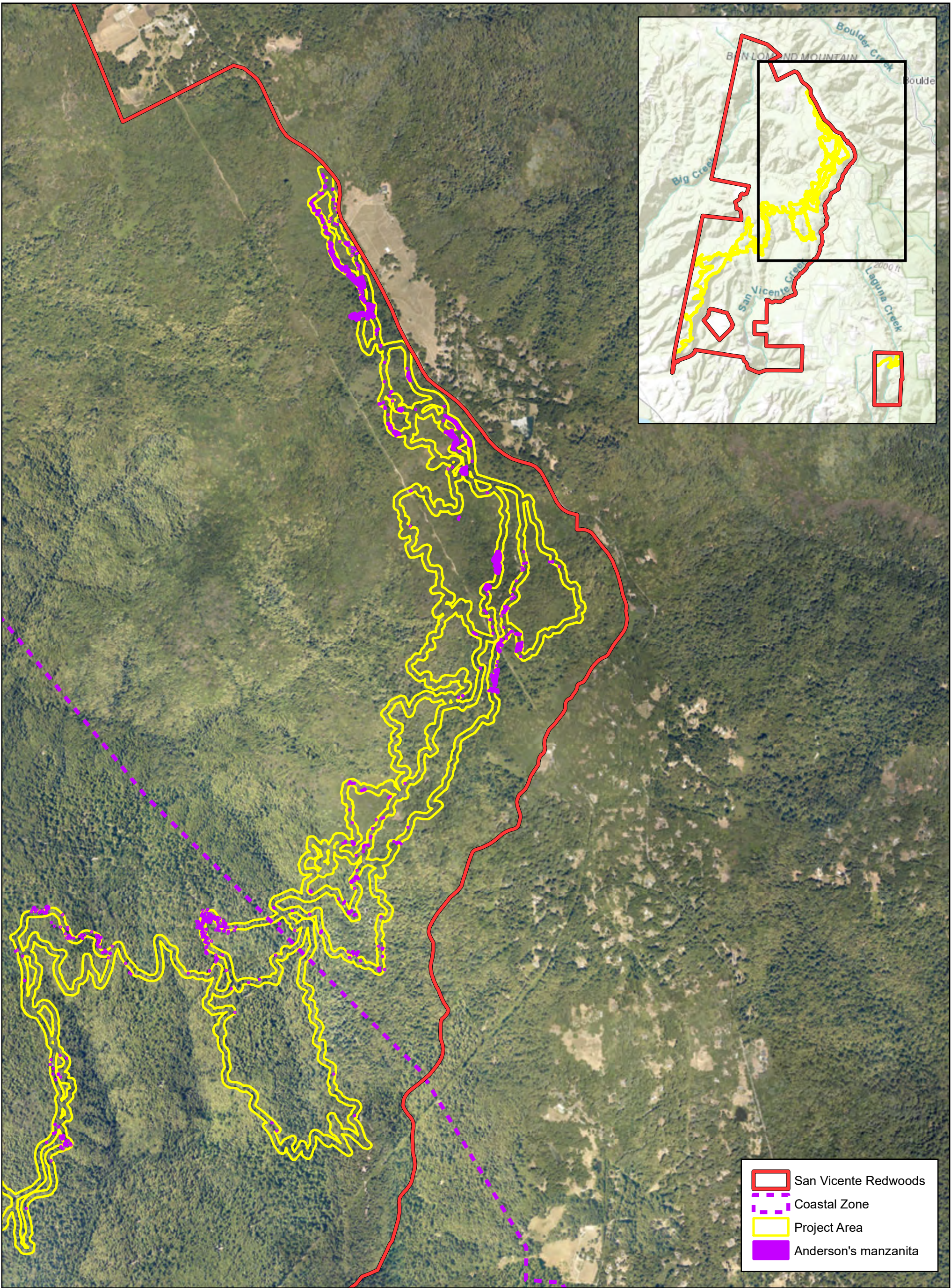


Figure 7A. Special-Status Plant Species North

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

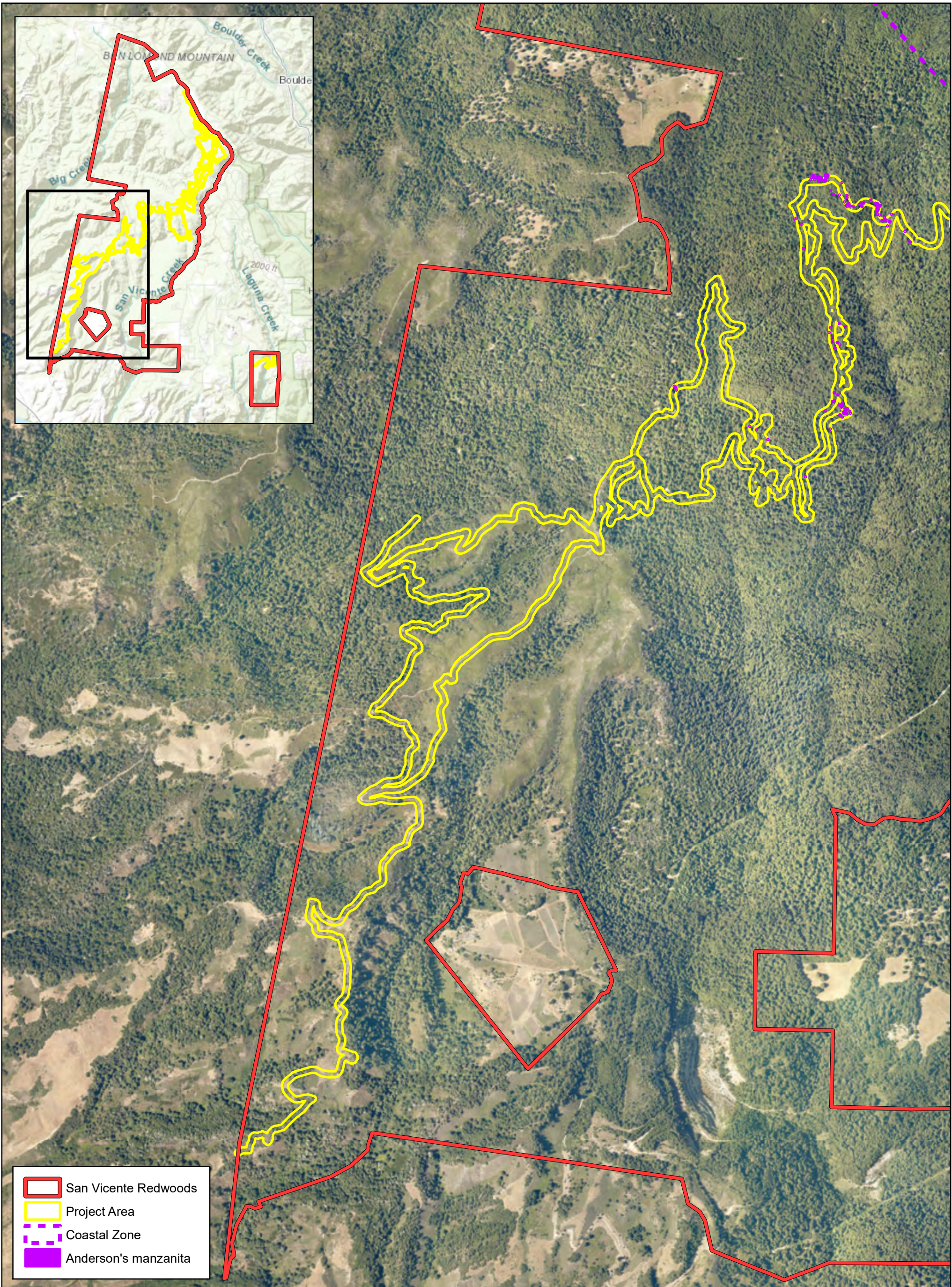


Figure 7B. Special Status Plants South

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

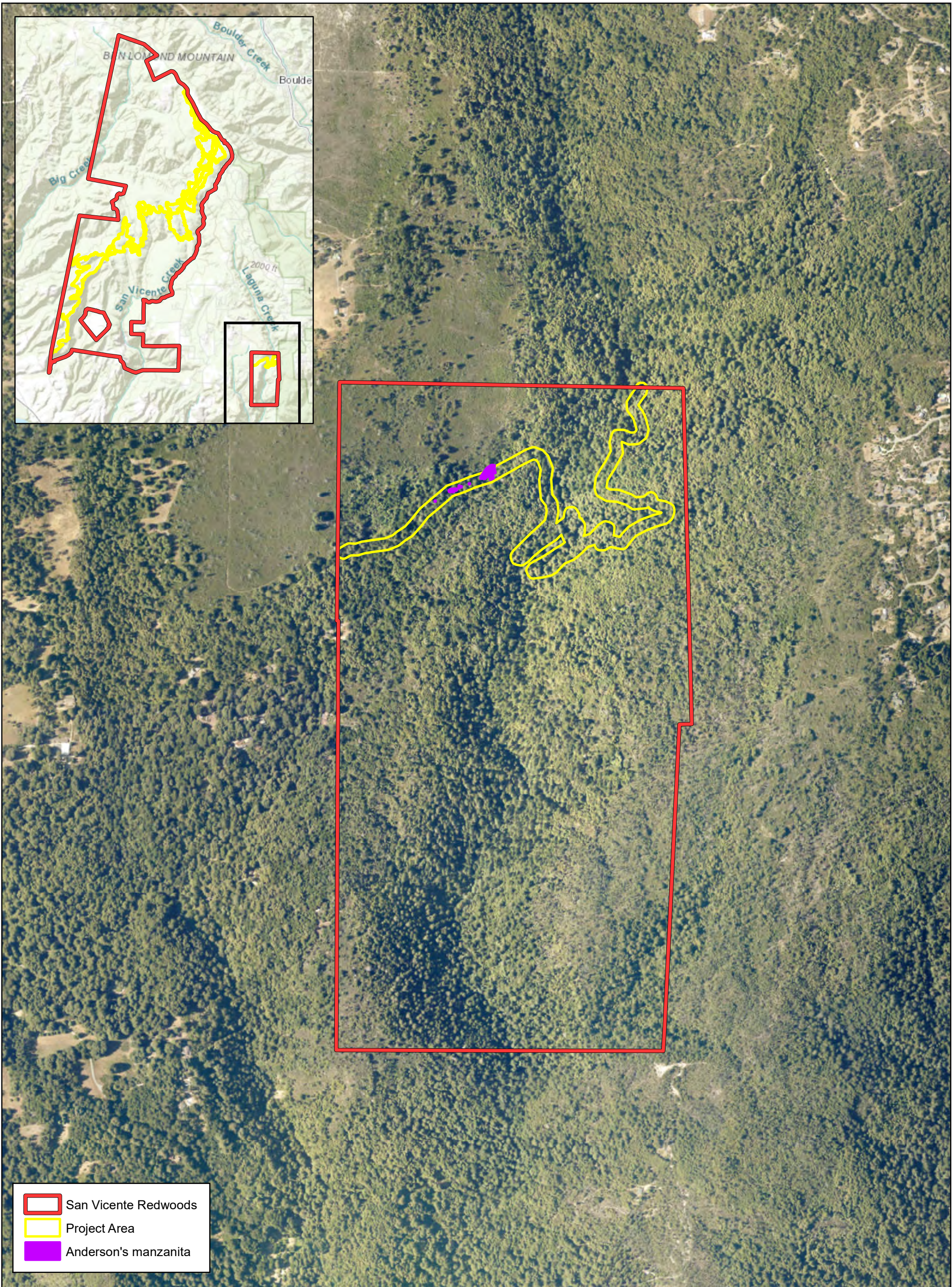


Figure 7C. Special Status Plants Laguna Parcel

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

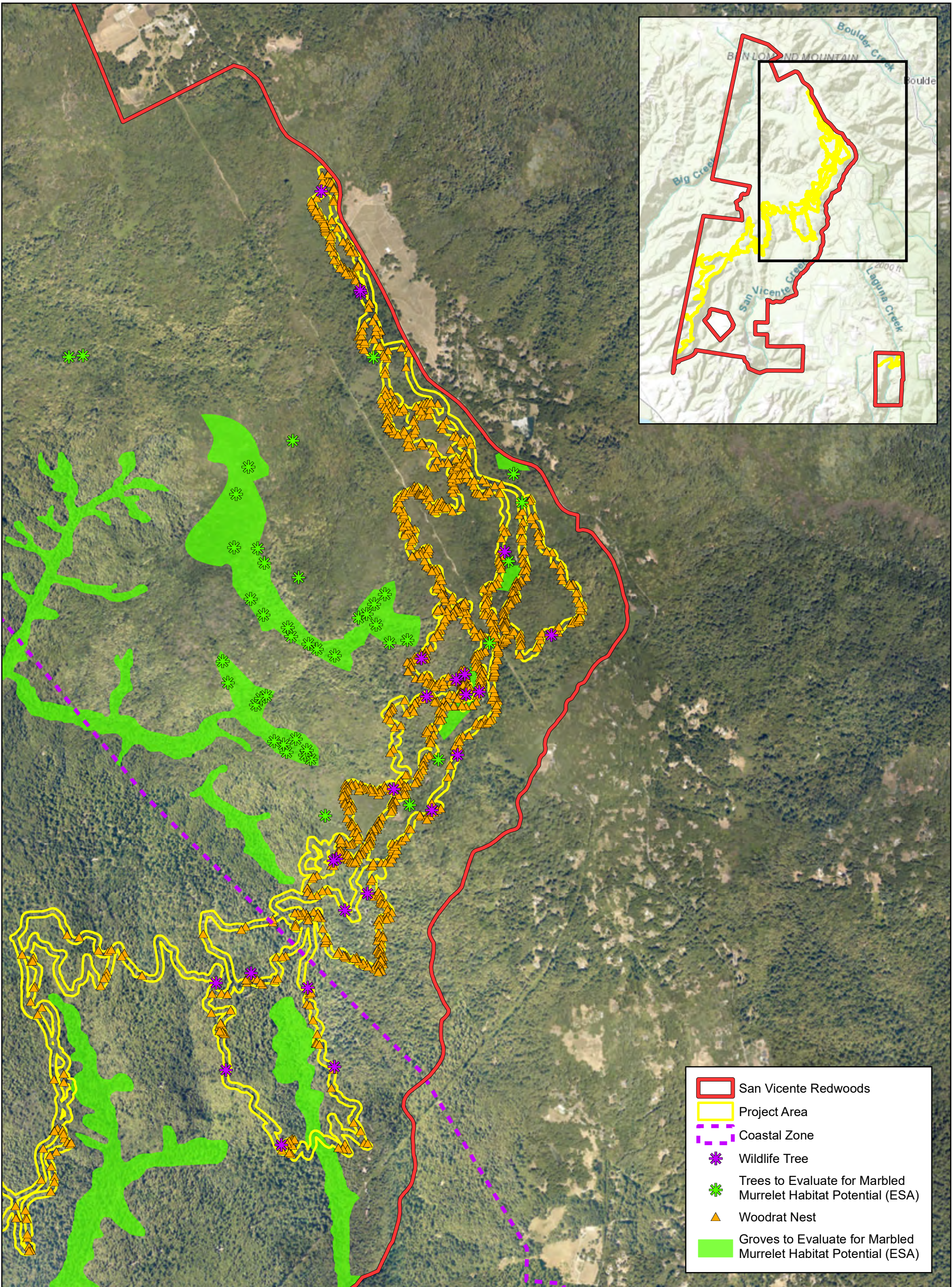


Figure 9A. Special-Status Wildlife Species North

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 5001,000 2,000
Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

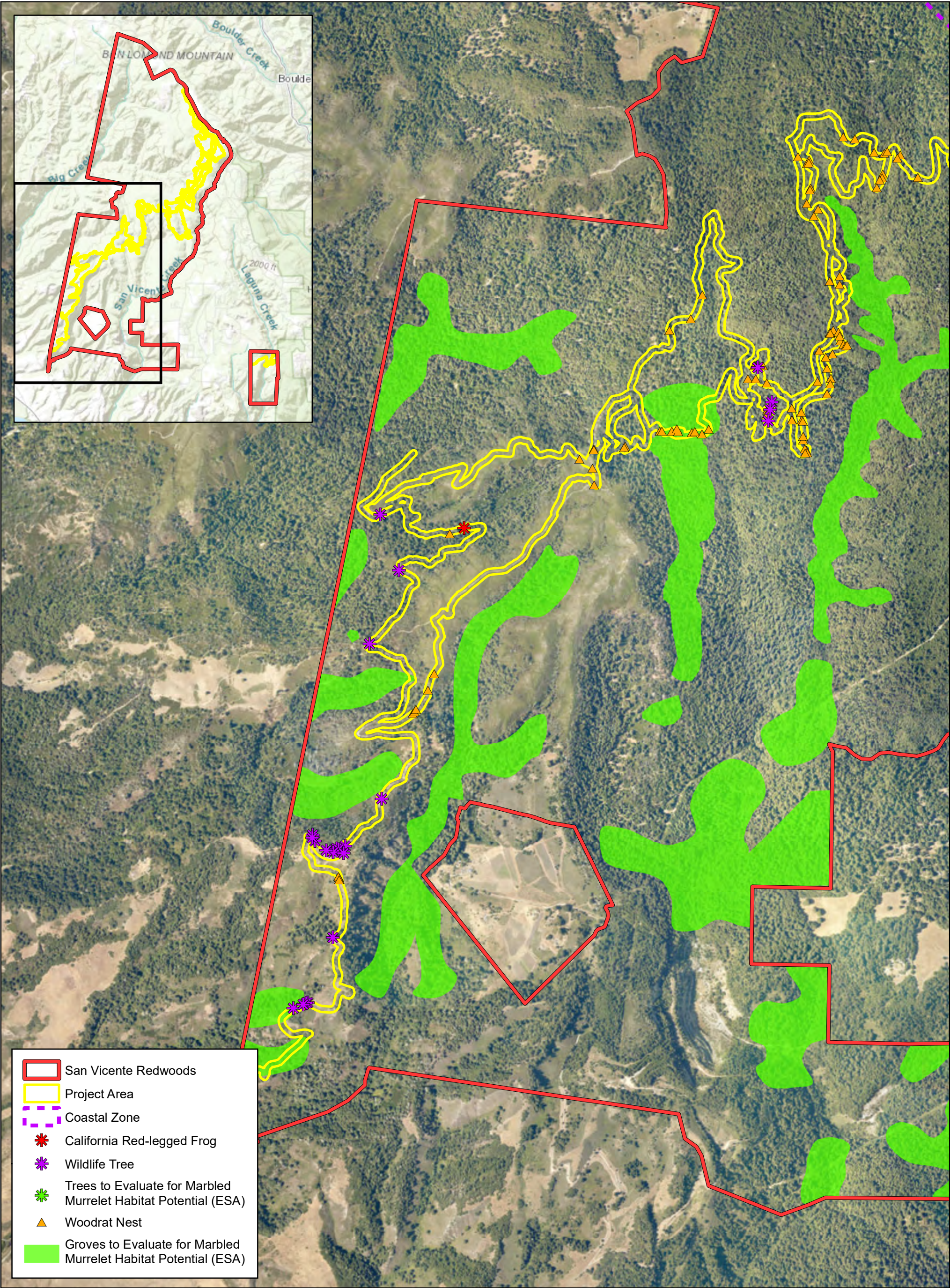


Figure 9B. Special Status Plants South

DRAFT

San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

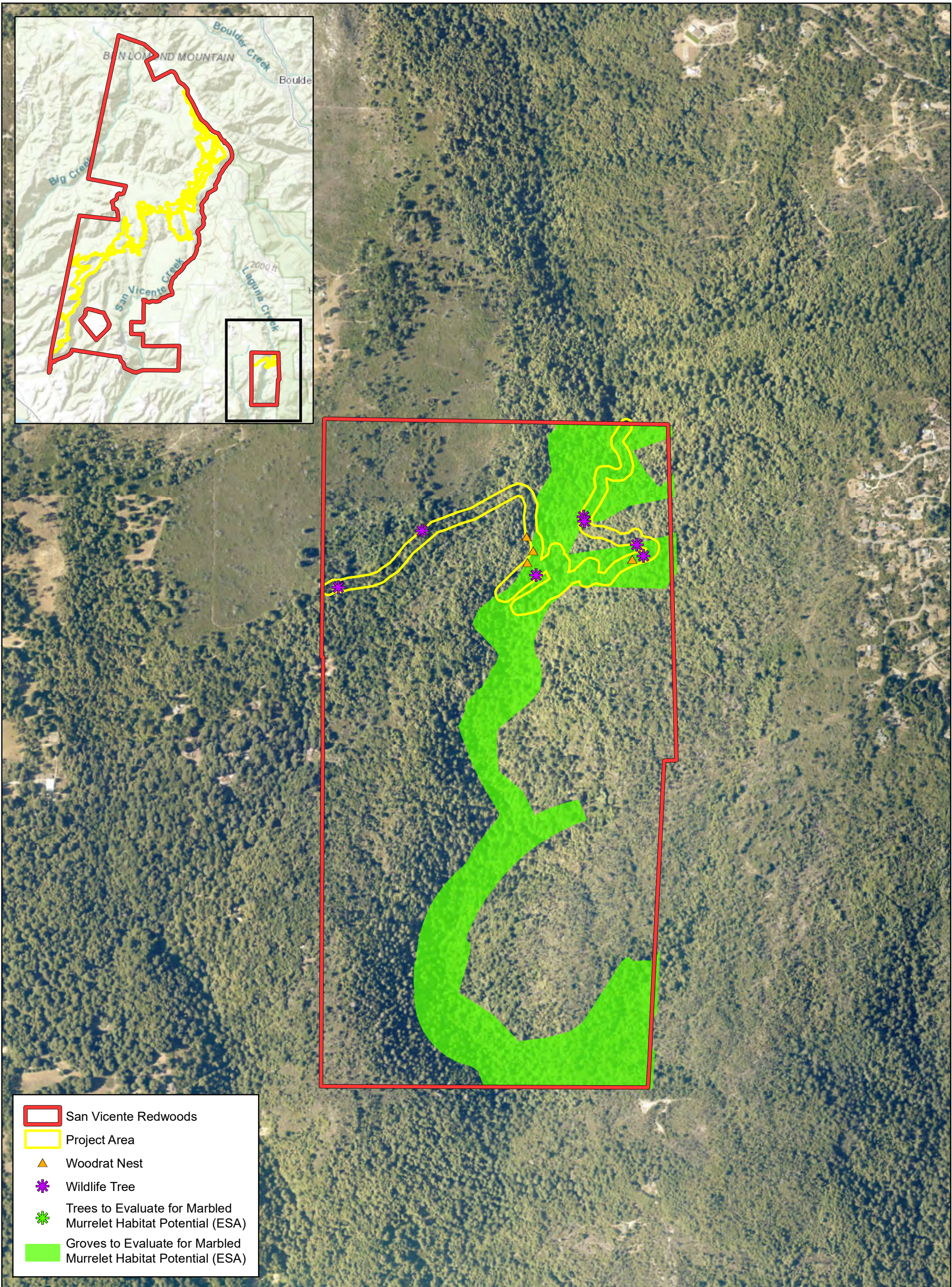


Figure 9C. Special Status Wildlife Laguna Parcel

DRAFT



San Vicente Redwoods
Draft Public Access Plan
Santa Cruz County, California

0 500 1,000 2,000 Feet

Map Prepared Date: 4/23/2018
Map Prepared By: SGillespie
Base Source: Esri World Imagery
Data Source(s): WRA, DCE, SCCBP

APPENDIX B

LIST OF OBSERVED PLANT AND WILDLIFE SPECIES

Appendix B1. Plant species observed within the Project Area for the San Vicente Redwoods Public Access Plan (PlaceWorks 2018) during surveys conducted by WRA biologists on December 16-17, 2015, January 20-22, February 10-12, June 15-16, August 15-17 and 24-25, and October 21, 2016, and May 30-June 1 and August 8-9, 2017. Plant nomenclature follows Baldwin et al. (2012) and subsequent revisions by the Jepson Flora Project (2017).

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Acacia dealbata</i>	Silver wattle	non-native (invasive)	tree, shrub	-	Moderate
<i>Acer macrophyllum</i>	Bigleaf maple	native	tree	-	-
<i>Achillea millefolium</i>	Yarrow	native	perennial herb	-	-
<i>Acmispon americanus</i> var. <i>americanus</i>	Spanish lotus	native	annual herb	-	-
<i>Acmispon glaber</i>	Deerweed, california broom	native	perennial herb	-	-
<i>Acmispon heermannii</i> var. <i>orbicularis</i>	Round leaved heermann's lotus	native	perennial herb	-	-
<i>Acmispon parviflorus</i>	Hill lotus	native	annual herb	-	-
<i>Adenostoma fasciculatum</i>	Chamise	native	tree, shrub	-	-
<i>Agoseris grandiflora</i>	Giant mountain dandelion	native	perennial herb	-	-
<i>Agrostis</i> sp.	-	-	-	-	-
<i>Aira caryophylla</i>	Silvery hairgrass	non-native (invasive)	annual grass	-	-
<i>Anaphalis margaritacea</i>	Pearly everlasting	native	perennial herb	-	-
<i>Anisocarpus madioides</i>	Woodland madia	native	perennial herb	-	-
<i>Aralia californica</i>	California spikenard	native	perennial herb	-	-
<i>Arbutus menziesii</i>	Madrono	native	tree	-	-
<i>Arctostaphylos andersonii</i>	Anderson's manzanita	native	shrub	Rank 1B.2	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Arctostaphylos crustacea</i> ssp. <i>crinita</i>	Crinite manzanita	native	shrub	-	-
<i>Arnica discoidea</i>	Rayless arnica	native	perennial herb	-	-
<i>Artemisia californica</i>	Coastal sage brush	native	shrub	-	-
<i>Artemisia douglasiana</i>	California mugwort	native	perennial herb	-	-
<i>Asarum caudatum</i>	Creeping wild ginger	native	perennial herb	-	-
<i>Asyneuma prenanthoides</i>	California harebell	native	perennial herb	-	-
<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	Western lady fern	native	fern	-	-
<i>Avena barbata</i>	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate
<i>Baccharis pilularis</i> ssp. <i>consanguinea</i>	Coyote brush	native	shrub	-	-
<i>Brachypodium distachyon</i>	Purple false brome	non-native (invasive)	annual, perennial grass	-	Moderate
<i>Briza maxima</i>	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited
<i>Briza minor</i>	Little rattlesnake grass	non-native	annual grass	-	-
<i>Bromus carinatus</i>	California brome grass	native	perennial grass	-	-
<i>Bromus diandrus</i>	Ripgut brome	non-native (invasive)	annual grass	-	Moderate
<i>Bromus hordeaceus</i>	Soft chess	non-native (invasive)	annual grass	-	Limited

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Bromus laevipes</i>	Narrow flowered brome	native	annual, perennial grass	-	-
<i>Bromus racemosus</i>	Smooth brome	non-native	perennial grass	-	-
<i>Calochortus albus</i>	White fairy lantern	native	perennial herb	-	-
<i>Calyptridium monandrum</i>	Common pussypaws	native	annual herb	-	-
<i>Calystegia macrostegia</i> ssp. <i>cyclostegia</i>	Coast morning glory	native	perennial herb, vine	-	-
<i>Calystegia purpurata</i> ssp. <i>purpurata</i>	Smooth western morning glory	native	perennial herb	-	-
<i>Camissoniopsis hirtella</i>	Hairy sun cup	native	annual herb	-	-
<i>Cardamine hirsuta</i>	Hairy bitter cress	non-native	annual herb	-	-
<i>Carduus pycnocephalus</i> ssp. <i>pycnocephalus</i>	Italian thistle	non-native (invasive)	annual herb	-	Moderate
<i>Carex barbarae</i>	Valley sedge	native	perennial grasslike herb	-	-
<i>Carex globosa</i>	Round fruit sedge	native	perennial grasslike herb	-	-
<i>Carex leptopoda</i>	Slender-footed sedge	native	perennial grasslike herb	-	-
<i>Carex obnupta</i>	Slough sedge	native	perennial grasslike herb	-	-
<i>Carex tumulicola</i>	Split awn sedge	native	perennial grasslike herb	-	-
<i>Castilleja affinis</i> ssp. <i>affinis</i>	Wight's indian paint brush	native	perennial herb	-	-
<i>Ceanothus leucodermis</i>	Chaparral whitethorn	native	shrub	-	-
<i>Ceanothus papillosus</i>	Wartleaf ceanothus	native	shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Ceanothus thyrsiflorus</i> var. <i>thyrsiflorus</i>	Blue blossom	native	tree, shrub	-	-
<i>Centaurea melitensis</i>	Tocalote	non-native (invasive)	annual herb	-	Moderate
<i>Centaureum tenuiflorum</i>	Slender centaury	non-native	annual herb	-	-
<i>Cephalanthera austiniiae</i>	Phantom orchid	native	perennial herb	-	-
<i>Cerastium glomeratum</i>	Large mouse ears	non-native	annual herb	-	-
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	Common soaproot	native	perennial herb	-	-
<i>Chorizanthe diffusa</i>	Diffuse spineflower	native	annual herb	-	-
<i>Chrysolepis chrysophylla</i> var. <i>chrysophylla</i>	Golden chinquapin	native	tree, shrub	-	-
<i>Cirsium brevistylum</i>	Indian thistle	native	perennial herb	-	-
<i>Cirsium occidentale</i>	Western thistle	native	perennial herb	-	-
<i>Cirsium vulgare</i>	Bull thistle	non-native (invasive)	perennial herb	-	Moderate
<i>Claytonia parviflora</i>	Narrow leaved miner's lettuce	native	annual herb	-	-
<i>Claytonia perfoliata</i>	Miner's lettuce	native	annual herb	-	-
<i>Clinopodium douglasii</i>	Yerba buena	native	perennial herb	-	-
<i>Clintonia andrewsiana</i>	Red clintonia	native	perennial herb	-	-
<i>Collomia heterophylla</i>	Varied leaved collomia	native	annual herb	-	-
<i>Conium maculatum</i>	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate
<i>Corallorhiza maculata</i>	Summer coral root	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Cortaderia jubata</i>	Andean pampas grass	non-native (invasive)	perennial grass	-	High
<i>Corylus cornuta ssp. californica</i>	Beaked hazelnut	native	shrub	-	-
<i>Crassula connata</i>	Sand pygmy weed	native	annual herb	-	-
<i>Crocanthemum scoparium</i>	Bisbee Peak Rushrose	native	shrub	-	-
<i>Croton setiger</i>	Turkey-mullein	native	perennial herb	-	-
<i>Cryptantha sp.</i>	Cryptantha	native	annual herb	-	-
<i>Cuscuta sp.</i>	Dodder	-	annual herb	-	-
<i>Cynoglossum grande</i>	Houndstongue	native	perennial herb	-	-
<i>Cynosurus echinatus</i>	Dogtail grass	non-native (invasive)	annual grass	-	Moderate
<i>Cyperus eragrostis</i>	Tall cyperus	native	perennial grasslike herb	-	-
<i>Dactylis glomerata</i>	Orchardgrass	non-native (invasive)	perennial grass	-	Limited
<i>Daucus pusillus</i>	Wild carrot	native	annual herb	-	-
<i>Deinandra increscens ssp. increscens</i>	Grassland tarweed	native	annual herb	-	-
<i>Dendromecon rigida</i>	Bush poppy	native	shrub	-	-
<i>Dichelostemma capitatum ssp. capitatum</i>	Wild hyacinth	native	perennial herb	-	-
<i>Digitalis purpurea</i>	Foxglove	non-native (invasive)	perennial herb	-	Limited
<i>Drymocallis glandulosa</i>	Sticky cinquefoil	native	perennial herb	-	-
<i>Dudleya lanceolata</i>	Southern California dudleya	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Elymus glaucus</i>	Blue wildrye	native	perennial grass	-	-
<i>Epilobium canum</i>	California fuchsia, zauschneria	native	perennial herb	-	-
<i>Epilobium ciliatum</i>	Slender willow herb	native	perennial herb	-	-
<i>Epilobium minutum</i>	Minute willowherb	native	annual herb	-	-
<i>Epipactis helleborine</i>	Helleborine	non-native	perennial herb	-	-
<i>Equisetum telmateia ssp. braunii</i>	Giant horsetail	native	fern	-	-
<i>Ericameria arborescens</i>	Golden fleece	native	shrub	-	-
<i>Erigeron canadensis</i>	Canada horseweed	native	annual herb	-	-
<i>Eriodictyon californicum</i>	Yerba santa	native	shrub	-	-
<i>Eriogonum nudum</i>	Naked buckwheat	native	shrub	-	-
<i>Eriophyllum confertiflorum</i>	Yellow yarrow	native	shrub	-	-
<i>Eriophyllum lanatum</i>	Wooly sunflower	native	perennial herb	-	-
<i>Eriophyllum staechadifolium</i>	Lizard tail	native	perennial herb	-	-
<i>Erodium botrys</i>	Big heron bill	non-native (invasive)	annual herb	-	-
<i>Erodium cicutarium</i>	Coastal heron's bill	non-native (invasive)	annual herb	-	Limited
<i>Eschscholzia californica</i>	California poppy	native	annual, perennial herb	-	-
<i>Eurybia radulina</i>	Roughleaf aster	native	perennial herb	-	-
<i>Festuca bromoides</i>	Brome fescue	non-native	annual grass	-	-
<i>Festuca californica</i>	California fescue	native	perennial grass	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Festuca myuros</i>	Rattail sixweeks grass	non-native (invasive)	annual grass	-	-
<i>Festuca perennis</i>	Italian rye grass	non-native	annual, perennial grass	-	-
<i>Festuca rubra</i>	Red fescue	native	perennial grass	-	-
<i>Fragaria vesca</i>	Wild strawberry	native	perennial herb	-	-
<i>Frangula californica</i>	California coffeeberry	native	shrub	-	-
<i>Fumaria parviflora</i>	Fine leaved fumitory	non-native	annual herb	-	-
<i>Galium aparine</i>	Cleavers	native	annual herb	-	-
<i>Galium californicum</i>	California bedstraw	native	perennial herb	-	-
<i>Galium porrigens</i>	Climbing bedstraw	native	vine, shrub	-	-
<i>Gamochaeta ustulata</i>	Featherweed	native	perennial herb	-	-
<i>Garrya elliptica</i>	Coast silk tassel	native	tree, shrub	-	-
<i>Gastridium phleoides</i>	Nit grass	non-native	annual grass	-	-
<i>Gaultheria shallon</i>	Salal	native	shrub	-	-
<i>Genista monspessulana</i>	French broom	non-native (invasive)	shrub	-	High
<i>Helenium puberulum</i>	Sneezeweed	native	perennial herb	-	-
<i>Heracleum maximum</i>	Common cowparsnip	native	perennial herb	-	-
<i>Heteromeles arbutifolia</i>	Toyon	native	shrub	-	-
<i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i>	Golden aster	native	perennial herb	-	-
<i>Heuchera micrantha</i>	Alum root	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Hieracium albiflorum</i>	White flowered hawkweed	native	perennial herb	-	-
<i>Holcus lanatus</i>	Common velvetgrass	non-native (invasive)	perennial grass	-	Moderate
<i>Holodiscus discolor</i>	Oceanspray	native	shrub	-	-
<i>Hulsea heterochroma</i>	Red rayed hulsea	native	perennial herb	-	-
<i>Hypericum perforatum</i> ssp. <i>perforatum</i>	Klamathweed	non-native	perennial herb	-	-
<i>Hypochaeris glabra</i>	Smooth cats ear	non-native (invasive)	annual herb	-	Limited
<i>Hypochaeris radicata</i>	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate
<i>Iris fernaldii</i>	Fernald's iris	native	perennial herb	-	-
<i>Juncus bufonius</i>	Common toad rush	native	annual grasslike herb	-	-
<i>Juncus effusus</i> ssp. <i>pacificus</i>	Pacific rush	native	perennial grasslike herb	-	-
<i>Juncus hesperius</i>	Coast or bog rush	native	perennial grasslike herb	-	-
<i>Juncus patens</i>	Spreading rush	native	perennial grasslike herb	-	-
<i>Lathyrus vestitus</i>	Common pacific pea	native	perennial herb	-	-
<i>Lepechinia calycina</i>	Pitcher sage	native	shrub	-	-
<i>Linum bienne</i>	Flax	non-native	annual herb	-	-
<i>Logfia gallica</i>	Narrowleaf cottonrose	non-native	annual herb	-	-
<i>Lonicera hispidula</i>	Pink honeysuckle	native	vine, shrub	-	-
<i>Lupinus albus</i> var. <i>collinus</i>	Silver bush lupine	native	shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Lupinus bicolor</i>	Bicolored lupine	native	annual, perennial herb	-	-
<i>Lupinus succulentus</i>	Arroyo lupine	native	annual herb	-	-
<i>Lysimachia arvensis</i>	Scarlet pimpernel	non-native	annual herb	-	-
<i>Lysimachia latifolia</i>	Pacific starflower	native	perennial herb	-	-
<i>Madia gracilis</i>	Gumweed	native	annual herb	-	-
<i>Maianthemum racemosum</i>	Feathery false lily of the valley	native	perennial herb	-	-
<i>Marah fabacea</i>	California man-root	native	perennial herb, vine	-	-
<i>Melica geyeri</i>	Geyer's onion grass	native	perennial grass	-	-
<i>Melica imperfecta</i>	Coast range melic	native	perennial grass	-	-
<i>Mimulus aurantiacus</i>	Sticky monkeyflower	native	shrub	-	-
<i>Mimulus moschatus</i>	Musk monkeyflower	native	perennial herb	-	-
<i>Mimulus pilosus</i>	Snouted monkeyflower	native	annual herb	-	-
<i>Monardella villosa</i>	Coyote mint	native	perennial herb	-	-
<i>Morella californica</i>	California wax myrtle	native	shrub	-	-
<i>Myosotis latifolia</i>	Wide leaved forget-me-not	non-native (invasive)	perennial herb	-	Limited
<i>Navarretia squarrosa</i>	Skunkweed	native	annual herb	-	-
<i>Nemophila parviflora</i>	Small flowered nemophila	native	annual herb	-	-
<i>Notholithocarpus densiflorus</i> var. <i>densiflorus</i>	Tanoak	native	tree, shrub	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Nuttallanthus texanus</i>	Blue toadflax	native	annual, perennial herb	-	-
<i>Orobanche fasciculata</i>	Pinyon broomrape	native	perennial herb (parasitic)	-	-
<i>Osmorhiza berteroi</i>	Sweetcicely	native	perennial herb	-	-
<i>Oxalis corniculata</i>	Creeping wood sorrel	non-native (invasive)	perennial herb	-	-
<i>Oxalis oregana</i>	Redwood sorrel	native	perennial herb	-	-
<i>Panicum sp.</i>	-	-	-	-	-
<i>Pellaea andromedifolia</i>	Coffee fern	native	fern	-	-
<i>Pentagramma triangularis</i>	Gold back fern	native	fern	-	-
<i>Perideridia kelloggii</i>	Yampah	native	perennial herb	-	-
<i>Phacelia malvifolia</i>	Stinging phacelia	native	annual herb	-	-
<i>Phacelia rattanii</i>	Rattan's phacelia	native	annual herb	-	-
<i>Pinus attenuata</i>	Scrub pine	native	tree	-	-
<i>Pinus coulteri</i>	Coulter pine	native	tree	-	-
<i>Pinus ponderosa</i>	Yellow pine	native	tree	-	-
<i>Piperia elegans ssp. elegans</i>	Elegant piperia	native	perennial herb	-	-
<i>Plantago lanceolata</i>	Ribwort	non-native (invasive)	perennial herb	-	Limited
<i>Polygala californica</i>	Milkwort	native	perennial herb	-	-
<i>Polypogon interruptus</i>	Ditch beard grass	non-native	perennial grass	-	-
<i>Polystichum munitum</i>	Western sword fern	native	fern	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Prosartes hookeri</i>	Drops of gold	native	perennial herb	-	-
<i>Prunella vulgaris</i>	Self heal	native	perennial herb	-	-
<i>Pseudognaphalium californicum</i>	Ladies' tobacco	native	annual, perennial herb	-	-
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	non-native	annual herb	-	-
<i>Pseudognaphalium ramosissimum</i>	Pink cudweed	native	biennial herb	-	-
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas fir	native	tree	-	-
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	Western bracken fern	native	fern	-	-
<i>Quercus agrifolia</i> var. <i>agrifolia</i>	Coast live oak	native	tree	-	-
<i>Quercus chrysolepis</i>	Gold cup live oak	native	tree	-	-
<i>Quercus parvula</i> var. <i>shrevei</i>	Shreve's oak	native	tree	-	-
<i>Quercus wislizeni</i> var. <i>wislizeni</i>	Interior live oak	native	tree, shrub	-	-
<i>Rhododendron occidentale</i>	Western azalea	native	tree, shrub	-	-
<i>Ribes</i> sp.	Currant, gooseberry	native	shrub	-	-
<i>Rosa gymnocarpa</i> var. <i>gymnocarpa</i>	Wood rose	native	shrub	-	-
<i>Rubus leucodermis</i>	White bark raspberry	native	shrub	-	-
<i>Rubus parviflorus</i>	Thimbleberry	native	vine, shrub	-	-
<i>Rubus ursinus</i>	California blackberry	native	vine, shrub	-	-
<i>Rumex acetosella</i>	Sheep sorrel	non-native (invasive)	perennial herb	-	Moderate
<i>Rumex salicifolius</i>	Willow leaved dock	native	perennial herb	-	-
<i>Rupertia physodes</i>	Common rupertia	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Rytidosperma penicillatum</i>	Purple awned wallaby grass	non-native (invasive)	perennial grass	-	Limited
<i>Salix scouleriana</i>	Scouler willow	native	tree, shrub	-	-
<i>Sambucus nigra ssp. caerulea</i>	Blue elderberry	native	shrub	-	-
<i>Sambucus racemosa var. racemosa</i>	Red elderberry	native	shrub	-	-
<i>Scirpus microcarpus</i>	Mountain bog bulrush	native	perennial grasslike herb	-	-
<i>Scrophularia californica</i>	California bee plant	native	perennial herb	-	-
<i>Senecio minimus</i>	Coastal burnweed	non-native (invasive)	annual, perennial herb	-	-
<i>Sequoia sempervirens</i>	Coast redwood	native	tree	-	-
<i>Sisyrinchium bellum</i>	Blue eyed grass	native	perennial herb	-	-
<i>Solanum douglasii</i>	Douglas' nightshade	native	perennial herb	-	-
<i>Solanum umbelliferum</i>	Blue witch	native	shrub	-	-
<i>Solidago velutina ssp. californica</i>	California goldenrod	native	perennial herb	-	-
<i>Sonchus asper ssp. asper</i>	Sow thistle	non-native (invasive)	annual herb	-	-
<i>Sonchus oleraceus</i>	Sow thistle	non-native	annual herb	-	-
<i>Stachys rigida var. quercetorum</i>	Rough hedgenettle	native	perennial herb	-	-
<i>Stephanomeria exigua ssp. coronaria</i>	White plume wirelettuce	native	annual herb	-	-
<i>Stipa pulchra</i>	Purple needle grass	native	perennial grass	-	-
<i>Symphoricarpos mollis</i>	Snowberry	native	shrub	-	-
<i>Symphyotrichum subspicatum</i>	Douglas aster	native	perennial herb	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Torilis arvensis</i>	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate
<i>Toxicodendron diversilobum</i>	Poison oak	native	vine, shrub	-	-
<i>Toxicoscordion fremontii</i>	Fremont's star lily	native	perennial herb	-	-
<i>Trifolium angustifolium</i>	Narrow leaved clover	non-native	annual herb	-	-
<i>Trifolium campestre</i>	Hop clover	non-native	annual herb	-	-
<i>Trifolium dubium</i>	Shamrock	non-native	annual herb	-	-
<i>Trifolium glomeratum</i>	Clustered clover	non-native	annual herb	-	-
<i>Trifolium hirtum</i>	Rose clover	non-native (invasive)	annual herb	-	Limited
<i>Trifolium microcephalum</i>	Small head clover	native	annual herb	-	-
<i>Trifolium variegatum</i>	Variegated clover	native	annual herb	-	-
<i>Trifolium willdenovii</i>	Tomcat clover	native	annual herb	-	-
<i>Trillium chloropetalum</i>	Giant wakerobin	native	perennial herb	-	-
<i>Trillium ovatum ssp. ovatum</i>	Western wakerobin	native	perennial herb	-	-
<i>Umbellularia californica</i>	California bay	native	tree	-	-
<i>Urtica dioica</i>	Stinging nettle	native	perennial herb	-	-
<i>Vaccinium ovatum</i>	Evergreen huckleberry	native	shrub	-	-
<i>Verbascum thapsus</i>	Woolly mullein	non-native (invasive)	perennial herb	-	Limited
<i>Verbascum virgatum</i>	Wand mullein	non-native	perennial herb	-	-
<i>Verbena lasiostachys</i> var. <i>lasiostachys</i>	Vervain	native	perennial herb	-	-
<i>Vicia hassei</i>	Hasse's vetch	native	vine	-	-

Scientific Name	Common Name	Origin	Form	Rarity Status ¹	Cal-IPC Status ²
<i>Vicia sativa</i>	Spring vetch	non-native	annual herb, vine	-	-
<i>Viola ocellata</i>	Western heart's ease	native	perennial herb	-	-
<i>Viola sempervirens</i>	Redwood violet	native	perennial herb	-	-
<i>Whipplea modesta</i>	Modesty	native	vine, shrub	-	-
<i>Woodwardia fimbriata</i>	Western chain fern	native	fern	-	-
<i>Zeltnera muehlenbergii</i>	Muehlenberg's centaury	native	annual herb	-	-

¹Key to Rarity Status

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
SR	State Rare
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

²Key to Cal-IPC Status

High	These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate	These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited	These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Appendix B2. Wildlife species observed within the Project Area for the San Vicente Redwoods Public Access Plan (PlaceWorks 2018) during surveys conducted by WRA biologists on December 16-17, 2015, January 20-22, February 10-12, June 15-16, August 15-17 and 24-25, and October 21, 2016, and May 30-June 1 and August 8-9, 2017.

Common Name	Species
MAMMALS	
mountain lion	<i>Puma concolor</i>
black-tailed deer	<i>Odocoileus hemionus</i>
coyote	<i>Canis latrans</i>
mole	<i>Scapanus spp.</i>
San Francisco dusky-footed woodrat	<i>Neotoma fuscipes annectens</i>
Western grey squirrel	<i>Sciurus griseus</i>
BIRDS	
American robin	<i>Turdus migratorius</i>
Anna's Hummingbird	<i>Calypte anna</i>
chestnut-backed chickadee	<i>Poecile rufescens</i>
dark-eyed junco	<i>Junco hyemalis</i>
Eurasian collared-dove	<i>Streptopelia decaocto</i>
oak titmouse	<i>Baeolophus inornatus</i>
pileated woodpecker	<i>Dryocopus pileatus</i>
Steller's jay	<i>Cyanocitta stelleri</i>
Townsend's warbler	<i>Setophaga townsendii</i>
western scrub-jay	<i>Aphelocoma californica</i>
AMPHIBIANS	
California slender salamander	<i>Batrachoseps attenuatus</i>
black salamander	<i>Aneides flavipunctatus</i>

APPENDIX C

POTENTIAL FOR SPECIAL-STATUS SPECIES TO OCCUR IN THE PROJECT AREA

Appendix C. Potential for special-status species to occur in the Project Area. List compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database, U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory search of the Franklin Point, Big Basin, Año Nuevo, Davenport, Felton, Castle Rock Ridge, and Santa Cruz USGS 7.5 minute quadrangles and a review of other CDFW lists and publications (Jennings and Hayes 1994, Zeiner et al. 1990).

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Plants				
Blasdale's bent grass <i>Agrostis blasdalei</i>	Rank 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Elevation ranges from 20 to 490 feet (5 to 150 meters). Blooms May-Jul.	Unlikely. Although the Project Area is located within 2 miles of an occurrence of this species, the Project Area does not contain coastal bluff scrub, coastal dune, or coastal prairie habitat.	No further action recommended for this species.
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	Rank 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation ranges from 10 to 1640 feet (3 to 500 meters). Blooms Mar-Jun.	Unlikely. Although this species has been documented less than 2 miles to the west of the Project Area, the Project Area lacks suitable grassy openings required to support this species.	No further action recommended for this species.
coast rockcress <i>Arabis blepharophylla</i>	Rank 4.3	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub/rocky. Elevation ranges from 10 to 3610 feet (3 to 1100 meters). Blooms Feb-May.	Unlikely. Although the Project Area contains suitable broadleaved upland forest habitat, it does not contain the open, rocky habitat required by this species.	No further action recommended for this species.
Anderson's manzanita <i>Arctostaphylos andersonii</i>	Rank 1B.2	Broadleaved upland forest, chaparral, north coast coniferous forest/openings, edges. Elevation ranges from 200 to 2490 feet (60 to 760 meters). Blooms Nov-May.	Present. This species was observed in the Project Area.	See Section 7.0 of the BRA for recommended avoidance, minimization, and mitigation measures for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Schreiber's manzanita <i>Arctostaphylos glutinosa</i>	Rank 1B.2	Closed-cone coniferous forest, chaparral; on diatomaceous shale. Elevation ranges from 560 to 2250 feet (170 to 685 meters). Blooms (Nov), Mar-Apr.	Not Observed. This species has been documented adjacent to the west of the Project Area on siliceous shale soil, which is also present in the Project Area. However, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. glutinosa</i> was not observed. It is assumed this species is not present.	No further action recommended for this species.
Ohlone manzanita <i>Arctostaphylos ohloneana</i>	Rank 1B.1	Closed-cone coniferous forest, coastal scrub/siliceous shale. Elevation ranges from 1480 to 1740 feet (450 to 530 meters). Blooms Feb-Mar.	Not Observed. This species has been documented adjacent to the west of the Project Area on siliceous shale soil, which is also present in the Project Area. However, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. ohloneana</i> was not observed. It is assumed this species is not present.	No further action recommended for this species.
Pajaro manzanita <i>Arctostaphylos pajaroensis</i>	Rank 1B.1	Chaparral (sandy). Elevation ranges from 100 to 2490 feet (30 to 760 meters). Blooms Dec-Mar.	Not Observed. Although this species is reported in the CNDDDB to occur within the larger San Vicente Redwoods property, all <i>Arctostaphylos</i> species observed within the Project Area were identified to species level, and <i>A. pajaroensis</i> was not observed. It is assumed that this species is not present.	No further action recommended for this species.
Kings Mountain manzanita <i>Arctostaphylos regismontana</i>	Rank 1B.2	Broadleaved upland forest, chaparral, north coast coniferous forest/granitic or sandstone. Elevation ranges from 1000 to 2400 feet (305 to 730 meters). Blooms Jan-Apr.	Not Observed. All <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. regismontana</i> was not observed. It is assumed that this species is not present.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Bonny Doon manzanita <i>Arctostaphylos silvicola</i>	Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/inland marine sands. Elevation ranges from 390 to 1970 feet (120 to 600 meters). Blooms Jan-Mar.	Not Observed. All <i>Arctostaphylos</i> species observed within the Project Area were identified to species level; <i>A. silvicola</i> was not observed. In addition, the Project Area does not contain suitable Zayante coarse sands required to support this species. It is assumed that this species is not present.	No further action recommended for this species.
marsh sandwort <i>Arenaria paludicola</i>	FE, SE, Rank 1B.1	Marshes and swamps (freshwater or brackish)/sandy, openings. Elevation ranges from 10 to 560 feet (3 to 170 meters). Blooms May-Aug.	Unlikely. The Project Area does not contain suitable open marsh or swamp habitat and the species is thought to be extirpated from Santa Cruz County.	No further action recommended for this species.
coastal marsh milk-vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	Rank 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides). Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms Apr-Oct.	Unlikely. The Project Area does not contain suitable coastal marsh, swamp, or other saline mesic habitats required to support this species. The Project Area is also outside of the known elevation range for this species.	No further action recommended for this species.
Brewer's calandrinia <i>Calandrinia breweri</i>	Rank 4.2	Disturbed or burned sites on sandy or loamy soils in chaparral or coastal scrub. Elevation ranges from 30 to 4000 feet (10-1220 meters). Blooms Jan-Jun.	Unlikely. This species was originally determined to have potential to occur in open, disturbed areas such as along the powerline road; however, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Mountains pussypaws <i>Calyptridium parryi</i> var. <i>hesseae</i>	Rank 1B.1	Chaparral, cismontane woodland/sandy or gravelly, openings. Elevation ranges from 1000 to 5020 feet (305 to 1530 meters). Blooms May-Aug.	Unlikely. This species has been documented in the vicinity and was originally determined to have potential to occur in suitable sandy openings in chaparral and cismontane woodland habitat. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
swamp harebell <i>Campanula californica</i>	Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), north coast coniferous forest/mesic. Elevation ranges from 0 to 1330 feet (1 to 405 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable bog, marsh, or other mesic habitats required to support this species and the nearest known occurrence is located over 8 miles away.	No further action recommended for this species.
bristly sedge <i>Carex comosa</i>	Rank 2B.1	Coastal prairie, marshes and swamps (lake margins), valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	Unlikely. This species was originally determined to have potential to occur along streams within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
deceiving sedge <i>Carex saliniformis</i>	Rank 1B.2	Coastal prairie, coastal scrub, meadows and seeps, marshes and swamps (coastal salt)/mesic. Elevation ranges from 10 to 750 feet (3 to 230 meters). Blooms Jun (Jul).	Unlikely. This species was originally determined to have potential to occur along streams within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
johnny-nip <i>Castilleja ambigua</i> var. <i>ambigua</i>	Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pool margins. Elevation ranges from 0 to 1430 feet (0 to 435 meters). Blooms Mar-Aug.	Unlikely. The Project Area does not contain suitable openings in coastal prairie, coastal scrub, marsh, swamp, grassland, or other mesic habitats required to support this species.	No further action recommended for this species.
Ben Lomond spineflower <i>Chorizanthe pungens</i> var. <i>hartwegiana</i>	FE, Rank 1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills). Elevation ranges from 300 to 2000 feet (90 to 610 meters). Blooms Apr-Jul.	Unlikely. The Project Area does not contain suitable ponderosa pine sandhill habitat or Zayante coarse sands required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Scotts Valley spineflower <i>Chorizanthe robusta</i> <i>var. hartwegii</i>	FE, Rank 1B.1	Meadows and seeps (sandy), valley and foothill grassland (mudstone and purissima outcrops). Elevation ranges from 750 to 800 feet (230 to 245 meters). Blooms Apr-Jul.	Unlikely. The Project Area does not contain suitable open grassland habitat necessary to support this species.	No further action recommended for this species.
robust spineflower <i>Chorizanthe robusta</i> <i>var. robusta</i>	FE, Rank 1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub/sandy or gravelly. Elevation ranges from 10 to 980 feet (3 to 300 meters). Blooms Apr-Sep.	Unlikely. Although most of the Project Area is dominated by dense forest which is not suitable for this species, this species was originally determined to have potential to occur in openings at road crossings such as along the powerline alignment may have potential to support this species. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Franciscan thistle <i>Cirsium andrewsii</i>	Rank 1B.2	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub/mesic, sometimes serpentine. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar-Jul.	Unlikely. Although the Project Area may contain suitable habitat elements, it does not contain mesic sites on serpentine soils. Additionally, the nearest known occurrence is over 8 miles from the Project Area.	No further action recommended for this species.
Santa Clara red ribbons <i>Clarkia concinna</i> ssp. <i>automixa</i>	Rank 4.3	Chaparral, cismontane woodland. Elevation ranges from 300 to 4920 feet (90 to 1500 meters). Blooms (Apr), May-Jun (Jul).	Unlikely. Although the Project Area contains suitable habitat elements, the nearest known occurrences are located over 10 miles away on the eastern slopes of the Santa Cruz Mountains. No occurrences are known from the western slopes.	No further action recommended for this species.
San Francisco collinsia <i>Collinsia multicolor</i>	Rank 1B.2	Closed-cone coniferous forest, coastal scrub/sometimes serpentine. Elevation ranges from 100 to 820 feet (30 to 250 meters). Blooms (Feb), Mar-May.	Unlikely. The Project Area lacks suitable closed cone coniferous forest or coastal scrub necessary to support this species. In addition, the Project Area is located above the known elevation range of this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
branching beach aster <i>Corethrogyne leucophylla</i>	Rank 3.2	Closed-cone coniferous forest, coastal dunes. Elevation ranges from 10 to 200 feet (3 to 60 meters). Blooms May-Dec.	Unlikely. The Project Area lacks suitable closed cone coniferous forest or coastal dunes and is located above the known elevation range for this species.	No further action recommended for this species.
clustered lady's-slipper <i>Cypripedium fasciculatum</i>	Rank 4.2	Lower montane coniferous forest, north coast coniferous forest/usually serpentine seeps and streambanks. Elevation ranges from 330 to 7990 feet (100 to 2435 meters). Blooms Mar-Aug.	Unlikely. Although the Project Area contains streams, they are located high in the watershed and do not support the hydrology required by this species. In addition, no serpentine seeps occur within the Project Area.	No further action recommended for this species.
mountain lady's-slipper <i>Cypripedium montanum</i>	Rank 4.2	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 610 to 7300 feet (185 to 2225 meters). Blooms Mar-Aug.	Unlikely. This species was originally determined to have potential to occur in broadleaved upland forest, cismontane woodland, and lower montane coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
California bottle brush <i>Elymus californicus</i>	Rank 4.3	Moist openings in mixed evergreen/redwood forest and oak/riparian forest. Elevation ranges from 50-155 feet (15-47 meters). Blooms May-Nov.	Moderate Potential. This species was originally determined to have potential to occur in moist openings in forested habitats within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Ben Lomond buckwheat <i>Eriogonum nudum</i> var. <i>decurrens</i>	Rank 1B.1	Chaparral, cismontane woodland, lower montane coniferous forest (maritime ponderosa pine sandhills)/sandy. Elevation ranges from 160 to 2620 feet (50 to 800 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable Ponderosa pine sandhill habitat required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
sand-loving wallflower <i>Erysimum ammophilum</i>	Rank 1B.2	Chaparral (maritime), coastal dunes, coastal scrub/sandy, openings. Elevation ranges from 0 to 200 feet (0 to 60 meters). Blooms Feb-Jun.	Unlikely. The Project Area does not contain suitable sandy openings in maritime chaparral, coastal dunes, or coastal scrub required to support this species and the nearest known occurrence is located over 8 miles from the Project Area.	No further action recommended for this species.
Santa Cruz wallflower <i>Erysimum teretifolium</i>	FE, SE, Rank 1B.1	Chaparral, lower montane coniferous forest/inland marine sands. Elevation ranges from 390 to 2000 feet (120 to 610 meters). Blooms Mar-Jul.	Unlikely. Although the Project Area may contain suitable habitat elements, it does not contain Zayante coarse sands necessary to support this species.	No further action recommended for this species.
stinkbells <i>Fritillaria agrestis</i>	Rank 4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland/clay, sometimes serpentine. Elevation ranges from 30 to 5100 feet (10 to 1555 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable grassy openings required by this species and the nearest known occurrence is over 8 miles away.	No further action recommended for this species.
fragrant fritillary <i>Fritillaria liliacea</i>	Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland/often serpentine. Elevation ranges from 10 to 1350 feet (3 to 410 meters). Blooms Feb-Apr.	Unlikely. The Project Area does not contain suitable grassy openings, heavy clay, or serpentine soils required by this species.	No further action recommended for this species.
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	Rank 3.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland/sandy or serpentine. Elevation ranges from 50 to 1310 feet (15 to 400 meters). Blooms Jun-Sep.	Unlikely. The Project Area does not contain suitable open, coastal habitats or serpentine soils required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
short-leaved evax <i>Hesperovax sparsiflora</i> var. <i>brevifolia</i>	Rank 1B.2	Coastal bluff scrub (sandy), coastal dunes, coastal prairie. Elevation ranges from 0 to 710 feet (0 to 215 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable coastal bluff scrub, coastal dunes, or coastal prairie. Although an occurrence is located in seemingly unsuitable habitat less than 2 miles from the site, the occurrence is from 1954 and no other occurrences occur within the quadrangles examined for this report.	No further action recommended for this species.
Santa Cruz cypress <i>Hesperocyparis abramsiana</i> var. <i>abramsiana</i>	FE, SE, Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/sandstone or granitic. Elevation ranges from 920 to 2620 feet (280 to 800 meters).	Not Observed. Although this species is known to occur within the immediate vicinity of the Project Area, WRA received anecdotal evidence that the population has been extirpated (Nadia Hamey, forester for Santa Cruz Land Trust, pers comm, April 6, 2016). The species was not observed during surveys conducted for this report. The species is identifiable year-round and would have been observed if present. Therefore, it is assumed that the species is not present within the Project Area.	No further action recommended for this species.
Butano Ridge cypress <i>Hesperocyparis abramsiana</i> var. <i>butanoensis</i>	FE, SE, Rank 1B.2	Closed-cone coniferous forest, chaparral, lower montane coniferous forest/sandstone. Elevation ranges from 1310 to 1610 feet (400 to 490 meters). Blooms Oct.	Not Observed. This species was not observed during surveys conducted for this report. The species is identifiable year-round and would have been observed if present. Moreover, the species is only known from Butano Ridge, located over 8 miles from the Project Area. Therefore, it is assumed that the species is not present within the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Loma Prieta hoita <i>Hoita strobilina</i>	Rank 1B.1	Chaparral, cismontane woodland, riparian woodland/usually serpentine, mesic. Elevation ranges from 100 to 2820 feet (30 to 860 meters). Blooms May-Jul (Aug), (Oct).	Unlikely. Suitable mesic serpentine soils are not present within the Project Area and the nearest known occurrence is located over 12 miles away on the eastern slopes of the Santa Cruz Mountains.	No further action recommended for this species.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT, SE, Rank 1B.1	Coastal prairie, coastal scrub, valley and foothill grassland/often clay, sandy. Elevation ranges from 30 to 720 feet (10 to 220 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable coastal prairie, coastal scrub, or valley or foothill grassland habitats required to support this species and the Project Area is located above the known elevation range for this species.	No further action recommended for this species.
Kellogg's horkelia <i>Horkelia cuneata</i> var. <i>sericea</i>	Rank 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub/sandy or gravelly, openings. Elevation ranges from 30 to 660 feet (10 to 200 meters). Blooms Apr-Sep.	Unlikely. The Project Area does not contain suitable coastal sandhill habitat necessary to support this species and the Project Area is located above the known elevation range of this species.	No further action recommended for this species.
Point Reyes horkelia <i>Horkelia marinensis</i>	Rank 1B.2	Coastal dunes, coastal prairie, coastal scrub/sandy. Elevation ranges from 20 to 2480 feet (5 to 755 meters). Blooms May-Sep.	Unlikely. Although the Project Area contains at least three known occurrences of this species and the species was observed outside of the Project Area by WRA biologists, the species was not observed within the Project Area.	No further action recommended for this species.
harlequin lotus <i>Hosackia gracilis</i>	Rank 4.2	Wet areas in meadows and other grassy habitats, roadside ditches, etc. Elevation ranges from 0-2300 feet (0-700 meters). Blooms Mar-Jul.	Unlikely. The Project Area does not contain suitable mesic meadows, grasslands, or grassy road shoulders capable of supporting this species.	No further action recommended for this species.
coast iris <i>Iris longipetala</i>	Rank 4.2	Coastal prairie, lower montane coniferous forest, meadows and seeps/mesic. Elevation ranges from 0 to 1970 feet (0 to 600 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable mesic sites on heavy soils required to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
large-flowered leptosiphon <i>Leptosiphon grandiflorus</i>	Rank 4.2	Sandy soils in open, grassy flats. Elevation ranges from 15-4000 feet (5-1220 meters). Blooms Apr-Aug.	Unlikely. The Project Area does not contain suitable open, grassy habitats necessary to support this species.	No further action recommended for this species.
woolly-headed lessingia <i>Lessingia hololeuca</i>	Rank 3	Broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland/clay, serpentine. Elevation ranges from 50 to 1000 feet (15 to 305 meters). Blooms Jun-Oct.	Unlikely. The Project Area does not contain suitable serpentine soils required to support this species.	No further action recommended for this species.
smooth lessingia <i>Lessingia micradenia</i> var. <i>glabrata</i>	Rank 1B.2	Chaparral, cismontane woodland/serpentine, often roadsides. Elevation ranges from 390 to 1380 feet (120 to 420 meters). Blooms (May), (Jun), Jul-Nov.	Unlikely. The Project Area does not contain suitable serpentine soils required to support this species.	No further action recommended for this species.
Point Reyes meadowfoam <i>Limnanthes douglasii</i> ssp. <i>sulphurea</i>	SE, Rank 1B.2	Coastal prairie, meadows and seeps (mesic), marshes and swamps (freshwater), vernal pools. Elevation ranges from 0 to 460 feet (0 to 140 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable vernal wet depressional features required to support this species and the nearest known occurrence is located over 10 miles away.	No further action recommended for this species.
arcuate bush-mallow <i>Malacothamnus arcuatus</i>	Rank 1B.2	Chaparral, cismontane woodland. Elevation ranges from 50 to 1160 feet (15 to 355 meters). Blooms Apr-Sep.	Unlikely. This species was originally determined to have potential to occur in gravelly openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	Rank 3.2	Broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland/rocky. Elevation ranges from 150 to 2710 feet (45 to 825 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain sunny, open rocky areas necessary to support this species.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
marsh Microseris <i>Microseris paludosa</i>	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 20 to 1160 feet (5 to 355 meters). Blooms Apr-Jun (Jul).	Unlikely. The Project Area does not contain sunny openings on mesic soils necessary to support this species.	No further action recommended for this species.
Santa Cruz County monkeyflower <i>Mimulus rattanii</i> ssp. <i>decurtatus</i>	Rank 4.2	Chaparral, lower montane coniferous forest/margins, gravelly. Elevation ranges from 1310 to 1640 feet (400 to 500 meters). Blooms May-Jul.	Unlikely. This species was originally determined to have potential to occur in gravelly openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
northern curly-leaved Monardella <i>Monardella sinuata</i> ssp. <i>nigrescens</i>	Rank 1B.2	Chaparral, coastal dunes, coastal scrub, lower montane coniferous forest (ponderosa pine sandhills)/sandy. Elevation ranges from 0 to 980 feet (0 to 300 meters). Blooms (Apr), May-Jul (Aug), (Sep).	Unlikely. This species was originally determined to have potential to occur in openings on sandy soils throughout the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
woodland woollythreads <i>Monolopia gracilens</i>	Rank 1B.2	Broadleaved upland forest (openings), chaparral (openings), cismontane woodland, north coast coniferous forest (openings), valley and foothill grassland/serpentine. Elevation ranges from 330 to 3940 feet (100 to 1200 meters). Blooms (Feb), Mar-Jul.	Unlikely. The Project Area does not contain serpentine soils or suitable forest openings required to support this species. In addition, the nearest known occurrence is located over 6 miles away from the Project Area.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Dudley's lousewort <i>Pedicularis dudleyi</i>	SR, Rank 1B.2	Chaparral (maritime), cismontane woodland, north coast coniferous forest, valley and foothill grassland. Elevation ranges from 200 to 2950 feet (60 to 900 meters). Blooms Apr-Jun.	Unlikely. An occurrence of this species is located approximately 2 miles to the northeast of the Project Area and this species was originally determined to have potential to occur in cismontane woodland and coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> <i>var. kleei</i>	Rank 1B.2	Chaparral, lower montane coniferous forest, north coast coniferous forest. Elevation ranges from 1310 to 3610 feet (400 to 1100 meters). Blooms May-Jun.	Unlikely. An occurrence is known within less than 1 mile from the Project Area and this species was originally determined to have potential to occur in coniferous forest habitat within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE, SE, Rank 1B.1	Cismontane woodland, valley and foothill grassland (often serpentine). Elevation ranges from 110 to 2030 feet (35 to 620 meters). Blooms Mar-May.	Unlikely. The Project Area does not contain suitable open, dry rocky slopes and grassy areas necessary to support this species, nor does the Project Area contain serpentine soils.	No further action recommended for this species.
Monterey pine <i>Pinus radiata</i>	Rank 1B.1	Closed-cone coniferous forest, cismontane woodland. Elevation ranges from 80 to 610 feet (25 to 185 meters).	Not Observed. Monterey pine is identifiable year-round, but was not observed within the Project Area during surveys conducted for this report. It is assumed that this species is not present.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
white-flowered rein orchid <i>Piperia candida</i>	Rank 1B.2	Broadleaved upland forest, lower montane coniferous forest, north coast coniferous forest/sometimes serpentine. Elevation ranges from 100 to 4300 feet (30 to 1310 meters). Blooms (Mar), May-Sep.	Unlikely. There is a known occurrence of this species within 2.5 miles from the site and the species was originally determined to have potential to occur in suitable habitat within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Choris' popcornflower <i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	Rank 1B.2	Chaparral, coastal prairie, coastal scrub/mesic. Elevation ranges from 50 to 520 feet (15 to 160 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable mesic sites in chaparral, coastal prairie, or coastal scrub habitats necessary to support this species. In addition, the Project Area is located above the known elevation range for this species.	No further action recommended for this species.
Hickman's popcorn flower <i>Plagiobothrys chorisianus</i> var. <i>hickmanii</i>	Rank 4.2	Moist depressions in sandy deposits over clay. Elevation ranges from 50-600 feet (15-185 meters). Blooms Apr-Jun.	Unlikely. The Project Area does not contain suitable open, mesic sites necessary to support this species.	No further action recommended for this species.
San Francisco popcornflower <i>Plagiobothrys diffusus</i>	SE, Rank 1B.1	Coastal prairie, valley and foothill grassland. Elevation ranges from 200 to 1180 feet (60 to 360 meters). Blooms Mar-Jun.	Unlikely. The Project Area does not contain suitable coastal prairie or other grassland habitats required to support this species.	No further action recommended for this species.
Scotts Valley Polygonum <i>Polygonum hickmanii</i>	FE, SE, Rank 1B.1	Valley and foothill grassland (mudstone and sandstone). Elevation ranges from 690 to 820 feet (210 to 250 meters). Blooms May-Aug.	Unlikely. The Project Area does not contain suitable grassland habitats required to support this species and the species is only known from one location in Scott's Valley.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
pine rose <i>Rosa pinetorum</i>	Rank 1B.2	Closed-cone coniferous forest, cismontane woodland. Elevation ranges from 10 to 3100 feet (2 to 945 meters). Blooms May-Jul.	Unlikely. This species was originally determined to have potential to occur in coniferous forest or cismontane woodland within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
<i>Sanicula hoffmannii</i> Hoffmann's sanicle	Rank 4.3	Broadleaved upland forest, coastal bluff scrub, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest/often serpentine or clay. Elevation ranges from 100 to 980 feet (30 to 300 meters). Blooms Mar-May.	Unlikely. This species was originally determined to have potential to occur in broadleaved upland forest and lower montane coniferous forest within the Project Area. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
chaparral ragwort <i>Senecio aphanactis</i>	Rank 2B.2	Chaparral, cismontane woodland, coastal scrub/sometimes alkaline. Elevation ranges from 50 to 2620 feet (15 to 800 meters). Blooms Jan-Apr.	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	Rank 4.2	Broadleaved upland forest, coastal prairie, coastal scrub, north coast coniferous forest, riparian woodland/often in disturbed areas. Elevation ranges from 0 to 2400 feet (0 to 730 meters). Blooms (Mar), Apr-Aug.	Unlikely. Although the Project Area may contain suitable habitat elements, the nearest known occurrence is located over 10 miles to the southeast of the site and is listed as possibly extirpated.	No further action recommended for this species.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
San Francisco campion <i>Silene verecunda</i> <i>ssp. verecunda</i>	Rank 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland/sandy. Elevation ranges from 100 to 2120 feet (30 to 645 meters). Blooms (Feb), Mar-Jun (Aug).	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
Santa Cruz Microseris <i>Stebbinsoseris</i> <i>decipiens</i>	Rank 1B.2	Broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland/open areas, sometimes serpentine. Elevation ranges from 30 to 1640 feet (10 to 500 meters). Blooms Apr-May.	Unlikely. This species was originally determined to have potential to occur in openings such as along the powerline road. However, this species was not observed during seasonally-timed surveys and was determined to be unlikely to occur in the Project Area.	No further action recommended for this species.
slender-leaved pondweed <i>Stuckenia filiformis</i> <i>ssp. alpina</i>	Rank 2B.2	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 980 to 7050 feet (300 to 2150 meters). Blooms May-Jul.	Unlikely. The Project Area lacks suitable marsh or swamp habitat necessary to support this species.	No further action recommended for this species.
Santa Cruz clover <i>Trifolium</i> <i>buckwestiorum</i>	Rank 1B.1	Broadleaved upland forest, cismontane woodland, coastal prairie/gravelly, margins. Elevation ranges from 340 to 2000 feet (105 to 610 meters). Blooms Apr-Oct.	Unlikely. The Project Area lacks openings with moist grassland and gravelly margins necessary to support this species.	No further action recommended for this species.
Mammals				
Hoary bat <i>Lasiurus cinereus</i>	WBWG Medium	Hoary bats are solitary and roost primarily in foliage of both coniferous and deciduous trees, near the ends of branches, 3-12 meters above the ground (WBWG 2012). Roosts are usually at the edge of a clearing. Summer tree roosts are typically located along edge habitats close to feeding grounds.	Moderate. This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016). Mature conifer and broadleaf trees in the Project Area have the potential to support roosting sites.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Pallid bat <i>Antrozous pallidus</i>	SSC, WBWG High	Roost habitat for this species includes buildings, hollows in trees, caverns, and bridges.	Moderate. This species has been documented to occur within 3.75 miles of the Project Area (CDFW 2016). Cavities within large mature trees in the Project Area and nearby rock outcroppings, and cave features in the have the potential to support roosting sites.	Recommendations for this species are provided in Section 7.2.2
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SSC, WBWG High	Lives in a wide variety of habitats but most common in mesic sites. Day roosts highly associated with caves and mines. Need appropriate roosting, maternity, and hibernacula sites free from human disturbance.	High. This species has been documented roosting within cave habitat within the property and near the Project Area and there are numerous occurrences within 5 miles of Project Area.	Recommendations for this species are provided in Section 7.2.2
western red bat <i>Lasiurus blossevillei</i>	SSC, WBWG; High	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores).	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the riparian habitat. Suitable foraging habitat is supported within and adjacent to creek habitat throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2
silver-haired Bat <i>Lasionycteris noctivagans</i>	WBWG; Medium	Summer habitats include coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. This species is primarily a forest dweller, feeding over streams, ponds, and open brushy areas. It roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the forest habitat. Suitable foraging habitat is supported within and adjacent to creek habitat throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
fringed myotis <i>Myotis thysanodes</i>	WBWG; High	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwoods/sequoia groves. Buildings, mines, and large snags are important day and night roosts.	Moderate. The Project Area contains potentially suitable maternity roosting habitat within the large stands of conifer and hardwood forest habitat found throughout the Project Area. Nearby cave and cliff area of the San Vicente Quarry may also support roosting.	Recommendations for this species are provided in Section 7.2.2
long-legged myotis <i>Myotis volans</i>	WBWG; High	Generally associated with woodlands and forested habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	Unlikely. This species is more common in coastal regions with redwood/sequoia stands. This species may occasionally forage or occur as a migrant through the area; however, roosting habitat is suboptimal and the Project Area is unlikely to support maternity roosting.	No further actions are recommended.
western mastiff bat <i>Eumops perotis</i>	SSC, WBWG; High	Found in a wide variety of open, arid and semi-arid habitats. Distribution appears to be tied to large rock structures which provide suitable roosting sites, including cliff crevices and cracks in boulders.	Unlikely. The Project Area does not contain open arid habitats. While potential roosting habitat for this species may occur within the rock and cliff crevices of the San Vicente Quarry, the Project Area does not contain such rock habitat and therefore is unlikely to support roosting.	No further actions are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
ringtail (ring-tailed cat) <i>Bassariscus astutus</i>	CFP	Ringtail is widely distributed throughout most of California, absent from some portions of the Central Valley and northeastern California. Found in a variety of habitats throughout the western US including riparian areas, semi-arid country, deserts, chaparral, oak woodlands, pinyon pine woodlands, juniper woodlands and montane conifer forests usually under 1400m in elevation. Typically uses cliffs or large trees for shelter.	Moderate. The Project Area provides wooded habitat of varying composition that could support the species and it's foraging needs. The Project Area is also surrounded by forest which provides a habitat corridor for the species.	Due to the elusive nature of this species, it is unlikely to be directly impacted by construction or trail activities and no further surveys or avoidance measures are recommended.
Salt-marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE, SE, CFP	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is the primary habitat. Does not burrow, but builds loosely organized nests and requires higher areas for flood escape.	No Potential. Suitable salt-marsh habitat is not present in the Project Area. There are no documented occurrences within 5 miles of the Permanente Property (CDFW 2016).	No further surveys or avoidance measures are recommended.
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	SSC	Forest habitats of moderate canopy and moderate to dense understory. Also in chaparral habitats. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials.	Present. This species has been observed throughout the Project Area.	Recommendations for this species are provided in Section 7.2.2
Monterey ornate shrew <i>Sorex ornatus salarius</i>	SSC	Riparian, wetland and upland areas in the vicinity of the Salinas River delta. Prefers moist microhabitats. Feeds on insects and other invertebrates found under logs, rocks, and litter.	Unlikely. The Project Area is located outside of the species known range.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
American badger <i>Taxidea taxus</i>	SSC	Occurs in drier open stages of most scrub, forest, and herbaceous habitats where friable soils and prey populations are present.	Unlikely. Dense woodland within the Project Area provides unsuitable habitat for this species, and no badger burrows were observed in the Project Area during the site assessment. While there are documented occurrences >2.5 miles southeast of the Project Area, burrow habitat and open herbaceous habitat more characteristic of the species does not occur.	No further surveys or avoidance measures are recommended.
Birds				
California brown pelican <i>Pelecanus occidentalis californicus</i>	FD, SD, CFP	Generally a winter visitor to the region (though present nearly year-round). Nests colonially on offshore islands; nearest rookeries are on the Channel Islands. San Francisco Bay provides important foraging and loafing habitat.	No Potential. No foraging or nesting habitat is present, and this species does not nest in the area.	No further surveys or avoidance measures are recommended.
golden eagle <i>Aquila chrysaetos</i>	CFP, BCC	Resident in rolling foothill and mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range.	Unlikely. The Project Area does not provide suitable nesting habitat for this species, nor does it provide foraging habitat. The species may fly over the Project Area.	No further surveys or avoidance measures are recommended.
bald eagle <i>Haliaeetus leucocephalus</i>	FD, SE, CFP, BCC	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	Unlikely. The Project Area does not provide suitable nesting habitat for this species, nor does it provide foraging habitat. The species may fly over the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
white-tailed kite <i>Elanus leucurus</i>	CFP	Resident in coastal and valley lowlands. Preys on small mammals and other small vertebrates, and insects. Nests in trees and larger shrubs, often in relatively isolated stands.	Unlikely. The dense forest that dominates the Project Area does not provide typical nesting or foraging habitat for this species.	No further surveys or avoidance measures are recommended.
ferruginous hawk <i>Buteo regalis</i>	BCC	Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys and fringes of pinyon-juniper habitats. Winters west of Cascades-Sierra Nevada.	Unlikely. Occasionally observed along the open coast terraces of Santa Cruz County (eBird 2016). However, dense forest within the Project Area provides unsuitable habitat for this species.	No further surveys or avoidance measures are recommended.
northern harrier <i>Circus cyaneus</i>	SSC	Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. May also occur in alkali desert sinks.	Unlikely. The dense forest habitat that dominates the Project Area does not provide suitable nesting for the species. Foraging habitat is largely precluded, and while the species may occur along nearby open coast terraces of Santa Cruz County (eBird 2016), the Project Area is not anticipated to support the species.	No further surveys or avoidance measures are recommended.
prairie falcon <i>Falco mexicanus</i>	BCC	Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	Unlikely. Occasionally observed in coastal Santa Cruz County (eBird 2016). However, dense forest that dominates the Project Area provides unsuitable habitat for this species.	No further surveys or avoidance measures are recommended.
American peregrine falcon <i>Falco peregrinus anatum</i>	FD, SD, CFP	Largely resident. Requires protected cliffs, ledges or manmade structures for nesting. Often associated with coasts, bays, marshes and other open expanses of water. Preys primarily upon waterbirds; forages widely.	Unlikely. The Project Area does not contain suitable cliff habitat to support nesting. While the species has been documented to nest along the cliffs of the San Vicente Quarry, and may fly overhead, the Project Area does not support nesting.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California clapper rail <i>Rallus longirostris obsoletus</i>	FE, SE, CFP	Resident in salt marshes of the San Francisco Bay Estuary, with largest populations in south San Francisco Bay. Requires mud flats for foraging and dense marsh vegetation on higher ground for nesting.	No Potential. Suitable salt-marsh habitat is not present in the Project Area.	No further surveys or avoidance measures are recommended.
marbled murrelet <i>Brachyramphus marmoratus</i>	FT, SE	(Nesting) Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	High Potential. There are numerous occurrences of this species throughout the Santa Cruz Mountains, the closest of which are approximately 1 mile to the west and 1.9 miles to the east of the Project Area (CDFW 2016). Within the Project Area, several stands of old-growth redwood potentially suitable for nesting habitat occur. Therefore, while the species has not be documented within the Project Area, the presence of potentially suitable nesting habitat and the proximity to known occurrences makes it likely that the species would utilize the Project Area.	Recommendations for this species are provided in Section 7.2.2
western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT, SSC, BCC	Federal listing applies only to the Pacific coastal population. Found on sandy beaches, dry salt ponds, mudflats and adjacent levees, and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	No Potential. Project Area lacks sandy beaches, dry salt ponds, mudflats, levees or shores.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California least tern <i>Sterna antillarum browni</i>	FE, SE, CFP	Summer resident. Breeds along the California coast from San Francisco Bay south. Nests colonially on barren or sparsely vegetated, flat substrates near water. Forages for small fish, typically in shallow shoreline habitats. San Francisco Bay colonies usually located on dry/abandoned salt ponds and along estuarine shores.	No Potential. Project Area lacks nesting colony and foraging habitat.	No further surveys or avoidance measures are recommended.
California black rail <i>Laterallus jamaicensis coturniculus</i>	ST, CFP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	No Potential. The Project Area does not contain suitable marsh habitat.	No further surveys or avoidance measures are recommended.
burrowing owl <i>Athene cunicularia</i>	SSC, BCC	Largely resident in the region. Found in grasslands and other open habitats with a sparse to absent shrub/tree canopy. Nests and roosts in old mammal burrows, typically those of ground squirrels. Preys upon insects, and also small mammals, reptiles and birds.	Unlikely. The dense forest that dominates the Project Area precludes the presence of this species. No ground squirrel burrows were observed in the Project Area and the dense woodlands do not provide suitable habitat for this species. No sign of burrowing owl was observed during the site assessment.	No further surveys or avoidance measures are recommended.
short-eared owl <i>Asio flammeus</i>	SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	No potential. No suitable marshland to support nesting or foraging is present within the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
long-eared owl <i>Asio otus</i>	SSC	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Unlikely. The Project Area does not provide suitable riparian bottomland habitat characteristic of the species nesting areas.	No further surveys or avoidance measures are recommended.
Vaux's swift <i>Chaetura vauxi</i>	SSC	Redwood, Douglas-fir, and other coniferous forests. Nests in large hollow trees and snags. Often nests in flocks. Forages over most terrains and habitats but shows a preference for foraging over rivers and lakes.	High potential. Large stands of coniferous forest with complex canopies and snags occur throughout the Project Area. Potentially suitable nesting and foraging habitat is prevalent in the Project Area.	Recommendations for this species are provided in Section 7.2.2
black swift <i>Cypseloides niger</i>	SSC, BCC	Summer resident. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above surf. Forages widely.	Unlikely. The Project Area is not known to contain cliffs with waterfall features that would be suitable for nesting. While nesting along the coastline to the west and south has been documented, and the species may opportunistically forage or fly over the Project Area, nesting is not anticipated to be supported in the Project Area.	No further surveys or avoidance measures are recommended.
Allen's hummingbird <i>Selasphorus sasin</i>	BCC	Inhabits mixed evergreen, riparian woodlands, eucalyptus and cypress groves, oak woodlands, and coastal scrub during breeding season. Nest in shrubs and trees with dense vegetation.	High Potential. Mature oak and riparian woodland within the Project Area provides suitable nesting habitat.	Recommendations for this species are provided in Section 7.2.2

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Lewis' woodpecker <i>Melanerpes lewis</i>	BCC	Uncommon winter resident occurring on open oak savannahs, broken deciduous and coniferous habitats.	Unlikely. The species does not nest along coastal California, and while the species has been sporadically observed in Santa Cruz County, the dense woodland of the Project Area is not conducive to the open foraging areas needed for the species (eBird 2016).	No further surveys or avoidance measures are recommended.
Nuttall's woodpecker <i>Picoides nuttallii</i>	BCC	Relatively dense oak and riparian woods. Can also occur in urban and residential settings.	High Potential. Mature oak and riparian woodland provides suitable nesting habitat for this relatively common species.	Recommendations for this species are provided in Section 7.2.2
olive-sided flycatcher <i>Contopus cooperi</i>	SSC, BCC	Nesting habitats are mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir and lodgepole pine. Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	High Potential. Mixed conifer, redwood, and pine forest throughout the Project Area provide suitable nesting habitat for this species. The species has been observed frequently along roads surrounding the Project Area (eBird 2016).	Recommendations for this species are provided in Section 7.2.2
willow flycatcher <i>Empidonax traillii</i>	SE, BCC	Inhabits extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters; 2000 to 8000 foot elevation. Require dense willow thickets for nesting/roosting. Low, exposed branches are used for singing posts/hunting perches	Unlikely. No suitable willow nesting habitat exists within the Project Area, and there are no CNDDDB records within the vicinity (CDFW 2016). The species may occur briefly during migration.	No further surveys or avoidance measures are recommended.
loggerhead shrike <i>Lanius ludovicianus</i>	SSC, BCC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Unlikely. The dense forest and woodland within the Project Area is not typical foraging and nesting habitat for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Least Bell's vireo <i>Vireo bellii pusillus</i>	FE, SE	This species is a Summer resident of Southern California but whose range is extending northward. Nesting occurs in riparian areas in the vicinity of water or in dry river bottoms. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, coyote brush or mesquite.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
bank swallow <i>Riparia riparia</i>	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean.	Unlikely. No suitable nesting habitat exists within the Project Area, and the species is unlikely to forage/ pass through here. The nearest CNDDDB record for this species is located 8 miles northwest of the Project Area and dated 1987 (CDFW 2016).	No further surveys or avoidance measures are recommended.
oak titmouse <i>Baeolophus inornatus</i>	BCC	Oak woodland and savannah, open broad-leaved evergreen forests containing oaks, and riparian woodlands. Associated with oak and pine-oak woodland and arborescent chaparral.	Present. This species is commonly found within mature oak woodland habitat, which occurs in the Project Area.	Recommendations for this species are provided in Section 7.2.2
yellow warbler <i>Setophaga petechia</i>	SSC, BCC	Frequents riparian plant associations. Prefers willows, cottonwoods, aspens, sycamores and alders for nesting and foraging. Also nests in montane shrubbery in open conifer forests.	Unlikely. No suitable willow nesting habitat exists within the Project Area, and there are no CNDDDB records within the vicinity (CDFW 2016). The species may occur briefly during migration.	No further surveys or avoidance measures are recommended.
San Francisco (saltmarsh) common yellowthroat <i>Geothlypis trichas sinuosa</i>	SSC, BCC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	Unlikely. No suitable marsh habitat exists in or near the area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
yellow-breasted chat <i>Icteria virens</i>	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forage and nest within 10 feet of ground.	Unlikely. Suitable riparian thickets do not exist in the Project Area, and the species has not been observed in the vicinity of the Project Area (CDFW 2016, eBird 2016).	No further surveys or avoidance measures are recommended.
grasshopper sparrow <i>Ammodramus savannarum</i>	SSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs, and scattered shrubs. Loosely colonial when nesting.	Unlikely. Dense forest and woodland habitat occurs throughout the Project Area, which does not provide suitable grassland habitat.	No further surveys or avoidance measures are recommended.
Bryant's savannah sparrow <i>Passerculus sandwichensis alaudinus</i>	SSC	Associated with the coastal fog belt, primarily between Humboldt and northern Monterey Counties. Occupies low tidally influenced habitats, adjacent to ruderal areas; often found where pickleweed communities merge into grassland. Infrequently found in drier grasslands.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
Bell's sage sparrow <i>Amphispiza belli belli</i>	BCC	Year-round resident, though shows seasonal movements. Prefers dense chaparral and scrub habitats for breeding; strongly associated with chamise. Also occurs in more open habitats during winter.	Unlikely. The Project Area does not contain patches of scrub habitat and lacks suitable nesting habitat for the species. While the species has been documented to the east and north of the Project Area (eBird 2016), the Project Area contains suboptimal foraging habitat relative to areas outside of the Project Area and is unlikely to support nesting.	No further surveys or avoidance measures are recommended.
Lawrence's goldfinch <i>Spinus lawrencei</i>	BCC	Nests in open oak or other arid woodland and chaparral, near water. Nearby herbaceous habitats used for feeding. Closely associated with oaks.	Unlikely. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
tricolored blackbird <i>Agelaius tricolor</i>	SSC	Resident, though disperses somewhat when not breeding. Typically nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs. Highly colonial; breeding aggregations tend to be large.	Unlikely. No suitable freshwater marsh or riparian thicket habitat is present in the Project Area. There are no CNDDDB records in the vicinity (CDFW 2016).	No further surveys or avoidance measures are recommended.
purple martin <i>Progne subis</i>	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	Moderate Potential. The Project Area contains coniferous forests that may provide suitable nesting habitat. This species has been observed east of the Project Area in Bonny Doon Ecological Preserve (eBird 2016).	Recommendations for this species are provided in Section 7.2.2
Reptiles and Amphibians				
California tiger salamander <i>Ambystoma californiense</i>	FT, ST, SSC	Inhabits annual grasslands, spending most of the year underground in mammal burrows. Breeding occurs in vernal pools and other seasonal aquatic features. In the immediate vicinity of San Francisco Bay, occurs only in Fremont.	No Potential. There is no suitable aquatic breeding or upland aestivation habitat present for this species. This species has not been documented to occur within 5 miles of the Project Area (CDFW 2016).	No further surveys or avoidance measures are recommended.
Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i>	FE, SE, CFP	Wet meadows near sea level in a few restricted locales in Santa Cruz and Monterey counties. Aquatic larvae prefer shallow (<12 inches) water, using clumps of vegetation or debris for cover. Adults use mammal burrows.	No Potential. This species has a limited range, and is not documented to occur north of Aptos, which is over 15 miles southeast of the Project Area (USFWS 2009). The Project Area does not support habitat for this species, and the species is not known for the area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
California red-legged frog <i>Rana aurora</i>	FT, SSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	Moderate Potential. This species has been documented to occur within the property and adjacent to the Project Area in 1997 and there are many documented occurrences within 2 miles (CDFW 2016). While no suitable aquatic breeding habitat was observed, the Project Area provides dispersal and seasonal aquatic non-breeding habitat that may support the species. The Project Area is located within dispersal distance of known occurrences.	Recommendations for this species are provided in Section 7.2.2
foothill yellow-legged frog <i>Rana boylei</i>	SSC	Found in rocky streams in a variety of habitats. Feeds on both aquatic and terrestrial invertebrates. Closely associated with water.	Unlikely. There are no CNDDDB occurrences within 5 miles of the Project Area (CDFW 2016). The Project Area does not contain perennial streams with suitable basking habitat.	No further surveys or avoidance measures are recommended.
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	FT, ST	Alameda Whipsnake is restricted to valley-foothill hardwood habitat of the Coast Ranges between Monterey and San Francisco Bay. They inhabit south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	No Potential. The Project Area is outside of the species' known range, and does not contain suitable habitat.	No further surveys or avoidance measures are recommended.
Blainville's (coast) horned lizard <i>Phrynosoma blainvillii</i>	SSC	Habitat variable, most common in lowlands along sandy washes with low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of insect forage are primary microhabitat components.	No Potential. No suitable lowland or wash habitat is present in the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE, SE, CFP	Found in the vicinity of freshwater marshes, ponds and slow-moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least one foot. Upland areas near water are also very important. Adults prey chiefly on large frogs.	No Potential. The Project Area is outside of this subspecies' known range, and provides no typical aquatic habitat or forage.	No further surveys or avoidance measures are recommended.
Pacific pond turtle <i>Actinemys marmorata</i>	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter. Nests are excavated in areas with friable soil and vegetative cover.	Unlikely. There are no perennial streams or pond habitat that would support the species. Basking habitat is limited within the dense woodland of the Project Area. The nearest CNDDDB occurrence for this species is over 4 miles east of the Project Area (CDFW 2016).	No further surveys or avoidance measures are recommended.
Fishes				
green sturgeon <i>Acipenser medirostris</i>	FT, SSC	Anadromous. Spawns in the Sacramento and Klamath River systems. Lingering transients may be found throughout the San Francisco Bay Estuary, particularly juveniles.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
tidewater goby <i>Eucyclogobius newberryi</i>	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	No Potential. No brackish water habitat is present within or immediately adjacent to the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Delta smelt <i>Hypomesus transpacificus</i>	FT, ST	Endemic to the Sacramento-San Joaquin delta area; found in areas where salt and freshwater systems meet. It occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	No Potential. The Project Area is outside of the range for this species and does not contain suitable habitat.	No further surveys or avoidance measures are recommended.
longfin smelt <i>Spirinchus thaleichthys</i>	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	No Potential. The Project Area does not contain suitable estuarine habitat.	No further surveys or avoidance measures are recommended.
Coho salmon - Central CA Coast ESU <i>Oncorhynchus kisutch</i>	FE, SE	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water and sufficient dissolved oxygen.	No Potential. Coho is known to occur within the lower reaches of San Vicente Creek; however, fish passage barriers, steep gradient, and the ephemeral nature of the streams in the Project Area make it unlikely for this species to occur. Coho is not known from Laguna Creek, and known natural fish passage barriers downstream of the Project Area make it unlikely that Coho to occur.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
steelhead - Central CA Coast DPS <i>Oncorhynchus mykiss irideus</i>	FT	Anadromous, spending most of life cycle in the ocean. This ESU occurs from the Russian River south to Soquel Creek and Pajaro River, including the San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	Unlikely. Steelhead occur within the mainstem of San Vicente Creek up to the quarry tunnel and the lower reaches of Mill Creek; however, partial fish passage barriers, narrow steep channels, and the ephemeral nature of the streams in the main parcel make it unlikely for this species to occur there. Steelhead are known from the lower reaches of Laguna Creek; however, a known natural barrier occurs downstream of the site, making it unlikely that steelhead would occur there.	No further surveys or avoidance measures are recommended.
steelhead – South/ Central CA Coast DPS <i>Oncorhynchus mykiss irideus</i>	FT	Occurs in coastal basins from the Pajaro River south to, but not including, the Santa Maria River. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	Unlikely. Steelhead occur within the mainstem of San Vicente Creek up to the quarry tunnel and the lower reaches of Mill Creek; however, this location is in the territorial area for Central California Coast DPS steelhead. Therefore the Project Area is outside of the range for this DPS. Further, steelhead are unlikely to occur in the Project Area for the reasons outlined for the Central California Coast DPS.	No further surveys or avoidance measures are recommended.
Chinook salmon - Winter-run ESU <i>Oncorhynchus tshawytscha</i>	FE, SE	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Chinook salmon - Central Valley Spring-run ESU <i>Oncorhynchus</i> <i>tshawytscha</i>	FT, ST	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year, or remain in freshwater and migrate as yearlings.	No Potential. The Project Area is outside of the known range for this species.	No further surveys or avoidance measures are recommended.
Invertebrates				
Conservancy fairy shrimp <i>Branchinecta</i> <i>conservatio</i>	FE	Lives in ephemeral or temporary pools of freshwater (vernal pools) that form in the cool, wet months of the year. Highly turbid water is preferred.	No Potential. No vernal pool or seasonal wetland habitat is present within the Project Area.	No further surveys or avoidance measures are recommended.
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT	Inhabits small, clear-water sandstone-depression pools, grassy swales, slumps, or basalt-flow depression pools.	No Potential. No vernal pool or seasonal wetland habitat is present within the Project Area.	No further surveys or avoidance measures are recommended.
Ohlone tiger beetle <i>Cicindela ohlone</i>	FE	Sparsely vegetated native grasslands on costal terrace in Santa Cruz County. Substrate is poorly-drained clay or sandy clay soil over bedrock of Santa Cruz mudstone.	No Potential. The nearest CNDDDB occurrence for this species is located 4.8 miles southeast of the Project Area (CDFW 2016). The Project Area is not within the coastal terrace and does not contain native grasslands.	No further surveys or avoidance measures are recommended.
Valley elderberry longhorn beetle <i>Desmocerus</i> <i>californicus</i> <i>dimorphus</i>	FT	Occurs only in the central valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	No Potential. The Project Area is out of the species' known range.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
vernal pool tadpole shrimp <i>Lepidurus packardii</i>	FE	VPTS pools are commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No Potential. The Project Area provides no suitable vernal/seasonal pool habitat, and is outside of this species' known range (the nearest population is isolated in Fremont on the eastern shore of the Bay).	No further surveys or avoidance measures are recommended.
Myrtle's silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval foodplant thought to be <i>Viola adunca</i> .	No Potential. The Project Area is outside of the species known range.	No further surveys or avoidance measures are recommended.
monarch butterfly <i>Danaus plexippus</i>	Roost Habitat Protected by CDFW	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	Unlikely. Typical winter roost sites do not exist in the Project Area.	No further surveys or avoidance measures are recommended.
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. <i>Plantago erecta</i> is the primary host plant.	No Potential. No native serpentine grasslands or larval host or nectar plants are present in the Project Area.	No further surveys or avoidance measures are recommended.
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	FE	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz counties. <i>Eriogonum latifolium</i> and <i>Eriogonum parvifolium</i> are utilized as host plants and adult food plants.	No Potential. Suitable habitat and host/food plants are not present in the Project Area.	No further surveys or avoidance measures are recommended.

SPECIES	STATUS ¹	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE ²	RECOMMENDATIONS
Mount Hermon (=barbate) June beetle <i>Polyphylla barbata</i>	FE	Known only from sand hills in Santa Cruz County (type locality). Occurs in open, sandy habitat on Zayante series soils.	No Potential. The nearest CNDDDB occurrence for this species is located 4.8 miles east of the Project Area (CDFW 2016). No sand hill habitat or suitable Zayante soils are present in the Project Area.	No further surveys or avoidance measures are recommended.
Zayante band-winged grasshopper <i>Trimerotropis infantilis</i>	FE	Endemic to isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem). Restricted to sand parkland habitat found on ridges and hills within this very limited ecosystem.	No Potential. No sandhills habitat or suitable Zayante soils are present in the Project Area.	No further surveys or avoidance measures are recommended.

¹Key to status codes

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
SE	State Endangered
ST	State Threatened
SR	State Rare
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group Priority Species
Rank 1B.1	CNPS Rank 1B.1: Rare, threatened, or endangered in California and elsewhere (seriously threatened in California)
Rank 1B.2	CNPS Rank 1B.2: Rare, threatened, or endangered in California and elsewhere (moderately threatened in California)
Rank 2B.1	CNPS Rank 2B.1: Rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in California)
Rank 2B.2	CNPS Rank 2B.2: Rare, threatened, or endangered in California, but more common elsewhere (moderately threatened in California)
Rank 3.1	CNPS Rank 3.1: Plants about which more information is needed - A review list (seriously threatened in California)
Rank 3.2	CNPS Rank 3.2: Plants about which more information is needed - A review list (moderately threatened in California)
Rank 4.2	CNPS Rank 4.2: Plants of limited distribution - A watch list (moderately threatened in California)
Rank 4.3	CNPS Rank 4.3: Plants of limited distribution - A watch list (not very threatened in California)

²Key to Potential for Occurrence

No Potential	None of the habitat components meeting the species requirements are present. The habitat is clearly unsuitable for the species.
Unlikely	Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
Moderate Potential	Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
High Potential	All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
Present	Species is observed on the site or has been recorded (i.e. CNDDDB, other reports) on the site recently.
Not Observed	The species is identifiable year-round but was not observed during surveys or the survey occurred when the species should have been apparent and identifiable but the species was not observed. These species are assumed to not be present.

APPENDIX D
SITE PHOTOGRAPHS



Example of shaded fuel break within the Project Area.



Example of shaded fuel break within the Project Area.



Example of open, sunny edge habitat where plant diversity is expected to be higher and a larger number of rare plants have potential to occur.



Example of dense, shaded understory habitat where plant diversity is expected to be lower and fewer rare plants have potential to occur.



Anderson's manzanita flowers.



Typical leaf arrangement for Anderson's manzanita.



Anderson's manzanita in flower.



Anderson's manzanita growth form under open, sunny conditions.



Example of a regulated stream.



Example of a regulated stream.



Example of a drainage feature determined to be non-jurisdictional.



Example of a drainage feature determined to be non-jurisdictional.



Example of a woodrat midden in the Project Area.



Example of a woodrat midden in the Project Area.



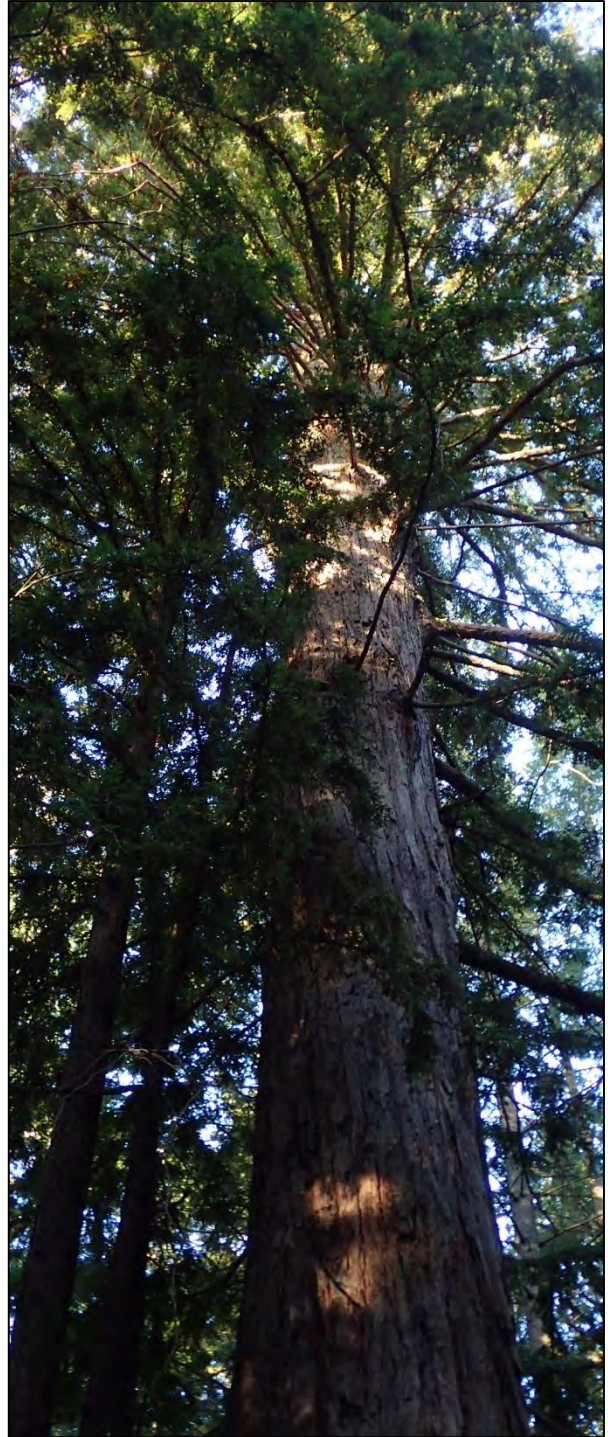
Example of a woodrat midden in the Project Area.



Example of a woodrat midden in the Project Area.



Example of a potentially significant wildlife tree.



Example of a potentially significant wildlife tree.



Laguna Creek, a perennial stream located on the Laguna parcel.

Attachment 6

Cultural Resources Analysis

(Note: The Cultural Resources Study includes confidential information regarding the locations of archaeological resources that is protected by law and is not available to the general public.)



COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
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KATHLEEN MOLLOY, PLANNING DIRECTOR

Bryan Largay
Land Trust of Santa Cruz County
617 Water Street
Santa Cruz, CA 95060

July 16, 2018

Subject: San Vicente Woods Archaeologic Report, Application REV181100

Dear Mr. Largay:


The review of your archaeological report, prepared by Rachel M. Hennessy and Thomas Origer, dated November 7, 2016, revised October 25, 2017, has been completed. The subject report evaluates the potential impact to known cultural and historic resources resulting from the development of a parking area and recreational trails in the Santa Cruz mountains along the north coast of unincorporated Santa Cruz County.

After a thorough review of the reports submitted and the resources on site, the County accepts the report and finds the proposed recommendations adequate to ensure no significant impacts to cultural or historic resources occur as a result of this project, with the exception of recommendation 3. Post Construction Monitoring. This recommendation, and the accompanying Construction Protocol CR1.4 in the Initial Study Checklist, qualify as deferred mitigation and as such are not allowed under CEQA. For the initial study, the identification of impacts due to the intensification of activity around known historic resources that could be subject to vandalism or removal shall be mitigated through a signage program at all entrances to the property that includes a brief description of the history San Vicente Railroad, including various camps throughout the area, a discussion of the historic value of these sites, and the citation of the codes which protect artifacts. The signage will also include the requirements to stay on trails.

The changes to the recommendation will take place in the initial study, but it will be the applicants responsibility to put the signage program together and identify posting locations.

If you have any questions regarding this letter, please call me at 831-454-3201.

Sincerely,


Matthew Johnston
Environmental Coordinator

Note A *Cultural Resources Study*, prepared by Tom Origer & Associates, October 2017, includes confidential information and is not be made available to the general public.

Attachment 7

Geotechnical Investigation



GEOTECHNICAL INVESTIGATION



**SAN VICENTE REDWOODS STAGING AREA
CEMEX PROPERTY EMPIRE GRADE
SANTA CRUZ, CALIFORNIA**

FOR
FALL CREEK ENGINEERING
SANTA CRUZ, CALIFORNIA



CONSULTING GEOTECHNICAL ENGINEERS

17103-SZ23-E11
JANUARY 11, 2018
www.4pacific-crest.com



Pacific Crest

ENGINEERING INC

GEOTECHNICAL | ENVIRONMENTAL | CHEMICAL | MATERIAL TESTING | SPECIAL INSPECTIONS

January 11, 2018

Project No. 17103-SZ23-E11

Mr. Peter Haase
c/o Ms. Samantha Sharp
Fall Creek Engineering Inc.
1525 Seabright Avenue
Santa Cruz, CA

Subject: **Geotechnical Investigation – Design Phase**
San Vicente Redwoods Staging Area
APN 080-011-42
Santa Cruz County, California

Dear Ms. Sharp,


In accordance with your authorization, we have performed a geotechnical investigation for the proposed parking lot and entry road for the San Vicente Redwoods, off of Empire Grade in Santa Cruz County, California.

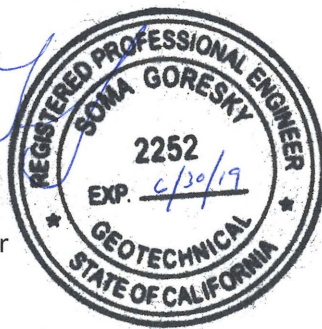
The accompanying report presents our findings, conclusions and recommendations for the subject project. If you have any questions concerning the information presented in this report, please call our office.

Very truly yours,

PACIFIC CREST ENGINEERING INC.

Prepared by:


Soma Goresky
Associate Engineer
GE 2252
Expires 6/30/19



Copies: 3 to Client

Reviewed by:



Elizabeth M. Mitchell
President/Principal Geotechnical
GE 2718
Expires 12/31/18



TABLE OF CONTENTS

I.	INTRODUCTION	1
	PURPOSE AND SCOPE	1
	PROJECT LOCATION	1
	PROPOSED IMPROVEMENTS.....	1
II.	INVESTIGATION METHODS	2
	FIELD INVESTIGATION	2
	LABORATORY TESTING.....	2
III.	FINDINGS AND ANALYSIS	3
	GEOLOGIC SETTING	3
	SURFACE CONDITIONS.....	3
	SUBSURFACE CONDITIONS.....	3
	FAULTING AND SEISMICITY	4
	GEOTECHNICAL HAZARDS.....	5
IV.	DISCUSSION AND CONCLUSIONS.....	6
	GENERAL	6
	PRIMARY GEOTECHNICAL CONSIDERATIONS.....	7
V.	RECOMMENDATIONS.....	7
	EARTHWORK.....	7
	FOUNDATIONS	12
	PAVEMENT DESIGN.....	14
	EROSION CONTROL	16
	PLAN REVIEW	16
VI.	LIMITATIONS AND UNIFORMITY OF CONDITIONS.....	16
VII.	IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL REPORT.....	18

APPENDIX A

REGIONAL SITE MAP

SITE MAP SHOWING TEST BORINGS

KEY TO SOIL CLASSIFICATION

LOG OF TEST BORINGS

PARTICLE SIZE ANALYSIS

R-VALUE TEST REPORTS

I. INTRODUCTION

PURPOSE AND SCOPE

This report describes the geotechnical evaluation and presents our conclusions and recommendations for the proposed parking lot for the San Vicente Redwoods off of Empire Grade, in Santa Cruz, California.

Our scope of services for this project has consisted of:

1. Site reconnaissance to observe the existing conditions.
2. Review of the following published maps:
 - Geologic Map of Santa Cruz County, California, Brabb, 1997.
 - Preliminary Map of Landslide Deposits in Santa Cruz County, California, Cooper-Clark and Associates, 1975.
 - Map Showing Geology and Liquefaction Potential of Quaternary Deposits in Santa Cruz County, California, Dupré, 1975.
 - Map Showing Faults and Their Potential Hazards in Santa Cruz County, California, Hall, Sarna-Wojcicki, Dupré, 1974.
 - Geographic Information System – Santa Cruz County, “GISWEB Interactive Mapping Application” <http://gis.co.santa-cruz.ca.us/internet/wwwgisweb/viewer.htm>
3. The drilling and logging of 5 test borings.
4. Laboratory testing of selected soil samples retrieved from our borings.
5. Engineering analysis of the field and laboratory test results.
6. Preparation of this report documenting our investigation and presenting geotechnical recommendations for the design and construction of the project.

PROJECT LOCATION

The subject site is located on the northwest side of Empire Grade about 0.1 miles north of its intersection with Braemoor Drive. Please refer to the Regional Site Map, Figure No. 1, in Appendix A for the general vicinity of the project site, which is located by the following coordinates:

Latitude = 37.115901 degrees
Longitude = -122.155557 degrees

PROPOSED IMPROVEMENTS

The Santa Cruz Land Trust is planning a staging area and parking lot for access to the San Vicente Redwoods trails. We have been provided with a set of preliminary plans titled “San Vicente Redwoods, Staging Area” dated June 2017. These plans depict the layout of the proposed parking lot and access roads. Proposed improvements include a vault toilet and two, 5,000 gallon water tanks. Maximum cuts and fills are shown to be about 5 to 7 feet in depth with a total grading volume of about 3,000 cubic yards. We understand the parking lot and access roads we either be unsurfaced (full depth baserock) or surfaced with asphalt concrete.



II. INVESTIGATION METHODS

FIELD INVESTIGATION

Five, 6-inch diameter test borings were drilled at the site on October 4, 2017. The approximate location of the test borings is shown on the Site Map, Figure No. 2, in Appendix A. The drilling method used was hydraulically operated continuous flight augers on a truck mounted drill rig. An engineer from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to choose sampler type and locations.

Relatively undisturbed soil samples were obtained at various depths by driving a split spoon sampler 18 inches into the ground. This was achieved by dropping a 140 pound hammer a vertical height of 30 inches. The hammer was actuated with a wire winch. The number of blows required to drive the sampler each 6 inch increment and the total number of blows required to drive the last 12 inches was recorded by the field engineer. The outside diameter of the samplers used was 3 inch or 2 inch and is designated on the Boring Logs as "L" or "T", respectively.

The field blow counts in 6 inch increments are reported on the Boring Logs adjacent to each sample as well as the standard penetration test data. All standard penetration test data has been normalized to a 2 inch O.D. sampler and is reported on the Boring Logs as SPT "N" values. The normalization method used was derived from the second edition of the Foundation Engineering Handbook (H.Y. Fang, 1991). The method utilizes a Sampler Hammer Ratio which is dependent on the weight of the hammer, height of hammer drop, outside diameter of sampler, and inside diameter of sample.

The soils encountered in the borings were continuously logged in the field and visually described in accordance with the Unified Soil Classification System (ASTM D2488) as described in the Boring Log Explanation, Figures No. 3 and 4, in Appendix A. The soil classification was verified upon completion of laboratory testing in accordance with ASTM D2487.

Appendix A contains the site plan showing the locations of the test borings, our borings logs and an explanation of the soil classification system used. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual.

LABORATORY TESTING

The laboratory testing program was developed to aid in evaluating the engineering properties of the materials encountered at the site. Laboratory tests performed include:

- Moisture Density relationships in accordance with ASTM D2937.
- Field penetrometer testing to approximate unconfined compressive strength.
- Gradation testing in accordance with ASTM D422.
- "R" Value testing in accordance with California 301

The results of the laboratory testing is presented on the boring logs opposite the sample tested and/or presented graphically in Appendix A.



III. FINDINGS AND ANALYSIS

GEOLOGIC SETTING

The site is located on a bedrock ridge crest that is roughly parallel to Empire Grade. The surficial geology in the area of the project site is mapped as quartz diorite. The deposits locally are a decomposed highly weathered granite.

The bedrock encountered during our field investigation is consistent with this description and the native soils overlain the bedrock are consistent with residual soils typically derived from this formation.

Based on the mapping by Cooper Clark (1975), the nearest landslides to the site are over 2000 feet away. No faults are mapped in the vicinity.

SURFACE CONDITIONS

The subject property is about 4½ acres in size and gently slopes at about a 10:1 (horiz:vert) inclination downwards towards the west. It is bordered by Empire Grade to the northeast and undeveloped forested land on the remaining 3 sides.

The area is covered with a dense growth of mature trees, mostly consisting of oak, madrone and fir.

A rough graded, unsurfaced road borders the area with associated grading consisting of cuts and fills generally less than 1 to 2 feet in depth. Beyond this, no signs of prior development are evident.

SUBSURFACE CONDITIONS

Our subsurface exploration consisted of five test boring drilled as across the site. The borings extended between 11 and 21 feet below existing grade. The soil profiles and classifications, laboratory test results and groundwater conditions encountered for each test boring are presented in the Logs of Test Borings, in Appendix A. The general subsurface conditions are described below.

Subsurface conditions encountered within our borings generally consisted of about 3½ to 5 feet of colluvial soil composed of a loose to very loose silty sand.

Decomposed granite bedrock was encountered between 3½ to 5 feet below ground surface. The bedrock we encountered is a fine grained sandstone, has a medium rock hardness, and based on our field blow counts is weathered to a competent medium dense to dense silty sand.

Groundwater was encountered in one of our five borings at about 15 feet below ground surface. Outside of this, no evidence of shallow ground water was observed at the site.

The groundwater conditions described in this report reflect the conditions encountered during our drilling investigation at the specific locations drilled. It must be anticipated that perched and regional groundwater tables may vary with location and could fluctuate with variations in rainfall, runoff, irrigation and other changes to the conditions encountered at the time our observations were made.



Please refer the Logs of Test Borings in Appendix A, for a more detailed description of the subsurface conditions encountered in each of our test borings at the subject site.

FAULTING AND SEISMICITY

Faulting

Mapped faults which have the potential to generate earthquakes that could significantly affect the subject site are listed in Table No. 1. The fault distances are approximate distances based the U.S. Geological Survey and California Geological Survey, Quaternary fault and fold database, accessed on March 2017 from the USGS website (<http://earthquake.usgs.gov/hazards/qfaults/>) and overlaid onto Google Earth.

Table No. 1 - Distance to Significant Faults

Fault Name	Distance (miles)	Direction
Zayante-Vergeles	1½	Northeast
Butano	7.0	Northeast
San Gregorio	7.0	Southwest
San Andreas	9.0	Northeast

Seismic Shaking and CBC Design Parameters

Due to the proximity of the site to active and potentially active faults, it is reasonable to assume the site will experience high intensity ground shaking during the lifetime of the project. Structures founded on thick soft soil deposits are more likely to experience more destructive shaking, with higher amplitude and lower frequency, than structures founded on bedrock. Generally, shaking will be more intense closer to earthquake epicenters. Thick soft soil deposits large distances from earthquake epicenters, however, may result in seismic accelerations significantly greater than expected in bedrock.

Selection of seismic design parameters should be determined by the project structural designer. The site coefficients and seismic ground motion values shown in the table below were developed based on CBC 2016 incorporating the ASCE 7-10 standard, and the project site location.



Table No. 2 - 2016 CBC Seismic Design Parameters¹

Seismic Design Parameter	ASCE 7-10 Value
Site Class	D
Spectral Acceleration for Short Periods	$S_s = 1.5g$
Spectral Acceleration for 1-second Period	$S_1 = 0.6g$
Short Period Site Coefficient	$F_a = 1.0$
1-Second Period Site Coefficient	$F_v = 1.5$
MCE Spectral Response Acceleration for Short Period	$S_{MS} = 1.5g$
MCE Spectral Response Acceleration for 1-Second Period	$S_{M1} = 0.9g$
Design Spectral Response Acceleration for Short Period	$S_{DS} = 1.0g$
Design Spectral Response Acceleration for 1-Second Period	$S_{D1} = 0.6g$
Seismic Design Category ²	D

Note 1: Design values have been obtained by using the Ground Motion Parameter Calculator available on the USGS website at <http://earthquake.usgs.gov/hazards/designmaps/usdesign.php>.

Note 2: The Seismic Design Category assumes a structure with Risk Category I, II or III occupancy as defined by Table 1604.5 of the 2016 CBC. Pacific Crest Engineering Inc. should be contacted for revised Table 2 seismic design parameters if the proposed structure has a different occupancy rating than that assumed.

The recommendations of this report are intended to reduce the potential for structural damage to an acceptable risk level, however strong seismic shaking could result in architectural damage and the need for post-earthquake repairs. It should be assumed that exterior improvements such as pavements, slabs or sidewalks may need to be repaired or replaced following strong seismic shaking.

GEOTECHNICAL HAZARDS

A quantitative analysis of geotechnical hazards was beyond our scope of services for this project. In general however, the geotechnical hazards associated with the project site include seismic shaking (discussed above), ground surface fault rupture, liquefaction, lateral spreading, landsliding and expansive soils. A qualitative discussion of these hazards is presented below.

Ground Surface Fault Rupture

Pacific Crest Engineering Inc. has not performed a specific investigation for the presence of active faults at the project site. Based upon our review of the Santa Cruz County GIS Hazard Maps, the project site is not mapped within a fault hazard zone.

Ground surface fault rupture typically occurs along the surficial traces of active faults during significant seismic events. Since the nearest known active, or potentially active fault trace is mapped approximately 1½ miles from the site, it is our opinion that the potential for ground surface fault rupture to occur at the site should be considered low.



Liquefaction and Lateral Spreading

Based upon our review of the Santa Cruz County GIS Hazard Maps, the project site is not mapped within a liquefaction hazard zone.

Liquefaction tends to occur in loose, saturated fine grained sands and coarse silt, or clay with low plasticity. The project site is shallowly underlain by granitic bedrock, an earth material that is not susceptible to liquefaction. Consequently, it is our opinion that liquefaction is not a hazard associated with the subject site.

Liquefaction induced lateral spreading occurs when a liquefied soil mass fails toward an open slope face, or fails on an inclined topographic slope. Our analysis indicates that the site has a low potential for liquefaction, consequently the potential for lateral spreading is also considered low.

Landsliding

No landslide deposits are mapped within the subject property (Cooper-Clark, 1975). The subject site and immediate vicinity are relatively flat to gently sloping. It is our opinion that the potential for shallow landsliding to occur and adversely affect the proposed development should be considered low.

Expansive Soils

The subject site is underlain by a relatively thick surficial layer of silty sand which is non-plastic and we infer has a low expansion potential.

IV. DISCUSSION AND CONCLUSIONS

GENERAL

1. The results of our investigation indicate that the proposed development is feasible from a geotechnical engineering standpoint, provided our recommendations are included in the design and construction of the project.
2. Grading and foundation plans should be reviewed by Pacific Crest Engineering Inc. during their preparation and prior to contract bidding.
3. Pacific Crest Engineering Inc. should be notified at least four (4) working days prior to any site clearing and grading operations on the property in order to observe the stripping and disposal of unsuitable materials, and to coordinate this work with the grading contractor. During this period, a pre-construction conference should be held on the site, with at least the client or their representative, the grading contractor, a County representative and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.
4. Field observation and testing must be provided by a representative of Pacific Crest Engineering Inc., to enable them to form an opinion as to the degree of conformance of the exposed site conditions to those foreseen in this report, the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to grading or foundation excavation that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc., the Geotechnical Engineer of Record,



will render the recommendations of this report invalid, unless the Client hires a new Geotechnical Engineer who agrees to take over complete responsibility for this report's findings, conclusions and recommendations. The new Geotechnical Engineer must agree to prepare a Transfer of Responsibility letter. This may require additional test borings and laboratory analysis if the new Geotechnical Engineer does not completely agree with our prior findings, conclusions and recommendations.

PRIMARY GEOTECHNICAL CONSIDERATIONS

5. Based upon the results of our investigation, it is our opinion that the primary geotechnical issues associated with the design and construction of the proposed project at the subject site are the following:

- a. *Soft Surficial Soils and Settlement:* Surficial conditions at the site generally consist of 3 to 5 feet of very loose silty sand that is compressible under vehicle loading. Settlement of this surficial soil could affect gradients and drainage in the proposed parking lot and driveways and potentially cause damage or distress to proposed foundations or flatwork. In order to reduce settlement we recommend surficial soils within all improvement areas be subexcavated and recompacted as engineered fill. Detailed recommendations are provided in the following section of this report.
- b. *Moisture Sensitive Soils:* The surficial soils consist of fine sands and silts which are highly moisture sensitive. Meeting the minimum compaction specifications with these types of soil can be difficult. Contractors should be made aware of the difficult compaction characteristics of the site soils.
- c. *Strong Seismic Shaking:* The project site is located within a seismically active area and strong seismic shaking is expected to occur within the design lifetime of the project. Improvements should be designed and constructed in accordance with the most current CBC and the recommendations of this report to minimize reaction to seismic shaking. Structures built in accordance with the latest edition of the California Building Code have an increased potential for experiencing relatively minor damage which should be repairable, however strong seismic shaking could result in architectural damage and the need for post-earthquake repairs.

V. RECOMMENDATIONS

EARTHWORK

Clearing and Stripping

1. The initial preparation of the site will consist of tree and brush removal. Surface vegetation, tree roots and organically contaminated topsoil should be removed ("stripped") from areas that will support engineered fill, buildings foundations, concrete slabs-on-grade or other improvements. This should include removal of the entire stump and root ball.
2. It is anticipated that the depth of organic material and strippings may be 6 inches or more. To remove the root balls of the dense stand of trees may require subexcavations of 12 inches or more across the site. Final required depth of stripping must be based upon visual observations by a representative of Pacific Crest Engineering Inc., in the field. The required depth of stripping will vary based upon the type and density of vegetation across the project site.



3. Septic tanks and leaching lines, if found, must be completely removed. The extent of removal of debris should be designated by a representative of Pacific Crest Engineering Inc. in the field. This material must be removed from the site.
4. Any voids created by the removal of tree and root balls must be backfilled with properly compacted engineered fill which meets the requirements of this report.
5. Any wells encountered shall be capped in accordance with the requirements and approval of the County Health Department. The strength of the cap shall be equal to the adjacent soil and shall not be located within 5 feet of a structural footing.

Subgrade Preparation

6. It is possible that there are areas of man-made fill at the site that our field investigation did not detect. Areas of man-made fill, if encountered, will need to be completely excavated to undisturbed native material. The excavation process should be observed and the extent designated by a representative of Pacific Crest Engineering Inc., in the field. Any voids created by fill removal must be backfilled with properly compacted engineered fill.
7. After clearing and stripping are completed the following subexcavation depths are recommended:

Roadway and parking areas:	24 inches below existing grade
Concrete flatwork/slabs and foundations:	12 inches below bottom of slab/footing or 36 inches below existing grade, whichever is greater.
8. Subexcavations should extend at least 5 feet horizontally beyond foundations and at least 2 feet horizontally beyond pavements and flatwork.
9. Final depth of subexcavation should be determined by a representative of Pacific Crest Engineering Inc., in the field.
10. After completion of any subexcavations the base of the excavation should be scarified 8 inches, moisture conditioned and compacted as engineered fill. The moisture conditioning procedure will depend upon the time of year that the work is done, but it should result in the soils being 1 to 3 percent over optimum moisture content at the time of compaction.

Material for Engineered Fill

11. Native or imported soil proposed for use as engineered fill should meet the following requirements:
 - a. free of organics, debris, and other deleterious materials,
 - b. free of "recycled" materials such as asphaltic concrete, concrete, brick, etc.,
 - c. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open,
 - d. free of rocks in excess of 2 inches in size.



12. In addition to the above requirements, import fill should have a Plasticity Index between 4 and 12, and a minimum Resistance "R" Value of 30, and be non-expansive.

13. Samples of any proposed imported fill planned for use on this project should be submitted to Pacific Crest Engineering Inc. for appropriate testing and approval not less than ten (10) working days before the anticipated jobsite delivery. This includes proposed import trench sand, drain rock and for aggregate base materials. Imported fill material delivered to the project site without prior submittal of samples for appropriate testing and approval must be removed from the project site.

Engineered Fill Placement and Compaction

14. Following the subexcavation and subgrade preparation areas should be brought up to design grades with engineered fill that is moisture conditioned and compacted according to the recommendations of this report. Recompacted sections should extend at least 5 feet horizontally beyond all footings, slabs and pavement areas, where possible.

15. Engineered fill should be placed in maximum 8 inch lifts, before compaction, at a water content which is within 1 to 3 percent of the laboratory optimum value.

16. All soil on the project should be compacted to a minimum of 90% of its maximum dry density. The upper 8 inches of the soil subgrade in the pavement areas, and all aggregate subbase and aggregate base should be compacted to a minimum of 95% of its maximum dry density.

17. The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be performed in accordance with ASTM Test #D6938 (nuclear method).

18. The site soils are highly moisture sensitive and meeting the required compaction specifications will be highly dependent on careful moisture control. Earthwork contractors should be made aware of the moisture sensitivity of the soils and potential compaction difficulties.

19. We recommend field density testing be performed in maximum 2 foot elevation differences. In general terms, we recommend at least one compaction test per 200 linear feet of utility trench or retaining wall backfill, and at least one compaction test per 2,000 square feet of building or structure area. This is a subjective value and may be changed by the geotechnical engineer based on a review of the final project layout and exposed field conditions.

20. Engineered fill placed on existing slopes that are steeper than 5:1 (horizontal:vertical) should be keyed and benched into competent native material. Toe keys should be constructed at the base of the fill slope with a minimum 10 foot wide width and sloped negatively at least 2% into the bank. The depth of the keyways will vary, depending on the materials encountered. It is anticipated that the depth of the keyways may be 3 to 6 feet, but at all locations shall be at least 2 feet into firm material.

21. Subsequent benches may be required as the fill section progresses upslope. Benches and keys will be designated in the field by a representative of Pacific Crest Engineering Inc



Cut and Fill Slopes

22. Fill slopes should be constructed with engineered fill meeting the minimum density requirements of this report and have a gradient no steeper than 2:1 (horizontal to vertical). Fill slopes should not exceed 15 feet in vertical height unless specifically reviewed by Pacific Crest Engineering Inc. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

23. Permanent cut slopes in soil shall not exceed a 2:1 (horizontal to vertical) gradient. All cut slopes should not exceed a 15 foot vertical height unless specifically reviewed by a representative of Pacific Crest Engineering Inc. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

24. The above slope gradients are based on the strength characteristics of the materials under conditions of normal moisture content that would result from rainfall falling directly on the slope, and do not take into account the additional activating forces applied by seepage from spring areas or subsurface groundwater. Therefore, in order to maintain stable slopes at the recommended gradients, it is important that any seepage forces and accompanying hydrostatic pressure (if encountered) be relieved by adequate drainage. Drainage facilities may include subdrains, gravel blankets, rock fill surface trenches or horizontally drilled drains. Configurations and type of drainage will be determined by a representative of Pacific Crest Engineering Inc. during the grading operations.

25. The surfaces of all cut and fill slopes should be prepared and maintained to reduce erosion. This work, at a minimum, should include track rolling of the slope and effective planting. The protection of the slopes should be installed as soon as practicable so that a sufficient growth will be established prior to inclement weather conditions. It is vital that no slope be left standing through a winter season without the erosion control measures having been provided.

26. The above recommended gradients do not preclude periodic maintenance of the slopes, as minor sloughing and erosion may take place.

27. If a fill slope is to be placed above a cut slope, the toe of the fill slope should be set back at least 8 feet horizontally from the top of the cut slope. A lateral surface drain should be placed in the area between the cut and fill slopes.

28. All flatwork should be set back at least 5 feet horizontally from the top of cut and fill slopes. All foundations should be set back at least 8 feet horizontally from the top of cut and fill slopes.

Soil Moisture and Weather Conditions

29. If earthwork activities are done during or soon after the rainy season, the on-site soils and other materials may be too wet in their existing condition to be used as engineered fill. These materials may require a diligent and active drying and/or mixing operation to reduce the moisture content to the levels required to obtain adequate compaction as an engineered fill. If the on-site soils or other materials are too dry, water may need to be added. In some cases the time and effort to dry the on-site soil may be considered excessive, and the import of aggregate base may be required.



Utility Trench Backfill

30. Utility trenches that are parallel to the sides of the building should be placed so that they do not extend below a line sloping down and away at a 2:1 (horizontal to vertical) slope from the bottom outside edge of all footings.

31. Utility pipes should be designed and constructed so that the top of pipe is a minimum of 24 inches below the finish subgrade elevation of any road or pavement areas. Any pipes within the top 24 inches of finish subgrade should be concrete encased, per design by the project civil engineer.

32. For the purpose of this section of the report, backfill is defined as material placed in a trench starting one foot above the pipe, and bedding is all material placed in a trench below the backfill.

33. Unless concrete bedding is required around utility pipes, free-draining clean sand should be used as bedding. Sand bedding should be compacted to at least 95 percent relative compaction. Clean sand is defined as 100 percent passing the #4 sieve, and less than 5 percent passing the #200 sieve.

34. Approved imported clean sand or native soil should be used as utility trench backfill. Backfill in trenches located under and adjacent to structural fill, foundations, concrete slabs and pavements should be placed in horizontal layers no more than 8 inches thick. This includes areas such as sidewalks, patios, and other hardscape areas. Each layer of trench backfill should be water conditioned and compacted to at least 95 percent relative compaction

35. All utility trenches beneath perimeter footing or grade beams should be backfilled with controlled density fill (such as 2-sack sand\cement slurry) to help minimize potential moisture intrusion below interior floors. The length of the plug should be at least three times the width of the footing or grade beam at the building perimeter, but not less than 36 inches. A representative from Pacific Crest Engineering Inc. should be contacted to observe the placement of slurry plugs. In addition, all utility pipes which penetrate through the footings, stemwalls or grade beams (below the exterior soil grade) should also be sealed water-tight, as determined by the project civil engineer or architect.

36. Utility trenches which carry "nested" conduits (stacked vertically) should be backfilled with a control density fill (such as 2-sack sand\cement slurry) to an elevation one foot above the nested conduit stack. The use of pea gravel or clean sand as backfill within a zone of nested conduits is not recommended.

37. A representative from our firm should be present to observe the bottom of all trench excavations, prior to placement of utility pipes and conduits. In addition, we should observe the condition of the trench prior to placement of sand bedding, and to observe compaction of the sand bedding, in addition to any backfill planned above the bedding zone.

38. Jetting of the trench backfill is not recommended as it may result in an unsatisfactory degree of compaction.

39. Trenches must be shored as required by the local agency and the State of California Division of Industrial Safety construction safety orders.



Excavations and Shoring

40. It should be understood that on-site safety is the *sole responsibility* of the Contractor, and that the Contractor shall designate a *competent person* (as defined by CAL-OSHA) to monitor the slope excavation prior to the start of each work day, and throughout the work day as conditions change. The competent person designated by the Contractor shall determine if flatter slope gradients are more appropriate, or if shoring should be installed to protect workers in the vicinity of the slope excavation. Refer to Title 8, California Code of Regulations, Sections 1539-1543.

41. All excavations must meet the requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA approved state plan requirements.

42. If shallow ground water is encountered excavation de-watering may be necessary. Temporary dewatering may be achieved by sloping the excavation to a system of sump pumps placed within the excavation, trenching from the base of excavations to discharge water by gravity flow, or other means. It is the Contractor's responsibility to design an adequate de-watering system for the project site, and to submit a detailed de-watering plan to the geotechnical engineer for review at least two weeks prior to the start of construction.

43. The "top" of any temporary cut slope and excavations should be set-back at least ten feet (measured horizontally) from any nearby structure or property line. Any excavations which cannot meet this requirement will need to have a shoring system designed to support steeper sidewall gradients.

44. Temporary shoring is not currently anticipated for this project. Should these requirements change, please contact our office for additional recommendations.

FOUNDATIONS

Spread Footings

45. Foundations are anticipated for two water tanks and a restroom vault only. We recommend that these structures be supported on a mat foundation bearing on engineered fill that is prepared and compacted as outlined in the earthwork section of this report.

46. For dead plus live loading, the mat may be designed for a net allowable bearing pressure of 2,500 pounds per square foot or a vertical modulus of subgrade reaction (K_{v1}) of 100 tons per cubic foot. This value may be increased by one-third when transient wind or seismic loads are included.

47. The mat should be designed to distribute the building loads uniformly over the entire area of the mat, and should have a minimum thickness of 8 inches.

48. The perimeter of the mat should be deepened and/or have a thickened edge so that it extends at least 12 inches below lowest adjacent compacted grade.



49. Lateral loads may be resisted by a combination of friction between the foundation bottom and the supporting subgrade. An ultimate friction coefficient of 0.3 may be used for friction between the foundations and supporting subgrade.
50. An ultimate passive pressure of 400 psf/foot may be used for footings embedded in compacted engineered fill. The upper 1 foot of soil should be ignored when calculating passive soil resistance.
51. Provided our recommendations are followed, total and differential settlement due to applied dead and live loads is expected to be within tolerable limits.
52. No footing should be placed closer than 8 feet horizontally from the top of a cut or fill slope.
53. Slab subgrades and footing excavations must be free of loose material prior to placing concrete. The footing excavations should be thoroughly saturated prior to placing concrete.
54. Slab subgrades and footing excavations must be observed by a representative of Pacific Crest Engineering Inc. before placement of formwork, steel and concrete to verify bedding into proper material.
55. The footings should contain steel reinforcement as determined by the project civil or structural engineer in accordance with applicable CBC or ACI Standards.

SLAB-ON-GRADE CONSTRUCTION

56. All concrete slabs-on-grade should be underlain by a minimum 6 inch thick capillary break consisting of $\frac{3}{4}$ inch clean crushed rock (no fines). If moisture sensitive floor coverings are not anticipated 6 inches of Class 2 baserock that is placed and compacted as specified in the earthwork section of this report may be used in lieu of the capillary break material.
57. Where floor coverings are anticipated or vapor transmission may be a problem, a vapor retarder/membrane should be placed between the capillary break layer and the floor slab in order to reduce the potential for moisture condensation under floor coverings. We recommend a high quality vapor retarder at least 10 mil thick and puncture resistant (Stego Wrap or equivalent). The vapor retarder must meet the minimum specifications for ASTM E-1745, Standard Specification For Water Vapor Retarder. Low density polyethylene film (such as Visqueen) does not meet minimum current standards and should not be used. Laps and seams should be overlapped at least six inches and properly sealed to provide a continuous layer beneath the entire slab that is free of holes, tears or gaps. Joints and penetrations should also be properly sealed.
58. If a sand layer is chosen as a cushion for slabs without floor coverings, it should consist of a clean sand. Clean sand is defined as 100 percent passing the #4 sieve, and less than 5 percent passing the #200 sieve.
59. Slab thickness, reinforcement, and doweling should be determined by the project civil or structural engineer. The use of welded wire mesh is not recommended for slab reinforcement.
60. Recommendations given above for the reduction of moisture transmission through the slab are general in nature and present good construction practice. Moisture protection measures for concrete slabs-on-grade should meet applicable ACI and ASTM standards. Pacific Crest Engineering Inc. are not waterproofing



January 11, 2018

experts. For a more complete and specific discussion of moisture protection within the structure, a qualified waterproofing expert should be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. The waterproofing consultant should provide recommendations for mitigation of potential adverse impacts of moisture vapor transmission on various components of the structure as deemed appropriate.

PAVEMENT DESIGN

61. A bulk sample of soil was recovered from the upper 3 feet within the 2 borings excavated in the parking lot area (B-2 and B-3). "R" values of 60 and 64 were measured in the laboratory on these samples. Based on the Caltrans Highway Design Manual Chapter 630 latest edition and an assumed R-value of 55, Table 3 below provides alternative pavement sections for traffic indices ranging from 4.5 and 6.0. This procedure assumes a 20-year design life, although it should be understood that if the pavement section is not surfaced with asphalt or oil and screenings the life expectancy may be significantly less. Final pavement section and design traffic index should be determined by the project civil engineer

**TABLE No. 3 Recommended Alternative Pavement Sections
(Based on R value = 55)**

Assumed Traffic Index	Asphalt Concrete (inches)	Class 2 Baserock R = 78 min (inches)	Total Section (inches)
4.5	0.0	7.0	7.0
4.5	2.0	3.0	5.0
5.0	0.0	8.0	8.0
5.0	2.0	3.5	5.5
5.5	0.0	8.5	8.5
5.5	2.0	4.5	6.5
6.0	0.0	9.5	9.5
6.0	2.5	4.5	7.0

62. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be used in design and construction:

- a. Properly scarify and moisture condition the upper 8 inches of the subgrade soil and compact it to a minimum of 95% of its maximum dry density, at a moisture content of 1 to 3% over the optimum moisture content for the soil.
- b. Provide sufficient gradient to prevent ponding of water.



- c. Use only quality materials of the type and thickness (minimum) specified. All aggregate base and subbase must meet Caltrans Standard Specifications for Class 2 materials, and be angular in shape. All Class 2 aggregate base should be $\frac{3}{4}$ inch maximum in aggregate size.
- d. Compact the base and subbase uniformly to a minimum of 95% of its maximum dry density.
- e. Maintenance should be undertaken on a routine basis. As mentioned above exposed baserock in pavement areas will likely require an accelerated maintenance program.

SURFACE DRAINAGE

63. Surface water drainage is the responsibility of the project civil engineer. The following should be considered by the civil engineer in design of the project.

64. Surface water must not be allowed to pond or be trapped adjacent to foundations, or on building pads and parking areas.

65. If the parking lot and driveway areas are to remain unsurfaced the owner should anticipate that higher than normal maintenance will be required to maintain drainage, fill potholes and smooth washboard conditions on the baserock surface. Regular maintenance to maintain drainage of water off of the baserock surface is important in order to increase the life of the pavement.

66. Slope failures can occur where surface drainage is allowed to concentrate on unprotected slopes. Appropriate landscaping and surface drainage control around the project area is imperative in order to minimize the potential for shallow slope failures and erosion. Stormwater discharge locations should not be located at the top or on the face of any slope.

67. Final grades should be provided with positive gradient away from all foundation elements. Soil grades should slope away from foundations at least 5 percent for the first 10 feet. Impervious surfaces should slope away from foundations at least 2 percent for the first 10 feet. Concentrations of surface runoff should be handled by providing structures, such as paved or lined ditches, catch basins, etc.

68. Irrigation activities at the site should be done in a controlled and reasonable manner.

69. Following completion of the project we recommend that storm drainage provisions and performance of permanent erosion control measures be closely observed through the first season of significant rainfall, to determine if these systems are performing adequately and, if necessary, resolve any unforeseen issues.

70. Surface drainage facilities must not be altered nor any filling or excavation work performed in the area without first consulting Pacific Crest Engineering Inc. Surface drainage improvements developed by the project civil engineer must be maintained by the property owner at all times, as improper drainage provisions can produce undesirable affects.



EROSION CONTROL

71. The surface soils are classified as having a moderate potential for erosion. Therefore, the finished ground surface should be planted with ground cover and continually maintained to minimize surface erosion. For specific and detailed recommendations regarding erosion control on and surrounding the project site, the project civil engineer or an erosion control specialist should be consulted.

PLAN REVIEW

72. We respectfully request an opportunity to review the project plans and specifications during preparation and before bidding to ensure that the recommendations of this report have been included and to provide additional recommendations, if needed. These plan review services are also typically required by the reviewing agency. Misinterpretation of our recommendations or omission of our requirements from the project plans and specifications may result in changes to the project design during the construction phase, with the potential for additional costs and delays in order to bring the project into conformance with the requirements outlined within this report. Services performed for review of the project plans and specifications are considered "post-report" services and billed on a "time and materials" fee basis in accordance with our latest Standard Fee Schedule.

VI. LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This Geotechnical Investigation was prepared specifically for Fall Creek Engineering and for the specific project and location described in the body of this report. This report and the recommendations included herein should be utilized for this specific project and location exclusively. This Geotechnical Investigation should not be applied to nor utilized on any other project or project site. Please refer to the ASFE "Important Information about Your Geotechnical Engineering Report" attached with this report.
2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be provided.
3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field.
4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural process or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. This report should therefore be reviewed in light of future planned construction and then current applicable codes. This report should not be considered valid after a period of two (2) years without our review.



5. This report was prepared upon your request for our services in accordance with currently accepted standards of professional geotechnical engineering practice. No warranty as to the contents of this report is intended, and none shall be inferred from the statements or opinions expressed.

6. The scope of our services mutually agreed upon for this project did not include any environmental assessment or study for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.



Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



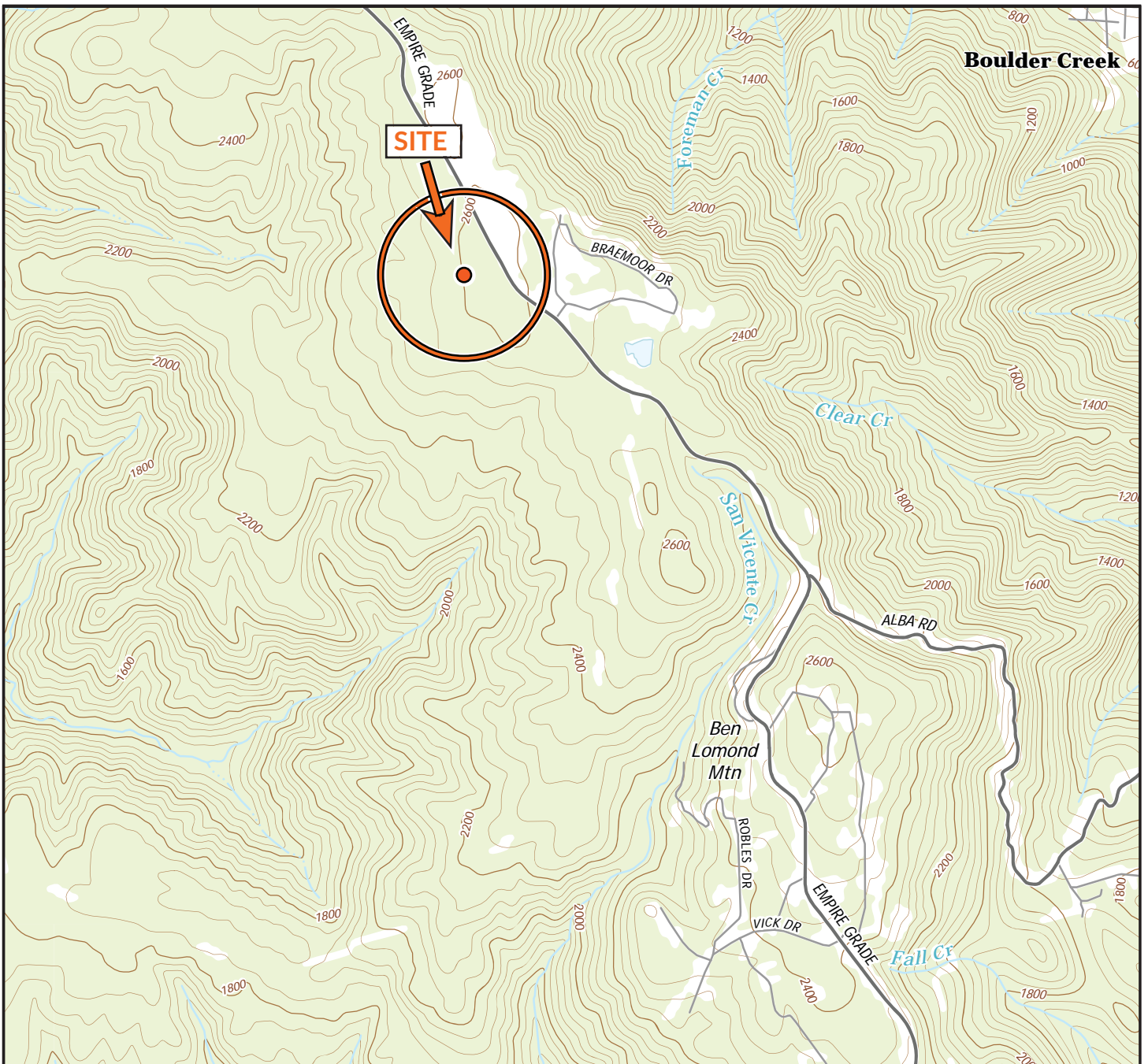
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APPENDIX A

Regional Site Map
Site Map Showing Test Borings
Key to Soil Classification
Log of Test Borings
Particle Size Analysis
R-Value Test Reports





0 2000 ft.

 Scale

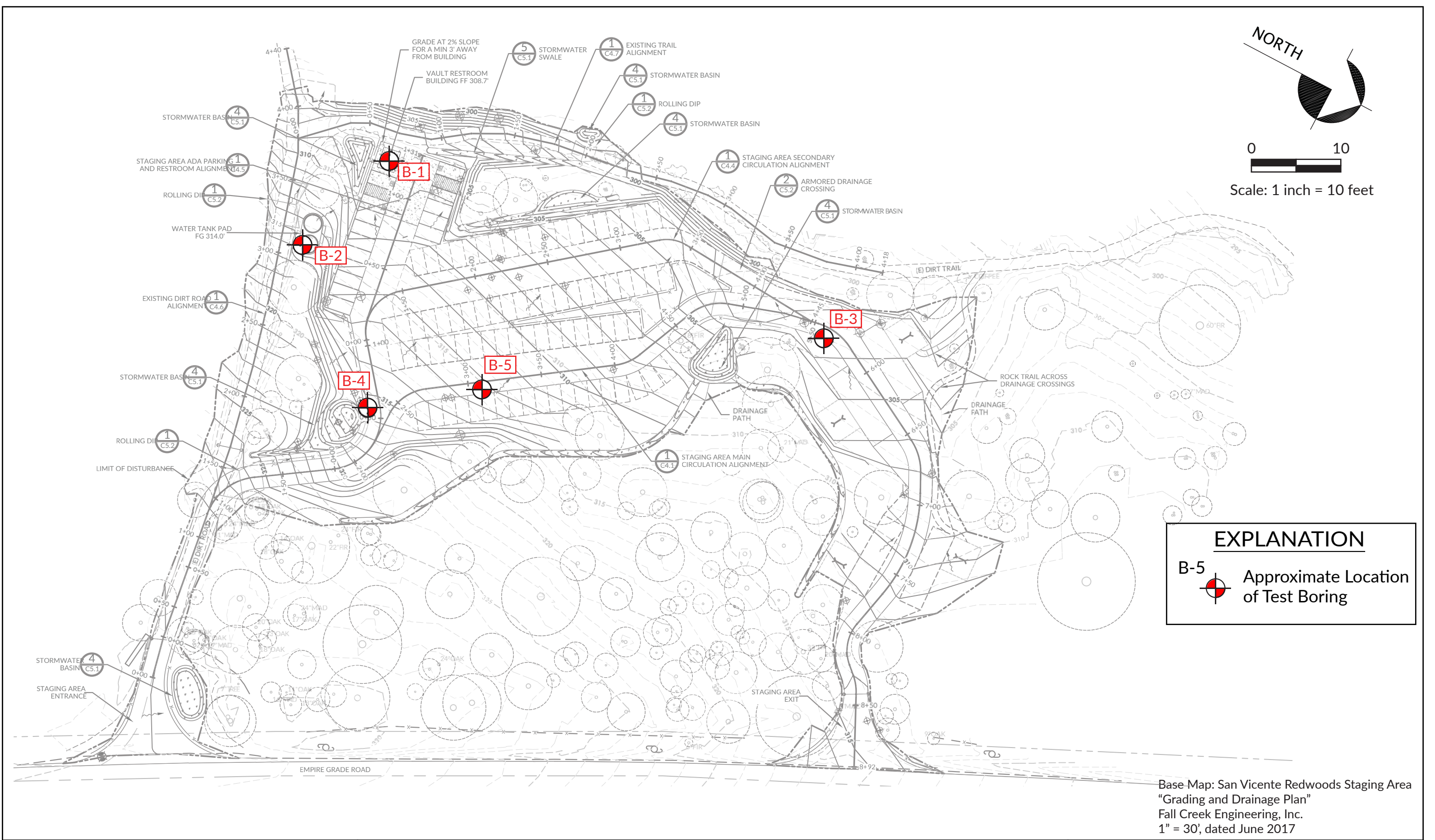


Base Map: United States Geological Survey
 Davenport Quadrangle, California - Santa Cruz County
 7.5 Minute Series, Davenport, CA 2015



Regional Site Map
 San Vicente Staging Area
 Santa Cruz County, California

Figure No. 1
 Project No. 17103
 Date: 1/11/18




KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS (FGS)
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		SYMBOL	FINES	COARSENESS	SAND/GRAVEL	GROUP NAME
SILT AND CLAY	*LL < 35% Low Plasticity	CL Lean Clay PI > 7 Plots Above A Line -OR- ML Silt PI > 4 Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Lean Clay / Silt
				15-30% plus No. 200	% sand ≥ % gravel	Lean Clay with Sand / Silt with Sand
			≥30% plus No. 200		% sand < % gravel	Lean Clay with Gravel / Silt with Gravel
					< 15% gravel	Sandy Lean Clay / Sandy Silt
		CL - ML 4 < PI < 7	<30% plus No. 200		≥ 15% gravel	Sandy Lean Clay with Gravel / Sandy Silt with Gravel
					< 15% sand	Gravelly Lean Clay / Gravelly Silt
			≥30% plus No. 200		≥ 15% sand	Gravelly Lean Clay with Sand / Gravelly Silt with Sand
			<30% plus No. 200	<15% plus No. 200		Silty Clay
				15-30% plus No. 200	% sand ≥ % gravel	Silty Clay with Sand
			≥30% plus No. 200		% sand < % gravel	Silty Clay with Gravel
					< 15% gravel	Sandy Silty Clay
					≥15% gravel	Sandy Silty Clay with Gravel
					< 15% sand	Gravelly Silty Clay
					≥ 15% sand	Gravelly Silty Clay with Sand
	35% ≤ *LL < 50% Intermediate Plasticity	CI	<30% plus No. 200	<15% plus No. 200		Clay
				15-30% plus No. 200	% sand ≥ % gravel	Clay with Sand
			≥30% plus No. 200		% sand < % gravel	Clay with Gravel
					< 15% gravel	Sandy Clay
					≥ 15% gravel	Sandy Clay with Gravel
					< 15% sand	Gravelly Clay
	*LL > 50% High Plasticity	CH Fat Clay Plots Above A Line -OR- MH Elastic Silt Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Fat Clay or Elastic Silt
				15-30% plus No. 200	% sand ≥ % gravel	Fat Clay with Sand
			≥30% plus No. 200		% sand < % gravel	Elastic Silt with Sand
						Fat Clay with Gravel / Elastic Silt with Gravel
					< 15% gravel	Sandy Fat Clay / Sandy Elastic Silt
					≥ 15% gravel	Sandy Fat Clay with Gravel / Sandy Elastic Silt with Gravel
			<30% plus No. 200		< 15% sand	Gravelly Fat Clay / Gravelly Elastic Silt
					≥ 15% sand	Gravelly Fat Clay with Sand / Gravelly Elastic Silt with Sand
			≥30% plus No. 200			

* LL = Liquid Limit
 * PI = Plasticity Index

BORING LOG EXPLANATION

Depth, ft.	Sample	Sample Type	SOIL DESCRIPTION
1	1-1	3	Soil Sample Number L = 3" Outside Diameter M = 2.5" Outside Diameter T = 2" Outside Diameter ST = Shelby Tube B = Bag Sample 1, 2, 3 = Retained Samples = Retained Sample  ← Ground water elevation
2	L	2	
3		1	
4			
5			

MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

CONSISTENCY

DESCRIPTION	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 - 0.5	2 - 4
FIRM	0.5 - 1.0	5 - 8
STIFF	1.0 - 2.0	9 - 15
VERY STIFF	2.0 - 4.0	16 - 30
HARD	> 4.0	> 30

KEY TO SOIL CLASSIFICATION - COARSE GRAINED SOILS
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		FINES	GRADE/TYPE OF FINES	SYMBOL	GROUP NAME *
GRAVEL	More than 50% of coarse fraction is larger than No. 4 sieve size	<5%	$Cu \geq 4$ and $1 \leq Cc \leq 3$	GW	Well-Graded Gravel / Well-Graded Gravel with Sand
			$Cu < 4$ and/or $1 > Cc > 3$	GP	Poorly Graded Gravel / Poorly Graded Gravel with Sand
		5-12%	ML or MH	GW - GM	Well-Graded Gravel with Silt / Well- Graded Gravel with Silt and Sand
				GP - GM	Poorly Graded Gravel with Silt / Poorly Graded Gravel with Silt and Sand
			CL, CI or CH	GW - GC	Well-Graded Gravel with Clay / Well-Graded Gravel with Clay and Sand
				GP - GC	Poorly Graded Gravel with Clay / Poorly Graded Gravel with Clay and Sand
		>12%	ML or MH	GM	Silty Gravel / Silty Gravel with Sand
			CL, CI or CH	GC	Clayey Gravel / Clayey Gravel with Sand
			CL - ML	GC - GM	Silty, Clayey Gravel / Silty, Clayey Gravel with Sand
SAND	50% or more of coarse fraction is smaller than No. 4 sieve size	<5%	$Cu \geq 6$ and $1 \leq Cc \leq 3$	SW	Well-Graded Sand / Well-Graded Sand with Gravel
			$Cu < 6$ and/or $1 > Cc > 3$	SP	Poorly Graded Sand / Poorly Graded Sand with Gravel
		5-12%	ML or MH	SW - SM	Well-Graded Sand with Silt / Well- Graded Sand with Silt and Gravel
				SP - SM	Poorly Graded Sand with Silt / Poorly Graded Sand with Silt and Gravel
			CL, CI or CH	SW - SC	Well-Graded Sand with Clay / Well-Graded Sand with Clay and Gravel
				SP - SC	Poorly Graded Sand with Clay / Poorly Graded Sand with Clay and Gravel
		>12%	ML or MH	SM	Silty Sand / Silty Sand with Gravel
			CL, CI or CH	SC	Clayey Sand / Clayey Sand with Gravel
			CL - ML	SC - SM	Silty, Clayey Sand / Silty, Clayey Sand with Gravel

* The term "with sand" refers to materials containing 15% or greater sand particles within a gravel soil, while the term "with gravel" refers to materials containing 15% or greater gravel particles within a sand soil.

US STANDARD SIEVE SIZE:	3 inch	¾ inch	No. 4	No. 10	No. 40	No. 200	0.002 µm
	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES AND BOULDERS	GRAVEL		SAND			SILT	CLAY


RELATIVE DENSITY


DESCRIPTION	STANDARD PENETRATION (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50


MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table


LOGGED BY <u>CLA</u>		DATE DRILLED <u>10/4/17</u>		BORING DIAMETER <u>6" SS</u>		BORING NO. <u>1</u>					
DRILL RIG <u>CCD Tractor with Wireline</u>				HAMMER TYPE <u>140 lb Down-Hole Safety Hammer</u>							
Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	% Passing #200 Sieve	Dry Density (pcf)	Moisture Content (%)	Additional Lab Results
1	1-1 L	2	SILTY SAND: Dark brown (10YR 3/3) changing to yellowish brown (10YR 5/6), very fine to fine grained with trace medium and coarse grains, poorly graded, quartz rich, poorly indurated, scattered rootlets, trace granitic gravels up to ½ inch in diameter, micaceous, 2 inch diameter sandstone gravel at 2 feet, dry, loose	SM	6	8		34	76	7	Non Plastic
2		1			7						
3	1-2 L	2			9						
4		1			7						
5			Increase in coarse to very coarse grained granitic sand and gravel, (completely weathered DG)		7	8		20	80	8	
6	1-3 T				7						
7					10						
8	1-4 L	2			14						
9		1	More competent/less weathered than the previous sample, increase in content of coarse to very coarse grains, lack of rootlets, very dense		29	50/6"	50/6"	11	110	5	
10	1-5 L	1			15						
11					50/6"						
12					50/6"						
13			Increase in content of coarse to very coarse sand grains		50/6"	50/6"			102	5	
14											
15	1-6 T										
16											
17			Less competent/more pulverized than the previous sample, slightly moist		32	50/6"	50/6"				
18											
19											
20	1-7 T										
21			GRANITIC ROCK: WEATHERED TO SAND WITH SILT: Olive brown (2.5Y 4/3), brownish yellow (10YR 6/8), white (WHITE 9.5/N), and black (10YR 2/1), very fine to very coarse grained, sub-angular to sub-rounded shaped, poorly graded, friable, micaceous, slightly moist, soft rock hardness		27	50/6"	50/6"				
22											
23											
24											
25			Boring terminated at 21 feet. No groundwater encountered.								

 <div>Pacific Crest ENGINEERING INC</div>	Log of Test Borings San Vicente Staging Area Santa Cruz County, California	Figure No. 5 Project No. 17103 Date: 1/11/18
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LOGGED BY <u>CLA</u>			DATE DRILLED <u>10/4/17</u>		BORING DIAMETER <u>6" SS</u>			BORING NO. <u>2</u>				
DRILL RIG <u>CCD Tractor with Wireline</u>					HAMMER TYPE <u>140 lb Down-Hole Safety Hammer</u>							
Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	% Passing #200 Sieve	Dry Density (pcf)	Moisture Content (%)	Additional Lab Results	
1	2-1 L	2	SILTY SAND: Dark brown (10YR 3/3) very fine to fine grained, poorly graded,quartz rich, poorly indurated, scattered mica flakes, scattered rootlets, trace sub-rounded shaped, granitic gravels up to ½ inch, dry, very loose	SM	3	4						
		2			3							
2		1			4							
3	2-2 L	2	Slight increase in gravel and rootlet content, trace coarse to very coarse grained granitic sand, loose		4	6			78	9		
		2			5							
4		1			6							
5	2-3 T		Medium dense	SM	12	43						
6			DECOMPOSED GRANITE: WEATHERED TO SILTY SAND: Olive brown (2.5Y 4/3), brownish yellow (10YR 6/8), white (WHITE 9.5/N), and black (10YR 2/1), very fine to very coarse grained, angular to sub-rounded shaped, poorly graded, friable, pulverized, micaceous, dry, dense		18							
7					25							
8	2-4 L	1	More competent/less weathered than the previous sample, lack of brownish yellow, trace red (2.5YR 4/6) patches, very dense		17	50/6"		7	106	5	Sand = 89% Gravel = 49% Fines = 7%	
9					50/6"							
10	2-5 L	1	Slightly less weathered, trace sub-angular shaped granitic gravels up to ½ inch in diameter		19							
11					50/6"	50/6"						
12												
13			Dense, consistent drilling to 15 feet									
14												
15	2-6 T		 White, black, and yellowish red (5YR 4/6), fairly competent, increase in content of coarse to very coarse grains, moist		27	50/6"						
16				50/6"								
17			Boring terminated at 16 feet. Groundwater initially encountered at 14'9".									
18												
19												
20												
21												
22												
23												

 Pacific Crest ENGINEERING INC	Log of Test Borings San Vicente Staging Area Santa Cruz County, California	Figure No. 6 Project No. 17103 Date: 1/11/18
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LOGGED BY <u>CLA</u>		DATE DRILLED <u>10/4/17</u>		BORING DIAMETER <u>6" SS</u>		BORING NO. <u>3</u>						
DRILL RIG <u>CCD Tractor with Wireline</u>				HAMMER TYPE <u>140 lb Down-Hole Safety Hammer</u>								
Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	% Passing #200 Sieve	Dry Density (pcf)	Moisture Content (%)	Additional Lab Results	
1	3-1 L	2	SILTY SAND: Brown (10YR 4/3), very fine to fine grained with trace medium and coarse grains, poorly graded, quartz and granitic sand, poorly indurated, micaceous, scattered rootlets, dry, loose	SM	3	5			80	8	R2 = 22% fines	
2		1			4							
3	3-2 L	2			5							
4		1	DECOMPOSED GRANITE: WEATHERED TO SILTY SAND: Olive brown (2.5Y 4/3), brownish yellow (10YR 6/8), white (WHITE 9.5/N), and black (10YR 2/1), very fine to very coarse grained, angular to sub-rounded shaped, poorly graded, friable, micaceous, trace rootlets, dry, loose Olive brown, reddish yellow (7.5YR 6/9), white and black, increase in content of coarse to very coarse grained sand, less weathered dense	SM	7	9			85	9		
5	3-3 T				8							
6					10							
7					17							
8	3-4 L	1			23							
9			Yellowish red (5YR 5/6), very dense		34	57		17		9		
10	3-5 L	1			28							
11					50/6"							50/6"
12			Yellowish red, brownish yellow, olive brown, white, and black, slightly more competent than the previous sample, slightly moist Boring terminated at 11 feet. No groundwater encountered.		28	50/6"						
13					50/6"							50/6"
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

 Pacific Crest ENGINEERING INC	Log of Test Borings San Vicente Staging Area Santa Cruz County, California	Figure No. 7 Project No. 17103 Date: 1/11/18
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LOGGED BY <u>CLA</u>			DATE DRILLED <u>10/4/17</u>			BORING DIAMETER <u>6" SS</u>			BORING NO. <u>4</u>								
DRILL RIG <u>CCD Tractor with Wireline</u>					HAMMER TYPE <u>140 lb Down-Hole Safety Hammer</u>												
Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	% Passing #200 Sieve	Dry Density (pcf)	Moisture Content (%)	Additional Lab Results						
1	4-1 L	2	SILTY SAND: Dark brown (10YR 3/3), very fine to fine grained, poorly graded, quartz rich, poorly indurated, trace medium grains, scattered mica flakes, scattered rootlets, slightly damp to dry, loose	SM	3	6			78	8							
2		1			5												
3	4-2 L	2			6												
4		1	Decrease in rootlet content	SM	3	9			84	8							
5					5												
6	4-3 T		DECOMPOSED GRANITE: WEATHERED TO SILTY SAND: Olive brown (2.5Y 4/3), brownish yellow (10YR 6/8), and white (WHITE 9.5/N), very fine to very coarse grained, angular to sub-rounded shaped, poorly graded, friable, micaceous, pulverized, dry, loose		13												
7					5												
8					8												
9	4-4 L	2	Decrease in silt content, slight decrease in coarse to very coarse grains, medium dense		13							21	16	8			
10					19							17			100	8	
11		1	Not as competent as the previous sample, slightly moist to dry		14												
12					19												
13	4-5 L	2	Slight increase in coarse to very coarse grained material		25							27				105	8
14		1		27													
15																	
16			Boring terminated at 11½ feet. No groundwater encountered.														
17																	
18																	
19																	
20																	
21																	
22																	
23																	

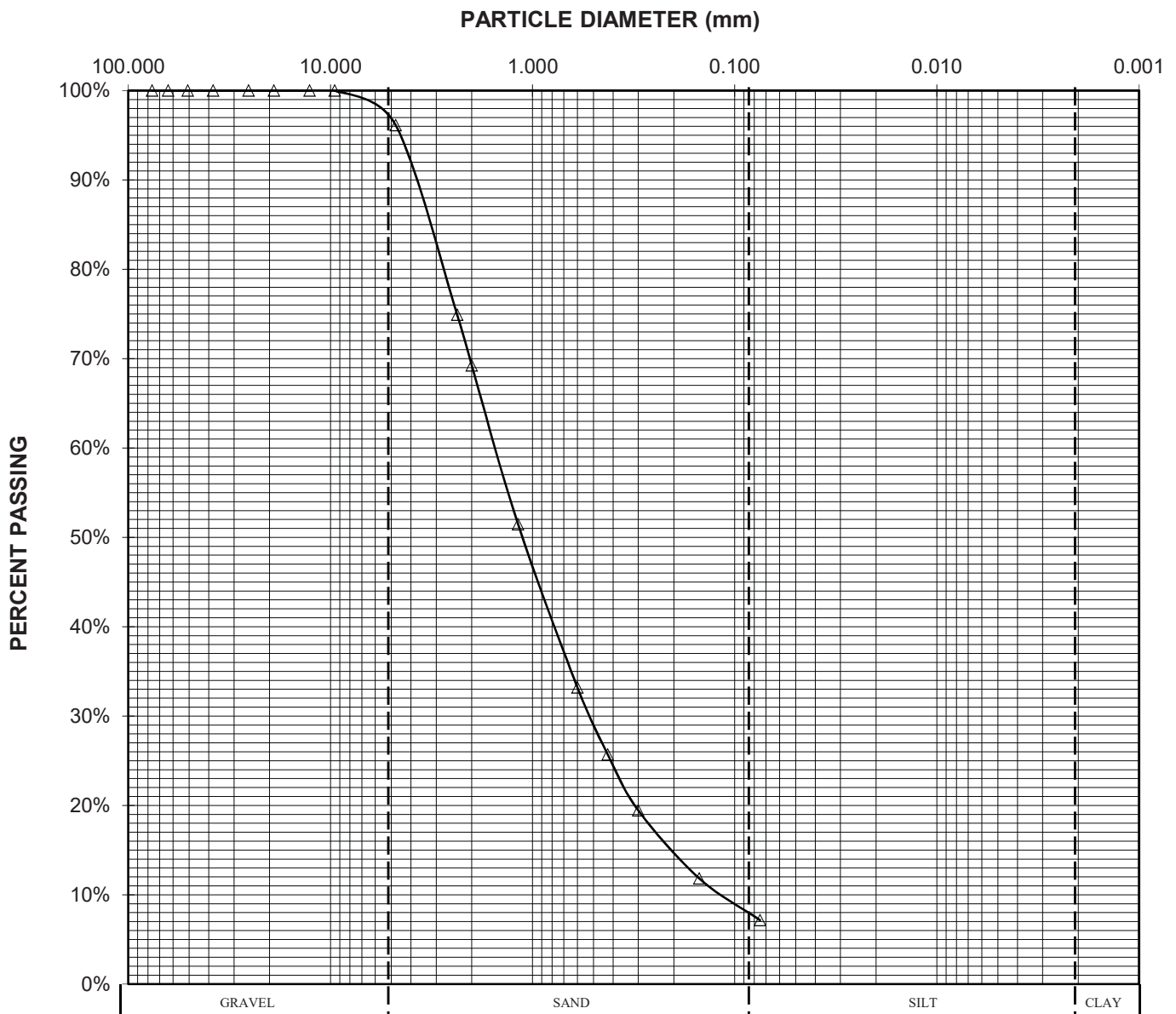
 Pacific Crest ENGINEERING INC	Log of Test Borings San Vicente Staging Area Santa Cruz County, California	Figure No. 8 Project No. 17103 Date: 1/11/18
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LOGGED BY <u>CLA</u>			DATE DRILLED <u>10/4/17</u>		BORING DIAMETER <u>6" SS</u>			BORING NO. <u>5</u>			
DRILL RIG <u>CCD Tractor with Wireline</u>					HAMMER TYPE <u>140 lb Down-Hole Safety Hammer</u>						
Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	% Passing #200 Sieve	Dry Density (pcf)	Moisture Content (%)	Additional Lab Results
1	5-1 L		SILTY SAND: Dark brown (10YR 3/3), very fine to fine grained, poorly graded, quartz rich, poorly indurated, micaceous, scattered rootlets, trace coarse to very coarse grains, trace sub-rounded shaped granitic gravels up to ½ inch, dry, very loose	SM	1	4		21	81	11	R1 = 22% fines
2		1			3						
3	5-2 L	2			4						
4		1	Decrease in rootlet content, slightly damp to dry	SM	6	8			81	9	
5	5-3 T		DECOMPOSED GRANITE: WEATHERED TO SILTY SAND: Brownish yellow (10YR 6/6), very pale brown (10YR 8/2), and white (WHITE 9.5/N), very fine to coarse grained, angular to sub-rounded shaped, poorly graded, scattered mica flakes, trace rootlets, friable, dry, loose Less weathered/more competent than the previous sample, trace yellowish red (5YR 5/8) patches, slightly moist to dry, medium dense								
6					9						
7					6						
8	5-4 L	2			12						
9		1		14							
10	5-5 L		15								
11			27	22							
12		1	19								
13			Red (2.5Y 4/6) changing to yellowish red (5YR 5/8), gray (10YR 6/1), white (10YR 8/1), and brownish yellow (10YR 6/8), trace binder		50/6"	50/6"			112	7	
14			Red, gray, and white, increase in coarse grain content, less weathered/more competent than the previous sample								
15			Boring terminated at 11½ feet. No groundwater encountered.								
16											
17											
18											
19											
20											
21											
22											
23											

 Pacific Crest ENGINEERING INC	Log of Test Borings San Vicente Staging Area Santa Cruz County, California	Figure No. 9 Project No. 17103 Date: 1/11/18
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PARTICLE SIZE ANALYSIS - T11/C136

SAMPLE NO: 2-4-1	% PASSING	% PASSING
	No. 4	No. 200
	96.1%	7.2%

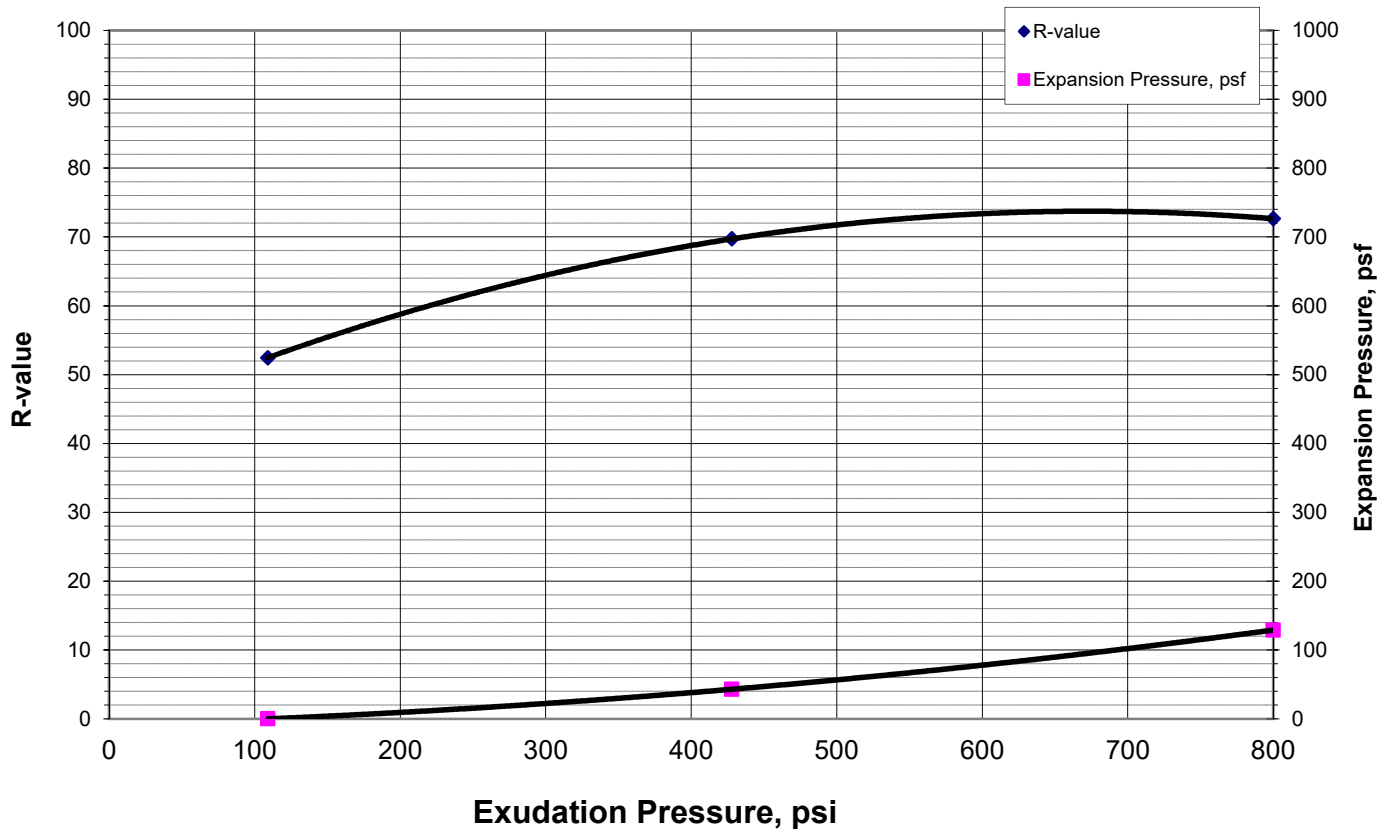


GRAVEL	SAND	SILT + CLAY
3.9%	89.0%	7.2%



R-value Test Report (Caltrans 301)

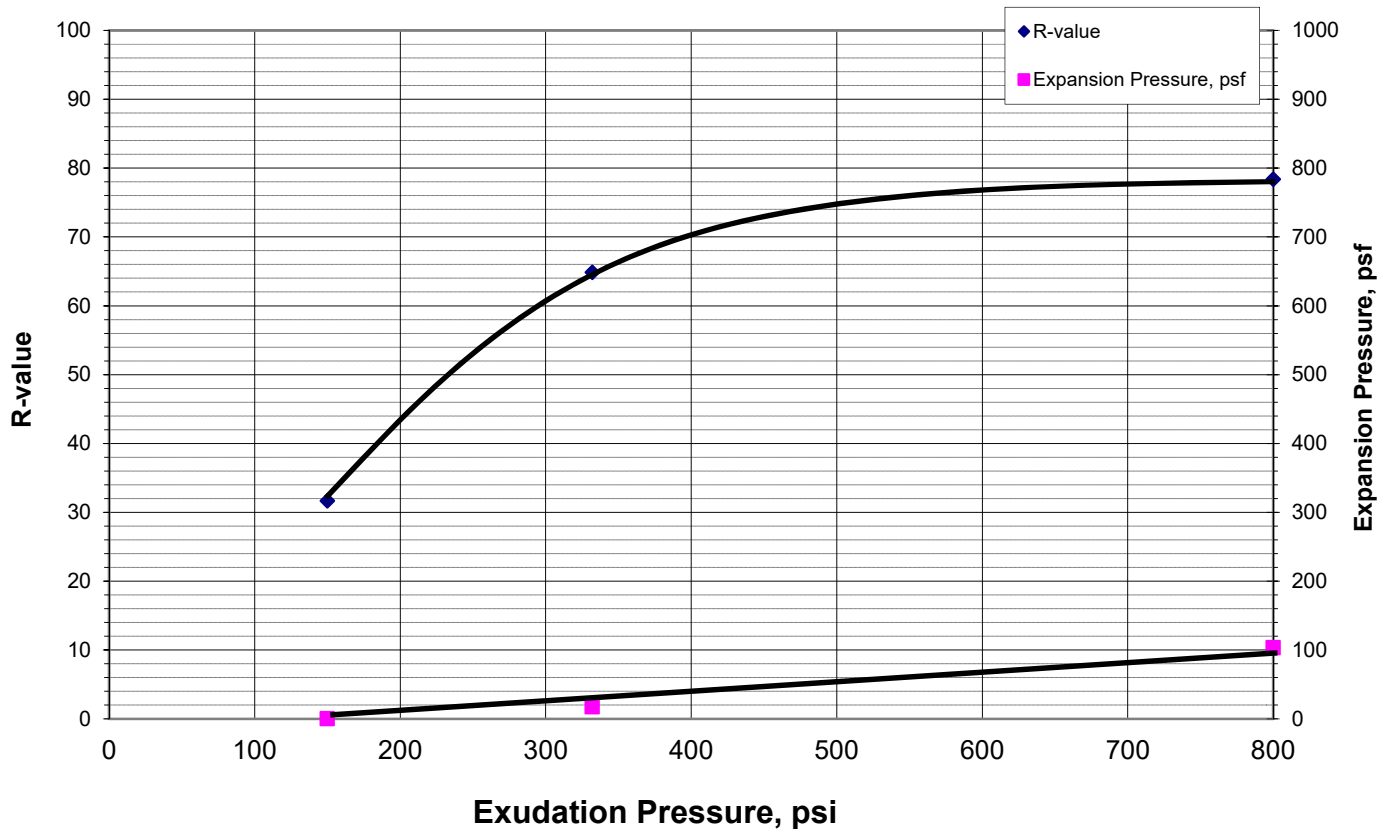
Job No.:	416-568	Date:	10/27/17	Initial Moisture,	11.5
Client:	Pacific Crest Engineering	Tested	PJ	R-value	64
Project:	San Vicente - 17103	Reduced	RU	Expansion Pressure	20 psf
Sample	B-3;R-2 @ 3-6'	Checked	DC		
Soil Type: Olive Brown Silty SAND (slightly plastic)					
Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	800	109	428		
Prepared Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	27	85	54		
Weight of Soil & Mold, grams	3031	3096	3084		
Weight of Mold, grams	2106	2098	2083		
Height After Compaction, in.	2.31	2.38	2.42		
Moisture Content, %	14.0	19.4	16.5		
Dry Density, pcf	106.5	106.4	107.6		
Expansion Pressure, psf	129	0	43		
Stabilometer @ 1000					
Stabilometer @ 2000	26	50	31		
Turns Displacement	4.15	4.38	4.20		
R-value	73	52	70		





R-value Test Report (Caltrans 301)

Job No.:	416-568	Date:	10/27/17	Initial Moisture,	12.1
Client:	Pacific Crest Engineering	Tested	PJ	R-value	60
Project:	San Vicente - 17103	Reduced	RU	Expansion Pressure	20 psf
Sample	B-5;R-1 @ 3-6'	Checked	DC		
Soil Type: Olive Brown Silty SAND (slightly plastic)					
Specimen Number	A	B	C	D	Remarks:
Exudation Pressure, psi	332	800	150		
Prepared Weight, grams	1200	1200	1200		
Final Water Added, grams/cc	43	24	66		
Weight of Soil & Mold, grams	3112	3027	3153		
Weight of Mold, grams	2076	2077	2093		
Height After Compaction, in.	2.44	2.31	2.45		
Moisture Content, %	16.1	14.3	18.2		
Dry Density, pcf	110.9	109.1	110.9		
Expansion Pressure, psf	17	103	0		
Stabilometer @ 1000					
Stabilometer @ 2000	35	20	84		
Turns Displacement	4.56	4.20	4.65		
R-value	65	78	32		



Attachment 8

Drainage Analysis



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August 15, 2018

Bryan Largay
Land Trust of Santa Cruz County
617 Water Street
Santa Cruz, CA 95060

Subject: **Drainage Analysis**
 San Vicente Redwoods Staging Area, APN 080-011-420
 Empire Grade, Santa Cruz County, California

Dear Bryan:

Fall Creek Engineering, Inc. (FCE) is pleased to present to you this drainage analysis for the proposed staging area at San Vicente Redwoods located off Empire Grade in Santa Cruz County, California. The purpose of this letter report is to present our evaluation of the existing and proposed drainage conditions at the site. In summary, FCE recommends on-site retention of stormwater through the use of best management practices (BMPs) that include vegetated retention basins (vegetated basins) and vegetated conveyance swales (vegetated swales).

The proposed staging area project includes new roads, parking stalls, accessible parking stalls, and a vault restroom building. The majority of the roads and parking area will be surfaced with aggregate base rock material. The new accessible parking spaces, driving aisle, and pad for the vault restroom will be surfaced with concrete. The accessible access routes from the accessible parking spaces will be surfaced with stabilized DG. The entrance and exit to the site off Empire Grade will be surfaced with asphalt concrete. Additional impervious surfaces include the vault restroom building and two new above-grade water tanks.

Onsite drainage improvements have been designed to infiltrate runoff from the proposed improvements. The drainage improvements have been designed to meet the requirements of the County of Santa Cruz Design Criteria (Feb 2017 edition). Attachment 1 presents the Site Improvement Plan for the staging area, which includes an overview of the existing and proposed drainage conditions.

The proposed drainage improvements include vegetated basins and vegetated swales. The vegetated basins are designed for retention of the 2-year, 2-hour storm and detention of the 10-year, 15-minute storm event. The vegetated swales are designed to convey stormwater runoff to vegetated basins.

FCE has performed drainage calculations for the proposed drainage improvements on the site. This letter report presents these drainage calculations and the results.

1. Existing Conditions

The site is located off of Empire Grade in the Santa Cruz Mountains. The site is situated on a northwest facing hillside with an average slope of 10%. The runoff on the site sheet flows from east to west in undeveloped forested areas to a swale downslope, which eventually feeds into Big

Creek located approximately 1.5 miles downstream of the site. There are two minor drainages that cross the site with small drainage areas and poor definition. Plants species on site consist primarily of coulter pine, douglas fir, madrone, coast live oak, tan oak, manzanita, and coffee berry.

The existing site includes an existing unpaved road with a gate at the entrance off Empire Grade and an existing unpaved trail. The staging area is proposed in an undeveloped area that is currently forested, with the primary tree species of Coulter Pine. This site was selected for development as these planted Coulter Pines pose both a fire hazard and are planted trees not native to this area that are aesthetically unpleasing, so tree removal is desirable.

The site includes an existing dirt road that is used to access the site for emergencies and for PG&E maintenance. The existing road is thru-cut in many locations and currently concentrates stormwater on the road until it is dispersed as sheetflow to vegetated areas downslope of the site. Drainage is an issue on this road and there is currently active erosion, causing the road to become more eroded and thru-cut over time. Additionally, runoff from Empire Grade flows onto the road, which is exacerbating the road's drainage issues.

The site also includes an existing trail that, in general, runs parallel to Empire Grade Road. The existing trail is outsloped and includes grade reversals to allow runoff to flow off the trail. The existing trail does not currently have any issues with drainage or erosion.

Soil Conditions

FCE evaluated the soils on the site using the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey. The results of the soil survey show that the primary soil type within the proposed site improvements area is Ben Lomond Sandy Loam. The Ben Lomond Sandy Loam soils are characterized as well-drained with moderate permeability (Ksat) ranging from 0.03 – 0.28 inch/hour of the most limiting layer. The site soils are a part of hydrologic soil group A and are appropriate for stormwater infiltration through the creation of vegetated basins. To be conservative, FCE has designed the vegetated basins using the lowest Ksat value of the published range of 0.03 in/hr. The USDA Soil Survey for this site is included in Attachment 6.

The project geotechnical engineer completed a site investigation including subsurface exploration with soil borings. The results of the site investigation are documented in the project geotechnical engineering report, included in Attachment 7. The soil borings encountered 3.5 – 5 feet of colluvial soil composed of loose to very loose silty sand overlying decomposed granite bedrock. Groundwater was encountered in one boring at a depth of 15 feet below ground surface.

2. Proposed Site Improvements

The proposed site improvements include a new staging area and trailhead for public access to the proposed trail network within San Vicente Redwoods. The staging area includes roads for access and circulation, parking areas, fire water storage and a wharf fire hydrant, and a vault restroom building. The roads and parking areas will be primarily surfaced with compacted aggregate base. The accessible parking and the vault restroom building pad will be surfaced with concrete. The accessible paths of travel from the accessible parking will be surfaced with

stabilized DG. The entrance and exit to the site off Empire Grade will be surfaced with asphalt concrete.

The existing unpaved road will be re-graded and filled, in lifts, to eliminate the existing thru-cut condition and alleviate the concentration of stormwater. The existing road will increase in elevation in order to meet the elevation of the vault restroom building. The existing trail will also be graded in order to meet the elevation of the vault restroom building and to provide an accessible route to the project's accessible trail segment. The existing road and existing trail will have a finished surfaced of compacted native soil, similar to their current condition.

FCE calculated the impervious area for the project, which is summarized in Table 1.

Table 1. Proposed Project Impervious Area

Improvement	Area (ft ²)	Surface Type	Weight	Impervious Area (SF)
Vault Restroom	171	Roof	100%	171
Accessible Parking and Driving Aisle	2,243	Concrete	100%	2,243
Water Tanks	226	Roof	100%	226
Accessible Access Route	489	Stabilized DG	100%	489
Armored Drainage Crossing	1,003	Articulated Concrete Mat	100%	1,003
Roads and Parking Areas	44,196	Compacted Aggregate Base	50%	22,098
Entrance and Exit	4,029	Asphalt Concrete	100%	4,029
Impervious Area Created by Project				30,259

The compacted aggregate base surfacing is considered a "semi-pervious" material. FCE gave a weight of 50% to this material towards the total impervious area calculations for the site, which is consistent with published runoff values for this material. The total impervious area created by the project is 30,259 square feet.

3. Regulatory Criteria

The drainage improvements for the staging area at San Vicente Redwoods have been designed to comply with the 2017 County of Santa Cruz Design Criteria, Part 3 Stormwater Management (Design Criteria). The Design Criteria defines "Large Projects" as site development projects where the land disturbing activity results in the addition or replacement of impervious surfaces greater than 5,000 square feet. Large projects shall be designed to include BMPs to minimize and mitigate pollutant and hydrologic impacts that may result from the site development. The proposed staging area at San Vicente Redwoods creates 30,259 square feet of impervious surface and is therefore considered a large project.

The new compacted aggregate base roadway and parking lot are considered semi-pervious areas and are self-mitigating due to the porosity of the material (as shown in the drainage calculations below). In addition, the site BMPs have been sized to accommodate runoff from these semi-pervious areas to manage stormwater from high intensity rain events, where stormwater may not have the chance to infiltrate fully into the porous pavement section. BMP sizing calculations are summarized in the sections below. FCE has included a detailed site assessment and BMP

analysis required by the Design Criteria for large projects. The Design Criteria call for use of retention treatment systems for management of stormwater runoff. These BMPs shall be designed to infiltrate the 2-year, 2-hour storm as well as manage the 10-year, 15-minute storm such that site discharge rates do not exceed those for pre-development conditions.

FCE analyzed the stormwater runoff for retention of a 2-year, 2-hour storm, and detention of a 10-year, 15-minute storm event. For sizing of the proposed vegetated basins, FCE utilized the Runoff Retention by the Storage Percolation Method, as provided by the County and cited as Figure SWM-24. Each vegetated basin proposed at the site was sized for retention of a 2-year, 2-hour storm, and detention of a 10-year, 15-minute storm event. Furthermore, the site as a whole was reviewed to ensure that site runoff does not exceed the pre-development condition for a minimum 10-year, 15-minute storm event. Finally, the proposed vegetated basins have all been over-sized and will accommodate larger storms than required by the Design Criteria. Any overflow from the vegetated basins will sheetflow to natural, landscaped areas. This overflow conveyance via sheetflow will accommodate the 25-year storm as required by the Design Criteria for a site size of 0 – 100 acres. The following section summarizes these drainage calculations.

4. Drainage Calculations

FCE proposes to use seven vegetated basins to manage both concentrated stormwater runoff from the proposed impervious areas and runoff from areas with existing drainage issues. Other areas of the site that are surfaced by semi-pervious surfaces, such as aggregate base road surfacing, are designed to be self-mitigating due to the porosity of the material. Any runoff occurring from these areas during high intensity storms will sheetflow to natural vegetated areas where soil infiltration will occur.

The seven vegetated basins proposed at the site are labeled Drainage Features #1 - #7. The locations of the proposed drainage features and their contributing drainage areas are shown in Attachment 2.

- Drainage Feature #1 will collect and manage run-on to the site from existing Empire Grade, which is paved with asphalt concrete as well as run-off from the adjacent entrance to the site, which is also paved with asphalt concrete.
- Drainage Feature #2 will collect and manage runoff from the top of the existing entrance road to the site in order to minimize stormwater runoff down the existing road, which is currently a drainage issue on the site.
- Drainage Feature #3 will collect and manage runoff from the adjacent concrete paved accessible parking area and roof runoff from the vault restroom building.
- Drainage Feature #4 will collect and manage runoff from the concrete paved accessible parking areas.
- Drainage Feature #5 will collect and manage runoff from a portion of the main aggregate base paved parking area.
- Drainage Feature #6 will collect and manage run-on to the site from undeveloped areas. An existing drainage path crosses Drainage Feature #6, and the intention of this vegetated basin is to minimize concentrated flow over the parking area circulation road.

In addition to the vegetated basin, an armored drainage crossing will be installed on the road where the drainage path leaves from the vegetated basin.

- Drainage Feature #7 will collect and manage run-off from the adjacent exit from the site, which is paved with asphalt concrete.

Any overflow from the proposed vegetated basins will sheetflow to natural, vegetated areas.

FCE calculated the storage volume required to retain a 2-year, 2-hour storm as required by the Design Criteria, using the Runoff Retention by the Storage Percolation Method. The Storage Percolation Method is based on the Modified Rational Method, with adaptations to account for soil infiltration. Additionally, the drainage features were sized for detention of the 10-year, 15-minute storm event using the Modified Rational Method as indicated from the Design Criteria. Finally, the proposed vegetated basins are designed such that any overflow will sheetflow from the site. This overflow method has been designed to accommodate the 25-year storm.

The Design Criteria stipulate that only impervious areas should be used in the Runoff Retention by the Storage Percolation Method sizing spreadsheet. FCE used the impervious and semi-impervious areas with a weighted runoff coefficient in the sizing spreadsheet. One of the proposed vegetated basins at the site will only manage run-off from natural vegetated areas. This basin was sized with the spreadsheet using the entire drainage area and the pre-development runoff coefficient for the entire drainage area.

The site has been broken into drainage areas for each drainage feature for the analysis. The drainage areas are presented in Attachment 2. Several overall site parameters were used in all calculations as shown in Table 2, including the site isopleth value, rational runoff coefficients, and soil parameters.

Table 2. General Parameters for Retention Drainage Feature Sizing

Parameters	Value	Source
Site location P60 isopleth	2.4	Fig. SWM-2
Site rational runoff coefficients		
Pre-development	0.45	Chow, <i>Applied Hydrology</i> USGS Soils Report: Ben Lomond Sandy Loam - Ksat
Saturated soil permeability (in/hr)	0.03	
Available water storage in soil (in)	6.1	USGS Soils Report: Ben Lomond Sandy Loam

The site isopleth P60 value was determined based on the project location and using the Design Criteria's Figure SWM-2.

The runoff coefficients were determined for both the pre-development conditions and the post-development conditions (see Rational Method calculations in Attachment 5 for post-development runoff coefficients). Runoff coefficients were determined from published values¹. Weighted runoff coefficients were determined for each drainage area based on the surface types and areas within that drainage area. The overall post-development weighted runoff coefficient for

¹ Chow, et al, 1988, *Applied Hydrology*, McGraw-Hill. Table 15.1.1 Runoff coefficients for use in the rational method.

the site was also determined. The drainage area for the site is defined as the drainage area to a point downstream which contains the entire site. A complete description of the drainage area parameters, including the overall weighted runoff coefficients, for each drainage area are presented in Attachment 3, and a summary is presented below in Table 3.

Lastly, the saturated soil permeability value and available water storage in soil came from the USGS Soils Report (Attachment 6) for Ben Lomond Sandy Loam.

Aggregate Base Surfaced Areas Self-Mitigation

FCE analyzed the proposed semi-impervious compacted aggregate base roads and parking areas for self-mitigation via storage of rainfall in the void spaces in the pavement surface. FCE utilized a porosity for compacted aggregate base of 30%². The proposed pavement section for compacted aggregate base road surfacing is 8-inches thick per the recommendations in the project geotechnical engineering report (Attachment 7) for a traffic index of 5.0. An 8-inch compacted aggregate base pavement section will have a void space equivalent to 2.4 inches based on a porosity of 30%. The 2 year, 2 hour storm for the site is 0.82 inches (calculated from the P60 isopleth for the site of 2.4). Therefore, the proposed semi-impervious compacted aggregate base roads and parking areas are self-mitigating and will retain the rainfall depth for the 2 year, 2 hour storm as required by the design criteria.

Drainage Feature Sizing Calculations

FCE completed drainage calculations for sizing the proposed drainage features on the site using Figure SWM-24 from the Design Criteria. The basin parameters and drainage area parameters used for sizing the drainage features are presented in Attachment 3. Many of the basin characteristics and the drainage areas were determined in AutoCAD and from the basin design parameters. The percent of void space was calculated based on a weighted average of the percent of the soil void space and the open space in the basin. The soil void space value was determined from published values on soil porosity³. The basin parameters were input into the retention calculator (Figure SWM-24) and the required storage was calculated in order to size the vegetated basins or confirm that the provided size is adequate. The results from the retention calculator (Figure SWM-24) are presented in Attachment 4.

The proposed drainage features were found to meet the retention and detention requirements from the Design Criteria. Table 3 below provides a summary of the results from drainage analysis.

² WEF and ASCS, 1998, *Urban Runoff Quality Management*, Table 5.12

³ USGS, 1983, *Basic Groundwater Hydrology*, USGS Water Supply Paper 2220.

Table 3. Drainage Analysis Summary

Drainage Feature	Area (ft ²)	Depth (ft)	Storage Volume* (ft ³)	Drainage Area (ft ²)	New Impervious & Semi-Impervious Area (ft ²)	Cpre	Cpost	Required Storage Volume (ft ³)**
1	692	2	1,041	12,925	1,851	0.45	0.86	272
2	1,069	3	2,093	25,509	3,350	0.45	0.50	48
3	480	2.5	769	30,981	4,506	0.45	0.60	113
4	294	2	379	5,583	2,138	0.45	0.69	86
5	598	2	707	22,718	11,374	0.45	0.50	157
6	864	2	1,168	52,864	0	0.45	0.45	512
7	349	2	415	16,772	1,732	0.45	0.86	185

*Does not include available water storage in soil

**Required Storage Volume (does not include available water storage in soil) results from Figure SWM-24 Runoff Retention by the Storage Percolation Method

The storage volume for each drainage feature exceeds the required storage volume. Therefore, all seven drainage features have more than sufficient volume to accommodate the runoff generated by their drainage areas. All of the drainage features are over-sized as space allowed in order to accommodate larger storm events.

Site Runoff Calculations

In addition to sizing the proposed drainage features on the site, FCE completed drainage calculations to confirm that the runoff from the site does not increase as a result of the proposed development for the 10-year, 15-minute storm as required by the Design Criteria. FCE completed runoff calculations for the site under pre-development and post-development conditions using the Rational Method following the Design Criteria as presented in Attachment 5. In addition, FCE calculated the runoff from each drainage feature's drainage area using the Rational Method. Because the drainage features have all been sized to more than accommodate detention of the 10-year, 15-minute storm, these runoff volumes were subtracted from the overall site post-development runoff. A summary of the results of the site runoff calculations is presented in Table 4.

Table 4: Site Runoff Calculations using the Rational Method
($Q = C_a * C * i * A$)

Description	C_a	C	i (inches)	A (acres)	Q (cfs)
Overall Site, Pre-development	1.1	0.45	2.61	8.63	11.17
Overall Site, Post-development	1.1	0.47	2.61	8.63	11.53
Drainage Feature #1	1.1	0.56	2.61	0.30	0.48
Drainage Feature #2	1.1	0.46	2.61	0.59	0.77
Drainage Feature #3	1.1	0.47	2.61	0.71	0.96
Drainage Feature #4	1.1	0.54	2.61	0.13	0.20
Drainage Feature #5	1.1	0.48	2.61	0.52	0.71
Drainage Feature #6	1.1	0.45	2.61	1.21	1.57
Drainage Feature #7	1.1	0.51	2.61	0.39	0.56
Overall Site, Post-development with drainage features					6.28

The parameters used in the Rational Method include antecedent moisture factors (C_a), weighted runoff coefficients (C), rainfall intensity (i), and drainage area (A). These parameters are multiplied in order to determine the resultant runoff (Q). The antecedent moisture factor of 1.1 was used for all the runoff calculations as required by the Design Criteria for a return period of 25 years, which is required for site of 0 – 100 acre size. The weighted runoff coefficients were calculated for the various surface types using published values⁴ and assumed values. The rainfall intensity was calculated per the Design Criteria for a 10-year, 15-minute storm using the P60 value for the site determined from the Design Criteria's Figure SWM-2. The drainage areas were determined from AutoCAD using surveyed topographic contours, proposed grading contours, and LiDAR contours outside the limit of survey.

The results of the runoff analysis for the site show that the post-development site with the proposed drainage features does not exceed the pre-development site runoff.

5. Conclusions

Based on our Drainage Analysis, FCE concludes the following:

1. The existing site is mostly undeveloped, forested area. There is an existing unpaved road off Empire Grade to the location of the proposed Staging Area. The existing road is thru-cut and has drainage issues, with runoff concentrating on the road, causing erosion.
2. The soils on the site are well drained with moderate permeability in Hydrologic soil group A. These soils are appropriate for stormwater infiltration in vegetated basins.
3. The proposed site development creates 30,259 square feet of impervious area. This size development is classified as a "Large Project" by the Santa Cruz County Design Criteria for stormwater management (Design Criteria).
4. The majority of the parking area and proposed roads will be surfaced with compacted aggregate base, which was determined to be self-mitigating based on a porosity of 30% for this semi-impervious material.

⁴ Chow, et al, 1988, *Applied Hydrology*, McGraw-Hill. Table 15.1.1 Runoff coefficients for use in the rational method.

5. The proposed site development includes seven vegetated basins, which have been sized for retention of the 2-year, 2-hour storm and detention of the 10-year, 15-minute storm as required by the Design Criteria.
6. Two of the proposed vegetated basins have been strategically located to manage the existing drainage issues along the existing unpaved road on the site.
7. The post-development runoff rate is less than the pre-development site runoff rate, and therefore meets the requirements of the County of Santa Cruz and does not pose a risk of erosion of downstream drainage features.

This concludes our drainage analysis for the proposed staging area at San Vicente Redwoods. Thank you for the opportunity to assist you with this project. Please contact us if you have any questions or require any additional information.

Sincerely,



ROBYN COOPER, MS, PE
Senior Engineer



SAMANTHA SHARP, PE
Senior Associate Engineer

Attachments

- Attachment 1. San Vicente Redwoods Staging Area – Site Improvement Plan
- Attachment 2. San Vicente Redwoods Staging Area – Drainage Areas
- Attachment 3. San Vicente Redwoods Staging Area Basin Parameters
- Attachment 4. Figure SWM-24 Runoff Retention by Storage Percolation Method
- Attachment 5. Rational Method Calculations Overall Site and Drainage Features
- Attachment 6. USDA NRCS Soil Survey Report for San Vicente Redwoods Staging Area
- Attachment 7. Geotechnical Investigation – San Vicente Redwoods Staging Area, completed by Pacific Crest Engineering, Inc., Dated January 11, 2018

ATTACHMENTS

ATTACHMENT 1

San Vicente Redwoods Staging Area – Site Improvement Plan

DRAWN BY:	SL
CHECKED BY:	RL
DATE:	AUGUST 2018
JOB NO:	21514
SCALE:	AS SHOWN
SHEET:	

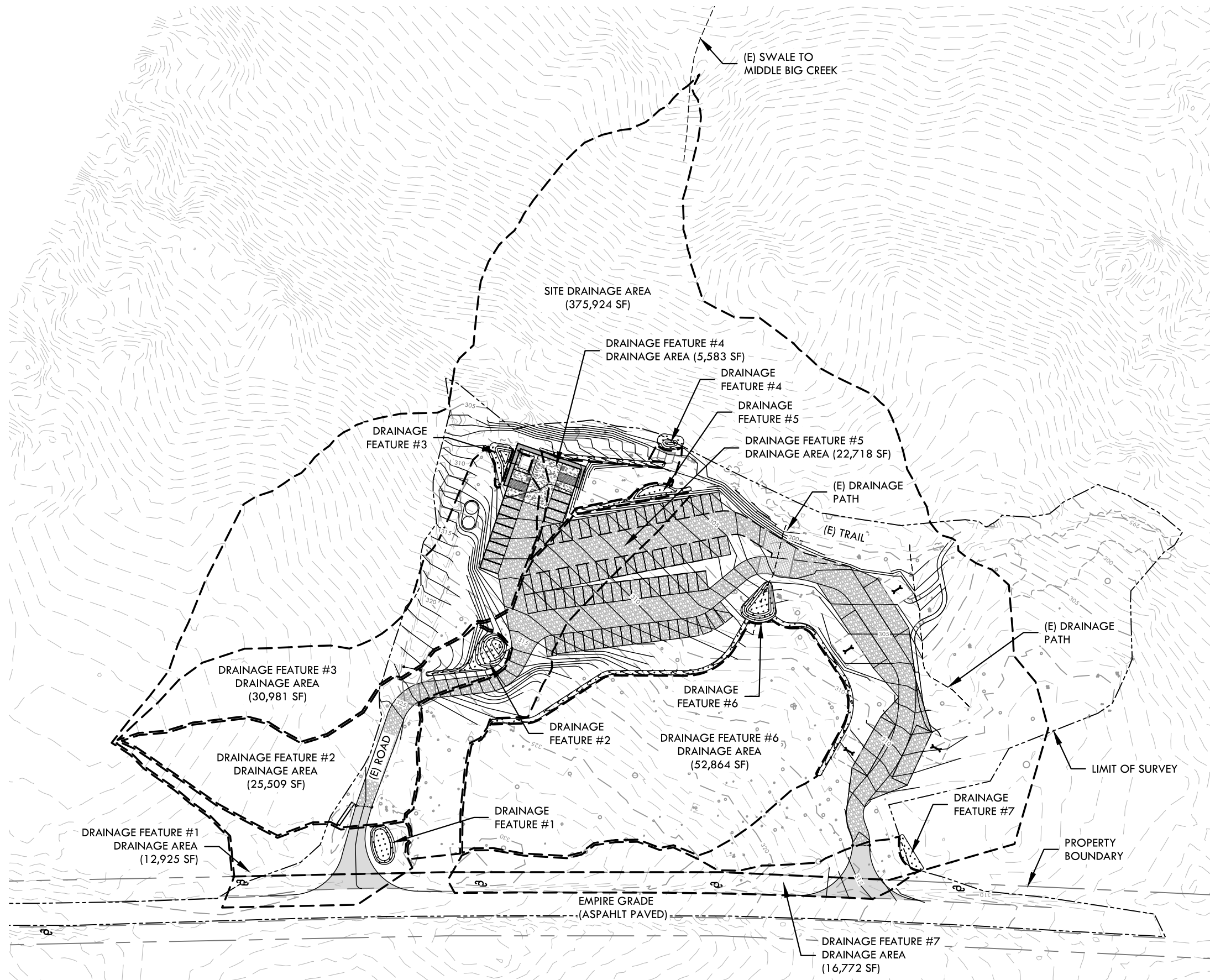
1525 SEABRIGHT AVE.
SANTA CRUZ, CA 95062
TEL. (831) 426-9054

DRAWN BY:	SL
CHECKED BY:	RL
DATE:	AUGUST 2018
JOB NO:	21514
SCALE:	AS SHOWN
SHEET:	

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

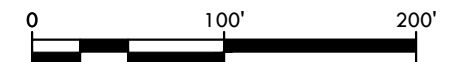
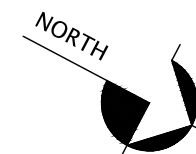
ATTACHMENT 2

San Vicente Redwoods Staging Area – Drainage Areas



- LEGEND:
- (E) CONTOUR
 - (E) DIRT ROAD/TRAIL EDGE
 - (E) ASPHALT ROAD EDGE
 - (E) DRAINAGE PATH
 - DRAINAGE AREA
 - CONTOUR
 - EDGE OF ROADWAY
 - (E) TREE
 - ⊗ (E) TREE TO BE REMOVED
 - BUILDING
 - CONCRETE ROAD SURFACING
 - AGGREGATE BASE ROAD SURFACING
 - ASPHALT CONCRETE ROAD SURFACING
 - STABILIZED DG SURFACING
 - ARTICULATED CONCRETE BLOCK
 - HORSE HITCH POST
 - SURFACE FLOW ARROW

- NOTES:
1. TOPOGRAPHIC SURVEY BY MICHAEL F. GOODHUE CIVIL ENGINEERS & LAND SURVEYORS, DATED AUGUST 2015.
 2. ELEVATION DATUM IS ASSUMED, BENCH MARK IS A NAIL AND SHINER SET IN EMPIRE GRADE, ELEVATION = 329.2'.
 3. CONTOURS SHOWN OUTSIDE THE LIMIT OF SURVEY WERE EXTRACTED FROM LIDAR DATA, ACQUIRED IN 2010 FOR THE CENTRAL COAST REGION OF CALIFORNIA.



SCALE: 1" = 100' @ 11" X 17"



ATTACHMENT 3

San Vicente Redwoods Staging Area Basin Parameters

Drainage Feature #1		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	692	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	349	AutoCAD
Volume (CF)	1,041	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	1,301	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
1,695	Asphalt	0.86
1,851	Asphalt	0.86
9,379	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.86	
New Impervious and Semi-Impervious Area	1,851	
Total Drainage Area	12,925	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	272	
Volume with soil (CF)	299	
Sizing for Detention		
Stored Volume (CF)	141	
Volume with soil (CF)	155	

Drainage Feature #2		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	1,069	AutoCAD
Depth (FT)	3	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	326	AutoCAD
Volume (CF)	2,093	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	2,441	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	94%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
3,350	Aggregate Base	0.50
22,159	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.50	
New Impervious and Semi-Impervious Area	3,350	
Total Drainage Area	25,509	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	48	
Volume with soil (CF)	51	
Sizing for Detention		
Stored Volume (CF)	27	
Volume with soil (CF)	29	

Drainage Feature #3		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	480	AutoCAD
Depth (FT)	2.5	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	134	AutoCAD
Volume (CF)	769	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	922	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	93%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
1,039	Concrete/Roof	0.88
144	Stabilized DG	0.80
3,323	Aggregate Base	0.50
26,475	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.60	
New Impervious and Semi-Impervious Area	4,506	
Total Drainage Area	30,981	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	113	
Volume with soil (CF)	121	
Sizing for Detention		
Stored Volume (CF)	62	
Volume with soil (CF)	67	

Drainage Feature #4		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	294	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	85	AutoCAD
Volume (CF)	379	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	474	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
886	Concrete/Roof	0.88
246	Stabilized DG	0.80
1,006	Aggregate Base	0.50
3,445	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.69	
New Impervious and Semi-Impervious Area	2,138	
Total Drainage Area	5,583	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	86	
Volume with soil (CF)	102	
Sizing for Detention		
Stored Volume (CF)	45	
Volume with soil (CF)	52	

Drainage Feature #5		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	598	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	110	AutoCAD
Volume (CF)	707	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	884	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
11,374	Aggregate Base	0.50
11,344	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.50	
New Impervious and Semi-Impervious Area	11,374	
Total Drainage Area	22,718	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	157	
Volume with soil (CF)	173	
Sizing for Detention		
Stored Volume (CF)	91	
Volume with soil (CF)	100	

Drainage Feature #6		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	864	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	304	AutoCAD
Volume (CF)	1,168	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	1,460	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
52,864	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.45	
New Impervious and Semi-Impervious Area	0	
Total Drainage Area	52,864	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	512	
Volume with soil (CF)	551	
Sizing for Detention		
Stored Volume (CF)	313	
Volume with soil (CF)	337	

Drainage Feature #7		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	349	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	66	AutoCAD
Volume (CF)	415	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	519	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
594	Asphalt	0.86
1,732	Asphalt	0.86
14,446	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.86	
New Impervious and Semi-Impervious Area	1,732	
Total Drainage Area	16,772	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	185	
Volume with soil (CF)	203	
Sizing for Detention		
Stored Volume (CF)	93	
Volume with soil (CF)	102	

Drainage Feature #1		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	692	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	349	AutoCAD
Volume (CF)	1,041	Calculated
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New Impervious and Semi-Impervious Area	1,851	
Total Drainage Area	12,925	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	272	
Volume with soil (CF)	299	
Sizing for Detention		
Stored Volume (CF)	141	
Volume with soil (CF)	155	

Drainage Feature #2		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	1,069	AutoCAD
Depth (FT)	3	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	326	AutoCAD
Volume (CF)	2,093	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	2,441	Calculated
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Drainage Area (SF)	Type	Runoff Coefficient
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Cpost (weighted)	0.50	
New Impervious and Semi-Impervious Area	3,350	
Total Drainage Area	25,509	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	48	
Volume with soil (CF)	51	
Sizing for Detention		
Stored Volume (CF)	27	
Volume with soil (CF)	29	

Drainage Feature #3		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	480	AutoCAD
Depth (FT)	2.5	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	134	AutoCAD
Volume (CF)	769	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
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Cpre	0.45	
Cpost (weighted)	0.60	
New Impervious and Semi-Impervious Area	4,506	
Total Drainage Area	30,981	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	113	
Volume with soil (CF)	121	
Sizing for Detention		
Stored Volume (CF)	62	
Volume with soil (CF)	67	

Drainage Feature #4		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	294	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	85	AutoCAD
Volume (CF)	379	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	474	Calculated
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Soil Void Space	55%	
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Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
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3,445	Undeveloped	0.45
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Cpost (weighted)	0.69	
New Impervious and Semi-Impervious Area	2,138	
Total Drainage Area	5,583	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	86	
Volume with soil (CF)	102	
Sizing for Detention		
Stored Volume (CF)	45	
Volume with soil (CF)	52	

Drainage Feature #5		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	598	AutoCAD
Depth (FT)	2	AutoCAD
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Drainage Area (SF)	Type	Runoff Coefficient
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11,344	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.50	
New Impervious and Semi-Impervious Area	11,374	
Total Drainage Area	22,718	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	157	
Volume with soil (CF)	173	
Sizing for Detention		
Stored Volume (CF)	91	
Volume with soil (CF)	100	

Drainage Feature #6		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	864	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	304	AutoCAD
Volume (CF)	1,168	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	1,460	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
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Cpost (weighted)	0.45	
New Impervious and Semi-Impervious Area	0	
Total Drainage Area	52,864	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	512	
Volume with soil (CF)	551	
Sizing for Detention		
Stored Volume (CF)	313	
Volume with soil (CF)	337	

Drainage Feature #7		
Basin Characteristics		
Parameter	Value	Source
Area (SF)	349	AutoCAD
Depth (FT)	2	AutoCAD
Side Slopes (H:V)	2	Design Criteria
Inner Area	66	AutoCAD
Volume (CF)	415	Calculated
Available water storage in soil (FT)	0.5	From Web Soil Survey
Volume with available soil volume (CF)	519	Calculated
Open Void Space	100%	USGS Water Supply Paper 2220 - Porosity of Soil
Soil Void Space	55%	
Weighted Void Space	91%	
Drainage Area Characteristics		
Drainage Area (SF)	Type	Runoff Coefficient
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14,446	Undeveloped	0.45
Cpre	0.45	
Cpost (weighted)	0.86	
New Impervious and Semi-Impervious Area	1,732	
Total Drainage Area	16,772	
SWM24 - Results		
Sizing for Retention		
Stored Volume (CF)	185	
Volume with soil (CF)	203	
Sizing for Detention		
Stored Volume (CF)	93	
Volume with soil (CF)	102	

ATTACHMENT 4

Figure SWM-24 Runoff Retention by Storage Percolation Method

PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #1Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: **2.40** Fig. SWM-2
 Rational Coefficients Cpre: **0.45**
 Cpost: **0.86**
 Impervious Area: **3546** ft²
 Saturated Soil Permeability: **0.03** in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.	
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	272	ft ³ storage volume calculated			Detention Rate To Storage (cfs)	Specified Detained Volume (cf)
						91	% void space assumed				
						299	ft ³ excavated volume needed				
						Structure Ratios	Length	Width*	Depth* [#]		
							15.00	10.00	1.00		
						Dimen. (ft)	18.88	12.59	1.26		
1440	0.35	0.013	0.025	-0.006	-321	317	ft ² internal surface area			-0.014	-1176
1200	0.38	0.014	0.027	-0.004	-144	222	ft ² effective surface area			-0.012	-865
960	0.41	0.015	0.029	-0.002	15	490.8	hrs estimated structure drainage time			-0.010	-571
720	0.45	0.017	0.032	0.001	149					-0.007	-301
480	0.51	0.019	0.036	0.006	244					-0.002	-66
360	0.57	0.021	0.040	0.010	270					0.001	31
240	0.65	0.024	0.046	0.015	272					0.007	106
180	0.72	0.026	0.051	0.020	259					0.012	131
120	0.82	0.030	0.058	0.028	231					0.020	141
90	0.91	0.034	0.064	0.034	208					0.026	138
60	1.04	0.039	0.074	0.043	176					0.035	126
45	1.15	0.042	0.081	0.051	154					0.043	115
30	1.32	0.049	0.093	0.063	126					0.055	99
20	1.52	0.056	0.107	0.077	102					0.069	82
15	1.67	0.062	0.118	0.088	87					0.080	72
10	1.92	0.071	0.136	0.105	69					0.097	58
5	2.43	0.090	0.172	0.141	46					0.133	40

* For pipe, use the square root of the sectional area.

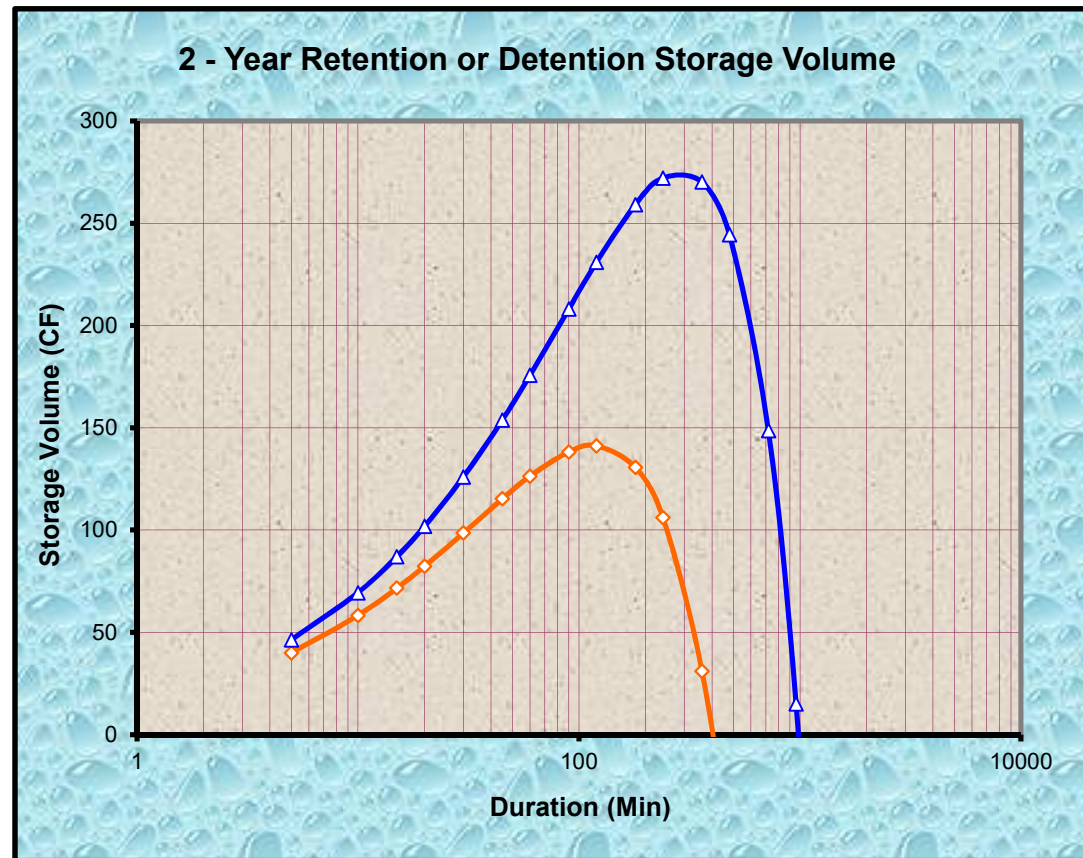
If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.

STRUCTURE DIMENSIONS FOR DETENTION141 ft³ storage volume calculated**91** % void space assumed**155** ft³ excavated volume needed

Structure Ratios Length Width* Depth*

15.00 10.00 1.00

Dimen. (ft) **15.17 10.11 1.01**



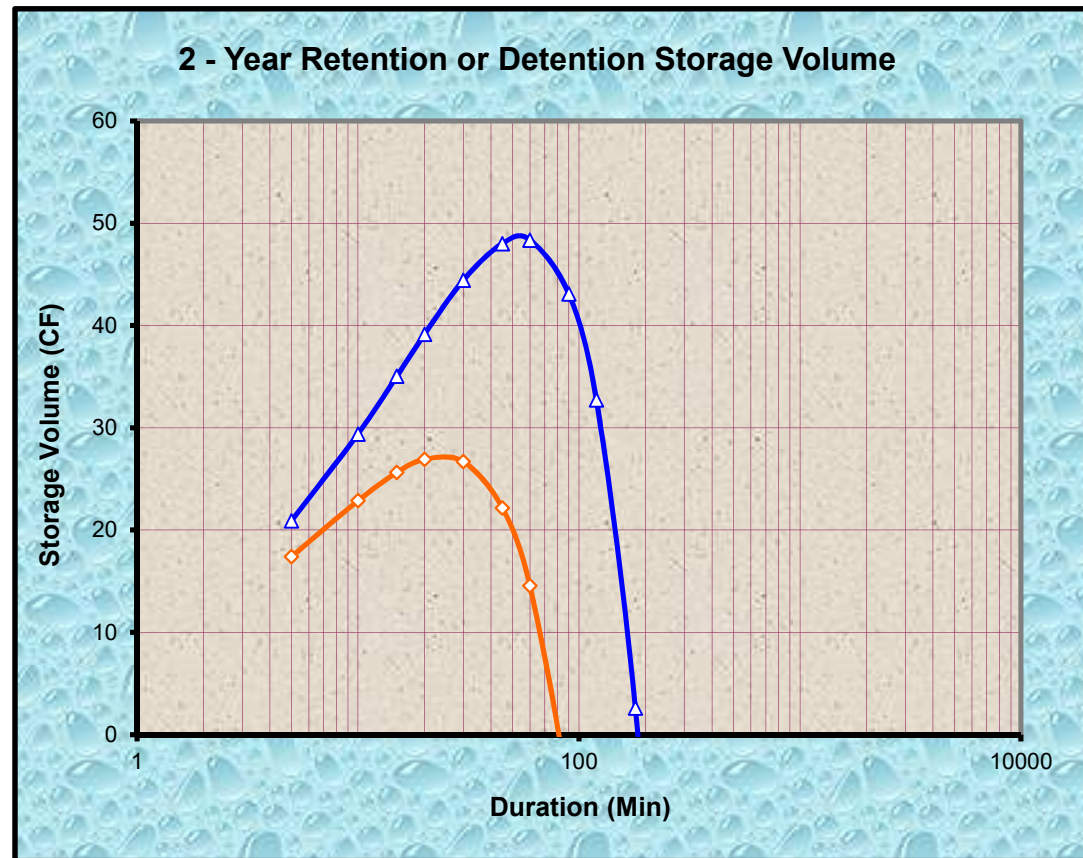
PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #2Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: 2.40 Fig. SWM-2
 Rational Coefficients Cpre: 0.45
 Cpost: 0.50
 Impervious Area: 3350 ft²
 Saturated Soil Permeability: 0.03 in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.	
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	48 ft ³ storage volume calculated				Detention Rate To Storage (cfs)	Specified Detained Volume (cf)
						<u>94</u> % void space assumed					
						51 ft ³ excavated volume needed					
						Structure Length	Width*	Depth* #			
						Ratios	<u>15.00</u>	<u>10.00</u>	<u>1.00</u>		
						Dimen. (ft)	<u>10.50</u>	<u>7.00</u>	<u>0.70</u>		
1440	0.35	0.012	0.014	-0.015	-1253	98 ft ² internal surface area				-0.023	-1962
1200	0.38	0.013	0.015	-0.014	-978	69 ft ² effective surface area				-0.022	-1572
960	0.41	0.014	0.016	-0.013	-713	282.0 hrs estimated structure drainage time				-0.021	-1191
720	0.45	0.016	0.017	-0.011	-462					-0.019	-824
480	0.51	0.018	0.020	-0.009	-231					-0.016	-475
360	0.57	0.020	0.022	-0.007	-127					-0.014	-312
240	0.65	0.023	0.025	-0.004	-36	* For pipe, use the square root of the sectional area.				-0.011	-161
180	0.72	0.025	0.028	-0.001	3	# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.				-0.009	-93
120	0.82	<u>0.029</u>	0.032	0.003	33					-0.004	-32
90	0.91	0.032	0.035	0.006	43					-0.001	-6
60	1.04	<u>0.036</u>	0.040	0.012	<u>48</u>	STRUCTURE DIMENSIONS FOR DETENTION				0.004	15
45	1.15	0.040	0.045	0.016	48	27 ft ³ storage volume calculated				0.008	22
30	1.32	0.046	0.051	0.022	44	<u>94</u> % void space assumed				0.015	27
20	1.52	0.053	0.059	0.030	39	29 ft ³ excavated volume needed				0.022	<u>27</u>
15	1.67	0.058	0.065	0.036	35	Structure Length	Width*	Depth*		0.028	26
10	1.92	0.067	0.074	0.046	29	Ratios	<u>15.00</u>	<u>10.00</u>	<u>1.00</u>	0.038	23
5	2.43	0.085	<u>0.094</u>	0.066	21	Dimen. (ft)	<u>8.64</u>	<u>5.76</u>	<u>0.58</u>	0.058	17



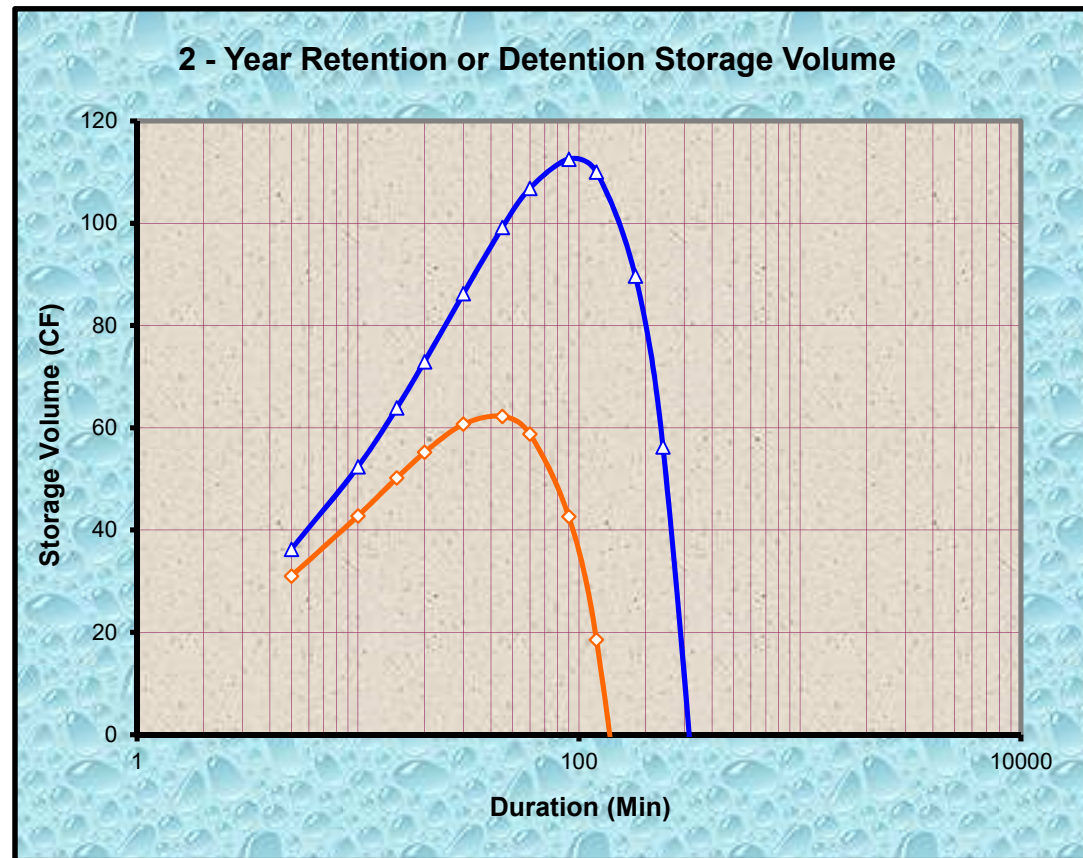
PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #3Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** PRESS TAB KEY & ENTER DESIGN VALUES**Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: 2.40 Fig. SWM-2
 Rational Coefficients Cpre: 0.45
 Cpost: 0.60
 Impervious Area: 4506 ft²
 Saturated Soil Permeability: 0.03 in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.	
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	113	ft ³ storage volume calculated			Detention Rate To Storage (cfs)	Specified Detained Volume (cf)
						<u>93</u>	% void space assumed				
						121	ft ³ excavated volume needed				
						Structure Ratios	Length	Width*	Depth* [#]		
1440	0.35	0.017	0.022	-0.017	-1347		<u>15.00</u>	<u>10.00</u>	<u>1.00</u>	-0.027	-2321
1200	0.38	0.018	0.023	-0.015	-1015	Dimen. (ft)	13.96	9.31	0.93	-0.025	-1833
960	0.41	0.019	0.025	-0.013	-700	173	ft ² internal surface area			-0.024	-1359
720	0.45	0.021	0.028	-0.011	-407	121	ft ² effective surface area			-0.021	-906
480	0.51	0.024	0.032	-0.007	-146	371.0	hrs estimated structure drainage time			-0.017	-485
360	0.57	0.027	0.035	-0.003	-35	* For pipe, use the square root of the sectional area.				-0.014	-292
240	0.65	0.031	0.041	0.002	56	# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.				-0.008	-119
180	0.72	0.034	0.045	0.006	90					-0.004	-44
120	0.82	<u>0.039</u>	0.052	0.013	110					0.003	19
90	0.91	0.043	0.057	0.018	<u>113</u>					0.008	43
60	1.04	<u>0.049</u>	0.065	0.027	107					0.016	59
45	1.15	0.054	0.072	0.033	99	STRUCTURE DIMENSIONS FOR DETENTION				0.023	<u>62</u>
30	1.32	0.062	0.083	0.044	86	62	ft ³ storage volume calculated			0.034	61
20	1.52	0.071	0.095	0.056	73	<u>93</u>	% void space assumed			0.046	55
15	1.67	0.079	0.105	0.066	64	67	ft ³ excavated volume needed			0.056	50
10	1.92	0.090	0.120	0.082	52	Structure Ratios	Length	Width*	Depth*	0.071	43
5	2.43	0.114	0.152	0.114	36		<u>15.00</u>	<u>10.00</u>	<u>1.00</u>	0.103	31
						Dimen. (ft)	11.46	7.64	0.76		



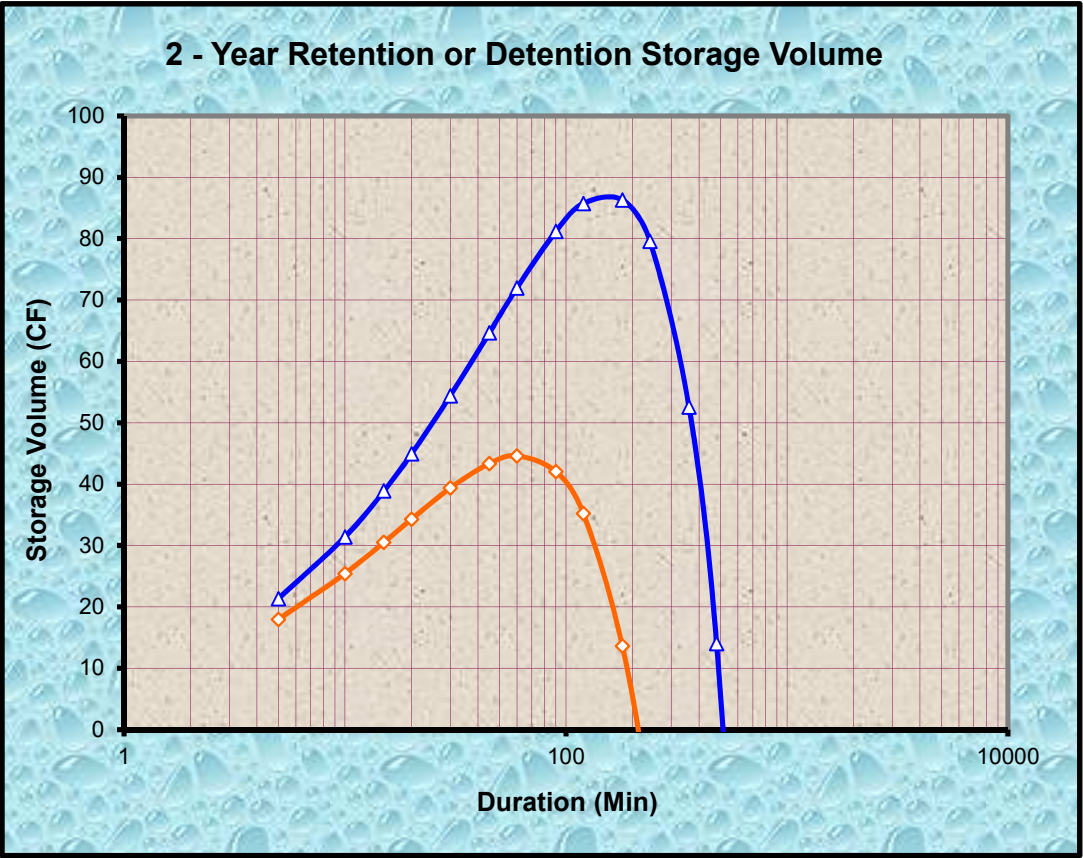
PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #4Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: **2.40** Fig. SWM-2
 Rational Coefficients Cpre: **0.45**
 Cpost: **0.69**
 Impervious Area: **2138** ft²
 Saturated Soil Permeability: **0.03** in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.			
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	86	ft³ storage volume calculated			Detention Rate To Storage (cfs)	Specified Detained Volume (cf)		
						85	% void space assumed						
						102	ft³ excavated volume needed						
						Structure Ratios	Length	Width*	Depth* #				
1440	0.35	0.008	0.012	-0.006	-468		15.00	10.00	1.00	-0.011	-966		
1200	0.38	0.008	0.013	-0.006	-330	Dimen. (ft)	13.17	8.78	0.88	-0.010	-749		
960	0.41	0.009	0.014	-0.005	-201	154	ft² internal surface area			-0.009	-541		
720	0.45	0.010	0.015	-0.003	-84	108	ft² effective surface area			-0.008	-344		
480	0.51	0.011	0.018	-0.001	14	319.9	hrs estimated structure drainage time			-0.006	-164		
360	0.57	0.013	0.019	0.001	53		* For pipe, use the square root of the sectional area. # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.			-0.004	-84		
240	0.65	0.014	0.022	0.004	80					-0.001			-15
180	0.72	0.016	0.024	0.006	86					0.001			14
120	0.82	0.018	0.028	0.010	86					0.005	35		
90	0.91	0.020	0.031	0.013	81					0.008	42		
60	1.04	0.023	0.036	0.017	72		STRUCTURE DIMENSIONS FOR DETENTION			0.012	45		
45	1.15	0.026	0.039	0.021	65	45	ft³ storage volume calculated			0.016	43		
30	1.32	0.029	0.045	0.027	54	85	% void space assumed			0.022	39		
20	1.52	0.034	0.052	0.033	45	52	ft³ excavated volume needed			0.029	34		
15	1.67	0.037	0.057	0.039	39	Structure Ratios	Length	Width*	Depth*	0.034	31		
10	1.92	0.043	0.066	0.047	31		15.00	10.00	1.00	0.042	25		
5	2.43	0.054	0.083	0.065	21	Dimen. (ft)	10.57	7.05	0.70	0.060	18		



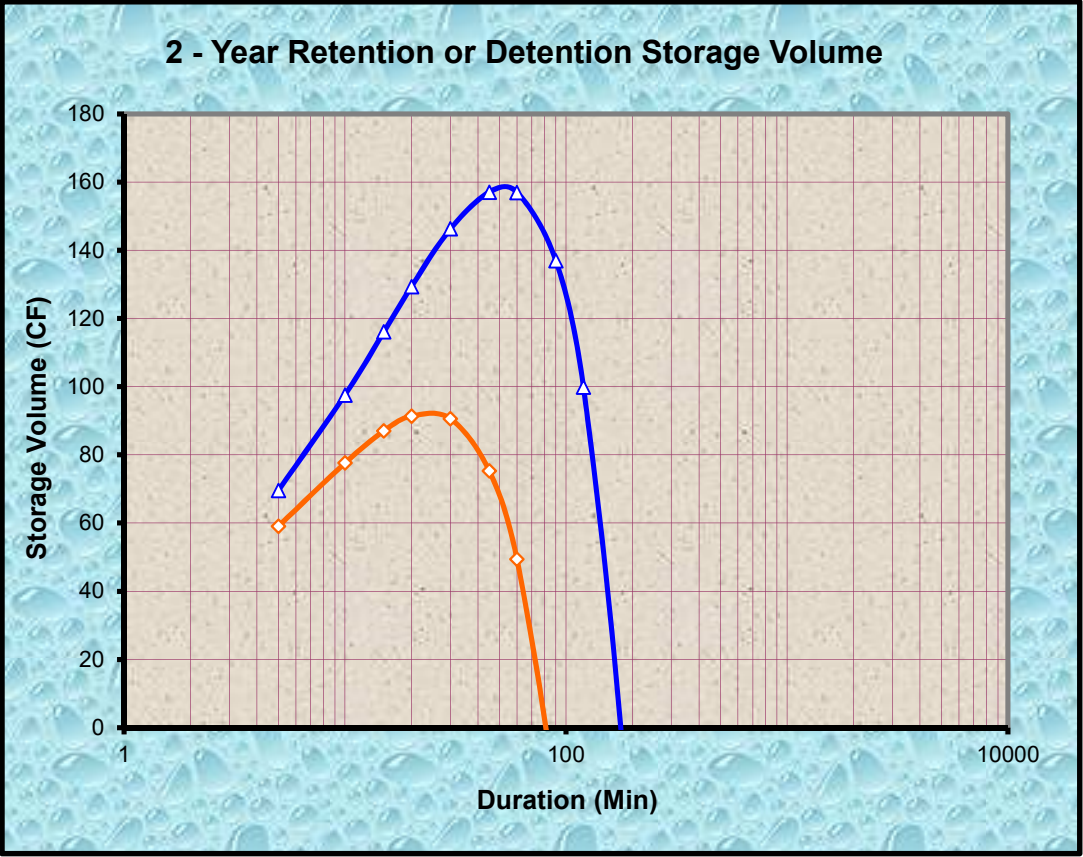
PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #5Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: **2.40** Fig. SWM-2
 Rational Coefficients Cpre: **0.45**
 Cpost: **0.50**
 Impervious Area: **11374** ft²
 Saturated Soil Permeability: **0.03** in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.	
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	157	ft³ storage volume calculated			Detention Rate To Storage (cfs)	Specified Detained Volume (cf)
						91	% void space assumed				
						173	ft³ excavated volume needed				
						Structure Ratios	Length	Width*	Depth* #		
1440	0.35	0.042	0.046	-0.051	-4308		15.00	10.00	1.00	-0.077	-6663
1200	0.38	0.044	0.049	-0.048	-3369	Dimen. (ft)	15.72	10.48	1.05	-0.074	-5338
960	0.41	0.048	0.053	-0.044	-2464	220	ft² internal surface area			-0.070	-4045
720	0.45	0.053	0.059	-0.039	-1604	154	ft² effective surface area			-0.065	-2796
480	0.51	0.061	0.068	-0.030	-810	408.7	hrs estimated structure drainage time			-0.056	-1613
360	0.57	0.067	0.075	-0.023	-453	* For pipe, use the square root of the sectional area. # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.				-0.049	-1059
240	0.65	0.077	0.086	-0.012	-138					-0.038	-547
180	0.72	0.085	0.094	-0.003	-6					-0.029	-315
120	0.82	0.098	0.108	0.011	100					-0.015	-109
90	0.91	0.108	0.120	0.022	137					-0.004	-22
60	1.04	0.124	0.137	0.040	157	STRUCTURE DIMENSIONS FOR DETENTION				0.014	49
45	1.15	0.136	0.151	0.054	157	91	ft³ storage volume calculated			0.028	75
30	1.32	0.157	0.174	0.076	146	91	% void space assumed			0.050	91
20	1.52	0.180	0.200	0.102	129	100	ft³ excavated volume needed			0.076	91
15	1.67	0.198	0.220	0.123	116	Structure Ratios	Length	Width*	Depth*	0.097	87
10	1.92	0.228	0.253	0.155	98		15.00	10.00	1.00	0.129	78
5	2.43	0.288	0.320	0.223	70	Dimen. (ft)	13.12	8.75	0.87	0.197	59



PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #6Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

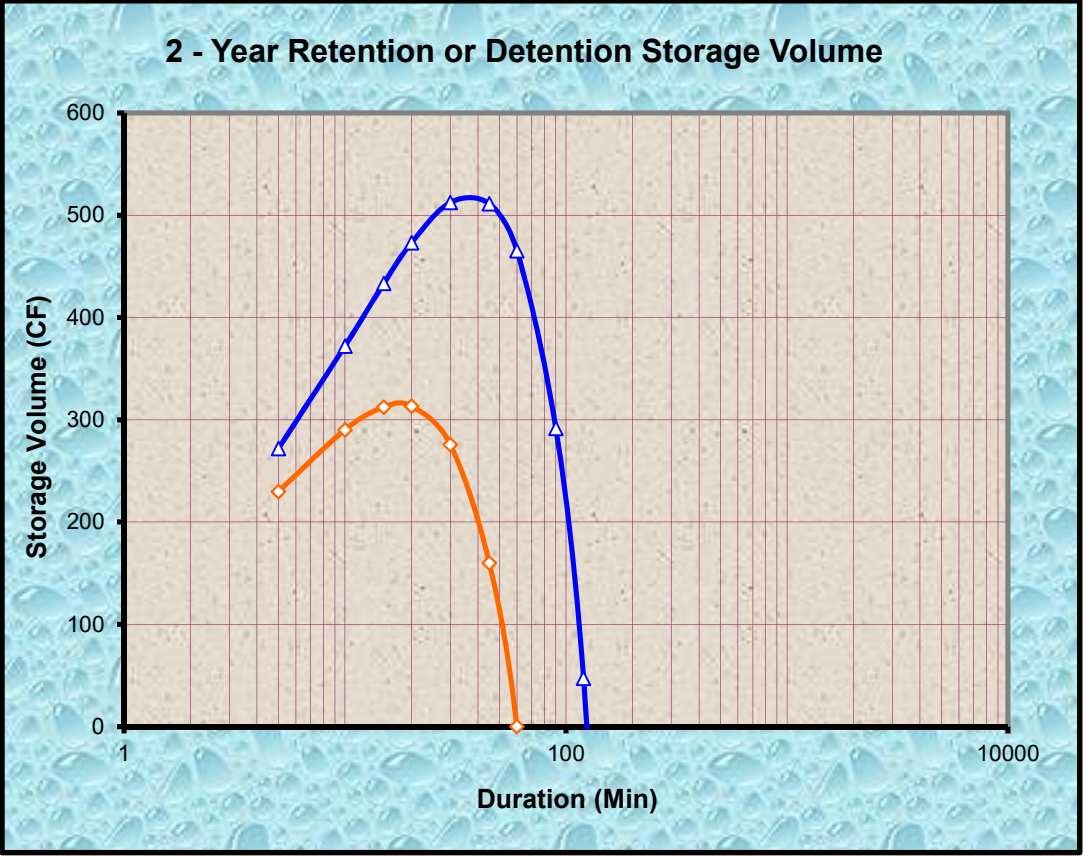
Site Location P60 Isopleth: 2.40 Fig. SWM-2
 Rational Coefficients Cpre: 0.45
 Cpost: 0.45
 Impervious Area: 52864 ft²
 Saturated Soil Permeability: 0.03 in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.	
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	512 ft ³ storage volume calculated				Detention Rate To Storage (cfs)	Specified Detained Volume (cf)
						<u>93</u> % void space assumed					
						551 ft ³ excavated volume needed					
						Structure Length	Width*	Depth* #			
						Ratios	<u>15.00</u>	<u>10.00</u>	<u>1.00</u>		
						Dimen. (ft)	<u>23.15</u>	<u>15.43</u>	<u>1.54</u>		
1440	0.35	0.194	0.194	-0.259	-22154	476 ft ² internal surface area				-0.380	-32831
1200	0.38	0.207	0.207	-0.247	-17551	333 ft ² effective surface area				-0.368	-26462
960	0.41	0.223	0.223	-0.230	-13085	615.0 hrs estimated structure drainage time				-0.351	-20228
720	0.45	0.246	0.246	-0.207	-8805					-0.328	-14178
480	0.51	0.283	0.283	-0.171	-4803					-0.292	-8401
360	0.57	0.312	0.312	-0.142	-2964					-0.263	-5671
240	0.65	0.358	0.358	-0.095	-1300					-0.216	-3115
180	0.72	0.395	0.395	-0.059	-571					-0.179	-1938
120	0.82	<u>0.453</u>	0.453	0.000	47					-0.121	-870
90	0.91	0.500	0.500	0.047	292					-0.074	-400
60	1.04	<u>0.574</u>	0.574	0.121	465					0.000	0
45	1.15	0.633	0.633	0.180	511					0.059	160
30	1.32	0.727	0.727	0.274	<u>512</u>					0.153	276
20	1.52	0.835	0.835	0.382	473					0.261	<u>313</u>
15	1.67	0.921	0.921	0.468	433					0.347	312
10	1.92	1.058	1.058	0.605	372					0.484	290
5	2.43	1.340	<u>1.340</u>	0.887	272					0.766	230
						STRUCTURE DIMENSIONS FOR DETENTION					
						313 ft ³ storage volume calculated					
						<u>93</u> % void space assumed					
						337 ft ³ excavated volume needed					
						Structure Length	Width*	Depth*			
						Ratios	<u>15.00</u>	<u>10.00</u>	<u>1.00</u>		
						Dimen. (ft)	<u>19.64</u>	<u>13.09</u>	<u>1.31</u>		

* For pipe, use the square root of the sectional area.

If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.



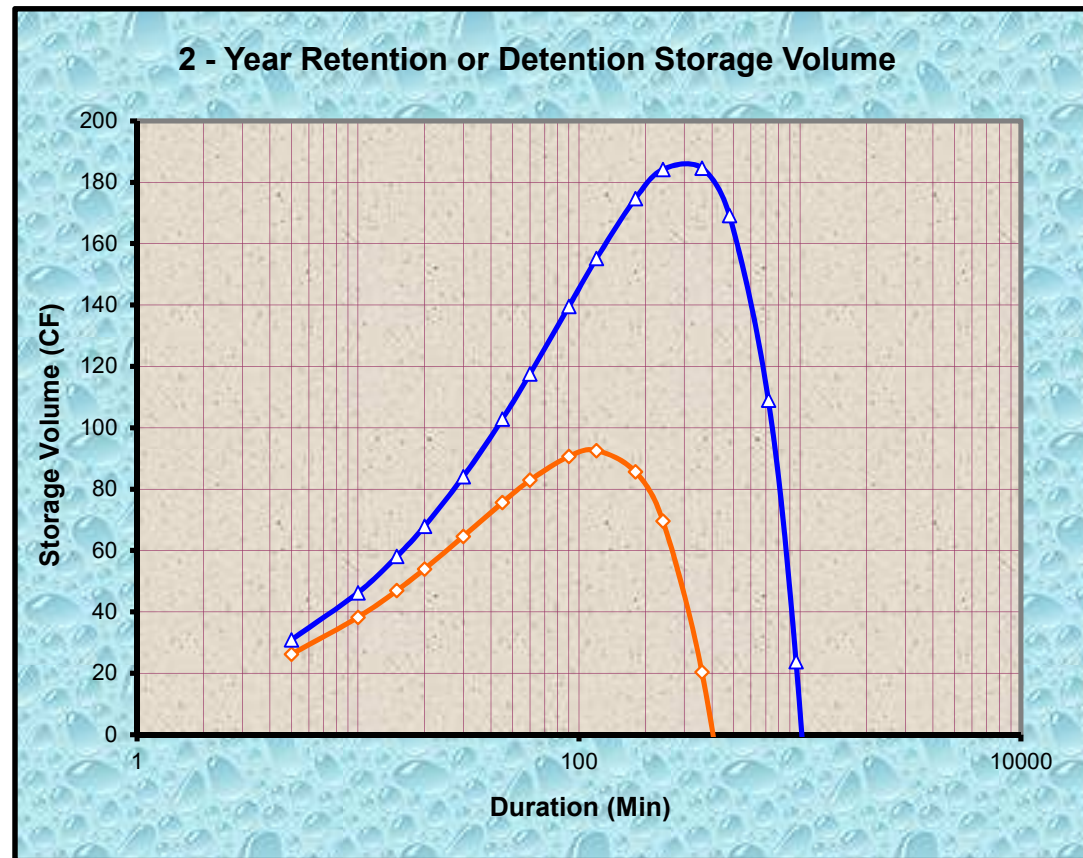
PROJECT: San Vicente Redwoods Staging Area (APN 080-011-42) - Drainage Feature #1Calc by: SLSDate: 8/14/2018**RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD****Data Entry:** **PRESS TAB KEY & ENTER DESIGN VALUES****Notes & Limitations on Use:**

SS Ver:1.0

Site Location P60 Isopleth: **2.40** Fig. SWM-2
 Rational Coefficients Cpre: **0.45**
 Cpost: **0.86**
 Impervious Area: **2326** ft²
 Saturated Soil Permeability: **0.03** in/hr

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
 Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
 Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
 Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
 Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

2 - YEAR DESIGN STORM				RETENTION @ 120 MIN.		STRUCTURE DIMENSIONS FOR RETENTION				DETENTION @ 60 MIN.		
Storm Duration (min)	2 - Year Intensity (in/hr)	Qpre (cfs)	Qpost (cfs)	Retention Rate To Storage (cfs)	Specified Retained Volume (cf)	185	ft³ storage volume calculated			Detention Rate To Storage (cfs)	Specified Detained Volume (cf)	
						91	% void space assumed					
						203	ft³ excavated volume needed					
						Structure Ratios	Length	Width*	Depth* #			
1440	0.35	0.009	0.016	-0.004	-193		15.00	10.00	1.00	-0.009	-772	
1200	0.38	0.009	0.017	-0.003	-78	Dimen. (ft)	16.59	11.06	1.11	-0.008	-568	
960	0.41	0.010	0.019	-0.001	24	245	ft² internal surface area			-0.007	-375	
720	0.45	0.011	0.021	0.001	109	171	ft² effective surface area			-0.005	-198	
480	0.51	0.012	0.024	0.004	169	431.3	hrs estimated structure drainage time			-0.002	-43	
360	0.57	0.014	0.026	0.006	185	* For pipe, use the square root of the sectional area. # If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.					0.001	20
240	0.65	0.016	0.030	0.010	184						0.005	70
180	0.72	0.017	0.033	0.013	175						0.008	86
120	0.82	0.020	0.038	0.018	155						0.013	93
90	0.91	0.022	0.042	0.022	140	STRUCTURE DIMENSIONS FOR DETENTION					0.017	91
60	1.04	0.025	0.048	0.028	118	93	ft³ storage volume calculated			0.023	83	
45	1.15	0.028	0.053	0.033	103	91	% void space assumed			0.028	76	
30	1.32	0.032	0.061	0.041	84	102	ft³ excavated volume needed			0.036	65	
20	1.52	0.037	0.070	0.050	68	Structure Ratios	Length	Width*	Depth*	0.045	54	
15	1.67	0.041	0.077	0.058	58		15.00	10.00	1.00	0.052	47	
10	1.92	0.047	0.089	0.069	46	Dimen. (ft)	13.18	8.79	0.88	0.064	38	
5	2.43	0.059	0.113	0.093	31					0.087	26	



ATTACHMENT 5

Rational Method Calculations for Overall Site and Drainage Features

DRAINAGE FEATURES

Rational Method as outlined in the County of Santa Cruz Design Criteria Manual February 2017

$$Q = C_a * C * i * A$$

	Items that are selected from spreadsheet
	items that are to be entered into the spreadsheet

Project Size (p. 60)

Size	Return Period Used	
0-100 acres	25	year
101-400 acres	50	year
over 400 acres	100	year
Cross Culverts on publicly maintained roads	100	year
Bridge Structures	100	year

Ca for return period storm event (p. 56)

Return Period	Ca
2 to 10	1
25	1.1
50	1.2
100	1.25

C Runoff Coefficient (from Chow, Applied Hydrology)

Character of Surface	Return Period (yrs)						
	2	5	10	25	50	100	500
DEVELOPED							
Asphalt	0.73	0.77	0.81	0.86	0.90	0.95	1.00
Concrete/roof	0.75	0.80	0.83	0.88	0.92	0.97	1.00
Grass Areas (lawns, park, etc.)							
<i>Poor Condition (grass cover less than 50% of area)</i>							
Flat (0-2%)	0.32	0.34	0.37	0.40	0.44	0.47	0.58
Average (2-7%)	0.37	0.40	0.43	0.46	0.49	0.53	0.61
Steep (over 7%)	0.40	0.43	0.45	0.49	0.52	0.55	0.62
<i>Fair Condition (grass cover on 50-75% of area)</i>							
Flat (0-2%)	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average (2-7%)	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep (over 7%)	0.37	0.40	0.42	0.46	0.49	0.53	0.60
<i>Good Condition (grass cover over 75% of area)</i>							
Flat (0-2%)	0.21	0.23	0.25	0.29	0.32	0.36	0.49
Average (2-7%)	0.29	0.32	0.35	0.39	0.42	0.46	0.56
Steep (over 7%)	0.34	0.37	0.40	0.44	0.47	0.51	0.58
UNDEVELOPED							
Cultivate Land							
Flat (0-2%)	0.31	0.34	0.36	0.40	0.43	0.47	0.57
Average (2-7%)	0.35	0.38	0.41	0.44	0.48	0.51	0.60
Steep (over 7%)	0.39	0.42	0.44	0.48	0.51	0.54	0.61
Pasture/Range							
Flat (0-2%)	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average (2-7%)	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep (over 7%)	0.37	0.40	0.42	0.46	0.49	0.53	0.60
Forrest/Woodlands							
Flat (0-2%)	0.22	0.25	0.28	0.31	0.35	0.39	0.48
Average (2-7%)	0.31	0.34	0.36	0.40	0.43	0.47	0.56
Steep (over 7%)	0.35	0.39	0.41	0.45	0.48	0.52	0.58

Weighted Runoff Coefficient (more than one area)**Drainage Feature #1**

	Description	Area (sf or acre)	C	2 Area Weighted	3 Area Weighted
Area 1	AC	1695	0.86		
Area 2	AC	1851	0.86	0.860	
Area 3	Undeveloped	9379	0.45		0.562

Drainage Feature #2

	Description	Area (sf or acre)	C	2 Area Weighted
Area 1	AB	3350	0.50	
Area 2	Undeveloped	22159	0.45	0.457

*Assumed 0.5 runoff coefficient for AB

Drainage Feature #3

	Description	Area (sf or acre)	C	2 Area Weighted	3 Area Weighted	4 Area Weighted
Area 1	Concrete/Roof	1039	0.88			
Area 2	Stabilized DG	144	0.80	0.870		
Area 3	AB	3323	0.50		0.60	
Area 4	Undeveloped	26427	0.45			0.471

*Assumed 0.8 runoff coefficient for stabilized DG

*Assumed 0.5 runoff coefficient for AB

Drainage Feature #4

	Description	Area (sf or acre)	C	2 Area Weighted	3 Area Weighted	4 Area Weighted
Area 1	Concrete/Roof	886	0.88			
Area 2	Stabilized DG	246	0.80	0.863		
Area 3	AB	1006	0.50		0.69	
Area 4	Undeveloped	3445	0.45			0.543

*Assumed 0.8 runoff coefficient for stabilized DG

*Assumed 0.5 runoff coefficient for AB

Drainage Feature #5

	Description	Area (sf or acre)	C	2 Area Weighted
Area 1	AB	11374	0.50	
Area 2	Undeveloped	11344	0.45	0.475

*Assumed 0.5 runoff coefficient for AB

Drainage Feature #6

	Description	Area (sf or acre)	C
Area 1	Undeveloped	52864	0.45

Drainage Feature \$7

	Description	Area (sf or acre)	C	2 Area Weighted	3 Area Weighted
Area 1	AC	594	0.86		
Area 2	AC	1732	0.86	0.860	
Area 3	Undeveloped	14446	0.45		0.507

Isopleth (Figure SWM-2 p.57)
Rainfall (Figure SWM-3 p.58)

2.4

		Rainfall Intensity (in/hr)						
Duration (hr)	Duration (min)	2-year	5-year	10-year	15-year	25-year	50-year	100-year
	10	1.92	2.55	3.00	3.27	3.60	4.05	4.50
	15	1.67	2.22	2.61	2.85	3.14	3.53	3.92
	30	1.32	1.75	2.06	2.25	2.48	2.79	3.10
1	60	1.04	1.38	1.63	1.78	1.95	2.20	2.44
2	120	0.82	1.09	1.29	1.40	1.54	1.74	1.93
4	240	0.65	0.86	1.02	1.11	1.22	1.37	1.52
6	360	0.57	0.75	0.88	0.96	1.06	1.19	1.33
12	720	0.45	0.59	0.70	0.76	0.84	0.94	1.05
24	1440	0.35	0.47	0.55	0.60	0.66	0.74	0.83

Flow Calculations

Drainage Feature #1

C*Ca=	0.62		
i=	2.61	in/hr	10 year, 15 min storm
A=	0.30	acres	Determine from CAD
Q=	0.48	cfs	

Drainage Feature #2

C*Ca=	0.50		
i=	2.61	in/hr	10 year, 15 min storm
A=	0.59	acres	Determine from CAD
Q=	0.77	cfs	

Drainage Feature #3

C*Ca=	0.52		
i=	2.61	in/hr	10 year, 15 min storm
A=	0.71	acres	Determine from CAD
Q=	0.96	cfs	

Drainage Feature #4

C*Ca=	0.60		
i=	2.61	in/hr	10 year, 15 min storm
A=	0.13	acres	Determine from CAD
Q=	0.20	cfs	

Drainage Feature #5

C*Ca=	0.52	
i=	2.61	in/hr
A=	0.52	acres

10 year, 15 min storm
Determine from CAD

Q=	0.71	cfs
----	------	-----

Drainage Feature #6

C*Ca=	0.50	
i=	2.61	in/hr
A=	1.21	acres

10 year, 15 min storm
Determine from CAD

Q=	1.57	cfs
----	------	-----

Drainage Feature #7

C*Ca=	0.56	
i=	2.61	in/hr
A=	0.39	acres

10 year, 15 min storm
Determine from CAD

Q=	0.56	cfs
----	------	-----

OVERALL SITE

Rational Method as outlined in the County of Santa Cruz Design Criteria Manual February 2017

$$Q = C_a * C * i * A$$

	Items that are selected from spreadsheet
	Items that are to be entered into the spreadsheet

Project Size (p. 60)

Size	Return Period Used	
0-100 acres	25	year
101-400 acres	50	year
over 400 acres	100	year
Cross Culverts on publicly maintained roads	100	year
Bridge Structures	100	year

Ca for return period storm event (p. 56)

Return Period	Ca
2 to 10	1
25	1.1
50	1.2
100	1.25

C Runoff Coefficient (from Chow, Applied Hydrology)

Character of Surface	Return Period (yrs)						
	2	5	10	25	50	100	500
DEVELOPED							
Asphalt	0.73	0.77	0.81	0.86	0.90	0.95	1.00
Concrete/roof	0.75	0.80	0.83	0.88	0.92	0.97	1.00
Grass Areas (lawns, park, etc.)							
Poor Condition (grass cover less than 50% of area)							
Flat (0-2%)	0.32	0.34	0.37	0.40	0.44	0.47	0.58
Average (2-7%)	0.37	0.40	0.43	0.46	0.49	0.53	0.61
Steep (over 7%)	0.40	0.43	0.45	0.49	0.52	0.55	0.62
Fair Condition (grass cover on 50-75% of area)							
Flat (0-2%)	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average (2-7%)	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep (over 7%)	0.37	0.40	0.42	0.46	0.49	0.53	0.60
Good Condition (grass cover over 75% of area)							
Flat (0-2%)	0.21	0.23	0.25	0.29	0.32	0.36	0.49
Average (2-7%)	0.29	0.32	0.35	0.39	0.42	0.46	0.56
Steep (over 7%)	0.34	0.37	0.40	0.44	0.47	0.51	0.58
UNDEVELOPED							
Cultivate Land							
Flat (0-2%)	0.31	0.34	0.36	0.40	0.43	0.47	0.57
Average (2-7%)	0.35	0.38	0.41	0.44	0.48	0.51	0.60
Steep (over 7%)	0.39	0.42	0.44	0.48	0.51	0.54	0.61
Pasture/Range							
Flat (0-2%)	0.25	0.28	0.30	0.34	0.37	0.41	0.53
Average (2-7%)	0.33	0.36	0.38	0.42	0.45	0.49	0.58
Steep (over 7%)	0.37	0.40	0.42	0.46	0.49	0.53	0.60
Forrest/Woodlands							
Flat (0-2%)	0.22	0.25	0.28	0.31	0.35	0.39	0.48
Average (2-7%)	0.31	0.34	0.36	0.40	0.43	0.47	0.56
Steep (over 7%)	0.35	0.39	0.41	0.45	0.48	0.52	0.58

Site Pre-development

Runoff Coefficient 0.45

Weighted Runoff Coefficient (more than one area)

Site Post-development

	Description	Area (sf or acre)	C	2 Area Weighted	3 Area Weighted	4 Area Weighted	5 Area Weighted	6 Area Weighted
Area 1	AB*	44,196	0.50					
Area 2	Roof/Concrete	2,640	0.88	0.521				
Area 3	Stabilized DG*	489	0.80		0.524			
Area 4	AC	4,029	0.86			0.551		
Area 5	Articulated Concrete Mat*	1,003	0.80				0.555	
Area 6	Undeveloped	323,567	0.45					0.465

*Assumed 0.5 runoff coefficient for AB, 0.8 runoff coefficient for stabilized DG, and 0.8 runoff coefficient for articulated concrete mat

Isopleth (Figure SWM-2 p.57)

2.4

Rainfall (Figure SWM-3 p.58)

		Rainfall Intensity (in/hr)						
Duration (hr)	Duration (min)	2-year	5-year	10-year	15-year	25-year	50-year	100-year
	10	1.92	2.55	3.00	3.27	3.60	4.05	4.50
	15	1.67	2.22	2.61	2.85	3.14	3.53	3.92
	30	1.32	1.75	2.06	2.25	2.48	2.79	3.10
1	60	1.04	1.38	1.63	1.78	1.95	2.20	2.44
2	120	0.82	1.09	1.29	1.40	1.54	1.74	1.93
4	240	0.65	0.86	1.02	1.11	1.22	1.37	1.52
6	360	0.57	0.75	0.88	0.96	1.06	1.19	1.33
12	720	0.45	0.59	0.70	0.76	0.84	0.94	1.05
24	1440	0.35	0.47	0.55	0.60	0.66	0.74	0.83

Flow Calculations

Site Pre-development Runoff

C*Ca=	0.50	
i=	2.61	in/hr
A=	8.63	acres

10 year, 15 min storm
Determine from CAD

Q=	11.17	cfs
----	-------	-----

Site Post-development Runoff

C*Ca=	0.51	
i=	2.61	in/hr
A=	8.63	acres

10 year, 15 min storm
Determine from CAD

Q=	11.53	cfs
----	-------	-----

Runoff Managed by Drainage Features (from DRAINAGE FEATURES Rational Method Calculations spreadsheet)

Drainage Feature #1, Q=	0.48	cfs
Drainage Feature #2, Q=	0.77	cfs
Drainage Feature #3, Q=	0.96	cfs
Drainage Feature #4, Q=	0.20	cfs
Drainage Feature #5, Q=	0.71	cfs
Drainage Feature #6, Q=	1.57	cfs
Drainage Feature #7, Q=	0.56	cfs

Total, Q=	5.25	cfs
-----------	------	-----

Site Post-development Runoff with Drainage Features

Q=	6.28	cfs
----	------	-----

ATTACHMENT 6

USDA NRCS Soil Survey Report for San Vicente Redwoods Staging Area



United States
Department of
Agriculture

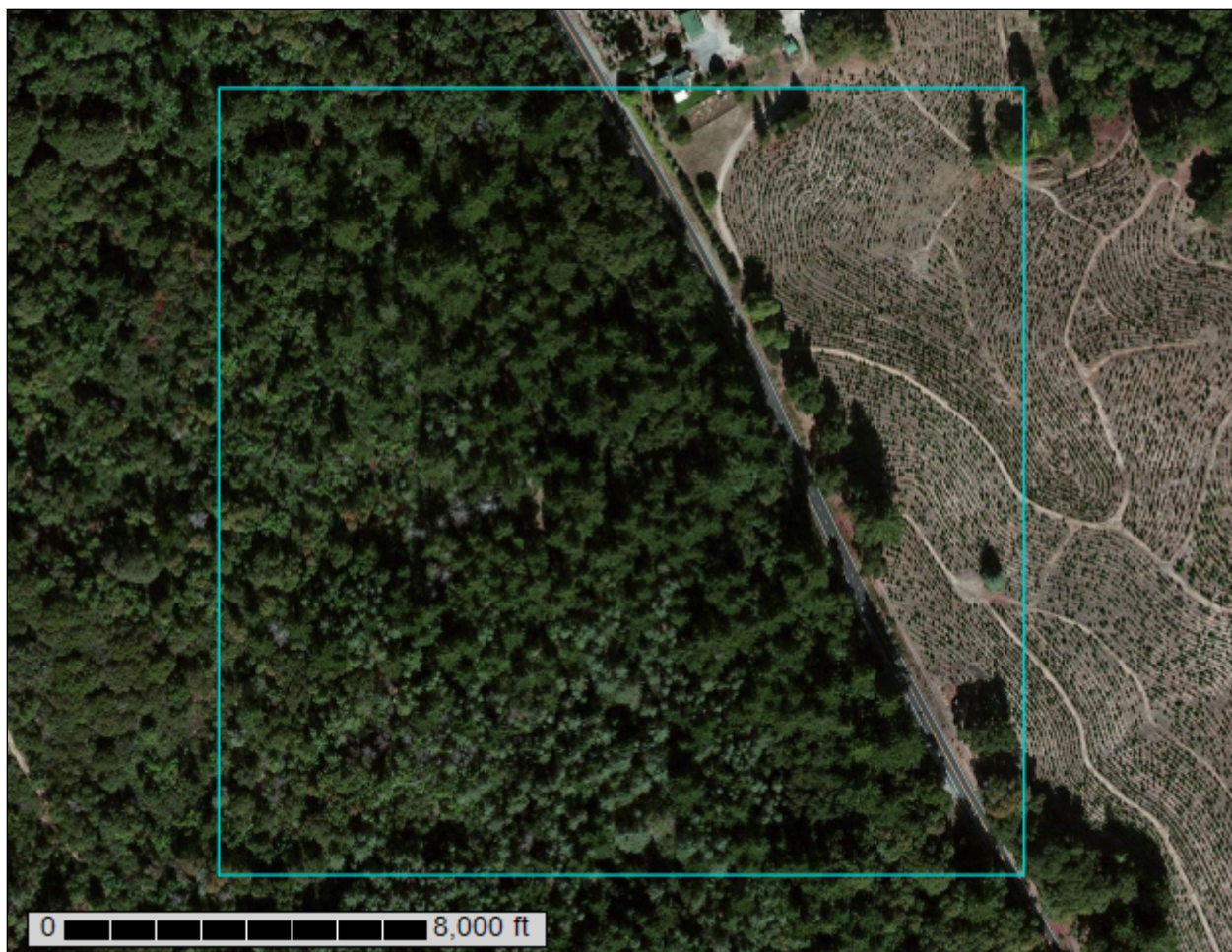
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Santa Cruz County, California**

**San Vicente Redwoods Staging
Area**



September 26, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	7
Soil Map.....	8
Legend.....	9
Map Unit Legend.....	10
Map Unit Descriptions.....	10
Santa Cruz County, California.....	12
110—Ben Lomond sandy loam, 5 to 15 percent slopes.....	12
References	15

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

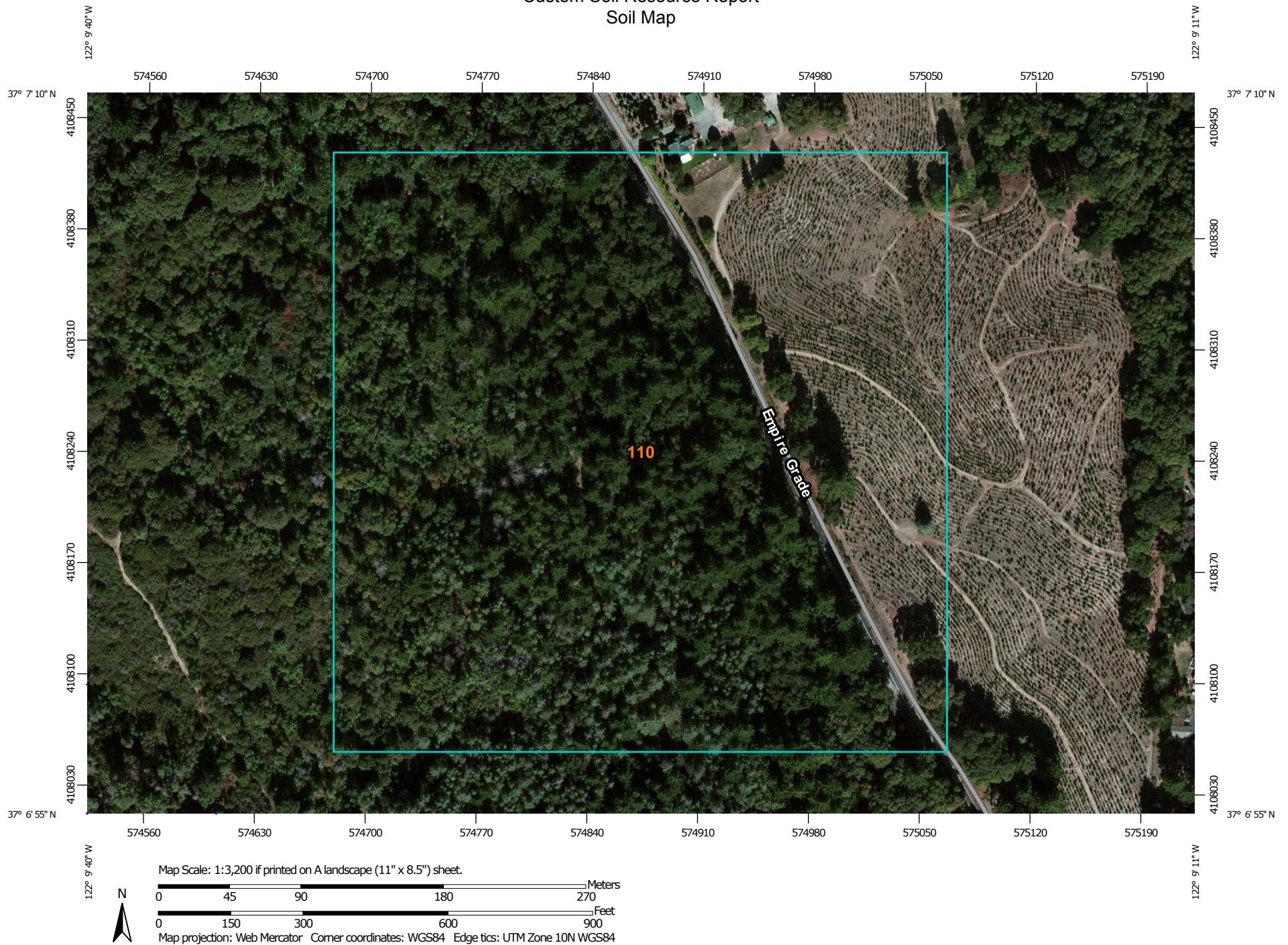
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Cruz County, California
Survey Area Data: Version 9, Sep 3, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 26, 2010—Sep 17, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Santa Cruz County, California (CA087)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
110	Ben Lomond sandy loam, 5 to 15 percent slopes	36.3	100.0%
Totals for Area of Interest		36.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Santa Cruz County, California

110—Ben Lomond sandy loam, 5 to 15 percent slopes

Map Unit Setting

National map unit symbol: h9d0

Elevation: 400 to 3,000 feet

Mean annual precipitation: 35 to 60 inches

Mean annual air temperature: 54 to 57 degrees F

Frost-free period: 220 to 230 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ben lomond and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ben Lomond

Setting

Landform: Ridges, mountain slopes

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Mountaintop, mountainflank

Down-slope shape: Convex, concave

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and/or residuum weathered from granite

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A1 - 2 to 7 inches: sandy loam

A2 - 7 to 19 inches: sandy loam

B - 19 to 30 inches: sandy loam

C - 30 to 46 inches: sandy loam

Cr - 46 to 50 inches: bedrock

Properties and qualities

Slope: 5 to 15 percent

Depth to restrictive feature: 40 to 60 inches to paralithic bedrock

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.03 to 0.28 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Catelli

Percent of map unit: 4 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Nisene

Percent of map unit: 3 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Aptos

Percent of map unit: 2 percent
Landform: Ridges, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Felton

Percent of map unit: 2 percent
Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank
Down-slope shape: Convex, concave
Across-slope shape: Linear, convex
Hydric soil rating: No

Lompico

Percent of map unit: 2 percent
Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank
Down-slope shape: Convex, concave
Across-slope shape: Linear, convex
Hydric soil rating: No

Sur

Percent of map unit: 1 percent
Landform: Mountainsides
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Custom Soil Resource Report

Zayante

Percent of map unit: 1 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Mountainflank, side slope

Down-slope shape: Convex, concave

Across-slope shape: Convex

Hydric soil rating: No

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ATTACHMENT 7

Geotechnical Investigation – San Vicente Redwoods Staging Area

Note Attachment 7 of the drainage analysis is the same *Geotechnical Investigation* that is included as Attachment 4 of this Initial Study. It has not been included here to eliminate redundancy.

Attachment 9

Noise Modeling Data

Noise and Vibration Basics

TERMINOLOGY AND NOISE DESCRIPTORS

The following are brief definitions of noise terminology:

- **Sound.** A vibratory disturbance that, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels which approximates the frequency response of the human ear.
- **Equivalent Continuous Noise Level (L_{eq}).** The mean of the noise level averaged over the measurement period, regarded as an average level.
- **Day-Night Level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 PM to 7 AM. The L_{dn} and the CNEL are similar noise descriptors and rarely differ by more than 1 dBA.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7 to 10 PM and 10 dB added to the A-weighted sound levels occurring during the period from 10 PM to 7 AM.

Note that L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

- **Sensitive Receptor.** Certain land uses are particularly sensitive to noise and vibration. Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, guest lodging (motels and hotels), libraries, religious institutions, hospitals, nursing homes, and passive recreation areas are generally more sensitive to noise than are commercial and industrial land uses.

CHARACTERISTICS OF SOUND

Sound is a pressure wave transmitted through the air. When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The standard unit of measurement of the loudness of sound is the decibel (dB). The human hearing system is not equally sensitive to sound at all frequencies. Sound waves below 16 Hz are not heard at all and are "felt" more as a vibration. Similarly, while people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz. Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is usually used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Because of the physical characteristics of noise transmission and noise perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1, Change in Sound Pressure Level, dB, presents the subjective effect of changes in sound pressure levels. Typical human hearing can detect changes of approximately 3 dBA or greater under normal conditions. Changes of 1 to 3 dBA are detectable under quiet, controlled conditions and changes of less than 1 dBA are usually indiscernible. A change of 5 dBA or greater is typically noticeable to most people in an exterior environment and a change of 10 dBA is perceived as a doubling (or halving) of the noise.

Table 1 Change in Sound Pressure Level, dB	
Change in Apparent Loudness	
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen 2009.

Point and Line Sources

Noise may be generated from a point source, such as a piece of construction equipment, or from a line source, such as a road containing moving vehicles. Because noise spreads in an ever-widening pattern, the given amount of noise striking an object, such as an eardrum, is reduced with distance from the source. This is known as "spreading loss." The typical spreading loss for point source noise is 6 dBA per doubling of the distance from the noise source.

A line source of noise, such as vehicles proceeding down a roadway, would also be reduced with distance, but the rate of reduction is affected by both distance and the type of terrain over which the noise passes. Hard sites, such as developed areas with paving, reduce noise at a rate of 3 dBA per doubling of the distance while soft sites, such as undeveloped areas, open space and vegetated areas reduce noise at a rate of 4.5 dBA per doubling of the distance. These represent the extremes and most areas would actually contain a combination

of hard and soft elements with the noise reduction placed somewhere in between these two factors. Unfortunately the only way to actually determine the absolute amount of attenuation that an area provides is through field measurement under operating conditions with subsequent noise level measurements conducted at varying distances from a constant noise source.

Objects that block the line of sight attenuate the noise source if the receptor is located within the "shadow" of the blockage (such as behind a sound wall). If a receptor is located behind the wall, but has a view of the source, the wall would do little to reduce the noise. Additionally, a receptor located on the same side of the wall as the noise source may experience an increase in the perceived noise level, as the wall would reflect noise back to the receptor compounding the noise.

Noise Metrics

Several rating scales (or noise "metrics") exist to analyze adverse effects of noise, including traffic-generated noise, on a community. These scales include the equivalent noise level (Leq), the community noise equivalent level (CNEL) and the day/night noise level (Ldn). Leq is a measurement of the sound energy level averaged over a specified time period.

The CNEL noise metric is based on 24 hours of measurement. CNEL differs from Leq in that it applies a time-weighted factor designed to emphasize noise events that occur during the evening and nighttime hours (when quiet time and sleep disturbance is of particular concern). Noise occurring during the daytime period (7:00 AM to 7:00 PM) receives no penalty. Noise produced during the evening time period (7:00 to 10:00 PM) is penalized by 5 dB, while nighttime (10:00 PM to 7:00 AM) noise is penalized by 10 dB. The Ldn noise metric is similar to the CNEL metric except that the period from 7:00 to 10:00 PM receives no penalty. Both the CNEL and Ldn metrics yield approximately the same 24-hour value (within 1 dB) with the CNEL being the more restrictive (i.e., higher) of the two.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium. A sound level of 190 dBA will rupture the eardrum and permanently damage the inner ear. Table 2 shows typical noise levels from various noise sources.

Table 2 Typical Noise Levels from Noise Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 1998, Table N-2136.2.

CHARACTERISTICS OF VIBRATION

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment, such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is described as the velocity, and the rate of change of the speed is described as the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During the construction of a building, the operation of construction equipment could cause groundborne vibration. The three main wave types of concern in the propagation of groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

- Surface or Rayleigh waves travel along the ground surface. They carry most of their energy along an expanding cylindrical wave front, similar to the ripples produced by throwing a rock into a lake. The

particle motion is more or less perpendicular to the direction of propagation (known as retrograde elliptical).

- Compression or P-waves are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.
- Shear or S-waves are also body waves, carrying their energy along an expanding spherical wave front. Unlike P-waves, however, the particle motion is transverse, or perpendicular to the direction of propagation.

The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal and RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units to compress the range of numbers required to describe the vibration. All PPV and RMS velocity are in in/sec and all vibration levels in this study are in dB relative to 1 micro-inch per second (abbreviated as VdB). The threshold of perception is approximately 65 VdB. Typically groundborne vibration generated by manmade activities attenuates rapidly with distance from the source of the vibration. Manmade vibration problems are usually confined to short distances (500 feet or less) from the source.

Construction generally includes a wide range of activities that can generate groundborne vibration. In general, demolition of structures generates the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at distances within 200 feet of the vibration sources. Heavy trucks can also generate groundborne vibrations that vary, depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, etc., all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration of normal traffic on streets and freeways with smooth pavement conditions. Trains generate substantial quantities of vibration due to their engines, steel wheels, and heavy loads.

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Noise Regulatory Environment

To limit exposure of people to intrusive and physically and/or psychologically damaging noise levels, the federal government, the State of California, some county governments, and most municipalities in the state have established standards and ordinances to control noise. The proposed project site is in the Santa Cruz Mountains within unincorporated Santa Cruz County. The pertinent federal and local regulations regarding noise and vibration are discussed below.

FEDERAL

Noise

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the U.S. Environmental Protection Agency (EPA). Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan. The construction of the project would be subject to these OSHA limitations and all workers would receive appropriate training, hearing protection, and breaks, accordingly, ensuring that they are not exposed to harmful noise levels. Similarly, once operational, noise in the workplace would be subject to OSHA limitations.

The U.S. Department of Housing and Urban Development (HUD) has set a goal of 45 dBA Ldn as a desirable maximum interior standard for residential units developed under HUD funding. This level is also generally accepted within the State of California. While HUD does not specify acceptable exterior noise levels, standard construction of residential dwellings constructed under Code of Federal Regulations, Title 24 standards typically provide 20 dBA of attenuation with the windows closed. Based on this premise, the exterior Ldn should not exceed 65 dBA.

Vibration

The human reaction to various levels of vibration varies from person to persons and is highly subjective. Table 3 shows the level at which vibration becomes perceptible based on various types of land uses that are sensitive to vibration.

Table 3 Vibration Perceptibility

Land Use Category	Max L _v (VdB) ¹	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and non-sensitive areas
Office	84	Felt vibration. Appropriate to offices and non-sensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms.

Source: FTA 2006.

¹ As measured in 1/3 octave bands of frequency over the frequency ranges of 8 to 80 Hz.

In addition to the vibration standards for human annoyance, the FTA also has vibration standards for architectural damage, as shown in Table 4. Architectural damage is possible when the peak particle velocity (PPV) exceeds 0.2 inch per second. This criterion is the threshold at which there is a risk of damage to residential buildings. For structures of reinforced concrete, steel, or timber, architectural damage is possible when the PPV exceeds 0.5 inch per second.

Table 4 Groundborne Vibration Impact Criteria, Architectural Damage

Building Category	PPV (inches per second) ¹	VdB
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2006.

¹ RMS velocity calculated from vibration level (VdB) using the reference of one micro-inch per second.

STATE OF CALIFORNIA

The California Office of Noise Control has set acceptable noise limits for sensitive uses. Sensitive-type land uses, such as homes and schools, are “normally acceptable” in exterior noise environments up to 65 dBA CNEL and “conditionally acceptable” in areas up to 70 dBA CNEL. A “conditionally acceptable” designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated in the design. By comparison, a “normally acceptable” designation indicates that standard construction can occur with no special noise reduction requirements.

Applicable interior standards for new multi-family dwellings are governed by Title 24 of the California Code of Regulations (California Building Standards Code). These standards require that acoustical studies be performed prior to construction in areas that exceed 60 dBA L_{dn}. Such studies are required to establish measures that will limit interior noise to no more than 45 dBA L_{dn} and this level has been applied to many communities in California.

LOCAL

County of Santa Cruz Standards

County of Santa Cruz County Code

The County of Santa Cruz regulates noise through the County Code, Title 8, Chapter 8.30 (Noise). Pursuant to the County Code, the county restricts noise levels generated at a property from exceeding certain noise levels for extended periods of time.

Offensive Noise

The County of Santa Cruz noise regulation is provided within Title 8, Chapter 8.30, of the County Code. Section 8.30.010 defines and regulates for offensive noise as follows. Under Section 8.30.010(A), no person shall make, cause, suffer, or permit to be made any offensive noise. Offensive noise is defined under Section 8.30.010(B) as follows:

“Offensive noise” means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

As provided under Section 8.30.010(C), the following factors shall be considered when determining whether a violation exists:

1) Loudness (Intensity) of the Sound.

- a. Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 a.m. and 10:00 p.m. and it is:
 - i. Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or
 - ii. In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute’s Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

- b. Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 p.m. and 8:00 a.m. and it is:

- i. Made within 100 feet of any building or place regularly used for sleeping purposes; or
- ii. Clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or
- iii. In excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

- 2) Pitch (frequency) of the sound, e.g., very low bass or high screech;
- 3) Duration of the sound;
- 4) Time of day or night;
- 5) Necessity of the noise, e.g., garbage collecting, street repair, permitted construction activities;
- 6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and
- 7) The proximity to any building regularly used for sleeping purposes.

County of Santa Cruz General Plan

Stationary Noise Standards

Policy 6.9.4, establishes the following noise standards as shown in Table 5 for commercial and industrial development.

Table 5 Maximum Allowable Noise Exposure – Stationary Sources¹

	Daytime ² (7 PM to 10 PM)	Nighttime ^{2,3} (10 PM to 7 AM)
Hourly L_{eq} – average hourly noise level, dB ⁴	50	45
Maximum level, dB ⁴	70	65
Maximum Level dB – Impulsive Noise ⁵	65	60

Source: Santa Cruz County 1994.

- ¹ As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.
 - ² Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced 5 dB if the ambient hour L_{eq} is at least 10 dB lower than the allowable limit.
 - ³ Applies only where the receiving land use operates or is occupied or is occupied during nighttime hours.
 - ⁴ Sound level measurements shall be made with "slow" meter response.
 - ⁵ Sound level measurements shall be made with "fast" meter response.
-

Ground Transportation

Policy 6.10.1 requires the evaluation of mitigation measures for any project that would cause significant degradation of the noise environment by:

- a. Cause the L_{dn} in existing residential areas to increase by 5 dB or more and remain below 60 dB;
- b. Causing the L_{dn} in existing residential areas to increase by 3 dB or more and, thereby, exceed an L_{dn} of 60 dB; or
- c. Causing the L_{dn} in existing residential areas to increase by 3 dB or more if the L_{dn} currently exceeds 60 dB.

Construction Noise

Policy 6.9.7 requires mitigation of construction noise as a condition of future project approvals.

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Average Construction Generated Noise - LTSC-01

Construction Noise at 50 Feet (dBA Leq)

50 hard or soft 0

Construction Phase	All Applicable Equipment in Use ¹	Minimum Required Equipment in Use ¹
Ground Clearing/Demolition	84	84
Excavation	89	79
Foundation Construction	78	78
Building Construction	87	75
Finishing and Site Cleanup	89	75

Construction Noise at Existing Residences

950

Construction Phase	All Applicable Equipment in Use ¹	Minimum Required Equipment in Use ¹
Ground Clearing/Grading	58	58
Excavation	63	53
Foundation Construction	52	52
Building Construction	61	49
Finishing and Site Cleanup	63	49

Construction Noise at Project Site Boundary

310

Construction Phase	All Applicable Equipment in Use ¹	Minimum Required Equipment in Use ¹
Ground Clearing/Grading	68	68
Excavation	73	63
Foundation Construction	62	62
Building Construction	71	59
Finishing and Site Cleanup	73	59

¹ Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for the USEPA, December 31, 1971. Based on analysis for Office Building, Hotel, Hospital, School, Public Works.

Construction Generated Vibration - LTSC-01

Vibration Annoyance Criteria			
Receptor:	Maximum Vibration Levels - Existing Structure	Closest Distance (feet):	980
Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB	
Caisson Drill	87	55	
Vibratory Roller	94	62	
Large bulldozer	87	55	
Small bulldozer	58	26	
Jackhammer	79	47	
Loaded trucks	86	54	
	Criteria	78	

Structural Damage Criteria

Receptor:	Maximum Vibration Levels - Existing Structure	Closest Distance (feet):	540
Equipment	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Caisson Drill	0.089	0.001	
Vibratory Roller	0.210	0.002	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.200	

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (2006).

PROJECT NAME		: Construction Noise Calculations		
	Receptor	Spatially AVG Distance(ft)	Minimum Distance (ft)	Land Use Type
1	Receptor 1	890	540	Residential
2	Receptor 2	0	0	Residential
3	Receptor 3	0	0	Residential
4	Receptor 4	0	0	Residential
5	Receptor 5	0	0	Residential
6	Receptor 6	0	0	Residential
7	Receptor 7	0	0	Residential
8	Receptor 8	0	0	Residential

[illegible]

Parking Lot Noise

Site	Leq	SEL	Lmax	Lmin	Peak	Uwpk	L(2)	L(8)	L(16)	L(25)	L(50)	L(90)	Measurement Distance
UCIParkingStructure	61.7	92.5	79.1	50.5	93.1	97.6	70.9	64.4	61.3	59.8	57.5	54.1	42

Source: Noise monitoring of noise sources common in parking lots and parking structures obtained from noise monitoring conducted at the University of California, Irvine.

Nearest Existing Residences (Woodbury Village)

	Distance to Property Line	Leq	SEL	Lmax	Lmin	Peak	Uwpk	L(2)	L(8)	L(16)	L(25)	L(50)	L(90)
Parking Lot	950	34.6	65.4	52.0	23.4	66.0	70.5	43.8	37.3	34.2	32.7	30.4	27.0

Noise Measurements of Sports Activities and the Parking Garage			
Monitoring Site	Lmax	Leq	Lmin
Boys Football Practice ¹	72.7	57.0	46.3
Tennis Court Activity ¹	73.3	59.5	51.0
Basketball Activity ²	77.1	63.6	53.9
Parking Garage ³	79.1	61.7	50.5

¹ Noise monitoring of boys football practice and tennis court activity was conducted on October 10, 2005 between the hours of 5:00 p.m. and 6:1700 p.m. at Miles Square Park sports fields.

² Noise monitoring of Sunday basketball activity was conducted on October 16, 2005 between the hours of 10:30 a.m. and 11:00 a.m. at Miles Square Park sports fields

³ Noise monitoring of the parking garage was conducted on October 10, 2005 between the hours of 3:10 and 3:30 p.m. at the University of California, Irvine, Social Sciences Parking Garage.

All noise measurements were 20 minutes in duration.

Boys Football Practice

Noise monitoring was conducted at 5:00 p.m. on October 10, 2005 approximately 50 feet from a boys football team practice at the southwest end of the playfield in Mile Square Park. The boys football team consisted of 17 players. Football practice took place in a large area with 2 baseballs fields. There were a total of three football teams, and 2 cheerleading squads located in this area. The two other football teams were practicing at the far east end of the playfield. The girls cheerleading squad was practicing at the far north end of the playfield. These other teams were located over 100 feet from monitoring activity. Primary noise during noise monitoring was football players screaming plays and exercises. Secondary noise included parking lot noise and other sports activities occurring farther from the practice field.

Tennis Court Activity

Noise Monitoring was conducted at 5:30 p.m. on October 10, 2005 at the tennis court area of Mile Square Park. Noise monitoring was conducted in the center isle between two tennis court activity areas. The noise meter was placed 20 feet from the single-player tennis court area and 22 feet from the multiple player tennis court area. There were 2 single player tennis courts and 3 multiple player tennis courts within a 50-foot radius of noise monitoring, although this area is part of a much larger tennis court complex of Mile Square Park, which includes 12 multiple-player tennis courts and 2 single player tennis courts.. There were 4 tennis players within the single court tennis area (2 to a court) and 6 tennis players within the team tennis court area located within the general vicinity of the noise monitoring location. Primary noise from tennis court activities was tennis balls hitting the hardcourt, wall and tennis racket. Secondary noise included noise from children playing on the playfields to the east of the tennis court complex area and noise from Brookhurst Street, located to the west of the tennis court complex.

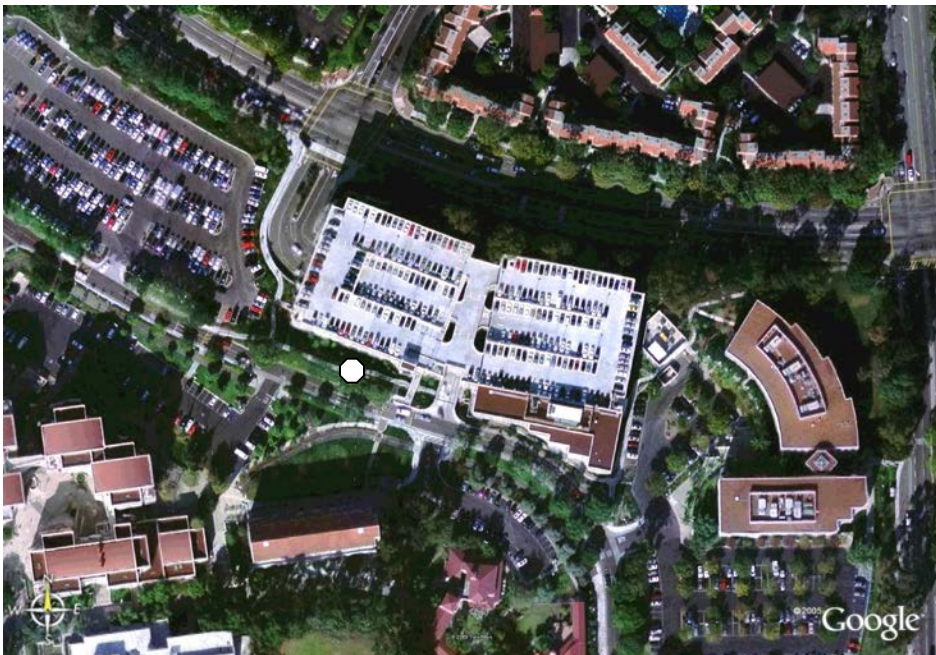
Basketball Court

Noise monitoring was conducted at 10:30 a.m. on October 16, 2005, 5 feet from the central courts and eight feet from the southern courts. The noise meter was placed on the southwest side of the basketball court area. The basketball court area consists of 6 full basketball courts; or 12 half-court basketball courts. Primary noise during monitoring was basketball activity

on the courts. Noise from basketball games and practice include sound of the basketball hitting the backboard and hardcourt area, noise from the hoop chain, and noise from players talking. The loudest single event noise from basketball activity is the basketball hitting the backboard. The noise meter was approximately 27 feet from two basketball hoops/ backboards that were in use. A 2 player half-court game was in progress approximately 5 feet from the noise monitoring location. A 10-player full-court basketball game was in progress 8 feet from the noise monitoring location. Other activity on the courts included a basketball game with 10 people and single player to the east (approximately 59 feet away). In addition, a 3 player game was in progress in the southeastern corner. Secondary noise included traffic from Brookhurst Street, which borders the western side of the basketball court area and small craft airplane overflights from the John Wayne International Airport.

Parking Garage

Noise monitoring was conducted at 3:10 p.m. on October 10, 2005 at the University of California, Irvine, Social Sciences Parking Structure. Noise monitoring was conducted approximately 10 feet from Pereira Drive and 42 feet from the parking structure. The Social Science Parking Lot accommodates 1,824 vehicles and is a seven story structure. The Social Sciences Parking Structure has two entrances/exits, one on the lower level, which provides ingress/egress to Campus Drive, and one on the second level, which provides ingress/egress to Pereira Drive. Noise measurements were taken near the Pereira Drive entrance, approximately 100 feet west of the entrance/exit. The meter was located southeast and one story above the Campus Drive entrance/exit. Monitoring was conducted at the end of the 2:00 pm to 3:20 pm. Monday/ Wednesday class period, and was apparent as large increases in pedestrian activity to the parking structure occurred during noise monitoring. Primary noise environment at the Social Sciences Parking Structure was noise from Pereira Drive and construction equipment noise from campus renovations further to the west. While the Social Sciences Parking Structure added to the noise environment, it was not the primary noise source. Noise sources during noise monitoring from the parking structure included car horns, car engines, brakes and tires, automatic lock beeps, car alarms, and car radios. Secondary noise environment in the vicinity of noise monitoring included students talking on their way to/back-from class. Although Campus Drive was located directly north of the noise monitoring, noise from traffic on this roadway was blocked by the placement of the Social Sciences Parking Structure between the roadway and the noise monitoring location. During noise monitoring, there were 35 light duty autos that entered/exited the parking structure through the Pereira Drive entrance/exit. Traffic volume on Pereira Drive during noise monitoring included 95 light duty autos, 1 medium duty truck, and 8 campus shuttle busses (heavy duty truck).



Attachment 10

Projected Visitor Counts and Parking Needs

MEMORANDUM

DATE January 12, 2016
TO Bryan Largay
Land Trust of Santa Cruz
FROM Isabelle Minn and Isby Fleischmann, PlaceWorks
RE **Projected Visitor Counts and Parking Needs**

This memorandum addresses future visitor use at the San Vicente Redwoods property. Visitors will access the property for various passive recreational activities, including dog walking, hiking, mountain biking, horseback riding, and picnicking. The number of visitors may affect traffic, parking needs, enforcement, and financial considerations, such as revenue generated from parking fees and the impact to the maintenance budget. Therefore, estimating visitor use is key to the planning, design, and environmental review processes.

METHODOLOGY

Visitor use was estimated for the San Vicente Redwoods property based primarily on comparisons with current visitor use at comparable parks and open spaces in the region, as well as our experience with open space and public access planning. Tracking visitation at existing open space preserves and parks is important to management and planning efforts. Visitor use at comparable parks and open spaces presented in this memorandum is based on both quantitative data and qualitative accounts and estimates from the users and managers of the properties. Information provided by managers of other open space preserves and parks are based on the best data available or observations, and represents best estimates rather than precise data. In order to compare information and estimates from different agencies, estimates were used to calculate annual, weekly, and daily visitation. When visitor use estimates were separated by type of use, analysis focused on use types that were consistent with uses planned for San Vicente Redwoods.

The ratio of trail users per mile of trail was also considered when comparing properties. While the National Recreation and Park Association (NRPA) standards for typical visitor counts is 90 users per day per mile on urban trails and 40 users per day per mile on rural trails, the average number of visitors on the comparable properties in Santa Cruz County was 8.3 visitors per mile of trail. Therefore, the NRPA standards were not assumed to be applicable for San Vicente Redwoods.

Key considerations for estimating visitor use include open space characteristics and facilities that will draw visitors, as well as the ease with which these facilities can be reached. Therefore, the attributes considered for comparable parks and open spaces included property size, unique features, facilities, trail connections, allowable uses, and accessibility to nearby urban areas.



VISITATION AT COMPARABLE PARKS AND OPEN SPACES

To estimate expected visitor use for San Vicente Redwoods, three open space properties located within Santa Cruz County were considered. These were selected due to their similarity to San Vicente Redwoods in either size, miles of trail, allowed uses, and accessibility from nearby the urban areas of Santa Cruz and San Jose. Several properties managed by Santa Clara County Parks and Midpeninsula Regional Open Space District (MROSD) were also reviewed in order to provide greater context. An overview of these properties is provided below and summarized in Table 1, emphasizing relevance to future use at San Vicente Redwoods. In addition to these comparable properties, projected future visitation at the Bureau of Land Management's Coast Dairies property and its implications to San Vicente Redwoods is discussed.

THE FOREST OF NISENE MARKS STATE PARK

Characteristics

The Forest of Nisene Marks State Park is a 10,257 acre property with approximately 30 miles of trails. Running, hiking, mountain biking, picnicking, backpacking, and camping (although negligible) are all uses allowed in the park. Similarly to San Vicente Redwoods, dogs are allowed on the entrance road only and the only restroom facility is located at the park entrance. Nisene Marks has three parking lots with a combined capacity of 60-85 cars and 3 trailers.

Accessibility

The Forest of Nisene Marks is 10.7 miles (a 22-minute drive) from Santa Cruz, 12.8 miles (a 26-minute drive) from Watsonville, and 40.4 miles (a 55-minute drive) from San Jose. There is one primary access point for the Park. In addition, there are numerous neighborhood trailheads around the Nisene Marks that support walk-in access from the rural residential communities that border the property, as well as from the more urban communities of Soquel and Aptos to the south. Many people live, work, and/or shop in the Cabrillo College and Aptos Village areas, which are within a quarter- to half-mile distance from Nisene Marks.

Estimated Existing Use

Estimates presented in this memorandum for visitation at both Nisene Marks and Wilder Ranch are based on California State Parks' monthly tracking, which considers actual counts and estimates of visitors that are not captured by the counts.

An estimated 106,094 people visit Nisene Marks annually, based on 2013 data provided by California State Parks, Santa Cruz District.¹ This is equivalent to 10 visitors per day per mile of trail. For both Nisene Marks and Wilder Ranch, typical peak use is estimated to be from 11am to 3pm on weekends and 4pm to 5pm on weekdays.

¹ E-mail from Alaina Boys, CSP, Santa Cruz District, on January 30, 2015

Implications for San Vicente Redwoods

The Forest of Nisene Marks State Park provides slightly less trail mileage than San Vicente Redwoods would provide for at buildout, but offers additional uses including camping and backpacking. Additionally, Nisene Marks is connected to the trail network of Soquel Demonstration State Forest, just as San Vicente Redwoods is envisioned as connecting to the future trails on the Coast Dairies property. While many characteristics of Nisene Marks parallel those anticipated for San Vicente Redwoods, its annual visitation is likely somewhat greater than the future visitation at San Vicente Redwoods due to high level of walk-in use.

WILDER RANCH STATE PARK**Characteristics**

Wilder Ranch State Park is a 7,000 acre property with approximately 34 miles of trails, including roads and singletrack for hiking, mountain biking, and horseback riding. In addition to trail use, camping is allowed and living history demonstrations and tours are provided. The park includes coastal terraces, valleys, and views of historical ranch buildings and gardens.

Accessibility

Wilder Ranch is less than 2.0 miles north of the City of Santa Cruz limits (a 5-minute drive) from Santa Cruz, 21.6 miles (a 34-minute drive) from Watsonville, and 36.0 miles (a 48-minute drive) from San Jose. Wilder Ranch has four parking lots, one paved and three unpaved. The paved parking lot has 74 vehicle spaces and 3 trailer/bus spaces, and the unpaved parking areas fit a combined 150-160 vehicles.

Estimated Existing Use

An estimated 472,809 people visit Wilder Ranch annually, based on 2013 data provided by California State Parks, Santa Cruz District. This is equivalent to 38 visitors per day per mile of trail.

Four annual special events are held at the park in April, July, October, and December. The events in April and December attract approximately 2,500 visitors, October's event attracts approximately 3,000 visitors, and July's attracts approximately 5,000 people. Visitation is equivalent to 38 users per day per mile of trail, however, this includes all visitation including visitors including non-trail users.

Implications for San Vicente Redwoods

Wilder Ranch has significantly higher use than other parks referenced in this memorandum. It is assumed that the high use is due largely to the proximity to Santa Cruz as well as the diversity of user experiences available, including different use types and natural and cultural resources. San Vicente Redwoods is slightly further from Santa Cruz and San Jose than Wilder Ranch, and will have fewer attractions and facilities. However, the high volume of use at Wilder Ranch does indicate high demand for trail use in the Santa Cruz area.



SOQUEL DEMONSTRATION STATE FOREST

Characteristics

The Soquel Demonstration State Forest (SDSF) is a 2,681 acre property with approximately 24 miles of trails. As with San Vicente Redwoods, allowable uses at SDSF include hiking, mountain biking, horseback riding, and picnicking, and not camping. Located on the San Andreas and Zayante faults, SDSF is only two miles north of the 1989 Loma Prieta earthquake epicenter. Geological activity has created steep slopes on the property, which are an attraction for mountain bikers. There are no restrooms or developed water sources on the property.

Accessibility

Soquel Demonstration State Forest is 22.2 miles (a 40-minute drive) from Santa Cruz, 17.5 miles (a 43-minute drive) from Watsonville, 28.0 miles (a 43-minute drive) from San Jose, and 56.1 miles (a 71-minute drive) from Half Moon Bay. The road to SDSF is narrow and often closed making it difficult to access.

Estimated Existing Use

Based on a combination of quantitative data and qualitative accounts, SDSF staff estimates that there are an estimated 20,000 visitors annually, including 2,700 hikers, 300 mushroom collectors, and 17,000 mountain bikers.² Over 60 percent of these visitors come on the weekend versus during the week. On any given weekend day, there are at least 75 vehicles located at the main entrance in the parking area and along Highland Way.

Implications for San Vicente Redwoods

SDSF is more challenging to access than San Vicente Redwoods will be given distance from urban areas. However, the property provides similar attractions (trails in forested environment) and receives a high volume of mountain bike use. It is assumed that San Vicente Redwoods will also receive a high percentage of mountain bike use, and that overall use will be higher than estimated for SDSF.

COMPARABLE OPEN SPACE AND PARKS IN NEIGHBORING COUNTIES

The properties described above are anticipated to provide the greatest insight into future use of San Vicente Redwoods. In order to provide a greater sample size, visitation estimates from Santa Clara County Parks and MROSD were also reviewed. Both agencies own and manage large parks and/or open space preserves within the region.

² Conversation with Angela Bernheisel at CALFIRE, on January 29, 2015. Note: new trail counters were recently installed on all major trails in SDSF in order to more accurately estimate recreation user numbers. However, the trail counters have not provided complete or accurate information thus far because they are not located on every trail, some are missing or damaged, and they can over count visitors who walk past them multiple times.



Santa Clara County Parks: Upper Stevens Creek

The Santa Clara County Department of Parks and Recreation Weekly Activity Report Summary for 2013 estimates that individual parks receive between 3,500 and 617,000 annual users. Upper Stevens Creek Park was identified as having similar attractions as San Vicente Redwoods.

Upper Stevens Creek Park is a 92-acre property that includes a non-power boating reservoir, picnic areas, and over 11 miles of single-track and multi-use trails for hiking, biking, and horseback riding. While Stevens Creek has only 11 miles of trail, it is connected to the Bay Area Ridge Trail and other open space areas, which provides for longer rides than planned for San Vicente Redwood. Upper Stevens Creek is 6.0 miles (15 minute drive) from the closest city (Saratoga), and 15.7 miles (a 23-minute drive) from San Jose, the closest major urban area. Based on the County of Santa Clara Parks and Recreation Department's 2013 Full Activity Report, there were 15,968 visitors in 2013. Of these visitors, all were trail users and 9,443 (59%) were mountain bikers. This is equivalent to 4 users per day per mile of trail.

Midpeninsula Regional Open Space District: El Corte Madera Creek Open Space Preserve

Midpeninsula Regional Open Space District owns and manages numerous open space preserves that provide trail opportunities to the public. El Corte Madera Creek Open Space Preserve was identified as having similar attributes as envisioned for San Vicente Redwoods. El Corte Madera Creek Open Space Preserve is a 2,817 acre preserve offering 28 miles of trails for hiking, biking and equestrian use. The Preserve is located 7 miles from the Town of Woodside, and therefore in closer proximity to the City of San Francisco and surrounding urban areas than San Vicente Redwoods. Based on the District's Visitor Estimate Survey project which collected data between 2007 and 2010, El Corte Madera Creek Open Space Preserve receives an estimated 89,435 visitors per year. This is equivalent to 8 users per day per mile of trail.

COAST DAIRIES

Projected Visitation

The Bureau of Land Management's Coast Dairies property borders the San Vicente Redwoods property to the southwest and is connected to San Vicente Redwoods by several roads including Warrenella Road. While the property is not currently open for public access, the deed restrictions state that the property will provide public access. Efforts are currently underway to have the property designated as a National Monument, which would elevate the visibility and status of the property.

Based on conversations with staff and the Interim Access Plan that was developed in 2013, it is anticipated that the Interim Access Stage (0-5 years) would include two hiking trails, property tours, and/or volunteer opportunities on management projects, and that the "Long-Term Access Stage" (5-10 years) would potentially include over 50 miles of trails and specific projects, such as a visitor center. BLM staff estimate that annual visitation will range between 50,000 and 150,000 during Interim Access, and between 100,000 and 300,000 at full buildout, with the potential for



higher visitation should the property be designated as a National Monument.³ For instance, visitation at Ford Ord National Monument increased substantially since its designation (from approximately 250,000 or 300,000 before designation in 2012 to approximately 450,000 in 2014; representing a 50-percent increase).⁴ BLM staff projects that National Monument Status designation for Coast Dairies could increase local use, but much of the additional use would be generated by tour buses, individuals collecting National Park and Monument stamps, sight-seers that conduct brief visits and do not utilize the extended trail network, and other non-local users. The amount of increase would depend on the type of designation, but is not expected to reach visitation levels at Ford Ord, where there is significant highway/road access, a variety of historical and natural attractions, and accessibility to southern, central and northern California populations.

Total annual visitation is generally higher at nationally recognized parks and open spaces in the region than the regional properties discussed above, based on review of visitation counts at Point Reyes National Seashore, Pinnacles National Park, and Fort Ord National Monument. Visitation at Wilder Ranch State Park, however, is comparable to that at nationally recognized sites. As discussed above, visitation at Ford Ord National Monument increased substantially following designation.

Annual visitation for Point Reyes National Seashore, Pinnacles National Park, and Fort Ord National Monument ranges between 244,943 and 2,711,090, as indicated in Table 2. However, the size, features, and attractions also vary dramatically. In order to provide a more meaningful comparison, annual use per trail mile and per acre of land were also reviewed, as shown in Table 2. While there are many features that could be compared, acreage and trail miles were selected as they allow for comparison with other properties discussed in this memorandum. Based on this analysis, if Coast Dairies were to reach 300,000 annual visitors per year, it would be within the low-range of use at the comparable National Monuments in terms of visitors per trail mile or visitors per acre. This analysis provides some insight into future use at Coast Dairies, but is not assumed to be comprehensive or definitive; further research would be necessary to confirm these preliminary findings.

Implications for San Vicente Redwoods

Future trail connection(s) between San Vicente Redwoods and the Coast Dairies property would result in visitors utilizing both properties during one recreational experience, and enable visitors to

³ PlaceWorks Conversation with David Moore, Outdoor Recreation Planner, US Bureau of Land Management, April 2, 2015.

⁴ PlaceWorks Conversation with David Moore, Outdoor Recreation Planner, US Bureau of Land Management, April 2, 2015, and email communication on 4/14/2015.



use staging areas at either property to access the connected trail system. Given the integration of these properties, it is anticipated that the visitation levels at one property will have direct implications to visitation and parking demand at the other property.

Visitation at Coast Dairies is projected to range between 100,000 and 300,000 at full buildout, with the potential for higher visitation should the property be designated as a National Monument. However, the increase in visitation related to National Monument designation is not likely to result in a substantial increase in visitors to the San Vicente Redwoods' Empire Grade staging area. This is because many of the visitors are likely to be short-stay visitors of the immediate Monument area that will not use the trail network to access adjacent San Vicente Redwoods, and because the San Vicente Redwoods staging area will be more difficult to access from major highways. Coast Dairies staging areas are assumed to provide adequate capacity to accommodate future visitor use of that destination with consideration to a national designation and to trail users that will park at Coast Dairies and connect to San Vicente Redwoods trails. However, given the potential for designation to increase use, the design of the San Vicente Redwoods staging area should consider the potential for future expansion.

ESTIMATED VISITOR USE AT SAN VICENTE REDWOODS

ESTIMATED USE FOR PHASE 1

During Phase 1, it is estimated that 13,140-14,600 people will visit San Vicente Redwoods annually. This is based on the following understanding and assumptions:

- **Characteristics and Facilities.** Under the Draft Master Plan, Phase 1 includes 4 miles of multi-use trails for hiking, mountain biking, and horseback riding. These trails are located on existing fire roads in the northern portion of the 8,500 acre property. Dog-walking is allowed on the 1.5-mile trail that runs parallel to Empire Grade Road. Phase 1 trails would be located within forested habitat with minimal variation, although several viewpoints into Devil's Gulch may attract visitors.
- **Accessibility.** Under Phase 1, the only access point for the recreational trails would be a staging area on Empire Grade Road. This location is 40.3 miles (a 57-minute drive) from San Jose, 15.0 miles (a 28-minute drive) from Santa Cruz, 32.5 miles (a 50-minute drive) from Watsonville, and 49.7 miles (a 66-minute drive) from Half Moon Bay.
- **Visitors per mile of trail.** This estimate assumes 9-10 visitors per mile of trail. It is assumed that Phase 1 visitation will be initially higher per mile of trail than most comparable properties given the novelty of a new open space. However, given limited facilities and attractions as well as the distance to Santa Cruz and other urban areas, it is assumed that use will be significantly lower than experienced at Wilder Ranch State Park.

ESTIMATED USE FOR BUILDOUT

For Buildout, it is estimated that 83,220-97,090 people will visit San Vicente Redwoods annually. This is based on the following understanding and assumptions:



- Characteristics.** At buildout, there would be approximately 38 miles of trails, including existing roads and new singletrack trails. Trails would be primarily separate use, and dog-walking would continue to be limited to the trail running parallel to Empire Grade Road. Through-trails would be established for all use types from Empire Grade to the Coast Dairies property, constituting a skyline-to-sea trail experience, and several internal loop-trails would be established. Trails would generally be within forested habitat. Key features visible from the trail network would generally be limited to include working forest, established forest, and the old railroad grade, as well as the potential skyline-to-sea trail. Limited picnic tables (no group sites) and benches would be provided, and camping would not be allowed.
- Accessibility.** There are no additional parking lots planned for Buildout, however an overflow parking area in proximity to the main parking lot may be considered. However, an additional access point will be the connection to the Coast Dairies property and its future trail networks. This access point would be approximately 12 miles north of the City of Santa Cruz. It is anticipated that visitation would be notably higher at buildout, yet given the limited access points and distance to many of the new trails it is anticipated that the increase in visitation will not reflect the increase in trails (buildout=9.5X the trail mileage of phase 1).
- Visitors per mile of trail.** This estimate assumes 6-7 visitors per mile of trail, which is lower than the assumption for Phase 1 as the visitation is not expected to increase at the same rate as trail mileage due to limited accessibility, as described above. This estimate is slightly lower than estimates for the Forest of Nisene Marks State Park and El Corte Madera Creek Open Space Preserve which is appropriate given that both these properties provide for more uses than San Vicente Redwoods and that Nisene Marks State Parks has a greater number of neighbors with walk-in access.

IMPLICATIONS FOR PARKING DEMAND

Visitation has a direct relationship to parking demand, and therefore projected visitation is a critical tool when planning parking and staging areas. Parking areas that do not accommodate actual use will lead to illegal parking, congestion, and negative visitor experience. Parking areas that are oversized for actual use can cause unnecessary impacts to resources and can be experienced as scars on the landscape. Appropriately sized parking areas will be designed for the optimal footprint needed to accommodate demand on average high-use days.

ESTIMATED DEMAND

Parking demand was estimated for San Vicente Redwoods based on the assumptions identified below, which were developed with consideration to existing parking supply/demand at the comparable parks and open space preserves discussed above as well as PlaceWorks' experience with similar projects. Parking estimates are based on the high end of the range of expected annual visitors.

Phase 1

It is anticipated that 12 parking spaces and 1-2 equestrian trailer spaces would accommodate demand during Phase 1 based on the following assumptions:

- Visitation projections of 14,600 at Phase 1
- 75-percent of visitation will take place on the weekend, equally distributed between Saturday and Sunday (equivalent to 105 visitors/ day on a weekend day)
- 85-percent of visitors will drive-in (others will walk, hike, bike or ride-in; there will be no access from Coast Dairies property)
- Of visitors that drive-in, there will be an average of 2.5 visitors/vehicle
- Vehicles will stay an average of 3 hours, therefore 3 vehicles can occupy one parking space each (3 vehicles/parking space/day)
- Equestrian trailer demand will be lower than Forest of Nisene Marks State Park (3 trailer spaces) given lower trail mileage

Buildout

It is anticipated that 47 parking spaces and 3-5 equestrian trailer spaces would accommodate demand at the Empire Grade Staging Area at Buildout based on the following assumptions:

- Visitation projections of 97,090 at Buildout
- 75-percent of visitation will take place on the weekend, equally distributed between Saturday and Sunday (Equivalent to 698 visitors/ day on a weekend day)
- Staging areas at Coast Dairies will be have adequate capacity to accommodate Coast Dairies' visitors
- 50-percent of visitors will drive-in (others will walk, hike, bike or ride-in; it is anticipated that many will access the property via trail connections to the Coast Dairies property)
- Of visitors that drive-in, there will be an average of 2.5 visitors/vehicle
- Vehicles will stay an average of 3 hours, therefore 3 vehicles can occupy one parking space each (3 vehicles/parking space/day)
- Equestrian trailer demand will be comparable to demand at the Forest of Nisene Marks State Park (3 trailer spaces)
- The Coast Dairies property is opened for public access and trail connections between San Vicente Redwoods and Coast Dairies staging areas will be completed (if this is not the case, visitation projections will remain at Phase 1 levels)

RECOMMENDATIONS FOR EMPIRE GRADE STAGING AREA

It is recommended that the staging area be designed to accommodate 50-60 vehicles and 3-5 trailers at Buildout, and 12 vehicles and 2 trailers during Phase 1. To maximize parking space and flexibility, it is recommended that the trailer spaces be designed as flexible parking space that can accommodate vehicles when necessary. Should Coast Dairies be designated as a National Monument, there is potential for a limited increase in parking to demand. To achieve the goal of minimizing the impacts from overflow parking on the surrounding neighborhoods and to

accommodate the potential for future parking demand increase due to high, it is recommended that the staging area be designed to accommodate an additional 40 spaces that would be constructed only if use demonstrates they are necessary.

As previously discussed, this recommendation for parking at buildout assumes that many visitors will access San Vicente Redwoods through the Coast Dairies property, and that staging areas at Coast Dairies will accommodate this use. If the Coast Dairies property and trail connections from Coast Dairies to San Vicente Redwoods are not opened to the public, San Vicente Redwoods visitation is projected to remain at Phase 1 levels. While the environmental review process for the San Vicente Redwoods Public Access Plan will be considerate of the relationship between San Vicente Redwoods and Coast Dairies, the Coast Dairies project and any proposed access features for the property will be reviewed under a separate environmental process.

TABLE 1 Comparison of Open Space Destinations in Santa Cruz County

	Owner	Size (acres)	Allowable Use	Trail Length (miles)	Driving Time from Nearby Cities (minutes)	Driving Distance from Nearby Cities (miles)	Parking Capacity	Annual Visitation (% by User Type)	Annual Visitation	Weekly Visitation (Annual/52 Weeks)	Daily Visitation (Annual/365 Days)	Weekday Visitation (25%)	Weekend Visitation (75%)	Users/Day/ Trail Miles
The Forest of Nisene Marks State Park	California State Parks	10,257	hiking, jogging, mountain biking, picnicking/bbq, camping	30	22 to Santa Cruz, 55 to San Jose,	11 to Santa Cruz, 40 to San Jose	3 parking lots with capacity for a total of 65-75 cars and/or 3 trailers	40% hikers, 50% bikers, 10% equestrians	106,094	2,040	291	102	763	10
Wilder Ranch State Park	California State Parks	7,000	hiking, mountain biking, equestrians, camping	34	10 to Santa Cruz, 48 to San Jose	2 to Santa Cruz, 36 to San Jose	74 vehicle spaces and 3 trailer/bus spaces in the main parking lot, 150-160 spaces in the overflow parking lot	35% hikers, 40% bikers, 15% equestrians, 10% visitor center based	472,809	9,092	1,295	453	3,400	38
Soquel Demonstration State Forest	CalFIRE	2,681	mountain biking, hiking, mushroom gathering (permit), events (special use permit)	24	43 to San Jose, 40 to Santa Cruz	28 to San Jose, 22 to Santa Cruz	60 parking spaces in main lot; roadside parking for 15+ vehicles on Highland Way	13.5% hikers, 85% bikers, 1.5% mushroom collectors	20,000	385	55	19	144	2
Upper Stevens Creek County Park	County of Santa Clara	1,077	hiking/running, mountain biking	11	15 to Saratoga, 23 to San Jose, 46 to Santa Cruz	6 to Saratoga, 16 to San Jose, 30 to Santa Cruz	Northern and southern park entrances; public transit available; Upper Stevens Creek by foot/horse/bike from Stevens Creek or Bay Area Ridge Trail	39% hikers, 59% bikers, 2% equestrians	15,968	307	44	15	115	4
El Corte de Madera Creek	MROSD	2,817	hiking, mountain biking, equestrians, picnicking	28	N/A	N/A	N/A	N/A	85,593	1,646	235	82	616	8
San Vicente Redwoods (PHASE 1)	POST, LTSC, Save the Redwoods League, Sempervires Fund	8,500	hiking, mountain biking, equestrians, picnicking	4	28 to Santa Cruz, 57 to San Jose	15 to Santa Cruz, 40 to San Jose	TBD	N/A	13,140	252	36	13	95	9
San Vicente Redwoods (BUILDOUT)	(same as above)	(same as above)	(same as above)	38	(same as above)	(same as above)	TBD	N/A	83,220	1,596	228	80	599	6

Attachment 11

Traffic Impact Analysis



San Vicente Redwoods Public Access Plan

Draft Report

September 20, 2017

Mott MacDonald
1300 First Street, Suite B,
Gilroy, California 95020

PlaceWorks
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San Vicente Redwoods Public Access Plan

Draft Report

September 20, 2017

Issue and revision record

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3	08/28/2017	Jeffrey Waller	Julie Oates	Leo Trujillo	Additional Revised Report (2)
4	09/20/2017	Jeffrey Waller	Julie Oates	Leo Trujillo	Additional Revised Report (3)

Information class: Standard

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Contents

1	Introduction	1
2	Existing Conditions	4
2.1	Existing Road Network	4
2.2	Existing Pedestrian Network	4
2.3	Existing Bicycle Network	4
2.4	Existing Conditions Traffic Operations	5
3	Existing Plus Project Conditions	6
3.1	Project Description	6
3.2	Project Trip Generation	6
3.3	Project Trip Distribution	7
3.4	Existing Plus Project Conditions Traffic Operations	8
3.5	Existing Plus Project Conditions Pedestrian Circulation	8
3.6	Existing Plus Project Conditions Bicycle Circulation	9
4	Cumulative Without Project and Cumulative Plus Project Conditions	10
4.1	Derivation of Cumulative Traffic Volumes	10
4.2	Cumulative Without Project and Cumulative Plus Project Conditions Traffic Operations	10
5	Project Access and Internal Circulation	12
5.1	Driveway Location	12
5.2	Driveway Operations	12
5.3	Sight Distance	12
5.3.1	Exit Driveway	12
5.3.2	Entry Driveway	13
5.4	Internal Circulation	13
6	Parking	14
6.1	Parking Supply	14
6.2	Overflow Parking	14

7	Comparison to Twin Gates	16
8	Recommendations	17
8.1	Existing Conditions	17
8.2	Existing Plus Project Conditions	17
8.3	Cumulative Conditions	17
9	References	18
9.1	List of References	18
9.2	List of Contacts	18

Tables

Table 1: Roadway Segment Volumes and Levels of Service – Existing Conditions	5
Table 2: Roadway Segment Volumes and Levels of Service – Existing and Existing Plus Project Conditions	8
Table 3: Roadway Segment Volumes and Levels of Service – Cumulative Without Project and Cumulative Plus Project Conditions	11

Figures

Figure 1: Trailhead Location Map	2
Figure 2: Trailhead Staging Plan	3
Figure 3: Project Trip Distribution	7

Appendix

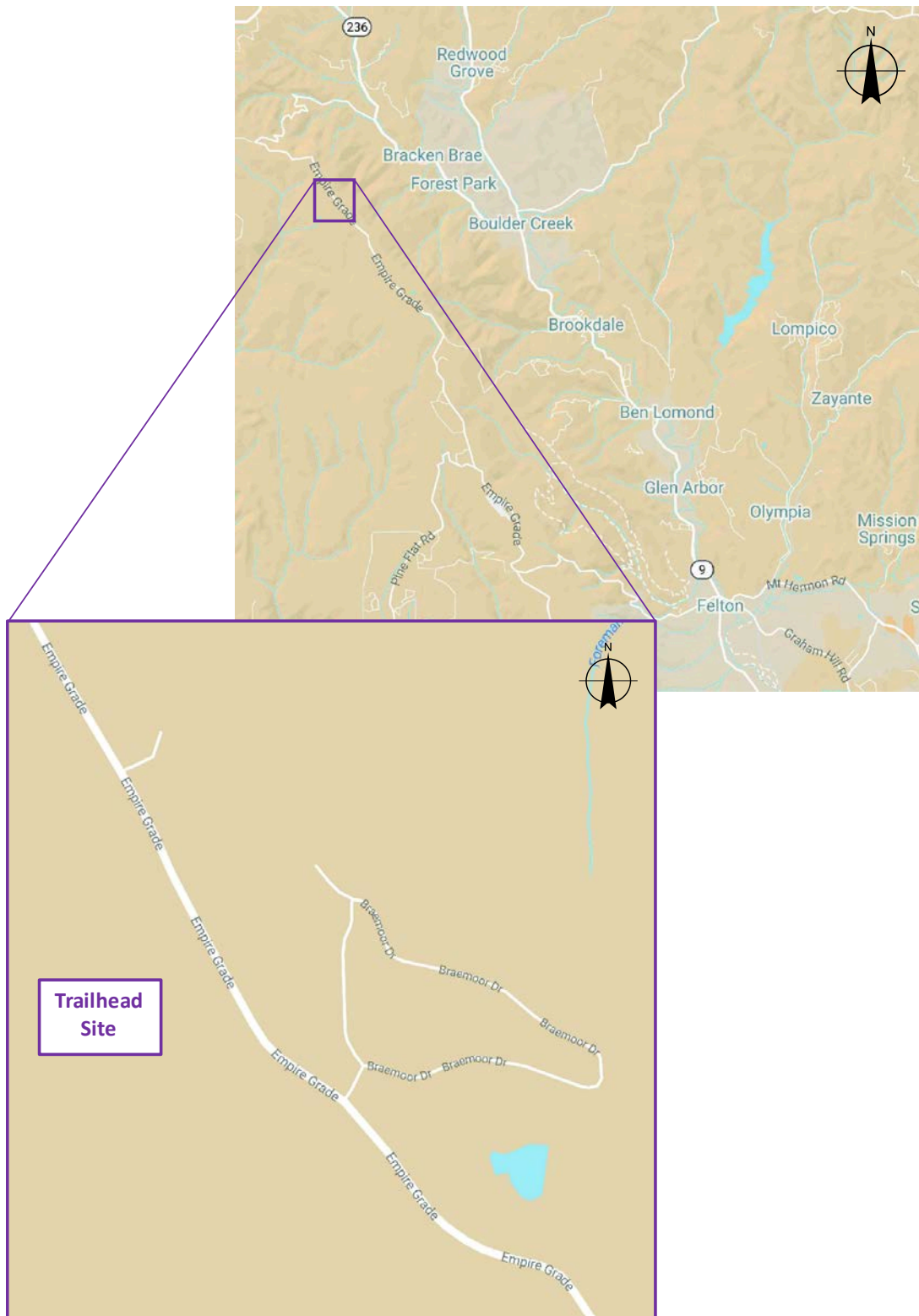
- A. Level of Service Descriptions
- B. Traffic Counts
- C. *Projected Visitor Counts and Parking Needs*, PlaceWorks, January 12, 2016

1 Introduction

This Traffic Impact Analysis (TIA) analyzes the potential traffic impacts of the proposed adoption and implementation of the proposed San Vicente Redwoods Public Access Plan project in Santa Cruz County, California. The public open space preserve area is located in the Santa Cruz Mountains above Davenport, north of State Route 1 and west of Empire Grade. The focus of this study is a trailhead (including a bathroom and parking area) for the public open space, to be located on Empire Grade approximately 1.25 miles north of Alba Road, opposite the Crest Ranch Choose and Cut Christmas Tree Farm. **Figure 1** depicts the location of the trailhead, and **Figure 2** depicts the trailhead staging plan.

This report identifies both the on-site and off-site traffic impacts associated with the study trailhead. The off-site review focuses on impacts to the adjacent street, trailhead access issues and a sight distance evaluation at the driveways. The onsite review includes onsite circulation and parking supply. Finally, comparisons and interactions with the Twin Gates trailhead/staging area, located on Empire Grade north of Santa Cruz, are addressed.

Figure 1: Trailhead Location Map



Basemap Source: Google Maps, 2017.

2 Existing Conditions

This chapter evaluates Existing conditions and includes a description of the trailhead setting.

2.1 Existing Road Network

Empire Grade is a two-lane rural roadway in Santa Cruz County. It extends from the outskirts of Santa Cruz – adjacent to the University of California at Santa Cruz (UCSC) – to the Lockheed Martin facility northwest of Boulder Creek. Empire Grade provides access to various rural residential properties and neighborhoods in the Santa Cruz Mountains west of the San Lorenzo River, including a CalFire station at Felton Empire Road. Empire Grade traverses moderately steep terrain with few sharp turns. The speed limit on Empire Grade is 40 miles per hour (mph).

At the trailhead site, Empire Grade is 24 feet wide, with 10-foot through lanes and two-foot paved shoulders in each direction. There are dirt shoulders on either side of the street, although near the proposed trailhead driveways, the shoulder along the southbound frontage of the roadway changes to an approximately two-foot deep drainage channel. Utility poles line the southbound frontage of the roadway, located approximately six feet off of the edge of pavement.

Felton Empire Road is a two-lane rural roadway in Santa Cruz County. Although it extends between Empire Road and State Route 9 in Felton, it also provides connections to other regional roadways. At its eastern end, it connects to Graham Hill Road, which provides access to Santa Cruz, and, indirectly, Scotts Valley and State Route 17. At its western end, it connects to Ice Cream Grade, which provides access to Bonny Doon. Overall, Felton Empire Road traverses very mountainous terrain with multiple sharp turns. The speed limit on Felton Empire Road is 35 mph.

2.2 Existing Pedestrian Network

There is no sidewalk in the vicinity of the trailhead site – pedestrians must walk on the paved shoulder, dirt shoulder, or roadway. Observations in June 2016 found no pedestrian traffic on Empire Grade near the trailhead site, which is consistent with the rural setting of the roadway.

2.3 Existing Bicycle Network

There are no Class I (bike path) or Class II (bike lanes) facilities on Empire Grade, Felton Empire Road or any other roadways in the area. Despite this, Santa Cruz County designates Empire Grade – from Jamison Creek Road to the city limits of Santa Cruz – as a “bikeway,” noting its overall importance in the countywide bicycle transportation network.

Santa Cruz County, in its bicycle plan, proposes to add Class II bicycle lanes in both directions of Empire Grade between Santa Cruz and Pine Flat Road. (Pine Flat Road intersects Empire Grade approximately three miles south of the trailhead.) There are no planned bicycle improvements on Felton Empire Road.

Observations in June 2016 found no bicycle activity on Empire Grade near the trailhead, although a small amount of bicycle activity likely occurs on weekends.

2.4 Existing Conditions Traffic Operations

Roadway segment levels of service are based on the threshold volumes in **Appendix A**. These thresholds are based on the *2010 Highway Capacity Manual* methodologies. However, to be conservative, the threshold volumes have been reduced 50% (Empire Grade) and 75% (Felton Empire Road) to better reflect the mountainous terrain traversed by both roadways.

New roadway segment counts were collected for seven consecutive days on Empire Grade near the trailhead driveways in June 2016 (Monday, June 20 through Sunday, June 26, 2016) and on Felton Empire Road just east of Empire Grade in July and August 2017 (Thursday, July 27 through Wednesday, August 2, 2017) – these counts can be found in **Appendix B**. These volumes were used to derive an average daily traffic (ADT) for both roadways.

Table 1 depicts the volumes and levels of service at the two study roadway segments.

The ADT on Empire Grade is 550 vehicles per day, or Level of Service (LOS) “A”. On Saturdays, ADT volumes are 630 vehicles per day, also LOS A.

The ADT on Felton Empire Road is 2,350 vehicles per day, or LOS C. On Saturdays, ADT volumes are 2,340 vehicles per day, also LOS C.

Table 1: Roadway Segment Volumes and Levels of Service – Existing Conditions

Roadway Segment		Type	Direction	LOS Std.	Peak Hour	Existing Conditions	
						Volume	LOS
1	Empire Grade North of Pine Flat Road	2-Lane Rural (Mountainous)	Two-Way	C	Weekday Saturday	550 630	A A
2	Felton Empire Road East of Empire Grade	2-Lane Rural (Very Mountainous)	Two-Way	C	Weekday Saturday	2,350 2,340	C C

Note: Level of service are based on the threshold volumes in **Appendix A**.

3 Existing Plus Project Conditions

This chapter describes the proposed trailhead and assesses its potential impacts on the surrounding roadways.

3.1 Project Description

The proposed project is the Public Access Plan for the San Vicente Redwoods open space preserve. The focus of this study is on the proposed trailhead on Empire Grade. This trailhead would serve the hikers, bicyclists and equestrians using the trails within the Public Access Plan Area. The trailhead would have parking (for both vehicles and trailers) and a bathroom.

Access to the trailhead would be via two driveways off of Empire Grade – one entry and one exit. The two driveways would be approximately 500 feet apart.

3.2 Project Trip Generation

This trip generation estimate is based on *Projected Visitor Counts and Parking Needs*, PlaceWorks, January 12, 2016 (see **Appendix C**). Mott MacDonald concurs with the analysis and conclusions of this estimate based on review of the document as well as supplemental analysis of the implications of visitation at Twin Gates trailhead on the project site, as further described in Section 7. Mott MacDonald has also estimated hourly traffic levels for the trailhead based on these daily estimates.

The PlaceWorks attendee and parking demand estimates are based on attendee levels at comparable parks and open spaces in the area, including The Forest of Nisene Marks State Park, Wilder Ranch State Park, and Soquel Demonstration State Forest. As stated above, Mott MacDonald has also compared visitation estimates with existing visitation at Twin Gates trailhead.

The study trailhead is estimated to attract 13,140 – 14,600 people per year at initial opening, and 83,220 – 97,090 people per year in the future. On an average weekday during the year, this would equate to 23 visitors/day (initial) and 149 visitors/day (future), or approximately 8 vehicles/day (initial) and 30 vehicles/day (future).

Higher activity levels are anticipated on weekends during the spring, summer and fall months, where as many as 105 visitors/day (initial) and 698 visitors/day (future) could visit the trailhead, or 36 vehicles/day (initial) and 140 vehicles/day (future). Assuming visitors begin and end their activities roughly during daylight hours (10 hours of the day), Mott MacDonald estimates an average of approximately 4 vehicles/hour (initial) and 14 vehicles/hour (future). During peak periods (mid-morning and mid-afternoon), activity could increase to 6 vehicles/hour (initial) and 18 vehicles/hour (future).

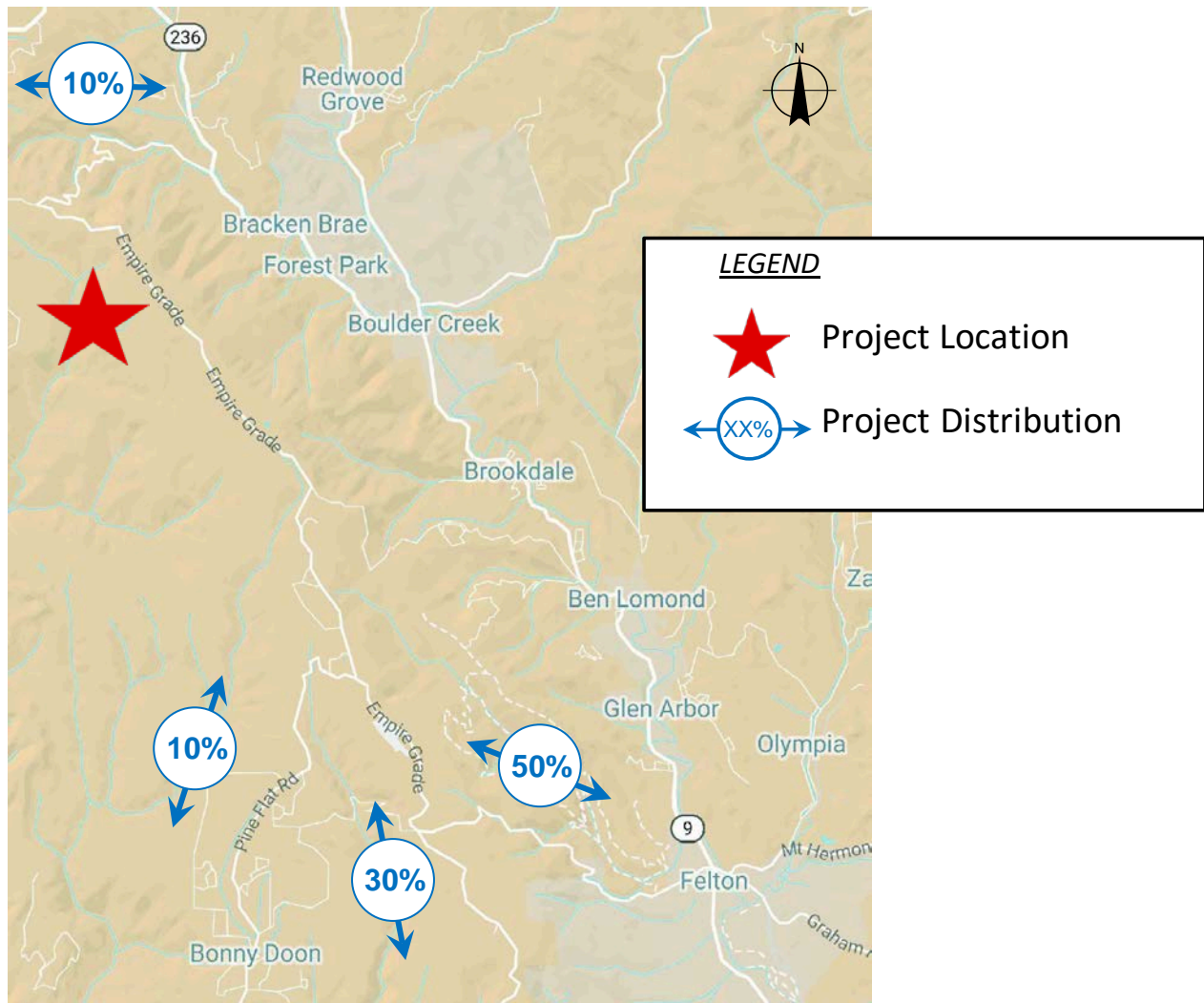
The vehicle rates noted above represent attendance at the trailhead, i.e., trips entering the facility. As all entering vehicles would also have to depart the trailhead during the same day, the total vehicle trip generation of the trailhead (inbound and outbound vehicles) would be double these rates, or 16 vehicles/day (initial) and 60 vehicles/day (future) during an average weekday and 64 vehicles/day (initial) and 280 vehicles/day (future) on weekends.

Note: These vehicle rates assume that the planned future connection of the project trail system to the Cotoni-Coast Dairies National Monument near Davenport will reduce the overall percentage of attendees that use the Empire Grade trailhead to access the overall trailhead site in the future.

3.3 Project Trip Distribution

Figure 3 depicts the anticipated project trip distribution. Due to the remoteness of the trailhead and the limited street network in the vicinity of the trailhead, it is estimated that 10% of the project traffic would travel to/from the north of the site and 90% would travel to/from the south. Using this distribution, the project trips were assigned to the two study roadway segments and combined with the existing volumes to create the Existing Plus Project conditions volumes in **Table 2**.

Figure 3: Project Trip Distribution



Basemap Source: Google Maps, 2017.

Table 2: Roadway Segment Volumes and Levels of Service – Existing and Existing Plus Project Conditions

Roadway Segment		Type	Direction	LOS Std.	Peak Hour	Existing Conditions		Existing Plus Project Conditions			
						Volume	LOS	Initial		Future	
								Volume	LOS	Volume	LOS
1 Empire Grade	North of Pine Flat Road	2-Lane Rural (Mountainous)	Two-Way	C	Weekday	550	A	566	A	610	A
					Saturday	630	A	694	A	910	A
2 Felton Empire Road	East of Empire Grade	2-Lane Rural (Very Mountainous)	Two-Way	C	Weekday	2,350	C	2,358	C	2,380	C
					Saturday	2,340	C	2,372	C	2,480	C

Note: Level of service are based on the threshold volumes in **Appendix A**.

3.4 Existing Plus Project Conditions Traffic Operations

The levels of service at the study roadway segments under Existing Plus Project conditions are shown in **Table 2**.

Adding the trailhead traffic to the existing volumes, the Existing Plus Project condition average volume on Empire Grade would rise to 566 vehicles/day (initial) and 610 vehicles/day (future). On Saturdays, daily volumes on Empire Grade would rise to 694 vehicles/day (initial) and 910 (future). All of these daily volumes would continue to represent LOS A conditions. As the Santa Cruz County level of service standard is LOS C, operations on Empire Grade would continue to be acceptable.

Average volumes on Felton Empire Road would rise under Existing Plus Project conditions to 2,358 vehicles/day (initial) and 2,380 vehicles/day (future). On Saturdays, volumes would be 2,372 vehicles/day (initial) and 2,480 vehicles/day. All of these daily volumes would continue to represent LOS C conditions. As the Santa Cruz County level of service standard is LOS C, operations on Felton Empire Road would continue to be acceptable.

Note: The traffic volumes on Empire Grade used in this analysis were collected in June 2016, presumably a high-volume month for study project traffic due to the consistently good weather during that time of the year. However, as noted in Chapter 1, the trailhead site is located opposite the Crest Ranch Choose and Cut Christmas Tree Farm, which has its driveway approximately 800 feet north of the exit driveway for the study project. Visitor activity at Crest Ranch causes traffic volumes on Empire Grade to increase between roughly Thanksgiving Day and Christmas Day. However, activity levels at the trailhead site would be lower during this period, due to colder weather and possible rain. Therefore, operations of Empire Grade would remain at or better than its LOS C standard throughout the year.

3.5 Existing Plus Project Conditions Pedestrian Circulation

Due to the rural setting of the trailhead and the relative remoteness of the area from major population centers, few pedestrians are anticipated to travel to and from the trailhead along the county roadway network. Pedestrians that do visit the trailhead are likely to be some of the small number of residents that live in the vicinity of the trailhead. Therefore, the project would not have an impact on pedestrian circulation. No improvements are required.

3.6 Existing Plus Project Conditions Bicycle Circulation

Due to the relative remoteness of the area from major population centers, relatively few bicyclists are anticipated to travel on the county roadway network to the trailhead, although a few bicyclists per month during the summer weekends may use the bathroom facility while passing through the area on Empire Grade. Therefore, the project would not have an impact on bicycle circulation. No improvements are required.

Although no bicycle improvements are required, it is suggested that Santa Cruz County consider modifying its bicycle plan to extend the proposed Class II bicycle lanes on Empire Grade from Pine Flat Road to the trailhead. This addition would improve the connectivity of the county bicycle network.

To access the project site trailhead via the area road network, visitors (whether driving or bicycling) will use various roadways with connections to Empire Grade and Felton Empire Road, including Jamison Creek Road, Pine Flat Road, and Bonny Doon Road. These roadways are relatively narrow and have little to no shoulders. However, when the trailhead traffic is dispersed over these roadways, the project would be adding relatively little traffic on any one roadway. In addition, the time periods of highest activity level at the trailhead on a weekday will likely be mid-morning to late afternoon, and thus would be outside of the peak weekday morning and evening commute periods on these roadways (7:00 – 9:00 AM and 4:00 – 6:00 PM). Therefore, the project would not impact the operations of these roadways.

4 Cumulative Without Project and Cumulative Plus Project Conditions

This chapter summarizes future traffic conditions and assesses the potential of the project to impact those conditions on the surrounding roadways.

4.1 Derivation of Cumulative Traffic Volumes

According to the Santa Cruz County Public Works Department, no future traffic volume projections exist for Empire Grade near the trailhead. There are also too few historical traffic volumes available for Empire Grade or any of the surrounding roadways to be able to derive a historical growth rate for traffic volumes in this area. Therefore, an assumed growth rate of 0.5% per year for 20 years – an overall growth rate of 10% -- was applied to the existing volumes on Empire Grade and Felton Empire Road to approximate Cumulative Without Project condition volumes. This level of growth is reflective of the rural nature of the surrounding area and the anticipated very low level of potential future development in the study area. It is also slightly higher than the projected yearly population growth projection (0.42% per year between 2010 and 2035) for unincorporated Santa Cruz County forecasted by the Association of Monterey Bay Area Governments (AMBAG) in its *2014 Regional Growth Forecast*, which was adopted on June 11, 2014.

4.2 Cumulative Without Project and Cumulative Plus Project Conditions Traffic Operations

The volumes and levels of service at the study roadway segments under Cumulative Without Project and Cumulative Plus Project conditions are shown in **Table 3**.

The Cumulative Without Project condition average daily volume on Empire Grade would be 605 vehicles/day, or LOS A. On Saturdays, daily volumes would be 693 vehicles per day, also LOS A.

Traffic volumes on Felton Empire Road under Cumulative Without Project conditions would be 2,585 vehicles/day, or LOS C. On Saturdays, daily volumes would be 2,574 vehicles/day, also LOS C.

Cumulative Plus Project volumes are the Cumulative Without Project volumes plus the trailhead trips. Under Cumulative Plus Project conditions, the average volume on Empire Grade would rise to 621 vehicles/day (initial) and 665 vehicles/day (future). On Saturdays, daily volumes would rise to 757 vehicles/day (initial) and 973 (future). All of these daily volumes would continue to represent LOS A conditions.

The average volume on Felton Empire Road under Cumulative Plus Project conditions would rise to 2,593 vehicles/day (initial) and 2,615 vehicles/day (future). On Saturdays, daily volumes would rise to 2,610 vehicles/day (initial) and 2,714 (future). All of these daily volumes would continue to represent LOS C conditions.

As the Santa Cruz County level of service standard is LOS C, operations on Empire Grade and Felton Empire Road would continue to be acceptable.

Table 3: Roadway Segment Volumes and Levels of Service – Cumulative and Cumulative Plus Project Conditions

Roadway Segment		Type	Direction	LOS Std.	Peak Hour	Cumulative Without Project Conditions		Cumulative Plus Project Conditions			
						Volume	LOS	Initial		Future	
								Volume	LOS	Volume	LOS
1 Empire Grade	North of Pine Flat Road	2-Lane Rural (Mountainous)	Two-Way	C	Weekday	605	A	621	A	665	A
					Saturday	693	A	757	A	973	A
2 Felton Empire Road	East of Empire Grade	2-Lane Rural (Very Mountainous)	Two-Way	C	Weekday	2,585	C	2,593	C	2,615	C
					Saturday	2,574	C	2,610	C	2,714	C

Note: Level of service are based on the threshold volumes in **Appendix A**.

5 Project Access and Internal Circulation

This chapter summarizes the project access and internal circulation issues associated with the trailhead.

5.1 Driveway Location

The driveway locations are on a continuously straight segment of Empire Grade. There is a relatively short vertical curve (i.e., downgrade) as one travels north on Empire Grade between the driveways, such that the elevation of the exit driveway is below that of the entry driveway.

5.2 Driveway Operations

The trailhead entry and exit driveways are anticipated to operate within acceptable levels of service, due to relatively low through volumes on Empire Grade. This minimizes the number of conflicting vehicles when entering or exiting the trailhead.

The entry and exit driveways are flared out at their intersection with Empire Grade. This will allow for left and right turning vehicles out of the exit driveway to turn onto Empire Grade independently of each other. It also allows vehicles pulling trailers (such as horse trailers) to turn onto Empire Grade without the trailers off-tracking off of the pavement.

There is no need for left or right turn lanes on Empire Grade into the trailhead staging area, nor any acceleration lanes for vehicles turning onto Empire Grade, again due to the relatively low through volumes on Empire Grade.

5.3 Sight Distance

Santa Cruz County standards require a minimum of 250 feet of sight distance on either side of a driveway. This is based on a driver location approximately 6 feet behind the edge of pavement of a roadway.

5.3.1 Exit Driveway

Field measurements in June 2016 found that the amount of sight distance available at the exit driveway exceeds the county sight distance requirement in both directions of Empire Grade. Trees and utility poles would not obstruct sight lines at the exit driveway. No improvements are required.

The County standard (250 feet of sight distance) is based on a speed limit of 35 mph. However, as the speed limit on Empire Grade is 40 mph, the sight distance was also compared to Caltrans sight distance requirements. For 40 mph, Caltrans requires a sight distance for private driveways of 300 feet. Field measurements in June 2016 found available sight distance to/from the north of over 500 feet, and available sight distance to/from the south of 440 feet. As both of these measurements exceed 300 feet, the available sight distance at the exit driveway also exceeds Caltrans standards.

5.3.2 Entry Driveway

At the entry driveway, no traffic would be exiting the driveway. Instead, vehicles would be turning off of Empire Grade itself, either slowing as they are turning off of the roadway or stopping while awaiting an adequate gap in traffic to make their turn. Therefore, the critical sight distance is the view of slowing, stopped or turning downstream vehicles on Empire Grade at the entry driveway.

Field measurements in June 2016 found that the amount of sight distance at the entry driveway exceeds the county sight distance requirements in both directions of Empire Grade. Available sight distance is 385 feet to/from the north and over 400 feet to/from the south; therefore, available sight distance also exceeds Caltrans requirements. No improvements are required.

5.4 Internal Circulation

The trailhead entry and exit are a minimum of 14 feet wide – more than adequate for one-way roadways. These roadways widen to 24 feet in the parking areas where two-way travel is allowed, which meets minimum standards for parking lot aisles.

As the entry roadway, exit roadway, and some of the parking aisles only allow one-way traffic, it is recommended that “ONE WAY” (R6-1 or equivalent) and “DO NOT ENTER” (R5-1 or equivalent) signs be placed throughout the parking area. Such signs are also recommended at the entry and exit driveways, in locations that would not obstruct the available sight distance.

As the horse trailer parking area would be located near the exit to the trailhead staging area, it is recommended that signs be added near the general parking area that direct visitors with trailers to the designated horse trailer parking area. This will help prevent visitors with horse trailers from mistakenly parking in either the general parking aisles or along the edge of the access roadway.

It is also suggested that a pathway from the parking area to the trails be added. Such a pathway would help to channel users of the trails to a centralized access point, concentrating foot/bicycle/equestrian traffic in a certain area. This will minimize impacts to native plants and trees farther away from this pathway.

6 Parking

This chapter summarizes the parking issues associated with the project.

6.1 Parking Supply

The trailhead staging plan on **Figure 2** indicates that in Phase 1 the trailhead would have 15 parking spaces, composed of 13 general parking spaces (2 of which are accessible parking spaces) and 2 horse trailer parking spaces. The parking area would be expanded in Phase 2 (Buildout) to 58 total spaces in the future, including 4 accessible spaces and 4 horse trailer parking spaces. Ultimately, as demand requires, the parking area can be expanded to a maximum of 98 total spaces.

The aforementioned PlaceWorks memorandum (**Appendix C**) estimates that the parking demand for the trailhead is 12 general vehicles and 1 - 2 horse trailers at initial opening, increasing to 47 standard vehicles and 3 - 5 horse trailers under future conditions. These demand estimates are based on parking demand at other similar facilities in the Santa Cruz Mountains. Mott MacDonald has reviewed and agrees with these estimates.

Although the number of initial vehicle parking spaces shown on **Figure 2** does exceed the projected demand, the fact that two of those spaces are accessible spaces may lead to a parking shortage on busier days at the trailhead. It is recommended that the project applicant address the potential for shortage during Phase 1 by either (1) constructing at least two of the future general vehicle spaces, thereby increasing the total initial number of vehicle spaces under Phase 1 to at least 17 spaces, (2) simply grading (i.e., unfinished grading) some of the Phase 2 or Phase 3 spaces to be used as overflow if all of the other spaces are filled, or (3) utilizing an adaptive management approach to monitor parking capacity and to expand the capacity as needed.

The number of future horse trailer parking spaces shown on **Figure 2** is 4 trailer spaces, which is in between the projected parking demand range of 3-5 trailer spaces. This could lead to a parking shortage for horse trailer spaces on busier days at the trailhead. It is recommended that either one additional horse trailer space be constructed in the area designated for Phase 3 (Additional Future Spaces), or that horse trailer parking be allowed to use these spaces when other horse trailer spaces are filled. Although this recommendation could reduce the overall number of general vehicle parking spaces, the resulting number of general spaces would still be more than adequate to meet future demand at the project trailhead.

If the recommended parking area modifications are incorporated into the trailhead site plan, the proposed parking supply can adequately accommodate parking demand under initial conditions, and can be expanded in the future to accommodate future increased demand.

6.2 Overflow Parking

As noted previously, the trailhead staging plan indicates that the onsite parking supply can be increased to as many as 98 total spaces, or nearly double the anticipated demand under future conditions. These additional spaces will provide adequate supply for any needed overflow parking demand, even if they are reduced to allow for an additional horse trail parking space as recommended above. Some of these spaces could also be simply graded (i.e., unfinished)

under Phase 1 conditions, to serve as an unmarked overflow parking area until formal spaces are necessary in the future.

7 Comparison to Twin Gates

This chapter compares the study project trailhead to the Twin Gates trailhead/staging area at the northern end of the University of California Santa Cruz campus.

There is currently another trailhead/staging area on Empire Grade, approximately 11 miles south of the project trailhead. The Twin Gates trailhead/staging area, located on Empire Grade at the northern end of the University of California Santa Cruz (UCSC) campus, provides access to various recreation trails on the university campus in that area. Members of the public have raised various concerns regarding the similarities and interactions between the two trailheads, specifically:

1. How does visitor activity at the Twin Gates compare with the trip activity projected at the project site; and
2. If potential visitors to the Twin Gates area are unable to find parking near the trailhead/staging area and instead choose to continue to the project site, can the project site accommodate the additional activity.

Addressing the first concern, the trip activity for the Twin Gates area is approximately 50 visitors per day. This is about double the number of anticipated attendees at the project trailhead under interim conditions and about one-third of the number of attendees projected under future conditions. However, a key difference between the study trailhead and Twin Gates is its location. As Twin Gates is located just north of Santa Cruz, it is easily accessible from the city and surrounding areas. This proximity to urbanized areas is more akin to The Forest of Nisene Marks State Park, which gets many shorter day trips due to its location near Aptos. Conversely, the study trailhead is located in a remote area of the Santa Cruz Mountains northwest of Felton, with relatively few nearby residents. Due to the additional travel time required to reach it and the length of the trails accessible from it, visitors to the study trailhead will likely be present there for multiple hours, rather than a quick trip.

As to the second concern, due to its distance from the Twin Gates trailhead and the difference in typical attendee dwell times at each trailhead, few, if any visitors are anticipated to travel to the study trailhead if there is insufficient parking available at the Twin Gates trailhead. As stated in Section 3, Mott MacDonald does not believe that any modification to the visitation estimates presented in the *Projected Visitor Counts and Parking Needs*, PlaceWorks, January 12, 2016 (see **Appendix C**) is necessary in light of Twin Gates visitation. Projected operations on the study roadway segments and proposed trailhead driveways would remain adequate with the small amount of overflow traffic from the Twin Gates trailhead. However, as previously noted, there is potential that the Phase 1 parking supply at the project trailhead may not be sufficient on peak days. The recommended parking improvements at the project trailhead staging area would also be more than adequate to accommodate the minimal amount of potential demand from overflow traffic from the Twin Gates trailhead. Long-term, as the staging area can be expanded to as many as 98 spaces, there is more than adequate parking supply to accommodate any overflow demand from the Twin Gates trailhead.

Note: As diversion of visitors from the Twin Gates trailhead to the project trailhead would be relatively infrequent, it would not affect the projected overall attendance rates or trip generation estimate for the project trailhead.

8 Recommendations

This chapter summarizes the recommendations discussed earlier in this document.

8.1 Existing Conditions

No improvements recommended under this scenario.

8.2 Existing plus Project Conditions

1. Add “ONE WAY” (R6-1 or equivalent) and “DO NOT ENTER” (R5-1 or equivalent) signs throughout the parking area on one-way roadways. Such signs and pavement markings are also recommended at the entry and exit driveways, in locations that would not obstruct the available sight distance. (Responsibility: Project Applicant)
2. Add signs near the general parking area that direct visitors with trailers to the designated horse trailer parking area. (Responsibility: Project Applicant)
3. Consider adding a pathway from the parking area to the trails. (Responsibility: Project Applicant)
4. Increase Phase 1 overflow capacity be either: (1) constructing at least two of the future general vehicle spaces, thereby increasing the total initial number of vehicle spaces under Phase 1 to at least 17 spaces, (2) simply grading (i.e., unfinished grading) some of the Phase 2 or Phase 3 spaces to be used as overflow if all of the other spaces are filled, or (3) utilizing an adaptive management approach to monitor parking capacity and to expand the capacity as needed. (Responsibility: Project Applicant)
5. Construct at least one additional horse trailer space in the overflow parking area under future conditions, or allow horse trailer parking in these spaces when other horse trailer spaces are filled. (Responsibility: Project Applicant)
6. Santa Cruz County should consider modifying its bicycle plan to extend the proposed Class II bicycle lanes on Empire Grade from Pine Flat Road to the trailhead. (Responsibility: County of Santa Cruz)

8.3 Cumulative Conditions

No additional improvements recommended under this scenario.

9 References

9.1 List of References

1. *Santa Cruz County Bicycle Plan*, Santa Cruz County Public Works Department, March 2011.
2. "Projected Visitor Counts and Parking Needs," PlaceWorks, January 12, 2016.
3. *2014 Regional Growth Forecast*, Association of Monterey Bay Area Governments (AMBAG), Adopted June 11, 2014.
4. *Highway Design Manual*, 6th Edition, California Department of Transportation (Caltrans), updated March 7, 2014.
5. *California Manual on Uniform Traffic Control Devices*, California Department of Transportation (Caltrans), Updated November 7, 2014.

9.2 List of Contacts

1. Isby Fleischmann, PlaceWorks, Berkeley, California.
2. Terri McCracken, PlaceWorks, Berkeley, California.
3. Brian Largay, Land Trust of Santa Cruz County, Santa Cruz, California.
4. Jack Sohriakoff, Santa Cruz Public Works Department (formerly), Santa Cruz, California.
5. Rodolfo Rivas, Santa Cruz Public Works Department, Santa Cruz, California.

Appendix A

Level of Service Descriptions

APPENDIX
LEVEL OF SERVICE THRESHOLD VOLUMES FOR VARIOUS ROADWAY TYPES
TOTAL DAILY VOLUMES IN BOTH DIRECTIONS (ADT)
(Rural Highway)

ROADWAY TYPE	CODE	LOS A	LOS B	LOS C	LOS D	LOS E
2-Lane Rural Highway (level terrain)	2R-L	4,000	8,000	12,000	17,000	25,000
2-Lane Rural Highway (rolling terrain)	2R-R	3,000	6,000	9,000	12,750	18,750
2-Lane Rural Highway (mountainous)	2R-M	2,000	4,000	6,000	8,500	12,500
2-Lane Rural Highway (very mountainous)	2R-VM	1,000	2,000	3,000	4,250	6,250

Notes:

1. The above threshold volumes for preliminary planning purposes only. If available, the results of detailed level of service analyses will typically have priority over the levels of service derived from this table. In that case this table can be used by the analyst for providing additional considerations for recommending the appropriate general roadway type for the specific condition being analyzed.
2. All above facilities assume a 60%/40% peak hour directional split. All above facilities assume peak hour representing approximately 10% of the Average Daily Traffic (ADT), except for mainline freeway facilities, which assume peak hour representing 9% of the Average Daily Traffic (ADT).
3. Based on *Highway Capacity Manual*, Transportation Research Board, 2010.
4. Rural highway (level terrain) is generally consistent with the *2010 Highway Capacity Manual* rural highway, assuming 8% trucks, 4% RV's, 20% no-passing, and level terrain. The greatest difference is that it assumes a maximum capacity (upper end of LOS E) of 25,000 rather than the 28,000 calculated using the new *Highway Capacity Manual*.
5. Rural Highway (rolling terrain) thresholds are estimated at 15% of Rural Highway (level terrain).
6. Rural Highway (mountainous) thresholds are estimated at 25% of Rural Highway (level terrain).
7. Rural Highway (very mountainous) thresholds are estimated as 50% of Rural Highway (level terrain).

Appendix B

Traffic Counts

Location: Empire Grade S/O Crest Ranch driveway
Date Range: 6/20/2016 - 6/26/2016
Site Code: 01

Time	Monday		Tuesday				Wednesday				Thursday				Friday				Saturday				Sunday			
	6/20/2016		6/21/2016				6/22/2016				6/23/2016				6/24/2016				6/25/2016				6/26/2016			
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total		
12:00 AM	1	0	1	2	5	7	1	3	4	1	4	5	3	1	4	1	1	2	1	4	5					
1:00 AM	0	0	0	0	0	0	1	0	1	1	0	1	1	1	2	1	5	6	0	0	1					
2:00 AM	1	1	2	0	0	0	1	1	2	0	0	0	0	0	2	1	0	1	0	0	1					
3:00 AM	1	0	1	2	0	2	2	0	2	0	0	1	1	1	2	1	0	1	1	0	1					
4:00 AM	2	1	3	1	3	4	1	3	4	3	2	5	2	1	3	1	1	2	0	0	3	4				
5:00 AM	13	2	15	10	2	12	14	0	14	13	1	14	11	1	12	0	1	1	2	12	1	13				
6:00 AM	49	3	52	44	5	49	44	5	49	52	5	57	53	2	55	10	2	12	7	1	8	47	5	52		
7:00 AM	25	9	34	34	7	41	18	12	30	13	10	23	11	5	16	5	4	9	5	1	6	22	10	31		
8:00 AM	30	9	39	29	11	40	16	9	25	16	10	26	18	17	35	17	8	25	9	7	16	20	10	30		
9:00 AM	33	12	45	22	17	39	22	15	37	11	12	23	19	18	37	12	12	24	16	10	26	18	15	33		
10:00 AM	13	12	25	12	9	21	8	20	28	16	15	31	25	12	37	28	12	40	19	11	30	12	15	27		
11:00 AM	22	16	38	19	19	38	17	10	27	20	23	43	12	24	36	28	23	51	26	24	50	19	17	36		
12:00 PM	19	13	32	17	8	25	14	13	27	19	12	31	15	17	32	34	56	90	25	16	41	17	11	28		
1:00 PM	16	16	32	15	25	40	13	14	27	17	11	28	15	19	34	39	40	79	37	14	51	15	17	32		
2:00 PM	8	17	25	12	16	28	12	13	25	16	14	30	13	20	33	19	27	46	50	30	80	13	14	28		
3:00 PM	13	13	26	16	23	39	11	23	34	11	18	29	15	44	59	21	20	41	31	26	57	13	21	34		
4:00 PM	9	50	59	19	63	82	16	47	63	11	49	60	20	22	42	24	21	45	9	20	29	15	53	68		
5:00 PM	19	31	50	12	17	29	16	17	33	20	15	35	18	18	36	22	13	35	13	7	20	16	16	32		
6:00 PM	18	13	31	8	13	21	7	14	21	12	9	21	14	14	28	17	9	26	15	10	25	9	12	21		
7:00 PM	9	4	13	4	8	12	11	7	18	8	9	17	11	12	23	15	18	33	10	7	17	8	8	16		
8:00 PM	7	6	13	7	7	14	5	6	11	5	5	10	7	6	13	8	9	17	4	3	7	6	6	12		
9:00 PM	4	4	8	10	3	13	4	5	9	4	6	10	2	10	12	13	13	26	9	3	12	6	5	11		
10:00 PM	4	3	7	3	3	6	0	4	4	4	7	14	10	15	25	5	8	13	2	2	4	3	5	8		
11:00 PM	4	1	5	4	1	5	1	3	4	4	4	7	11	4	3	7	3	6	3	2	5	3	4	7		
Total	320	236	556	302	265	567	255	244	499	279	244	523	298	284	582	328	302	630	295	201	496	279	251	530		
Percent	58%	42%	-	53%	47%	-	51%	49%	-	53%	47%	-	51%	49%	-	52%	48%	-	59%	41%	-	53%	47%	-		

1. Mid-week average includes data between Tuesday and Thursday.

Location: Felton Empire Rd Btwn Empire Grade and Maverick Ct
 Date Range: 7/27/2017 - 8/2/2017
 Site Code: 01

Time	Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Wednesday			Mid-Week Average		
	7/27/2017			7/28/2017			7/29/2017			7/30/2017			7/31/2017			8/1/2017			8/2/2017					
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	7	10	17	1	14	15	4	15	19	8	20	28	4	12	16	7	9	16	3	9	12	6	9	15
1:00 AM	5	7	12	5	9	14	2	11	13	2	8	10	1	4	5	2	6	8	0	3	3	2	5	8
2:00 AM	3	1	4	4	0	4	2	4	6	4	4	8	4	2	6	4	2	6	3	1	4	3	1	5
3:00 AM	1	1	2	1	1	2	1	1	2	2	2	4	4	2	6	5	2	7	3	2	5	3	2	5
4:00 AM	12	2	14	9	0	9	4	2	6	2	1	3	12	0	12	11	1	12	16	0	16	13	1	14
5:00 AM	33	15	48	26	4	30	9	1	10	7	1	8	37	10	47	27	13	40	41	13	54	34	14	47
6:00 AM	39	35	74	47	27	74	17	7	24	21	5	26	50	24	74	51	30	81	51	30	81	47	32	79
7:00 AM	83	23	106	85	26	111	30	28	58	37	11	48	79	28	107	85	27	112	84	37	121	84	29	113
8:00 AM	107	47	154	104	43	147	80	37	117	46	22	68	113	48	161	89	48	137	96	42	138	97	46	143
9:00 AM	100	43	143	83	45	128	94	49	143	58	64	122	81	51	132	97	44	141	84	66	150	94	51	145
10:00 AM	63	54	117	65	45	110	86	63	149	79	56	135	81	55	136	72	46	118	72	48	120	69	49	118
11:00 AM	73	56	129	84	77	161	82	94	176	75	81	156	67	54	121	88	51	139	99	66	165	87	58	144
12:00 PM	99	76	175	60	84	144	87	96	183	82	95	177	82	66	148	72	53	125	92	72	164	88	67	155
1:00 PM	88	69	157	72	73	145	102	81	183	97	100	197	64	78	142	82	64	146	71	94	165	80	76	156
2:00 PM	93	83	176	83	86	169	106	105	211	94	80	174	72	85	157	81	83	164	71	78	149	82	81	163
3:00 PM	67	97	164	75	86	161	90	90	180	60	73	133	81	96	177	74	99	173	72	74	146	71	90	161
4:00 PM	107	91	198	88	83	171	90	97	187	80	75	155	100	80	180	94	102	196	77	101	178	93	98	191
5:00 PM	62	116	178	72	92	164	88	80	168	73	80	153	66	130	196	91	107	198	84	97	181	79	107	186
6:00 PM	60	103	163	54	103	157	56	80	136	78	69	147	53	105	158	51	108	159	59	108	167	57	106	163
7:00 PM	27	84	111	45	80	125	47	49	96	39	48	87	39	83	122	37	82	119	45	72	117	36	79	116
8:00 PM	29	43	72	30	53	83	44	63	107	27	54	81	26	49	75	35	46	81	27	65	92	30	51	82
9:00 PM	14	65	79	22	55	77	17	50	67	23	38	61	16	43	59	22	54	76	15	38	53	17	52	69
10:00 PM	16	35	51	14	31	45	16	41	57	6	17	23	9	33	42	12	29	41	11	26	37	13	30	43
11:00 PM	7	12	19	7	18	25	10	31	41	4	21	25	8	20	28	11	27	38	8	15	23	9	18	27
Total	1,195	1,168	2,363	1,136	1,135	2,271	1,164	1,175	2,339	1,004	1,025	2,029	1,149	1,158	2,307	1,200	1,133	2,333	1,184	1,157	2,341	1,193	1,153	2,346
Percent	51%	49%	-	50%	50%	50%	50%	50%	50%	49%	51%	-	50%	50%	-	51%	49%	-	51%	49%	-	51%	49%	-

1. Mid-week average includes data between Tuesday and Thursday.

Appendix C

*Projected Visitor Counts
and Parking Needs,
Placeworks,
January 12, 2016*

MEMORANDUM

DATE January 12, 2016
TO Bryan Largay
Land Trust of Santa Cruz
FROM Isabelle Minn and Isby Fleischmann, PlaceWorks
RE **Projected Visitor Counts and Parking Needs**

This memorandum addresses future visitor use at the San Vicente Redwoods property. Visitors will access the property for various passive recreational activities, including dog walking, hiking, mountain biking, horseback riding, and picnicking. The number of visitors may affect traffic, parking needs, enforcement, and financial considerations, such as revenue generated from parking fees and the impact to the maintenance budget. Therefore, estimating visitor use is key to the planning, design, and environmental review processes.

METHODOLOGY

Visitor use was estimated for the San Vicente Redwoods property based primarily on comparisons with current visitor use at comparable parks and open spaces in the region, as well as our experience with open space and public access planning. Tracking visitation at existing open space preserves and parks is important to management and planning efforts. Visitor use at comparable parks and open spaces presented in this memorandum is based on both quantitative data and qualitative accounts and estimates from the users and managers of the properties. Information provided by managers of other open space preserves and parks are based on the best data available or observations, and represents best estimates rather than precise data. In order to compare information and estimates from different agencies, estimates were used to calculate annual, weekly, and daily visitation. When visitor use estimates were separated by type of use, analysis focused on use types that were consistent with uses planned for San Vicente Redwoods.

The ratio of trail users per mile of trail was also considered when comparing properties. While the National Recreation and Park Association (NRPA) standards for typical visitor counts is 90 users per day per mile on urban trails and 40 users per day per mile on rural trails, the average number of visitors on the comparable properties in Santa Cruz County was 8.3 visitors per mile of trail. Therefore, the NRPA standards were not assumed to be applicable for San Vicente Redwoods.

Key considerations for estimating visitor use include open space characteristics and facilities that will draw visitors, as well as the ease with which these facilities can be reached. Therefore, the attributes considered for comparable parks and open spaces included property size, unique features, facilities, trail connections, allowable uses, and accessibility to nearby urban areas.

VISITATION AT COMPARABLE PARKS AND OPEN SPACES

To estimate expected visitor use for San Vicente Redwoods, three open space properties located within Santa Cruz County were considered. These were selected due to their similarity to San Vicente Redwoods in either size, miles of trail, allowed uses, and accessibility from nearby the urban areas of Santa Cruz and San Jose. Several properties managed by Santa Clara County Parks and Midpeninsula Regional Open Space District (MROSD) were also reviewed in order to provide greater context. An overview of these properties is provided below and summarized in Table 1, emphasizing relevance to future use at San Vicente Redwoods. In addition to these comparable properties, projected future visitation at the Bureau of Land Management's Coast Dairies property and its implications to San Vicente Redwoods is discussed.

THE FOREST OF NISENE MARKS STATE PARK

Characteristics

The Forest of Nisene Marks State Park is a 10,257 acre property with approximately 30 miles of trails. Running, hiking, mountain biking, picnicking, backpacking, and camping (although negligible) are all uses allowed in the park. Similarly to San Vicente Redwoods, dogs are allowed on the entrance road only and the only restroom facility is located at the park entrance. Nisene Marks has three parking lots with a combined capacity of 60-85 cars and 3 trailers.

Accessibility

The Forest of Nisene Marks is 10.7 miles (a 22-minute drive) from Santa Cruz, 12.8 miles (a 26-minute drive) from Watsonville, and 40.4 miles (a 55-minute drive) from San Jose. There is one primary access point for the Park. In addition, there are numerous neighborhood trailheads around the Nisene Marks that support walk-in access from the rural residential communities that border the property, as well as from the more urban communities of Soquel and Aptos to the south. Many people live, work, and/or shop in the Cabrillo College and Aptos Village areas, which are within a quarter- to half-mile distance from Nisene Marks.

Estimated Existing Use

Estimates presented in this memorandum for visitation at both Nisene Marks and Wilder Ranch are based on California State Parks' monthly tracking, which considers actual counts and estimates of visitors that are not captured by the counts.

An estimated 106,094 people visit Nisene Marks annually, based on 2013 data provided by California State Parks, Santa Cruz District.¹ This is equivalent to 10 visitors per day per mile of trail. For both Nisene Marks and Wilder Ranch, typical peak use is estimated to be from 11am to 3pm on weekends and 4pm to 5pm on weekdays.

¹ E-mail from Alaina Boys, CSP, Santa Cruz District, on January 30, 2015

Implications for San Vicente Redwoods

The Forest of Nisene Marks State Park provides slightly less trail mileage than San Vicente Redwoods would provide for at buildout, but offers additional uses including camping and backpacking. Additionally, Nisene Marks is connected to the trail network of Soquel Demonstration State Forest, just as San Vicente Redwoods is envisioned as connecting to the future trails on the Coast Dairies property. While many characteristics of Nisene Marks parallel those anticipated for San Vicente Redwoods, its annual visitation is likely somewhat greater than the future visitation at San Vicente Redwoods due to high level of walk-in use.

WILDER RANCH STATE PARK**Characteristics**

Wilder Ranch State Park is a 7,000 acre property with approximately 34 miles of trails, including roads and singletrack for hiking, mountain biking, and horseback riding. In addition to trail use, camping is allowed and living history demonstrations and tours are provided. The park includes coastal terraces, valleys, and views of historical ranch buildings and gardens.

Accessibility

Wilder Ranch is less than 2.0 miles north of the City of Santa Cruz limits (a 5-minute drive) from Santa Cruz, 21.6 miles (a 34-minute drive) from Watsonville, and 36.0 miles (a 48-minute drive) from San Jose. Wilder Ranch has four parking lots, one paved and three unpaved. The paved parking lot has 74 vehicle spaces and 3 trailer/bus spaces, and the unpaved parking areas fit a combined 150-160 vehicles.

Estimated Existing Use

An estimated 472,809 people visit Wilder Ranch annually, based on 2013 data provided by California State Parks, Santa Cruz District. This is equivalent to 38 visitors per day per mile of trail.

Four annual special events are held at the park in April, July, October, and December. The events in April and December attract approximately 2,500 visitors, October's event attracts approximately 3,000 visitors, and July's attracts approximately 5,000 people. Visitation is equivalent to 38 users per day per mile of trail, however, this includes all visitation including visitors including non-trail users.

Implications for San Vicente Redwoods

Wilder Ranch has significantly higher use than other parks referenced in this memorandum. It is assumed that the high use is due largely to the proximity to Santa Cruz as well as the diversity of user experiences available, including different use types and natural and cultural resources. San Vicente Redwoods is slightly further from Santa Cruz and San Jose than Wilder Ranch, and will have fewer attractions and facilities. However, the high volume of use at Wilder Ranch does indicate high demand for trail use in the Santa Cruz area.



SOQUEL DEMONSTRATION STATE FOREST

Characteristics

The Soquel Demonstration State Forest (SDSF) is a 2,681 acre property with approximately 24 miles of trails. As with San Vicente Redwoods, allowable uses at SDSF include hiking, mountain biking, horseback riding, and picnicking, and not camping. Located on the San Andreas and Zayante faults, SDSF is only two miles north of the 1989 Loma Prieta earthquake epicenter. Geological activity has created steep slopes on the property, which are an attraction for mountain bikers. There are no restrooms or developed water sources on the property.

Accessibility

Soquel Demonstration State Forest is 22.2 miles (a 40-minute drive) from Santa Cruz, 17.5 miles (a 43-minute drive) from Watsonville, 28.0 miles (a 43-minute drive) from San Jose, and 56.1 miles (a 71-minute drive) from Half Moon Bay. The road to SDSF is narrow and often closed making it difficult to access.

Estimated Existing Use

Based on a combination of quantitative data and qualitative accounts, SDSF staff estimates that there are an estimated 20,000 visitors annually, including 2,700 hikers, 300 mushroom collectors, and 17,000 mountain bikers.² Over 60 percent of these visitors come on the weekend versus during the week. On any given weekend day, there are at least 75 vehicles located at the main entrance in the parking area and along Highland Way.

Implications for San Vicente Redwoods

SDSF is more challenging to access than San Vicente Redwoods will be given distance from urban areas. However, the property provides similar attractions (trails in forested environment) and receives a high volume of mountain bike use. It is assumed that San Vicente Redwoods will also receive a high percentage of mountain bike use, and that overall use will be higher than estimated for SDSF.

COMPARABLE OPEN SPACE AND PARKS IN NEIGHBORING COUNTIES

The properties described above are anticipated to provide the greatest insight into future use of San Vicente Redwoods. In order to provide a greater sample size, visitation estimates from Santa Clara County Parks and MROSD were also reviewed. Both agencies own and manage large parks and/or open space preserves within the region.

² Conversation with Angela Bernheisel at CALFIRE, on January 29, 2015. Note: new trail counters were recently installed on all major trails in SDSF in order to more accurately estimate recreation user numbers. However, the trail counters have not provided complete or accurate information thus far because they are not located on every trail, some are missing or damaged, and they can over count visitors who walk past them multiple times.



Santa Clara County Parks: Upper Stevens Creek

The Santa Clara County Department of Parks and Recreation Weekly Activity Report Summary for 2013 estimates that individual parks receive between 3,500 and 617,000 annual users. Upper Stevens Creek Park was identified as having similar attractions as San Vicente Redwoods.

Upper Stevens Creek Park is a 92-acre property that includes a non-power boating reservoir, picnic areas, and over 11 miles of single-track and multi-use trails for hiking, biking, and horseback riding. While Stevens Creek has only 11 miles of trail, it is connected to the Bay Area Ridge Trail and other open space areas, which provides for longer rides than planned for San Vicente Redwood. Upper Stevens Creek is 6.0 miles (15 minute drive) from the closest city (Saratoga), and 15.7 miles (a 23-minute drive) from San Jose, the closest major urban area. Based on the County of Santa Clara Parks and Recreation Department's 2013 Full Activity Report, there were 15,968 visitors in 2013. Of these visitors, all were trail users and 9,443 (59%) were mountain bikers. This is equivalent to 4 users per day per mile of trail.

Midpeninsula Regional Open Space District: El Corte Madera Creek Open Space Preserve

Midpeninsula Regional Open Space District owns and manages numerous open space preserves that provide trail opportunities to the public. El Corte Madera Creek Open Space Preserve was identified as having similar attributes as envisioned for San Vicente Redwoods. El Corte Madera Creek Open Space Preserve is a 2,817 acre preserve offering 28 miles of trails for hiking, biking and equestrian use. The Preserve is located 7 miles from the Town of Woodside, and therefore in closer proximity to the City of San Francisco and surrounding urban areas than San Vicente Redwoods. Based on the District's Visitor Estimate Survey project which collected data between 2007 and 2010, El Corte Madera Creek Open Space Preserve receives an estimated 89,435 visitors per year. This is equivalent to 8 users per day per mile of trail.

COAST DAIRIES

Projected Visitation

The Bureau of Land Management's Coast Dairies property borders the San Vicente Redwoods property to the southwest and is connected to San Vicente Redwoods by several roads including Warrenella Road. While the property is not currently open for public access, the deed restrictions state that the property will provide public access. Efforts are currently underway to have the property designated as a National Monument, which would elevate the visibility and status of the property.

Based on conversations with staff and the Interim Access Plan that was developed in 2013, it is anticipated that the Interim Access Stage (0-5 years) would include two hiking trails, property tours, and/or volunteer opportunities on management projects, and that the "Long-Term Access Stage" (5-10 years) would potentially include over 50 miles of trails and specific projects, such as a visitor center. BLM staff estimate that annual visitation will range between 50,000 and 150,000 during Interim Access, and between 100,000 and 300,000 at full buildout, with the potential for



higher visitation should the property be designated as a National Monument.³ For instance, visitation at Ford Ord National Monument increased substantially since its designation (from approximately 250,000 or 300,000 before designation in 2012 to approximately 450,000 in 2014; representing a 50-percent increase).⁴ BLM staff projects that National Monument Status designation for Coast Dairies could increase local use, but much of the additional use would be generated by tour buses, individuals collecting National Park and Monument stamps, sight-seers that conduct brief visits and do not utilize the extended trail network, and other non-local users. The amount of increase would depend on the type of designation, but is not expected to reach visitation levels at Ford Ord, where there is significant highway/road access, a variety of historical and natural attractions, and accessibility to southern, central and northern California populations.

Total annual visitation is generally higher at nationally recognized parks and open spaces in the region than the regional properties discussed above, based on review of visitation counts at Point Reyes National Seashore, Pinnacles National Park, and Fort Ord National Monument. Visitation at Wilder Ranch State Park, however, is comparable to that at nationally recognized sites. As discussed above, visitation at Ford Ord National Monument increased substantially following designation.

Annual visitation for Point Reyes National Seashore, Pinnacles National Park, and Fort Ord National Monument ranges between 244,943 and 2,711,090, as indicated in Table 2. However, the size, features, and attractions also vary dramatically. In order to provide a more meaningful comparison, annual use per trail mile and per acre of land were also reviewed, as shown in Table 2. While there are many features that could be compared, acreage and trail miles were selected as they allow for comparison with other properties discussed in this memorandum. Based on this analysis, if Coast Dairies were to reach 300,000 annual visitors per year, it would be within the low-range of use at the comparable National Monuments in terms of visitors per trail mile or visitors per acre. This analysis provides some insight into future use at Coast Dairies, but is not assumed to be comprehensive or definitive; further research would be necessary to confirm these preliminary findings.

Implications for San Vicente Redwoods

Future trail connection(s) between San Vicente Redwoods and the Coast Dairies property would result in visitors utilizing both properties during one recreational experience, and enable visitors to

³ PlaceWorks Conversation with David Moore, Outdoor Recreation Planner, US Bureau of Land Management, April 2, 2015.

⁴ PlaceWorks Conversation with David Moore, Outdoor Recreation Planner, US Bureau of Land Management, April 2, 2015, and email communication on 4/14/2015.



use staging areas at either property to access the connected trail system. Given the integration of these properties, it is anticipated that the visitation levels at one property will have direct implications to visitation and parking demand at the other property.

Visitation at Coast Dairies is projected to range between 100,000 and 300,000 at full buildout, with the potential for higher visitation should the property be designated as a National Monument. However, the increase in visitation related to National Monument designation is not likely to result in a substantial increase in visitors to the San Vicente Redwoods' Empire Grade staging area. This is because many of the visitors are likely to be short-stay visitors of the immediate Monument area that will not use the trail network to access adjacent San Vicente Redwoods, and because the San Vicente Redwoods staging area will be more difficult to access from major highways. Coast Dairies staging areas are assumed to provide adequate capacity to accommodate future visitor use of that destination with consideration to a national designation and to trail users that will park at Coast Dairies and connect to San Vicente Redwoods trails. However, given the potential for designation to increase use, the design of the San Vicente Redwoods staging area should consider the potential for future expansion.

ESTIMATED VISITOR USE AT SAN VICENTE REDWOODS

ESTIMATED USE FOR PHASE 1

During Phase 1, it is estimated that 13,140-14,600 people will visit San Vicente Redwoods annually. This is based on the following understanding and assumptions:

- **Characteristics and Facilities.** Under the Draft Master Plan, Phase 1 includes 4 miles of multi-use trails for hiking, mountain biking, and horseback riding. These trails are located on existing fire roads in the northern portion of the 8,500 acre property. Dog-walking is allowed on the 1.5-mile trail that runs parallel to Empire Grade Road. Phase 1 trails would be located within forested habitat with minimal variation, although several viewpoints into Devil's Gulch may attract visitors.
- **Accessibility.** Under Phase 1, the only access point for the recreational trails would be a staging area on Empire Grade Road. This location is 40.3 miles (a 57-minute drive) from San Jose, 15.0 miles (a 28-minute drive) from Santa Cruz, 32.5 miles (a 50-minute drive) from Watsonville, and 49.7 miles (a 66-minute drive) from Half Moon Bay.
- **Visitors per mile of trail.** This estimate assumes 9-10 visitors per mile of trail. It is assumed that Phase 1 visitation will be initially higher per mile of trail than most comparable properties given the novelty of a new open space. However, given limited facilities and attractions as well as the distance to Santa Cruz and other urban areas, it is assumed that use will be significantly lower than experienced at Wilder Ranch State Park.

ESTIMATED USE FOR BUILDOUT

For Buildout, it is estimated that 83,220-97,090 people will visit San Vicente Redwoods annually. This is based on the following understanding and assumptions:



- **Characteristics.** At buildout, there would be approximately 38 miles of trails, including existing roads and new singletrack trails. Trails would be primarily separate use, and dog-walking would continue to be limited to the trail running parallel to Empire Grade Road. Through-trails would be established for all use types from Empire Grade to the Coast Dairies property, constituting a skyline-to-sea trail experience, and several internal loop-trails would be established. Trails would generally be within forested habitat. Key features visible from the trail network would generally be limited to include working forest, established forest, and the old railroad grade, as well as the potential skyline-to-sea trail. Limited picnic tables (no group sites) and benches would be provided, and camping would not be allowed.
- **Accessibility.** There are no additional parking lots planned for Buildout, however an overflow parking area in proximity to the main parking lot may be considered. However, an additional access point will be the connection to the Coast Dairies property and its future trail networks. This access point would be approximately 12 miles north of the City of Santa Cruz. It is anticipated that visitation would be notably higher at buildout, yet given the limited access points and distance to many of the new trails it is anticipated that the increase in visitation will not reflect the increase in trails (buildout=9.5X the trail mileage of phase 1).
- **Visitors per mile of trail.** This estimate assumes 6-7 visitors per mile of trail, which is lower than the assumption for Phase 1 as the visitation is not expected to increase at the same rate as trail mileage due to limited accessibility, as described above. This estimate is slightly lower than estimates for the Forest of Nisene Marks State Park and El Corte Madera Creek Open Space Preserve which is appropriate given that both these properties provide for more uses than San Vicente Redwoods and that Nisene Marks State Parks has a greater number of neighbors with walk-in access.

IMPLICATIONS FOR PARKING DEMAND

Visitation has a direct relationship to parking demand, and therefore projected visitation is a critical tool when planning parking and staging areas. Parking areas that do not accommodate actual use will lead to illegal parking, congestion, and negative visitor experience. Parking areas that are oversized for actual use can cause unnecessary impacts to resources and can be experienced as scars on the landscape. Appropriately sized parking areas will be designed for the optimal footprint needed to accommodate demand on average high-use days.

ESTIMATED DEMAND

Parking demand was estimated for San Vicente Redwoods based on the assumptions identified below, which were developed with consideration to existing parking supply/demand at the comparable parks and open space preserves discussed above as well as PlaceWorks' experience with similar projects. Parking estimates are based on the high end of the range of expected annual visitors.

Phase 1

It is anticipated that 12 parking spaces and 1-2 equestrian trailer spaces would accommodate demand during Phase 1 based on the following assumptions:

- Visitation projections of 14,600 at Phase 1
- 75-percent of visitation will take place on the weekend, equally distributed between Saturday and Sunday (equivalent to 105 visitors/ day on a weekend day)
- 85-percent of visitors will drive-in (others will walk, hike, bike or ride-in; there will be no access from Coast Dairies property)
- Of visitors that drive-in, there will be an average of 2.5 visitors/vehicle
- Vehicles will stay an average of 3 hours, therefore 3 vehicles can occupy one parking space each (3 vehicles/parking space/day)
- Equestrian trailer demand will be lower than Forest of Nisene Marks State Park (3 trailer spaces) given lower trail mileage

Buildout

It is anticipated that 47 parking spaces and 3-5 equestrian trailer spaces would accommodate demand at the Empire Grade Staging Area at Buildout based on the following assumptions:

- Visitation projections of 97,090 at Buildout
- 75-percent of visitation will take place on the weekend, equally distributed between Saturday and Sunday (Equivalent to 698 visitors/ day on a weekend day)
- Staging areas at Coast Dairies will be have adequate capacity to accommodate Coast Dairies' visitors
- 50-percent of visitors will drive-in (others will walk, hike, bike or ride-in; it is anticipated that many will access the property via trail connections to the Coast Dairies property)
- Of visitors that drive-in, there will be an average of 2.5 visitors/vehicle
- Vehicles will stay an average of 3 hours, therefore 3 vehicles can occupy one parking space each (3 vehicles/parking space/day)
- Equestrian trailer demand will be comparable to demand at the Forest of Nisene Marks State Park (3 trailer spaces)
- The Coast Dairies property is opened for public access and trail connections between San Vicente Redwoods and Coast Dairies staging areas will be completed (if this is not the case, visitation projections will remain at Phase 1 levels)

RECOMMENDATIONS FOR EMPIRE GRADE STAGING AREA

It is recommended that the staging area be designed to accommodate 50-60 vehicles and 3-5 trailers at Buildout, and 12 vehicles and 2 trailers during Phase 1. To maximize parking space and flexibility, it is recommended that the trailer spaces be designed as flexible parking space that can accommodate vehicles when necessary. Should Coast Dairies be designated as a National Monument, there is potential for a limited increase in parking to demand. To achieve the goal of minimizing the impacts from overflow parking on the surrounding neighborhoods and to

accommodate the potential for future parking demand increase due to high, it is recommended that the staging area be designed to accommodate an additional 40 spaces that would be constructed only if use demonstrates they are necessary.

As previously discussed, this recommendation for parking at buildout assumes that many visitors will access San Vicente Redwoods through the Coast Dairies property, and that staging areas at Coast Dairies will accommodate this use. If the Coast Dairies property and trail connections from Coast Dairies to San Vicente Redwoods are not opened to the public, San Vicente Redwoods visitation is projected to remain at Phase 1 levels. While the environmental review process for the San Vicente Redwoods Public Access Plan will be considerate of the relationship between San Vicente Redwoods and Coast Dairies, the Coast Dairies project and any proposed access features for the property will be reviewed under a separate environmental process.

TABLE 1 Comparison of Open Space Destinations in Santa Cruz County

	Owner	Size (acres)	Allowable Use	Trail Length (miles)	Driving Time from Nearby Cities (minutes)	Driving Distance from Nearby Cities (miles)	Parking Capacity	Annual Visitation (% by User Type)	Annual Visitation	Weekly Visitation (Annual/52 Weeks)	Daily Visitation (Annual/365 Days)	Weekday Visitation (25%)	Weekend Visitation (75%)	Users/Day/ Trail Miles
The Forest of Nisene Marks State Park	California State Parks	10,257	hiking, jogging, mountain biking, picnicking/bbq, camping	30	22 to Santa Cruz, 55 to San Jose,	11 to Santa Cruz, 40 to San Jose	3 parking lots with capacity for a total of 65-75 cars and/or 3 trailers	40% hikers, 50% bikers, 10% equestrians	106,094	2,040	291	102	763	10
Wilder Ranch State Park	California State Parks	7,000	hiking, mountain biking, equestrians, camping	34	10 to Santa Cruz, 48 to San Jose	2 to Santa Cruz, 36 to San Jose	74 vehicle spaces and 3 trailer/bus spaces in the main parking lot, 150-160 spaces in the overflow parking lot	35% hikers, 40% bikers, 15% equestrians, 10% visitor center based	472,809	9,092	1,295	453	3,400	38
Soquel Demonstration State Forest	CalFIRE	2,681	mountain biking, hiking, mushroom gathering (permit), events (special use permit)	24	43 to San Jose, 40 to Santa Cruz	28 to San Jose, 22 to Santa Cruz	60 parking spaces in main lot; roadside parking for 15+ vehicles on Highland Way	13.5% hikers, 85% bikers, 1.5% mushroom collectors	20,000	385	55	19	144	2
Upper Stevens Creek County Park	County of Santa Clara	1,077	hiking/running, mountain biking	11	15 to Saratoga, 23 to San Jose, 46 to Santa Cruz	6 to Saratoga, 16 to San Jose, 30 to Santa Cruz	Northern and southern park entrances; public transit available; Upper Stevens Creek by foot/horse/bike from Stevens Creek or Bay Area Ridge Trail	39% hikers, 59% bikers, 2% equestrians	15,968	307	44	15	115	4
El Corte de Madera Creek	MROSD	2,817	hiking, mountain biking, equestrians, picnicking	28	N/A	N/A	N/A	N/A	85,593	1,646	235	82	616	8
San Vicente Redwoods (PHASE 1)	POST, LTSC, Save the Redwoods League, Sempervires Fund	8,500	hiking, mountain biking, equestrians, picnicking	4	28 to Santa Cruz, 57 to San Jose	15 to Santa Cruz, 40 to San Jose	TBD	N/A	13,140	252	36	13	95	9
San Vicente Redwoods (BUILDOUT)	(same as above)	(same as above)	(same as above)	38	(same as above)	(same as above)	TBD	N/A	83,220	1,596	228	80	599	6

January 18, 2019

Terri McCracken
Placeworks
1625 Shattuck Avenue, Suite 300
Berkeley, CA 94709

RE: San Vicente (CEMEX) Redwoods Land Use Public Access Plan

Dear Terri,

Mott MacDonald prepared the Traffic Impact Analysis (TIA) for the adoption and implementation of the proposed San Vicente Redwoods Public Access Plan project in Santa Cruz County (*San Vicente Redwoods Public Access Plan, Draft Report*, Mott MacDonald, September 20, 2017). This letter provides an update to the cumulative condition analysis documented in the TIA.

The cumulative condition traffic volumes that were analyzed in the TIA were determined by applying an average growth rate of 0.5 percent for 20 years to the existing traffic volumes. The average annual growth rate of was based on population growth estimates published by the Association of Monterey Bay Area Governments (AMBAG) in the 2014 Regional Growth Forecast. The 2014 Regional Growth Forecast projects the population for the unincorporated areas of Santa Cruz County would increase from 129,739 people in 2010 to 144,227 people in 2035, an increase of 14,488 people, or an average increase of 0.45 percent per year for 25 years.¹

The 2018 Regional Growth Forecast was adopted in 2018 and provides population growth estimates for 2040.² The 2018 Regional Growth Forecast projects the population for the unincorporated areas of Santa Cruz County would increase from 135,042 people in 2015 to 141,645 people in 2035, an increase of 6,603 people, or an average increase of 0.20 percent per year for 25 years.

¹ *2014 Regional Growth Forecast, Technical Documentation*, Association of Monterey Bay Area Governments, Adopted June 11, 2014.

² *2018 Regional Growth Forecast, Technical Documentation*, Association of Monterey Bay Area Governments, Adopted June 13, 2018.



The more recent population growth estimates published by AMBAG show a slower rate of growth than the population growth estimates published in 2014 that were utilized as the basis for calculating the cumulative traffic volume forecasts for the San Vicente project TIA. Therefore, the cumulative volume forecasts documented in the San Vicente project TIA are conservatively high. Analyzing the cumulative conditions using the lower growth rate based on the 2018 Regional Growth Forecast would not change the results and conclusions of the San Vicente project TIA.

If you have any questions or need additional information, please contact me at your convenience at (925) 398-7274 or shruti.malik@mottmac.com.

Very truly yours,

Mott MacDonald

A handwritten signature in blue ink, appearing to read 'Shruti Malik', with a horizontal line underneath.

Shruti Malik, TE, PMP, ENV SP
Transportation Planning Practice Leader
Northern California