

3.3 BIOLOGICAL RESOURCES

3.3 Biological Resources

3.3.1 Introduction

This section includes an evaluation of the potential for the proposed project to result in adverse impacts on biological resources. The section provides an overview of the natural and physical environment and the regulatory setting for the biological resources within the project area. The section also includes discussion of the potential project impacts on biological resources and appropriate mitigation measures, as necessary.

3.3.2 Scoping Comments

Comments related to biological impacts were received during the public scoping process. These comments and the location where they are addressed in the biological resources analysis are provided in Table 3.3-1.

Table 3.3-1 Biological Resources Scoping Comments

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
Charles Goodman	The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	Section 3.3.6, Impact 3.3-2
State Lands Commission	For land under the Commission’s jurisdiction, the Draft EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The District should conduct queries of the California Department of Fish and Wildlife’s (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service’s (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. The Draft EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.	Section 3.3.6, Impact 3.3-1
State Lands Commission	Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the Draft EIR should consider the Project’s potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic	Section 3.3.6, Impact 3.3-7

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Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	<p>organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the Draft EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).</p>	
State Lands Commission	<p>Construction Noise: The Draft EIR should also evaluate noise and vibration impacts on fish and birds from construction and restoration activities in the water. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.</p>	Section 3.3.6, Impact 3.3-1
CDFW	<p>Sufficient information regarding the environmental setting is necessary to understand the Project's, and its alternative's (if applicable), significant impacts on the environment (CEQA Guidelines, §§15125 and 15360). CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to: Coho salmon south of Punta Gorda (<i>Oncorhynchus kisutch</i>), state and federally listed as endangered:</p> <ul style="list-style-type: none"> - California Ridgway's rail (<i>Rallus obsoletus obsoletus</i>), state and federally listed as endangered, and a Fully Protected Species - Salt-marsh harvest mouse (<i>Reithrodontomys raviventris</i>), state and federally listed as endangered, and a Fully Protected Species - California black rail (<i>Laterallus jamaicensis coturniculus</i>), state listed as threatened and a Fully Protected Species - Central California Coast Distinct Population Segment Steelhead (<i>Oncorhynchus mykiss irideus</i>), federally listed as threatened - California red-legged frog (<i>Rana draytonii</i>), federally listed as threatened and a California Species of Special Concern (SSC) - Foothill yellow-legged frog (<i>Rana boylei</i>), SSC - Western pond turtle (<i>Emys marmorata</i>), SSC - Pallid bat (<i>Antrozous pallidus</i>), SSC - White-tailed kite (<i>Elanus leucurus</i>), Fully Protected Species - Napa false indigo (<i>Amorpha californica</i> var. <i>napensis</i>), California Rare Plant Rank 1B 	Section 3.3.3 Environmental Setting and Appendix D (Database Query Results for Special-Status Wildlife and Fish Species in the Project Vicinity)

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Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
CDFW	Habitat descriptions and species profiles should include information from multiple sources, including: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from positive occurrence databases such as the California Natural Diversity Database (CNDDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.	Section 3.3.3 Environmental Setting
CDFW	CDFW recommends that prior to Project implementation, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol .	Section 3.3.3 Environmental Setting. Protocol-level surveys were not conducted for this CEQA analysis; habitat associations and ranges of each special-status species were compared with existing habitat conditions in the project area; for some species (e.g., salt marsh harvest mouse and Ridgway's rail), presence was assumed.
CDFW	Botanical surveys for special-status plant species, including those with a California Rare Plant Rank (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants .	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-1
CDFW	The Project takes place along an urbanized corridor of Corte Madera Creek with residential, business, and community structures developed near the creek. The upstream segments of the Project provide freshwater habitat and a riparian corridor composed mostly of hardwood trees (CDFW 2009). The farthest downstream segment of the Project is tidally influenced and transitions to tidal wetland with fewer riparian trees. Corte Madera Creek is designated critical habitat for the state and federally listed as endangered Coho salmon South of Punta Gorda and the federally listed as threatened Central California Coast Distinct Population Segment Steelhead. Corte Madera Creek is also designated essential fish habitat for various life stages of salmon.	Section 3.3.3 Environmental Setting

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	Steelhead are present in the creek and Coho have historically utilized the watershed.	
CDFW	<p>The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as:</p> <ul style="list-style-type: none"> – Potential for “take” of special-status species – Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g. snags, roosts, overhanging banks) – Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence – Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features 	Section 3.3.6 Impact Discussion
CDFW	<p>Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels. Fully protected species such as California Ridgway’s rail, California black rail, and salt marsh harvest mouse, may not be taken or possessed at any time (Fish and Game Code § 3511). Therefore, the draft EIR is advised to include measures to ensure complete take avoidance of these fully protected species.</p>	Section 3.3.6 Mitigation Measures
CDFW	<p>Tree replacement ratios provided by CDFW:</p> <p>Oak trees:</p> <ul style="list-style-type: none"> – 4:1 replacement for trees 5 to 10 inches diameter at breast height (DBH) – 5:1 replacement for trees greater than 10 inches to 15 inches DBH – 15:1 replacement for trees greater than 15 inches DBH, which are considered old-growth oaks. <p>Replacement oaks will come from nursery stock grown from locally sourced acorns, or from acorns gathered locally, preferably from the same watershed in which they are planted.</p>	Section 3.3.6, Impact 3.3-2

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CDFW	<p>Other tree species greater than or equal to 6 inches DBH will be mitigated at the following ratios:</p> <ul style="list-style-type: none"> – 1:1 replacement for non-native trees – 3:1 replacement for native trees 	Section 3.3.6, Impact 3.3-2
CDFW	<p>The Project area should be revegetated and restored within the same season as construction following a Restoration Plan accepted in writing by CDFW. CDFW recommends habitat mapping and tree surveys be conducted to refine potential impacts prior to submitting the Restoration Plan. CDFW is available to work with the County to determine an appropriate offsite planting location as well.</p>	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-2
CDFW	<p>Both the on-site and potentially off-site Restoration Plan should monitor and maintain, as necessary, all plants for a minimum of ten (10) years to ensure successful revegetation. Planted trees and other vegetation should each have a minimum of 85 percent survival at the end of five years. If revegetation survival and/or cover requirements do not meet established goals, replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements should occur. Replacement plants should be monitored with the same survival and growth requirements for five years after planting.</p>	Section 3.3.6, Impact 3.3-2
CDFW (Gregg Erickson)	<p>Any proposed regrading in the draft EIR should assess impacts, and at a minimum, be designed to maintain existing year-round instream habitat. The analysis should include the geomorphology of the creek upstream of the bypass outlet. CDFW recommends a critical riffle analysis utilizing CDFW's Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. This may include addressing fish passage design criteria, sediment transport, design storm elevations, scour potential, and shear stress involved in the bypass structure.</p>	<p>The bypass outlet was part of the original USACE project and is no longer being proposed.</p> <p>The re-grading in Unit 4 and potentially adjacent to FAP is designed to maintain and expand year-round instream habitat.</p>
Town of Ross	<ul style="list-style-type: none"> • Number of trees and species to be removed and replanted in Frederick Allen Park and within the overall Riparian Corridor. • The impacts related to the lack of shade and habitat during the initial years of growth of younger replacement trees including at completion of construction, at 5 years after, and at 10 years after construction. 	Section 3.3.6, Impact 3.3-2
Marin Audubon Society	<p>What are the potential impacts of the steps to fish and birds attempting to feed or rest in the creek? We are concerned that use of the steps would result in the creek waters in the vicinity being reduced in habitat value for wildlife, particularly birds. Usually more wildlife can be viewed from further away, i.e. from the trail on the top</p>	Section 3.3.6, Impact 3.3-1

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	of the bank. Many studies have confirmed that wildlife leave when humans come close, and we would expect that would occur here.	
Garril Page	All along the creeks and roads, Ross’ trees reduce pollution, store carbon, help control storm water, reduce noise and raise property values. Trees promote biodiversity: plants, birds, insects, small animals and microscopic soil dwellers thrive under the tree canopy. Root systems of mature alders and willows in creek bank toes and along walls create stability. The native oaks and redwoods resist wildfire and provide shade and cool water for creeks. These attributes exist; they must be valued proportionately and weighed against the odds of an improbable return of endangered, extirpated coho, the small number of observed migratory salmon and trout, the ecological disturbances resulting from the FAP proposal’s expanded development and habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition and lessened quality of life for residents.	Section 3.3.6, Impact 3.3-2
Garril Page	Ross public life centers around the Post Office, The Common, Ross School, and the commercial area. If the FAP Riparian Corridor Project creates pools of still water, bats and other insect-eaters become an even more important resource. Residences along Ross’ creeks benefit from bats and insect predators. The proposed extent and duration of the FAP Riparian Corridor project will result in disturbance of roosts and habitat, and adversely affect enjoyment of exterior areas throughout Ross. Wildlife displaced by the project may never return to the denuded habitat.	Section 3.3.6, Impact 3.3-1
Garril Page	Excessive tree removal proposed for FAP Riparian Corridor creates ecological disturbances, expanded development, habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition where planned riparian growth may be more susceptible to wildfire.	Section 3.3.6, Impact 3.3-1

3.3.3 Environmental Setting

Methods

The greater Ross Valley area supports many special-status species. Database searches of CDFW’s CNDDDB (CDFW, 2020a), CNPS’s online Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2020a), USFWS’s iPAC tool (USFWS, 2020), and NMFS’s California Species List were conducted to generate lists of special-status species, sensitive natural communities, and designated critical habitats documented to occur in the vicinity of the project area. The database queries were based on a search of the USGS 7.5-minute quadrangle in which the project is located (San Rafael) and the surrounding eight quadrangles (Bollinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, Hunters Point, and

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Point Bonita), collectively referred to as the “project vicinity.” The resulting lists of special-status species and sensitive natural communities with potential to occur in the project vicinity are provided in Appendix D, including special-status species without the potential to occur in the study area because suitable habitat is not present or the study area is outside the species range.

In addition to the database queries described above, the following information sources were also reviewed:

- Aerial imagery (e.g., Google Earth)
- Historical and recent field reconnaissance and survey data
- USFWS species profiles, species recovery plans, and five-year species reviews
- Scientific research and/or peer-reviewed journal articles
- Unpublished reports
- Citizen science databases including eBird (2020) and iNaturalist (2020) (research-grade records)

Stillwater Sciences reviewed the database query results and then conducted reconnaissance-level biological surveys for botanical, fisheries, and wildlife resources as well as a field delineation of wetlands and waters of the U.S. within the project area on July 15, 2020. The survey extended from approximately 480 feet upstream of Unit 4 and down to the wetland downstream of Unit 2.

The database query results, information collected during the field reconnaissance and other information sources, and the habitat preferences and distributional range of each special-status species were compared with existing habitat conditions and species distribution in the project area. This comparison allowed for a determination of likelihood of each special-status species identified from the database queries to occur in the project area. This analysis resulted in the following categories of the likelihood for a special-status species to occur in or near the project area:

- *None* (no potential to occur): The project area is outside of the species’ known distribution or elevation range and/or the species’ required habitat is lacking from the project area.
- *Low* (not expected to occur): The species’ known distribution or elevation range overlaps with the project area, and the species’ required habitat is of very low quality or quantity in the project area; suitable key habitat or habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences.
- *Moderate* (may possibly occur): The species’ known distribution or elevation range overlaps with the project area, and the species’ required habitat occurs in the project area.
- *High* (present): The species has been documented in the project area and/or its required habitat occurs in the project area and is of high quality.

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Regional Setting

The project is located in Marin County in the San Francisco Bay Area, a floristic subregion of the California Floristic Province's Central Western California region, which contains a diverse assemblage of plant communities and wildlife habitat types. Marin County is located between the Pacific Ocean and San Francisco Bay in California's Coast Range. Elevations range from sea level up to 2,572 feet at the summit of Mount Tamalpais. Marin County has a mild Mediterranean climate with long dry summers and rainy winters; rainfall averages from 30 to 61 inches per year (Marin County Community Development Agency, 2004). Coastal fog is common, especially in late summer when it provides an important source of moisture for local plants and animals.

Approximately 50 percent of the land area in Marin County is under public management as parks, open space, conservation easements, and watershed lands. Most developed areas are in the eastern part of the county, between the San Francisco Bay and Mount Tamalpais. Natural community types in the county include mixed evergreen forest, oak woodland, pine forest, Douglas fir/redwood forest, grassland, coastal beach dune, northern coastal scrub, chaparral, coastal salt marsh, riparian, and freshwater marsh. These communities support a wide range of plant and animal species, including special-status species (Marin County Community Development Agency, 2007). Vegetation communities in Marin have been altered by agriculture, livestock grazing, timber operations, road building, and urban and suburban development beginning in the nineteenth century. Native perennial grasslands have been mostly replaced by non-native annual grassland, and invasive species now have widespread distribution. Marshlands have been filled and developed and creeks narrowed, culverted, and incised. Urban and suburban development have contributed to considerable fragmentation of the remaining natural areas and limited the available floodplain for creek systems (Marin County Community Development Agency, 2007).

Project Setting

Water flow in Corte Madera Creek is highest in early January and lowest from July through September, when flowing water is uncommon and the stream is predominantly dry (Town of Ross, 2009, in USACE 2010). Water flow during the site visit and delineation was approximately 0.84 cubic feet per second (cfs) as recorded at the U.S. Geological Survey (USGS) Ross gage.

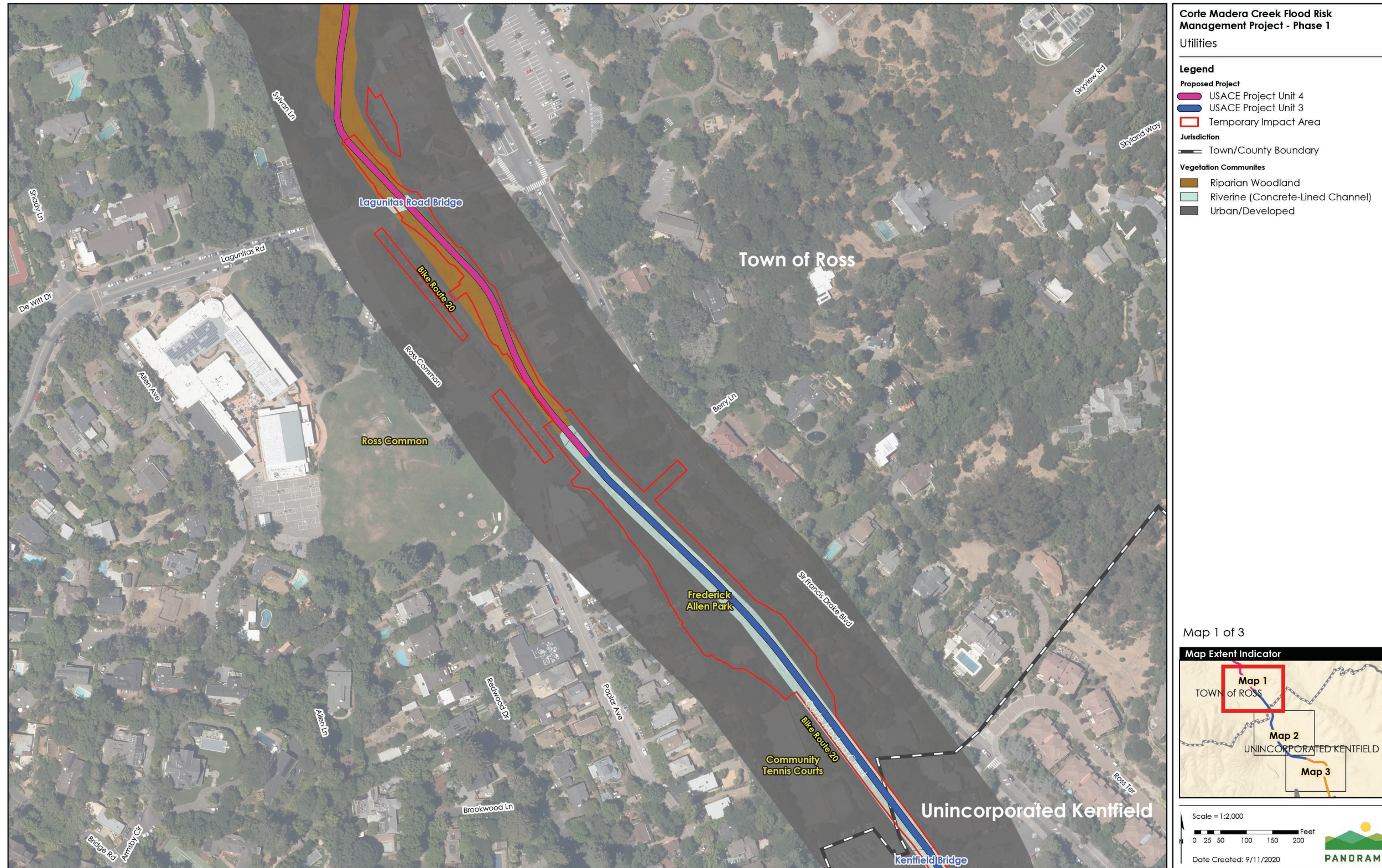
Vegetation Communities and Wetlands

The project area contains three vegetation communities/habitat types: riparian woodland within the natural channel of Unit 4 and, at the downstream end of the project within Unit 2, coastal brackish marsh and acacia woodland (Table 3.3-2; Figure 3.3-1 through Figure 3.3-3) (Atkins North America, Inc., 2011). Unvegetated types found throughout the project area include riverine (both concrete-lined and earthen-lined) as well as urban or developed areas.

Both nontidal waters and tidal waters were delineated in the project area during a preliminary jurisdictional delineation in July 2020 (Stillwater Sciences, 2020). No wetlands were identified outside of areas delineated as waters (i.e., no wetlands were documented above the ordinary high-water mark or, in tidal areas, above the high-tide line); however, areas mapped as waters included vegetated areas within the channel.

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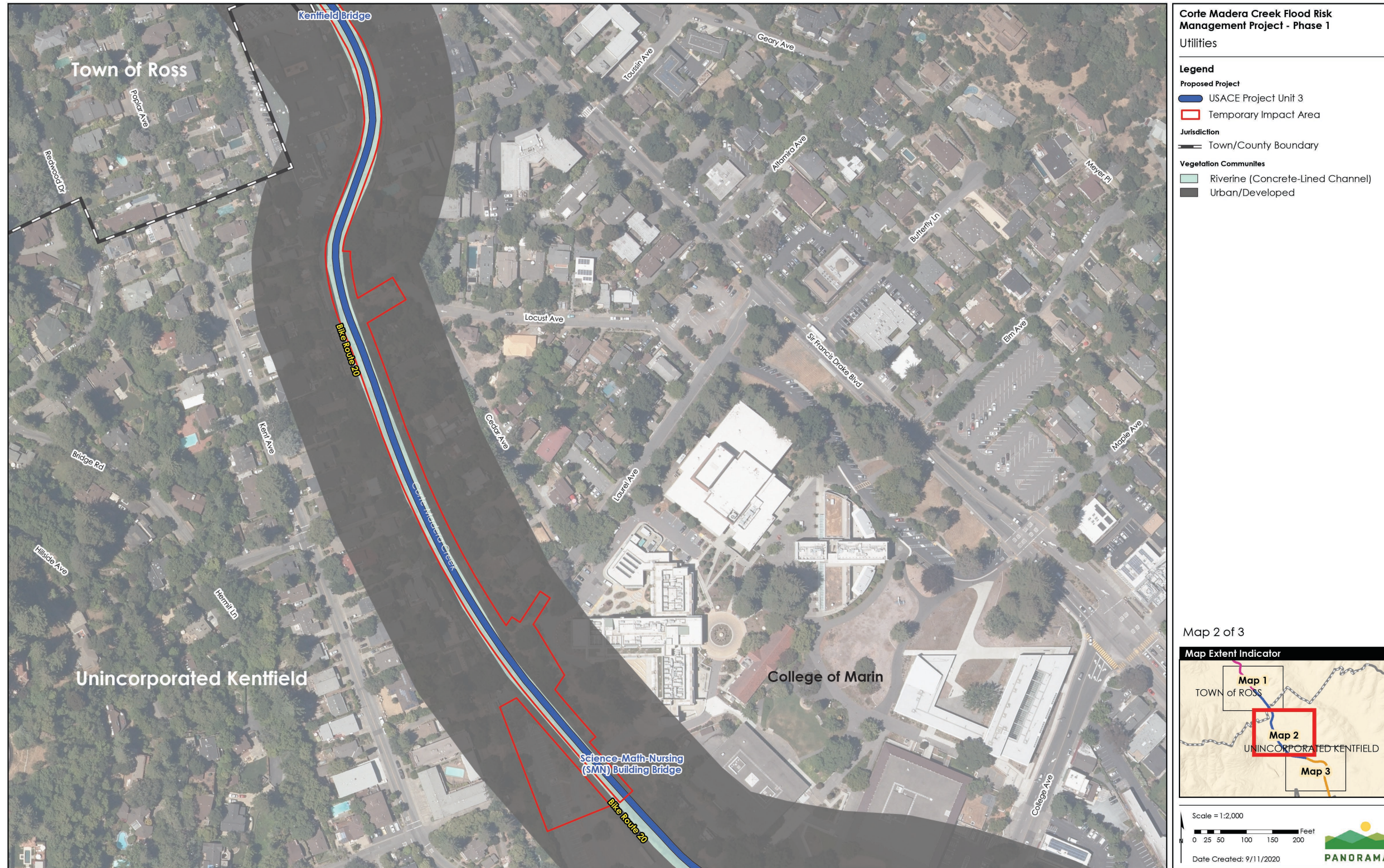
Figure 3.3-1 Habitat Types within Project Area (Map 1 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

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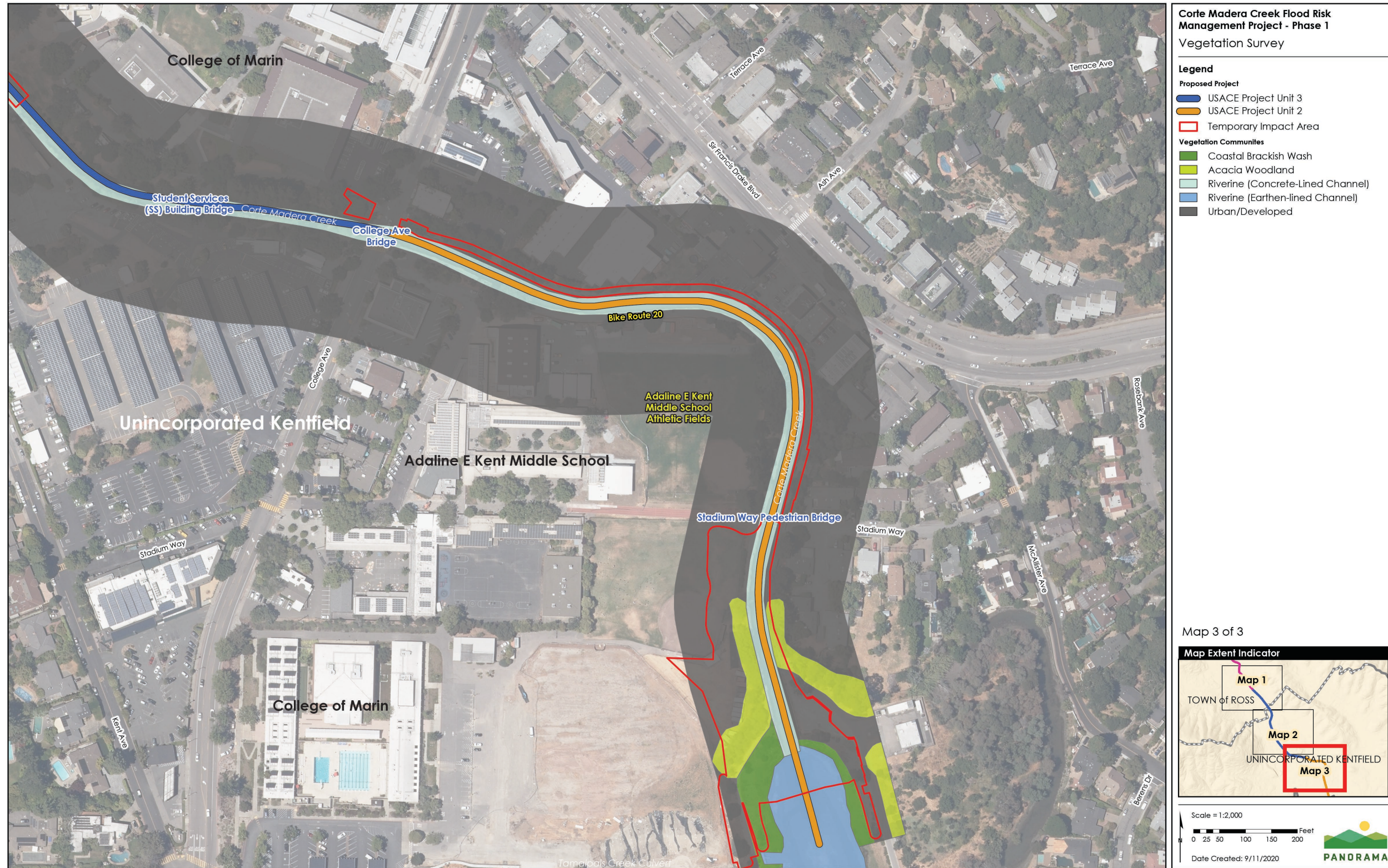
Figure 3.3-2 Habitat Types within Project Area (Map 2 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

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Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

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Table 3.3-2 Habitat Types within Project Area (acres)

Habitat Type	Unit 2	Unit 3	Unit 4
Coastal brackish marsh	0.23	--	--
Acacia woodland	0.42	--	--
Riparian woodland	--	--	0.55
Riverine (concrete-lined)	0.37	0.56	--
Riverine (earthen-lined)	0.22	--	0.15
Urban/developed	0.98	1.48	0.44

Coastal Brackish Marsh

Coastal brackish marsh habitat is an intertidal emergent wetland community dominated by grasses, forbs, and shrubs that are tolerant of salinities ranging from slight to moderate (0.5 to 18 ppt [parts per thousand] salt). Coastal brackish marsh habitat occurs in Unit 2 at the downstream end of the project area. Dominant species observed included tuberous bulrushes (*Bolboschoenus* spp.), pickleweed (*Salicornia pacifica*), alkali Russian thistle (*Salsola soda*), and cord grass species (*Spartina* spp.). The coastal brackish marsh may contain sensitive natural communities.

Acacia Woodland

Acacia woodland habitat with some eucalyptus trees occurs in Unit 2 of the project area. Dominant species observed include silver wattle (*Acacia dealbata*) and a few red gum (*Eucalyptus camaldulensis*) trees.

Riparian Woodland

The primary vegetation community in Unit 4 upstream of the existing Denil fish ladder is riparian woodland. This habitat includes the earthen streambed channel of Corte Madera Creek. No riparian woodland habitat exists in the project area downstream of the fish ladder in Units 2 and 3. Canopy cover within the riparian community ranges from 50 to 100 percent throughout Unit 4. Dominant species in the overstory include box elder (*Acer negundo*), silver wattle, big leaf maple (*Acer macrophyllum*), arroyo willow (*Salix lasiolepis*), blue gum (*Eucalyptus globulus*), Oregon ash (*Fraxinus latifolia*), redwood (*Sequoia sempervirens*), and white alder (*Alnus rhombifolia*). Species observed in the understory included Himalayan blackberry (*Rubus armeniacus*), periwinkle (*Vinca major*), English ivy (*Hedera helix*), cape ivy (*Delairea odorata*), French broom (*Genista monspessulana*), dotted smartweed (*Persicaria punctata*), poison oak (*Toxicodendron diversilobum*), and California man-root (*Marah fabaceus*).

Riparian woodland is a structurally complex and productive terrestrial community that forms a closed canopy of mature trees within and adjacent to rivers, creeks, and streams and provides a variety of wildlife species with abundant food, cover, and nesting habitat. Riparian woodland communities are natural vegetation communities that occur in association with streams. Throughout California, over 135 bird species alone depend on riparian habitat for all or a

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portion of their lives. Because of the value and scarcity of riparian woodlands, on both a state and region-wide scale, they are considered a sensitive habitat type and monitored by the CDFW. The riparian woodland of Unit 4 is somewhat fragmented by encroaching urbanization, including residential and commercial development, bridges, and landscaping vegetation.

Riverine (concrete-lined channel)

Riverine (concrete-lined channel) habitat in the project area consists of the USACE flood control channel that extends from the fish ladder downstream to Kent Middle School for approximately 4,900 feet. The channel has vertical walls, with a 33-foot-wide concrete streambed with a V-shaped thalweg in the center to concentrate low flows. From Unit 3 to the downstream end of the project, the concrete channels restrict establishment of riparian vegetation. Trees remain along the creek outside of the concrete walls but are often landscaping trees installed as part of urban development. The riverine vegetation in Units 2 and 3 of the project area is sparse, often weedy and non-native, and provides little quality habitat or shade to the creek.

Riverine (earthen-lined channel)

Riverine (earthen-lined channel) habitat includes open-water areas and closely associated vegetation that occur within a defined channel of a stream. Riverine habitat is generally bounded on the landward side by upland vegetation or channel bank. Riverine (earthen-lined channel) habitat within the project area is located in the natural channel of Unit 4 and a small portion of Unit 2 at the downstream end of the project area.

Urban/developed

Urban/developed habitat includes both landscape vegetation (i.e., ornamental plantings) and non-permeable non-vegetated infrastructure such as buildings, roads, trails, and other infrastructure. Landscape vegetation is found in areas of development associated with the Town of Ross Post Office, Town of Ross Police Station, Frederick Allen Park, residential backyards, Kentfield Hospital, and the College of Marin.

Vegetation associated with landscaping consists predominantly of nonnative tree species and includes Chinese pistache (*Pistacia chinensis* subsp. *falcata*), glossy privet (*Ligustrum lucidum*), English elm (*Ulmus minor*), weeping willow (*Salix babylonica*), Monterey pine (*Pinus radiata*), oleander (*Nerium oleander*), honeysuckle (*Lonicera* sp.), cork oak (*Quercus suber*), wisteria (*Wisteria sinensis*), wild plum (*Prunus* sp.), ornamental rose (*Rosa* sp.), and Mexican fan palm (*Washingtonia robusta*). This vegetation is present sporadically along the top of the vertical concrete channel walls and provides limited shade to the creek.

At Frederick Allen Park, areas mapped as landscaped vegetation (Atkins North America, Inc., 2011) includes a mix of native and nonnative landscape trees, of which approximately 69 percent were considered to be in good or excellent condition (i.e., little or no existing disease or damage in canopy or roots), 30 percent were in fair or marginal condition (i.e., minor existing disease or damage in canopy or roots), and 1 percent were either in poor condition (i.e., major existing disease or damage in canopy or root) or presented a hazard to a building and/or structure (GHD 2020). Two-thirds of the trees southeast of the bike path—which includes the

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majority of the park set back from the creek—are nonnative tree species and include Norway maple (*Acer platanoides*), southern magnolia (*Magnolia grandiflora*), Chinese pistache, American plum (*Prunus americana*), and English elm. The remaining one-third of the trees southeast of the bike path are native trees and include California buckeye (*Aesculus californica*), coast live oak (*Quercus agrifolia*), and valley oak (*Quercus lobata*). Trees northeast of the bike path and adjacent to the creek are predominantly native trees (i.e., 17 out of 21 trees) and include California buckeye, coast live oak, and valley oak with a few nonnative trees present (Monterey cypress [*Hesperocyparis macrocarpa*] and Monterey pine). Although Frederick Allen Park is mapped as urban/developed, due to its proximity to the creek, CDFW may consider all or a portion of the park to be within the riparian zone.

Fish

In 2000, A.A. Rich and Associates conducted field surveys of the Corte Madera Creek watershed to describe the flows, instream habitat, and fishes of Corte Madera Creek and its tributaries. These surveys collected the following five fish species from the Corte Madera Creek watershed: rainbow trout/Steelhead (*Oncorhynchus mykiss*), threespine stickleback (*Gasterosteus aculeatus*), California roach (*Hesperoleucus symmetricus*), sculpin (*Cottus* sp.), and Sacramento sucker (*Catostomus occidentalis*) (A. A. Rich and Associates, 2000). Stillwater Sciences observed rainbow trout/Steelhead, threespine stickleback, California roach, and Sacramento sucker during their field review on July 15, 2020. The A. A. Rich (2000) report also identified the limiting factors for rainbow Steelhead production in the Corte Madera Creek watershed as being the lack of stream flows and high water temperatures, depending on the creek and the reach location within the creek.

Historically, Corte Madera Creek supported tidewater goby (*Eucyclogobius newberryi*) in the estuary near its mouth, but Leidy (1984) reported that the last time this fish was collected from this locality was in 1958 and believed the tidewater goby was probably extirpated in this area. Corte Madera Creek also historically supported a population of the anadromous salmonid, coho salmon (*Oncorhynchus kisutch*), but the last report of a fisheries survey finding the juveniles of this salmon species in this creek was in 1984 (Leidy & Leidy., 1984; Leidy, Becker, & Harvey., 2005)(Leidy 1984; Leidy 2005). Though not historically present in Corte Madera Creek, another anadromous salmonid, adult Chinook salmon (*Oncorhynchus tshawytscha*), have been reported observed in the creek (Love, 2007). Straying of hatchery-origin chinook salmon to small and medium tributaries to the San Francisco Bay estuary increased greatly once CDFW began trucking salmon smolt downstream of the Sacramento-San Joaquin River Delta and releasing these smolts at Benicia to avoid excessive predation. Chinook salmon do not have a viable self-sustaining population in Corte Madera Creek.

Beginning in late May and extending through September, water temperatures are high (65 to 75 degrees Fahrenheit) in the concrete flood control channel (A. A. Rich and Associates, 2000). Stillwater Sciences recorded a water temperature of 73.4 degrees Fahrenheit on July 15, 2020, at noon. These water temperatures are stressful to any Steelhead or coho salmon in the area during spring and summer months and may be lethal during the smoltification/emigration and rearing life stages of Steelhead. Based on 1999 data, adult Steelhead migrating through the

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channel after mid-April could encounter stressful thermal conditions. Similarly, if the parr-to-smolt transformation is not complete by the end of April, there could be thermal stress, beginning in May. For rearing Steelhead, summer water temperatures in the concrete channel are stressful to potentially lethal, beginning in June and extending through September.

Healthy water temperatures for Steelhead range from 54 to 64 degrees Fahrenheit for the spawning, incubation, fry emergence, rearing, and adult life stages (A. A. Rich and Associates, 2000). Upstream of the concrete-lined flood control channel, water temperatures during fry and juvenile rearing begin to approach stressful levels in June. The upstream areas of Corte Madera Creek consist of long lateral scour pools alternating with riffle areas and a riparian canopy, which, along with subsurface flow, help keep the water temperatures cooler. Stillwater Sciences recorded a water temperature of 64.4 degrees Fahrenheit at 10 a.m. on July 15, 2020, in Unit 4.

CDFW (2010) conducted a stream habitat inventory within a 3,336-foot-long reach extending from the Kentfield Hospital Bridge upstream to the mouth of Ross Creek, of which 995 feet located between the fish ladder and bridge was concrete channel. The pool, riffle, and flatwater percentages by length of stream upstream of the concrete channel were 10.5, 5., and 55 percent, respectively. CDFW (2010) also recorded approximately 27 percent of the creek length being dry and 2 percent consisting of the fish ladder. Three pools were measured in the 2,341-foot-long reach upstream of the fish ladder (CDFW, 2010). The average maximum pool depth throughout the survey reach was 3.2 feet.

Flow during the reconnaissance survey on July 15, 2020 was 0.8 cfs, as recorded at the USGS Ross gage (#11460000). The pool, riffle, and flatwater percentages by length of stream along 1,183 feet of natural channel upstream of the fish ladder was 46, 19. and 35 percent, respectively. There were four pools within the Unit 4 survey reach, with maximum depths ranging from 2.3 to 4.3 feet. The substrate was primarily composed of gravel, with sand and cobble being subdominant.

Wildlife

The Corte Madera Creek watershed supports a relatively diverse assemblage of invertebrate, amphibian, reptile, bird, and mammal species. The overall quality of wildlife habitat within the project area is compromised by the concrete-lined channel in the majority of the project area, the proximity to human disturbance, fragmentation of the riparian woodland, density of nonnative vegetation, and lack of available food and escape cover. However, portions of the study area, especially within the natural creek bed segment (Unit 4) and in the coastal brackish marsh at the downstream end of the project area (Unit 2), provide value to wildlife and serve valuable habitat functions by offering wildlife species refuge from urban development.

Wildlife species or sign observed during the July 15, 2020, reconnaissance survey included the following: Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), black-crowned night heron (*Nycticorax nycticorax*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), killdeer (*Charadrius vociferus*), lesser yellowlegs (*Tringa flavipes*), Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), Pacific slope flycatcher (*Empidonax*

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difficilis), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), swallow (sp.) (*Tachycineta* sp.), chestnut-backed chickadee (*Poecile rufescens*), Wilson's warbler (*Cardellina pusilla*), spotted towhee (*Pipilo maculatus*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), hooded oriole (*Icterus cucullatus*), house sparrow (*Passer domesticus*), raccoon (scat) (*Procyon lotor*), river otter (scat) (*Lontra canadensis*), and black-tailed deer (scat) (*Odocoileus hemionus*).

Invertebrates

Insects observed in the watershed have included water striders, water scorpions, giant water bugs, water boatmen, water bugs (*Naucoridia* and *Dytiscidae*), diving beetles, whirligigs, Dobson fly larvae, caddis fly larvae, damselfly nymphs, dragonfly nymphs, mayfly nymphs, mosquitoes, gnats, and black flies (USACE, 1987, in Friends of Corte Madera Watershed, 2004). Crayfish are commonly observed in the freshwater reaches of the creek (Friends of Corte Madera Watershed, 2004) and were observed during the field reconnaissance on July 15, 2020.

Amphibians and Reptiles

Riverine habitats with a native streambed and adjacent upland vegetation provide suitable habitat for amphibian and reptiles, particularly within and adjacent to Unit 4 of Corte Madera Creek. Amphibians documented in the greater watershed have included California newt (*Taricha torosa*) and California giant salamander (*Dicamptodon ensatus*). The adjoining woodlands, forests and grasslands also support arboreal salamander (*Aneides lugubris*), California slender salamander, yellow-eyed salamander (*Ensatina eschscholtzii xanthoptica*), and Sierran treefrog (*Pseudacris sierrae*). Reptiles in the project area may include western fence lizard, Pacific gopher snake, ringneck snake (*Diadophis punctatus*), sharp-tailed snake (*Contia tenuis*), and California kingsnake (*Lampropeltis californiae*), among others.

Birds

Friends of Corte Madera Creek Watershed has conducted Christmas Bird Counts from 1978 to 2003. Common bird species observed during these surveys included: black-crowned night heron, snowy egret (*Egretta thula*), great egret (*Ardea alba*), green heron (*Butorides virescens*), great blue heron (*Ardea herodias*), pied-billed grebe (*Podilymbus podiceps*), western grebe (*Aechmophorus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), turkey vulture (*Cathartes aura*), Canada goose, American wigeon (*Anas americana*), green-winged teal (*Anas crecca*), canvasback (*Aythya valisineria*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), common goldeneye *Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*), ruddy duck (*Oxyura jamaicensis*), osprey (*Pandion haliaetus*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk, American kestrel (*Falco sparverius*), American coot (*Fulica americana*), killdeer, black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), willet (*Catoptrophorus semipalmatus*), least sandpiper (*Calidris minutilla*), ring-billed gull (*Larus delawarensis*), California gull (*Larus californicus*), herring gull (*Larus argentatus*), western gull (*Larus occidentalis*), rock pigeon (*Columbia livia*), band-tailed pigeon (*Columba fasciata*), mourning dove (*Zenaida macroura*), Anna's hummingbird, belted kingfisher (*Ceryle alcyon*), Nuttall's

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woodpecker, northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), chestnut-backed chickadee, oak titmouse (*Baeolophus inornatus*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Dendroica coronata*), California towhee (*Pipilo crissalis*), fox sparrow (*Passerella iliaca*), song sparrow, white-crowned sparrow (*Zonotrichia leucophrys*), white-throated sparrow (*Zonotrichia albicollis*), golden-crowned sparrow (*Zonotrichia atricapilla*), dark-eyed junco, red-winged blackbird (*Agelaius phoeniceus*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), American goldfinch (*Carduelis tristis*), and house sparrow (Friends of Corte Madera Watershed, 2004).

Mammals

Mammal species using the project area include those adapted to urban environments, including coyote (*Canis latrans*), raccoon, western gray squirrel (*Sciurus griseus*), black-tailed deer, and striped skunk (*Mephitis mephitis*).

Invasive Species

In addition to the native plant, fish, and wildlife species that are found within the project area, many non-native and invasive terrestrial and aquatic species also occur. Invasive plants are defined as noxious by state and federal regulation and classified by the California Invasive Plant Council (Cal-IPC) as high, moderate, limited, alert, or watch, depending on the severity of ecological impacts and rates of dispersal and establishment for each species (Cal-IPC, 2020). Invasive plant species documented within the overstory in the project area include silver wattle (moderate), red gum (limited), blue gum (limited), glossy privet (limited), and Mexican fan palm (moderate/alert). Invasive plant species documented within the understory include cape ivy (high), French broom (high), English ivy (high), Himalayan blackberry (high), Russian thistle (moderate), and periwinkle (moderate). Additional invasive plant species may be found or have the potential to become established within the project area.

The only invasive aquatic species known to occur in Corte Madera Creek is the New Zealand mud snail (*Potamopyrgus antipodarum*). This species was collected from the creek and positively identified during the July 15, 2020, reconnaissance visit.

European starlings and rock pigeons are widespread invasive bird species documented in the project area. Starlings compete with native birds and are known to cause agricultural damage. Rock pigeons are considered pests in urban areas though are not considered as a large threat to native birds.

Special-Status Species and Sensitive Natural Communities

Special-status species are plants and animals that are legally protected under the federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA) or under other regulations or policies such as the California Fish and Game Code and the Migratory Bird Treaty Act (MBTA). California species of special concern and plants identified as rare by the California Native Plant Society (CNPS) are also considered special status and evaluated during

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the CEQA environmental review process. The reason an individual taxon (species, subspecies, or variety) is given such recognition is primarily the documented or expected decline in the species' population, limitation of its population size or geographical extent, and/or distribution resulting, in many cases, from habitat loss/fragmentation. More information on these regulations and the agencies that implement their protections is provided in Section 3.3.4, Regulatory Setting.

Special-status species include the following:

- Species listed, proposed, or candidate species for listing as threatened or endangered by the USFWS pursuant to the ESA of 1969, as amended
- Species listed as rare, threatened, or endangered by the CDFW pursuant to the CESA of 1970, as amended
- Species designated as fully protected under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515)
- Species designated by the CDFW as California species of concern
- Plant species included on CDFW's most recent *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW, 2020b) with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4
- Plants designated as rare under the California Native Plant Protection Act
- Species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Section 15380)

Sensitive natural communities were defined as those natural community types with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) as listed in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

The subset of species that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-3. The subset of sensitive natural communities that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-4. Fish and wildlife species with a low to high likelihood to occur in the project area as well as plant or sensitive natural communities that have either a high likelihood to occur or previously documented occurrences that overlap with the project area are discussed in detail below.

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Table 3.3-3 Special-Status Species with a Low, Moderate, or High Likelihood to Occur in the Project Area

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Vascular Plants			
Sonoma alopecurus <i>Alopecurus aequalis</i> <i>var. sonomensis</i>	FE/none/1B.1	Freshwater marshes and swamps, and riparian scrub; 15 to 1,200 feet	Moderate; suitable habitat present in project area (Unit 2)
Bent-flowered fiddleneck <i>Amsinckia lunaris</i>	None/none/CRPR 1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland; 5 to 1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh sandwort <i>Arenaria paludicola</i>	FE/SE/CRPR 1B.1	Sandy soils and openings in freshwater or brackish marshes and swamps; 5 to 560 feet	Low; limited suitable habitat present in project area (Unit 2)
Coastal marsh milk-vetch <i>Astragalus pycnostachyus var. pycnostachyus</i>	None/none/CRPR 1B.2	Coastal dunes (mesic areas), coastal scrub, and streambanks of coastal salt marshes and swamps; 0 to 100 feet	Low; limited suitable habitat present in project area (Unit 2)
Thurber's reed grass <i>Calamagrostis crassiglumis</i>	None/none/CRPR 2B.1	Mesic areas in coastal scrub and freshwater marshes and swamps; 30 to 195 feet	Low; limited suitable habitat present in project area (Unit 2)
Seaside bittercress <i>Cardamine angulata</i>	None/none/CRPR 2B.2	Wet areas and streambanks in lower coniferous forest, North Coast coniferous forest; 80 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 4)
Bristly sedge <i>Carex comosa</i>	None/none/CRPR 2B.1	Coastal prairie, lake margins of marshes and swamps and valley and foothill grassland; 0 to 2,050 feet	Moderate; suitable habitat present in project area (Unit 2)
Lyngbye's sedge <i>Carex lyngbyei</i>	None/none/CRPR 2B.2	Brackish or freshwater marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Johnny-nip <i>Castilleja ambigua var. ambigua</i>	None/none/CRPR 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pool margins; 0 to 1,425 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes bird's-beak <i>Chloropyron maritimum subsp. palustre</i>	None/none/CRPR 1B.2	Coastal salt marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)

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Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Franciscan thistle <i>Cirsium andrewsii</i>	None/none/CRPR 1B.2	Mesic and sometimes serpentine soils in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub; 0 to 490 feet	Low; limited suitable habitat present in project area (Unit 4)
California lady's-slipper <i>Cypripedium californicum</i>	None/none/CRPR 4.2	Seeps and streambanks, usually serpentine areas of bogs and fens, and lower montane coniferous forest; 95 to 9,020 feet	Moderate; suitable habitat present in project area (Unit 4)
Western leatherwood <i>Dirca occidentalis</i>	None/none/CRPR 1B.2	Mesic areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland; 80 to 1,395 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
California bottle-brush grass <i>Elymus californicus</i>	None/none/CRPR 4.3	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland; 45 to 1,540 feet	Moderate; suitable habitat present in project area (Unit 4)
Fragrant fritillary <i>Fritillaria liliacea</i>	None/none/CRPR 1B.2	Often serpentine areas in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland; 5 to 1,345 feet	Low; limited suitable habitat present in project area (Unit 3 and 4)
Large-flowered leptosiphon <i>Leptosiphon grandiflorus</i>	None/none/CRPR 4.2	Usually sandy areas of coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland; 15 to 4,005 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh microseris <i>Microseris paludosa</i>	None/none/CRPR 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland; 15 to 1,165 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Baker's navarretia <i>Navarretia leucocephala subsp. bakeri</i>	None/none/CRPR 1B.1	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools; 15 to 5,710 feet	Moderate; suitable habitat present in project area (Unit 4)
Gairdner's yampah <i>Perideridia gairdneri subsp. gairdneri</i>	None/none/CRPR 4.2	Vernally mesic areas of broadleaved upland forest, chaparral, coastal prairie, vernal pools, and valley and foothill grassland; 0 to 2,000 feet	Moderate; suitable habitat present in project area (Unit 4)

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Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Michael's rein orchid <i>Piperia michaelii</i>	None/none/CRPR 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest; 5 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Hairless popcornflower <i>Plagiobothrys glaber</i>	None/none/CRPR 1A	Alkaline meadows and seeps and coastal salt marshes and swamps; 45 to 590 feet	Low; limited suitable habitat present in project area (Unit 2)
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	None/ST/CRPR 1B.1	Open areas and mesic soils in broadleaved upland forest, meadows and seeps, and North Coast coniferous forest; 30 to 2,200 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Nodding semaphore grass <i>Pleuropogon refractus</i>	None/none/CRPR 4.2	Mesic soils in lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, and riparian forest; 0 to 5,250 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Marin knotweed <i>Polygonum marinense</i>	None/none/CRPR 3.1	Coastal salt or brackish marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes checkerbloom <i>Sidalcea calycosa subsp. rhizomata</i>	None/none/CRPR 1B.2	Freshwater marshes and swamps near the coast; 5 to 245 feet	Low; limited suitable habitat present in project area (Unit 2)
Santa Cruz microseris <i>Stebbinsoseris decipiens</i>	None/none/CRPR 1B.2	Open areas (sometimes serpentinite) in broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland; 30 to 1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Suisun Marsh aster <i>Symphotrichum lentum</i>	None/none/CRPR 1B.2	Brackish and freshwater marshes and swamps; 0 to 10 feet	Moderate; suitable habitat present in project area (Unit 2)
Saline clover <i>Trifolium hydrophilum</i>	None/none/CRPR 1B.2	Marshes and swamps, mesic and alkaline soils in valley and foothill grassland, and vernal pools; 0 to 985 feet	Moderate; suitable habitat present in project area (Unit 2)
Nonvascular Plants			
Elongate copper moss	None/none/CRPR 4.3	On metamorphic rock (usually acidic, usually vernal mesic, often roadsides, sometimes carbonate) in broadleaved upland forest,	Low; suitable habitat potentially present in

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Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
<i>Mielichhoferia elongata</i>		chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, and subalpine coniferous forest; 0 to 6,430 feet	project area (Unit 3 and Unit 4)
Fish			
Coho salmon, central California coast ESU <i>Oncorhynchus kisutch</i>	FE/SE Critical habitat (designated)	Cool, low-gradient streams with deep pools and instream cover; spawns in gravel riffles	Low; presumed extirpated in Corte Madera Creek
Steelhead, central California coast DPS <i>Oncorhynchus mykiss</i>	FT/- Critical habitat (designated)	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in fresh water for one or more years before migrating to the ocean	High; known to be present in Corte Madera Creek
Longfin smelt <i>Spirnichus thaleichthys</i>	FC/ST	Open waters of estuaries, mostly in the middle or at the bottom of the water column; tolerate salinities ranging from nearly pure salt water to completely fresh water, though most prefer salinities of 15 to 30 ppt; spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate	Low; suitable habitat at the downstream end of project area in tidal marsh, but species not recorded in Corte Madera Creek
Amphibians			
California giant salamander <i>Dicamptodon ensatus</i>	-/SSC	Wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages	Low; marginally suitable habitat in Unit 4; reported observations in Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004)
California red-legged frog <i>Rana draytonii</i>	FT/SSC Critical habitat (designated)	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Low; suitable non-breeding aquatic habitat, but no hydrological connection to a known population; species presumed absent in eastern Marin County (District, 2017)

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Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Reptiles			
Western pond turtle <i>Actinemys marmorata</i>	–/SSC	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Low; suitable aquatic habitat found in Unit 4, though limited upland nesting habitat
Birds			
White-tailed kite <i>Elanus leucurus</i>	–/SFP	Year-round resident; lowland grasslands and wetlands with open areas; nests in trees near open foraging area	Moderate; documented along Corte Madera Creek in project area near Unit 2 (eBird, 2020); nesting and foraging habitat present
American peregrine falcon <i>Falco peregrinus anatum</i>		Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and, rarely, broken-top, predominant trees) for nesting; often forages near water	Low; foraging only; documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of project area
California Ridgway's rail <i>Rallus obsoletus obsoletus</i>	FE/SE, SFP	Salt and brackish water marshes, typically dominated by pickleweed (<i>Salicornia virginica</i>) and Pacific cordgrass (<i>Spartina foliosa</i>)	Moderate; observed in 2020 approximately 1,800 feet downstream of project area in tidal marsh
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	–/SSC	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh, often near upland habitats	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	–/SSC	Tidal salt marshes; requires dense vegetation for nesting; typically associated with California cord grass (<i>Spartina foliosa</i>), pickleweed (<i>Salicornia pacifica</i>), or gumplant (<i>Grindelia stricta</i>)	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
Mammals			
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE/SE, SFP	Tidal salt marshes; depend on dense cover, preferring pickleweed (<i>Salicornia pacifica</i>) and saltgrass	Low; marginally suitable habitat at the downstream end of project area in tidal marsh.
Western red bat <i>Lasiurus blossevillii</i>	–/SSC	Riparian forests; woodlands near streams, fields, and orchards	Low (foraging only); limited suitable roosting habitat found in project area

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Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Townsend's western big-eared bat <i>Corynorhinus townsendii</i>	–/SSC	Most abundant in mesic habitats; also found in oak woodlands, desert, vegetated drainages, caves or cave-like structures (including basal hollows in large trees, mines, tunnels, and buildings)	Low (foraging only); limited suitable roosting habitat found in project area
Pallid bat <i>Antrozous pallidus</i>	–/SSC	Throughout California except for elevations greater than 3,000 meters in the Sierra Nevada; roosts in rock crevices, tree hollows, mines, caves, and a variety of vacant and occupied buildings; feeds in a variety of open woodland habitats	Low (foraging only); limited suitable roosting habitat found in project area

^a Status codes:

Federal

FE = Listed as endangered under the federal Endangered Species Act (ESA)

FT = Listed as threatened under FESA

FC = Federal candidate species

State

SE = Listed as endangered under the California Endangered Species Act (CESA)

ST = Listed as threatened under CESA

SSC = CDFW species of special concern

SFP = State fully protected

CRPR

1B Plants rare, threatened, or endangered in California and elsewhere

2B Plants rare, threatened, or endangered in California, but more common elsewhere

3 More information needed about this plant, a review list

4 Plants of limited distribution, a watch list

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Source: (CDFW, 2020a)

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Table 3.3-4 Sensitive Natural Communities with a Low, Moderate, or High Likelihood to Occur in the Project Area

Natural community (Holland 1986)	Status (State Rank)	Distribution and Habitat Description	Likelihood within project area
Coastal brackish marsh	S2.1	Usually at the interior edges of coastal bays and estuaries or in coastal lagoons; most extensively developed around Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. Dominated by perennial, emergent, herbaceous monocots to two meters tall; cover is often complete and dense; plant species include plants from both salt marshes and freshwater marshes	High; species and structure are present in project area
Northern coastal salt marsh	S3.2	Occurs along the coast from Pt. Conception north to the Oregon border; extensive in the Bay Area and Humboldt, Marin, Monterey, and San Luis Obispo Counties; found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries; dominated by herbaceous, salt-tolerant hydrophytes, forming moderate to relatively complete cover, generally growing throughout the summer and dormant in winter	High; species and structure are present in project area
^a Status codes:		S3	Vulnerable
S1	Critically imperiled	0.1	Very threatened
S2	Imperiled	0.2	Threatened

Source: (CNPS, 2020a)

Special-Status Plants

None of the 29 vascular and non-vascular special-status plant species with potential to occur in the project area were considered to have high potential to occur; no special-status plant species were both documented within the immediate vicinity and had suitable habitat within the project area. Eighteen species have moderate potential to occur within the project area, and ten vascular and one non-vascular special-status plant species were determined to have a low potential to occur within the project area. Three species with previously documented occurrences that overlapped with the project area (Appendix D) are described further in the sections below.

Napa False Indigo

Napa false indigo (*Amorpha californica* var. *napensis*), a CRPR List 1B.2 species, is a shrub in the Fabaceae family and is endemic to California. It occurs in elevations ranging from 390 to 6,560 feet, in openings in broadleaved upland forest, chaparral, and cismontane woodland and blooms from April to July. It is threatened by development and habitat alteration as well as potentially by road maintenance (CNPS, 2020a). Napa false indigo is generally found in Marin, Napa, and Sonoma counties, with a few occurrences in Lake and Monterey counties, as well, and usually found in chaparral habitats. Eighteen of the 76 total documented occurrences of the

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species are located within the project vicinity (CDFW, 2020a). Known plant associates include madrone (*Arbutus menziesii*), tan oak (*Notholithocarpus densiflorus*), flat spurred piperia (*Piperia transversa*), Douglas fir (*Pseudotsuga menziesii*), coast live oak, canyon live oak (*Quercus chrysolepis*), California black oak (*Quercus kelloggii*), California nutmeg (*Torreya californica*), and California bay laurel (*Umbellularia californica*).

Although a 1924 documented occurrence of Napa false indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.8 mile) (CDFW, 2020a), and the project area is considered to be outside the plant's elevation range. In addition, development over the last 100 years within the valley bottom may have extirpated the occurrence. This being the case, this species is considered not likely to occur in the project area.

Santa Cruz Tarplant

Santa Cruz tarplant (*Holocarpha macradenia*) – a federally threatened, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 30 to 720 feet, often on clay and sandy soils of coastal prairie, coastal scrub, and valley and foothill grassland and blooms from June to October. It is seriously threatened by urbanization, agriculture, non-native plants, and lack of ecological disturbance (CNPS, 2020a). Santa Cruz tarplant was historically found in Alameda, Contra Costa, Monterey, Marin, Santa Cruz, and Solano counties; however, all natural populations have been extirpated, and only re-introduced populations are extant. It usually is found in grassy habitats. Two of the 37 total documented occurrences are located within the project vicinity, only one of which is considered extant (CDFW, 2020a). Known plant associates include wild oat (*Avena fatua*), rattlesnake grass (*Briza maxima*), bromes (*Bromus* spp.), California oat grass (*Danthonia californica*), wall barley (*Hordeum murinum*), and fescues (*Festuca* spp.) (USFWS, 2002).

Although an 1883 documented occurrence of Santa Cruz tarplant indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 1 mile) (CDFW, 2020a). The population is considered extirpated, and suitable habitat is not present in the project area. As such, this species is considered not likely to occur in the project area.

White-Rayed Pentachaeta

White-rayed pentachaeta (*Pentachaeta bellidiflora*) – a federally endangered, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 110 to 2,035 feet in cismontane woodland, and often serpentine areas of valley and foothill grassland, and blooms from March to May. It is threatened by development (CNPS, 2020a). White-rayed pentachaeta is found in Marin, Santa Cruz, and San Mateo counties and usually found in grassy or rocky areas. Six of the 14 total documented occurrences are located within the project vicinity, none of which are considered to be extant (CDFW, 2020a; CDFW, 2020d). Known plant associates include brodiaea species (*Brodiaea* spp.), tidy-tips (*Layia platyglossa*), dotseed plantain (*Plantago erecta*), and purple needle grass (*Stipa pulchra*) (CDFW, 2020a).

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Although a 1912 documented occurrence of white-rayed pentachaeta overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.4 mile) (CDFW, 2020a). The population is considered extirpated, and the project area is considered to be outside the plant's elevation range. This being the case, this species is considered not likely to occur in the project area.

Sensitive Natural Communities

Four sensitive natural communities were identified in database queries as potentially occurring within the project vicinity (Appendix D). These sensitive natural communities were documented in CNDDDB as Holland types (Holland, 1986) that were reviewed and translated to follow the vegetation classification system in the *Manual of California Vegetation (MCV)* (CNPS, 2020b). Two sensitive natural communities were determined to have no potential to occur as neither the characteristic plant species nor the habitat structure was present in the project area. Two communities, coastal brackish marsh and northern coastal salt marsh, were determined to have high potential to occur within the downstream end of Unit 2 (Source: (CDFW, 2020a)

Table 3.3-4). In addition, other sensitive natural communities may be present within the riparian habitat found in Unit 4. Although native oak species—predominantly coast live oak—are planted in some locations along the floodwall and within Frederick Allen Park, coast live oak woodland is not considered a sensitive natural community in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

Coastal Brackish Marsh

Coastal brackish marsh is generally located on the interior edges of coastal bays and estuaries or in coastal lagoons (Holland, 1986). The most extensive stands are located in Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. This habitat is dominated by perennial, emergent, herbaceous monocots approximately 6 feet tall. Vegetative cover is often dense, and plant associates include plants from both salt and freshwater marshes. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, salt marsh bulrush marshes, slough sedge swards, gum plant patches, salt rush swales, water-parsley marsh, ditch-grass mats, and pondweed mats (CNPS, 2020b).

This vegetation community was documented at the downstream end of the project area, in Unit 2. Although the habitat type is not mapped according to *MCV* vegetation alliances, portions of the coastal brackish marsh was dominated by tuberous bulrushes, the characteristic species of the salt marsh bulrush marshes, an S3-ranked sensitive natural community.

Northern Coastal Salt Marsh

Northern coastal salt marsh is generally located on the coast from Point Conception north to the Oregon border, with extensive stands in the San Francisco Bay Area (Holland, 1986). This habitat is found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries and is dominated by herbaceous, salt-tolerant hydrophytes. Vegetative cover is often dense. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, Parish's glasswort patches, alkali heath marsh, gum plant patches,

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pickleweed mats, western sea-purslane marshes, and California cordgrass marsh (CNPS, 2020b).

This vegetation community is potentially intermixed with the mapped coastal brackish marsh at the downstream end of the project area in Unit 2. Species documented within the coastal brackish marsh that are more closely associated with northern coastal salt marsh habitats include pickleweed and cord grass species, the characteristic species of pickleweed mats (S3), and, potentially, California cordgrass marsh (S3.2) if the cordgrass species present is determined to be California cordgrass (*Spartina foliosa*).

Fish

Coho Salmon, Central California Coast Evolutionarily Significant Unit

Coho salmon, although not observed in Corte Madera Creek since 1984, belong to the Central California Coast (CCC) Evolutionarily Significant Unit (ESU) and are state and federally listed as endangered. Corte Madera Creek is designated critical habitat for CCC Coho salmon. Adult Coho salmon typically migrate upstream from mid-November through mid-January then spawn into February or early March. As typical of Pacific salmon, Coho die after this single spawning episode. After rearing in the freshwater creek for usually one year, the juvenile Coho salmon out-migrate during spring high flows in April and May. They then spend 16 to 18 months at sea before returning as adults to spawn in their natal creek (Moyle, 2002). Juvenile Coho salmon prefer deeper pools (>3 feet) with overhead cover and habitat created by large woody debris in the stream channel. The juveniles do best in summer waters of 54 to 57 degrees Fahrenheit and do not persist in waters of 72 to 77 degrees Fahrenheit (Moyle, 2002).

Steelhead, Central California Coast Distinct Population Segment

Steelhead in Corte Madera Creek belong to the Central California Coast (CCC) Distinct Population Segment (DPS) and are federally listed as threatened. Corte Madera Creek is designated critical habitat for CCC Steelhead. Adult winter Steelhead enter the creeks and rivers on their spawning migrations between November and April. The timing of upstream migration for winter Steelhead is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. Steelhead spend anywhere from one to five years in saltwater; a period of two to three years is most common (Busby, et al., 1996). Steelhead spawn in mainstems, tributaries, and intermittent streams (Everest, 1973; Barnhart, 1986). Reiser and Bjornn (1979) found that Steelhead prefer spawning gravels ranging in size from 0.5 to 4.6 inches. The number of days required for Steelhead eggs to hatch is inversely proportional to water temperature and varies from about 19 days at 60.1 degrees Fahrenheit to about 80 days at 42.1 degrees Fahrenheit. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart, 1986). Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories, which they defend. Young Steelhead feed on a variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing Steelhead juveniles prefer water temperatures of 45.0 to 58.0 degrees Fahrenheit and have an upper lethal limit of 75.0 degrees Fahrenheit. Steelhead that are successful in surviving to adulthood spend at least two years in fresh water before emigrating downstream. Steelhead are known to inhabit

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Corte Madera Creek; however, population monitoring data are not available. In 1999, A.A. Rich conducted electrofishing in Corte Madera Creek and captured rainbow/Steelhead trout at a density of 0.03 to 0.14 fish/square meter of instream habitat (A. A. Rich and Associates, 2000).

Tidewater Goby

Tidewater goby is federally listed as an endangered species and a state species of special concern. It is distributed from San Diego County north to the mouth of the Smith River in Del Norte County. This species inhabits coastal lagoons and the uppermost zone of brackish large estuaries with muted tidal flow and prefers sandy substrate for spawning but can be found on silt, mud, or rocky substrates. Tidewater gobies can occur in water up to 15 feet in lagoons and within a wide range of salinity (0 to 42 ppt). This species was last observed in 1961 over a mile downstream of the project area and is likely extirpated from this locality (CDFW, 2020a). The project area does not contain the muted tidal flow estuarine conditions this species requires. Therefore, tidewater gobies will not be discussed in the impact assessment.

Longfin Smelt

The longfin smelt is a candidate for listing under federal ESA and is listed as threatened under CESA. Spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate. Most smelt die after spawning, but a few (mostly females) may live another year. The eggs are adhesive and hatch in 40 days, when water temperatures are 44 degrees Fahrenheit. Newly hatched larvae are 0.2 to 0.3 inches long. Larvae can be moved downstream to estuaries by high flows but may also spend considerable time in fresh water. Very few larvae (individuals smaller than 0.8 inches in length) are found in salinities greater than eight ppt. It takes almost three months for longfin smelt to reach the juvenile stage (USFWS, 2012). Rosenfield and Baxter (2007) reported that longfin smelt catch per unit effort was greater at channel sites (>23 feet deep) than at shoal sites (<23 feet deep) in the San Francisco Bay estuary in each age group, and the difference was significant from the first fall through the second spring of life and between the second fall and winter of life. This indicates that longfin smelt may preferentially select deep water rather than shallow water habitats. Sampling by the City of San Francisco during several years in the early 1980s detected longfin smelt in the Pacific Ocean, providing additional evidence that some part of this population migrates beyond the Golden Gate Bridge (City of San Francisco & CH2M HILL, 1985, in Rosenfield and Baxter, 2007). Longfin Smelt concentration in deep water habitats combined with migration into marine environments during summer months suggests that Longfin Smelt may be relatively intolerant of warm waters (Rosenfield & Baxter, 2007). The same may be true for Corte Madera Creek, especially given its shallow nature and summertime warming. Longfin smelt have been captured in the bay east of Corte Madera Creek, but no evidence establishes presence in the project area. Therefore, longfin smelt is not discussed further in the impact assessment.

Wildlife

California Giant Salamander

California giant salamander is endemic to California and a CDFW species of special concern. This species occurs in two, possibly three isolated regions from Mendocino County south to

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Sonoma and Marin Counties, then continuing south of the San Francisco Bay from San Mateo to southern Santa Cruz County (Nafis, 2018). This species occurs in wet, humid coastal forests, particularly in Douglas fir, redwood, red fir, and montane and valley-foothill riparian habitats with cold permanent and semi-permanent rocky streams and seepages. Larvae and aquatic adults use aquatic stream habitats, and terrestrial adults use cover objects such as logs, leaf litter, rocks, or subterranean tunnels (Nussbaum, Brodie, & Storm, 1983). Adults actively migrate on rainy nights (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

There is a low likelihood for California giant salamander to occur in the project area. There are reported observations of California giant salamander in upper Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004; iNaturalist, 2020). While there is suitable aquatic habitat in Unit 4, this unit flows directly into the concrete-lined channel, which is unsuitable habitat. Furthermore, the adjacent upland habitat for terrestrial adults is very limited in extent and quality because of the narrow band of forest cover and proximity to housing and other human development. California giant salamanders will not be affected by project implementation and therefore will not be discussed further.

California Red-Legged Frog

California red-legged frog is federally listed as threatened and is a CDFW species of special concern. The species' range occurs from south of Elk Creek in Mendocino County to Baja California, with isolated remnant populations occurring in the Sierra foothills, from sea level to approximately 8,000 feet (Stebbins, 2003; Shaffer, Fellers, Voss, Oliver, & Pauly, 2004). Most California red-legged frog populations are currently largely restricted to coastal drainages on the central coast of California. California red-legged frog habitat generally includes wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches. Breeding occurs in November through March, and habitats are generally characterized by still or slow-moving water with deep pools (usually at least 2.3 feet, though frogs have occasionally been known to breed in pools less than this depth) and emergent and overhanging vegetation (Jennings & Hayes, 1994). Breeding sites can be ephemeral or permanent; if ephemeral, inundation is usually necessary into the summer months (through July to August) for successful metamorphosis. Although some adults may remain resident year-round at favorable breeding sites, others may disperse overland up to a mile (1.6 kilometers) or more (Fellers & Kleeman, 2007). Movements may be along riparian corridors, but many individuals move directly from one site to another without apparent regard for topography or watershed corridors (Bulger, Scott, & Seymour, 2003). California red-legged frogs sometimes enter a dormant state during summer or in dry weather (aestivation), finding cover in small mammal burrows, moist leaf litter, root wads, or cracks in the soil.

California red-legged frogs are likely absent from the project area. While the project area is within the species' historical range, California red-legged frogs have not been detected in the Corte Madera Creek Watershed, and there are no known records within the species' dispersal range. The nearest CNDDDB occurrence is approximately 4 miles northeast of the project area, at Point San Pedro; there is an extensive network of development, roads, and human activity that would preclude dispersal from this area. There is suitable non-breeding aquatic habitat in

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Unit 4; the concrete channel in downstream Units 2 and 3 provides very little habitat value. High winter flows and the presence of predatory fish further reduce any habitat suitability for breeding. California red-legged frogs will not be affected by project implementation and therefore will not be discussed further.

Western Pond Turtle

Western pond turtle is a CDFW species of special concern. In California, this species is found from the Oregon border along the Pacific Coast Ranges to the Mexican border as well as west of the crest of the Cascades and Sierras. Western pond turtles inhabit fresh or brackish water characterized by areas of deep water, low flow velocities, moderate amounts of riparian vegetation, warm water and/or ample basking sites, and underwater cover elements, such as large woody debris and rocks (Jennings & Hayes, 1994). Along major rivers, western pond turtles are often concentrated within side channel and backwater areas. Turtles may move to off-channel habitats, such as oxbows, during periods of high flows (Holland D. C., 1994). Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through their first few years. Hatchlings spend much of their time feeding in shallow water with dense submerged or short emergent vegetation (Jennings & Hayes, 1994). Although an aquatic reptile, western pond turtles require upland habitats for basking, overwintering, and nesting, typically within 1 kilometer (0.6 mile) from aquatic habitats (Holland D. C., 1994).

Western pond turtle has a low likelihood of occurrence in the project area. There is suitable aquatic habitat in Unit 4, and the concrete channel downstream in Units 2 and 3 provides little habitat value. While there is some suitable aquatic habitat in Unit 4, there are few suitable deep pools and/or off-channel habitats and limited opportunities for basking sites as the reach is very shady. Western pond turtles require open uplands adjacent to water for nesting; the adjacent uplands are limited in extent and quality, providing marginal nesting opportunities because of the narrow band of forest cover and proximity to housing and other human development. The closest documented western pond turtle occurrence is at Phoenix Lake, a dammed impoundment of Ross Creek, which is located approximately 1.5 miles upstream from Lagunitas Road Bridge.

White-Tailed Kite

White-tailed kite is a CDFW fully protected species. White-tailed kite is a resident (breeding and wintering) species throughout central and coastal California, up to the western edge of the foothills of the Sierra Nevada; California constitutes the stronghold of its North American breeding range (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Dunk, 1995). They are not migratory but may make slight seasonal range shifts in coastal areas during winter (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). White-tailed kites breed in lowland grasslands, oak woodlands or savannah, and wetlands with open areas. Riparian corridors represent a preferred landscape characteristic for kites in both the breeding and non-breeding seasons (Erichsen, 1995). Groves of trees are required for perching and nesting, though kites do not seem to associate with particular tree species (Dunk, 1995). Preferred foraging sites include open and ungrazed grasslands, agricultural fields, wetlands, and meadows that support large populations of small mammals. The white-tailed kite's year-round diet consists almost entirely

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of small mammals (Dunk, 1995; Erichsen, 1995) but can also include birds, insects, and reptiles. White-tailed kites breed between February and October, with peak breeding in May through August (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

White-tailed kites have moderate potential to occur in the project area based on observations along Corte Madera Creek just downstream of the project area (eBird, 2020) and presence of suitable nesting and foraging habitat. The eBird (2020) sightings just downstream of the project area along Corte Madera Creek include two white-tailed kites “often seen in the area” and “carrying food,” both signs of a likely breeding pair. The riparian corridor in the project area includes numerous tall trees with structure suitable for nesting and perching. Open spaces along Unit 2 (e.g., near College of Marin) provide foraging opportunities.

American Peregrine Falcon

The American peregrine falcon is a CDFW fully protected species. This species breeds in coastal California north of Santa Barbara, southern portions of the Sierra Nevada, and other mountains in northern California (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). This species uses a variety of open habitats including wetlands, woodlands, cities, agricultural lands, and coastal areas (Gertsch, DeWater, & Walton, 1994); riparian habitat and wetlands are particularly important (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). American peregrine falcons typically nest in open settings with unobstructed views and open access, often near water (e.g., wetlands, rivers, coastal areas). Nests are usually made in a depression or scrape on a high cliff ledge but are also found in dunes, on human-made structures, and occasionally within abandoned raptor nests in large, predominant snags or trees (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). Birds in urban environments have been observed nesting on city buildings and bridges (White, Clum, Cade, & Hunt, 2002). American peregrine falcons hunt prey in a variety of open habitat types such as wetlands, estuaries, mudflats, marshes, meadows, lakes, and rivers (Porter, White, & Erwin, 1973). Generally monogamous throughout the year, American peregrine falcon pairs roost and hunt cooperatively (White, Clum, Cade, & Hunt, 2002). This species feeds mainly on birds and occasionally bats or other small mammals, fish, or insects (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002).

There is suitable foraging habitat for American peregrine falcon in the coastal brackish marsh in Unit 2 at the downstream end of the project area. This species has been documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of the project area (eBird, 2020). There are no cliffs or predominant trees in the project area where peregrine falcons would be expected to nest though they have been known to nest in man-made structures including water towers or tall buildings. As foraging habitat will not be affected by any project element, American peregrine falcon is not discussed further.

California Ridgway's Rail

California Ridgway's rail (formerly California clapper rail) is federally listed as endangered. Ridgway's rails reside and breed entirely within the marshes of the greater San Francisco Bay estuary, including the Central/South Bay, San Pablo Bay, and Suisun Marsh areas. Critical

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habitat has not been designated for this species. Ridgway's rails inhabit tidal salt marshes and brackish marshes, often dominated by pickleweed (*Sarcocornia pacifica*), gumplant (*Grindelia*), and/or cordgrass (*Spartina* spp.). Other plant associates include saltgrass (*Distichlis spicata*), bulrushes (*Scirpus* spp.), and cattails (*Typha* sp.). This species nests in the upper-middle tidal marsh plain or high tidal marsh zones. Nests must be high enough to be protected from tidal inundation for successful reproduction. To allow for concealment, vegetation surrounding the nest site is usually tall (50 centimeters high or greater near mean high water) (USFWS, 2010). Nest sites are composed of a platform and woven canopy of vegetation. Foraging and refuge areas include the adjacent transitional zone as well as the lower, middle, and high marsh zones.

There is a photo-verified 2019 Ridgway's rail sighting in Corte Madera Creek approximately 600 feet downstream of the project area on the right bank near a set of culverts (eBird, 2020). There are numerous other sightings from 2011, 2014, 2015, 2017, 2019, and 2020 in Hal Brown Park at Creekside, including calling, approximately 1,500 feet downstream of the project area. An adult Ridgway's rail with young has also been seen in the relict mouth of Tamalpais Creek near College of Marin Parking Lot 13, approximately 1,000 feet downstream of Unit 2 (S. Guldman, pers. comm. with D. Halligan, Stillwater, October 8, 2020). There is suitable cover habitat for this species immediately downstream of Unit 2 though it is not likely extensive enough to support nesting as the tidal zone at this location is very narrow. Recent Ridgway's rail surveys for the San Francisco Estuary Invasive *Spartina* Project report the College of Marin sub-area of Corte Madera Creek as having "insufficient habitat" (Oolofson Environmental, 2020).

Saltmarsh Common Yellowthroat

Saltmarsh common yellowthroat (also known as San Francisco common yellowthroat) (*Geothlypis trichas sinuosa*), a distinct subspecies of the common yellowthroat (*Geothlypis trichas*), is a CDFW species of special concern. It is a year-round resident in the San Francisco Bay Area. Typical habitats for San Francisco common yellowthroat include brackish marsh, riparian woodland/swamp, freshwater marsh, salt marsh, and upland freshwater marsh (Gardali & Evens, 2008). They are typically associated with peppergrass (*Lepidium latifolium*), cordgrass, and bulrush/tule (*Schoenoplectus* spp.) (Nur, Zack, Evens, & Gardali, 1997). The Point Reyes Bird Observatory found that during surveys, sites with more pickleweed tended to have fewer yellowthroats (Nur, Zack, Evens, & Gardali, 1997). Nests are usually placed over water in emergent aquatic vegetation, dense shrubs, or other dense vegetation.

There is suitable foraging and nesting habitat for saltmarsh common yellowthroat in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of common yellowthroat (*Geothlypis trichas*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

San Pablo Song Sparrow

San Pablo song sparrow (also known as Samuel's song sparrow) (*Melospiza melodia samuelis*), a distinct subspecies of the song sparrow (*Melospiza melodia*), is a CDFW species of special concern. This California endemic subspecies' distribution is restricted to tidal and muted tidal

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salt marshes along the San Pablo Bay, with the highest densities reported at the Petaluma River mouth (Spautz & Nur, 2008). Samuel's song sparrows are primarily associated with high marsh and pickleweed where there is tidal influence. Dense vegetation is required for nesting, song perches, and cover from predators (Marshall, 1948, in Spautz & Nur, 2008).

There is suitable foraging and nesting habitat for San Pablo song sparrow in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of song sparrow (*Melospiza melodia*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

Salt Marsh Harvest Mouse

Salt marsh harvest mouse is federally and state-listed as endangered and is a CDFW fully protected species. Populations are currently found only in small portions of San Francisco, San Pablo, and Suisun bays and their tributaries (USFWS, 2010). Optimal habitat includes saline emergent wetlands vegetated by deep and dense stands of pickleweed. Though salt marsh harvest mice are strong swimmers, they require non-submerged, salt-tolerant plants (such as gumplant) to escape high tides (USFWS, 2010). Salt marsh harvest mouse can tolerate high salinity food and water. Suitable habitat includes salt marshes with dense pickleweed (*Salicornia virginica*) adjacent to upland vegetation for escape from higher tides. The diet of salt marsh harvest mouse includes both green vegetation and seeds, but pickleweed is a major food source. The mice are seldomly found in cordgrass, alkali bulrush, or pure stands of salt grass (Shellhammer, et al., 1982, in LSA, 2012). Salt marsh harvest mouse may also occasionally move into adjoining upland grassland areas (USFWS, 2010). The life span of salt marsh harvest mouse is only eight to twelve months, requiring constant population renewal. Females are sexually active from March to November but may only bear one litter per year (USFWS, 1984). Young salt marsh harvest mice can disperse a considerable distance, but fragmented habitats preclude wide dispersal. Salt marsh harvest mice will not cross open areas to disperse.

There is a very low possibility that salt marsh harvest mouse would occur in the downstream end of the project area beyond the concrete channel where the intertidal wetland is present. This species was last observed downstream of the project in 1959. This species is now presumed extirpated from the vicinity of the project area (CDFW, 2020a). There were sightings of salt marsh harvest mouse from the Corte Madera Ecological Reserve, approximately 2 miles east/southeast of the project area, in 1990 (CDFW, 2020a). Numerous observations have been made in the salt marshes east of Highway 101. Despite its very low potential to occur because of marginally suitable habitat, the salt marsh harvest mouse is federally, and state listed as endangered and fully protected by CDFW; therefore, its presence will be assumed in the wetland portion of Unit 2 for the purposes of the impact assessment and mitigation measure development.

Western Red Bat

Western red bat is a CDFW species of special concern. In California, the western red bat has been observed near the Pacific Coast and in the Central Valley and the Sierra Nevada range and foothills. Roosts have often been observed in edge habitats—near streams, fields, orchards, or

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urban areas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). This species roosts non-colonially, in dense canopies and within tree foliage, beneath overhanging leaves (Constantine, 1959; Shump & Shump, 1982), at 2 to 40 feet above ground level (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Studies in the Central Valley found that summering populations are substantially more abundant in remnant riparian stands of cottonwood or sycamore greater than 164 feet wide than in younger, less-extensive stands (Pierson, Rainey, & Corben, 2000). Individuals may forage up to 0.3 to 0.6 mile from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990), both at canopy height and low over the ground (Shump & Shump, 1982). This species feeds primarily on small moths, but its diet may include a variety of other insects, such as crickets, beetles, and cicadas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Mating occurs in August and September. Breeding sites are associated with the same type and amount of cover as roost sites, within cottonwood/sycamore riparian habitats along large river drainages in the Central Valley (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Pierson & Rainey, 2003). Fertilization is delayed until March or April. After an 80- to 90-day gestation period, pups are born from late May through early July.

There is foraging habitat for western red bat in the project area along Corte Madera Creek and possible opportunities for roosting in tree foliage in the riparian woodland associated with Unit 4. There are no recorded occurrences within 5 miles of the project area (CDFW, 2020a); however, few bat surveys have been conducted in this region. Western red bat is not expected to roost in trees associated with Unit 4 or Frederick Allen Park as this species is primarily associated with Fremont cottonwoods and sycamores. Because there will be no impacts to roosting habitat, and effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Townsend's Big-Eared Bat

Townsend's big-eared bat is a CDFW species of special concern. They have been documented from sea level to 10,800 feet although, in California, maternity roosts appear to be confined to elevations below 5,900 feet (Pierson & Fellers, 1998; Sherwin & Piaggio, 2005). This species occurs throughout California and is associated with caves and structures in a variety of habitats from deserts to coastal scrub to montane forests. This cavity-dwelling species roosts and hibernates in caves (commonly limestone or basaltic lava), mines, buildings, bridges (with a cave-like understructure), rock crevices, tunnels, basal hollows in large trees, and cave-like attics (Pierson & Fellers, 1998; Pierson & Rainey, 2007). Foraging has been observed in a variety of habitats (e.g., oak woodlands, desert scrub, alfalfa fields, vegetated creek drainages and in forested areas).

There is foraging habitat for Townsend's big-eared bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

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Pallid Bat

Pallid bat, a CDFW species of special concern, is fairly widespread in California. Pallid bats occupy a variety of habitats, from arid deserts to grasslands to conifer forests and riparian areas. Roosts (including day, night, and maternity roosts) are typically located in rock crevices and cliffs; day roosts can also be found in tree hollows and caves (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). In more urban settings, roosts are frequently associated with human structures, such as abandoned buildings, abandoned mines, and bridges (Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). Overwintering roosts require relatively cool and stable temperatures out of direct sunlight. Pallid bats typically glean prey from the ground and may forage 1 to 3 miles from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). The pallid bat is a colonial species, with a typical maternal colony size of 50 to 300 individuals (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996). Breeding occurs from late October to February. With an average litter size of two, the young are born between April and July and are typically weaned in August (Sherwin & Rambaldini, 2005).

There is foraging habitat for pallid bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Habitat Connectivity and Wildlife Movement

Fish Passage

Fish passage and instream habitat in the Corte Madera watershed are described below in context of the needs of the anadromous Steelhead, which still ascend the creek as adults, spawn, and rear juveniles in the headwater tributaries. These same habitat and passage requirements approximate the needs of coho salmon that once utilized Corte Madera Creek. Rearing habitat requirement for the juvenile Steelhead are similar to that required for resident rainbow trout in the stream.

Adult Steelhead migrate from the ocean into coastal freshwater streams and rivers for spawning during high-flow events occurring from December through March (Love, 2007). Coho salmon, currently extirpated from Corte Madera Creek, typically make their spawning migration up small coastal streams like Corte Madera Creek with the rains of mid-November to mid-December (Moyle, 2002). Most of the project area along Corte Madera Creek functions as a migration route that links the saltwater habitat of San Francisco Bay with headwater Steelhead spawning and juvenile rearing locations. The quality of the creek as a migration corridor is degraded by the concrete channelization found in Units 2 and 3. The bulkhead and poorly functioning fish ladder at the boundary between Units 3 and 4 further impairs upstream movement. A survey of the watershed identified 48 stream crossings within areas accessible to Steelhead (Taylor, Ross and Associates, 2006). Some of these stream crossings were complete

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barriers to upstream movement (e.g., Phoenix Lake Dam), some were considered partial barriers (e.g., the Denil fish ladder), and others, such as the Lagunitas Road crossing, were not considered an obstruction (Taylor, Ross and Associates, 2006). Overall, Corte Madera Creek's anadromous fish migration corridor downstream of the Lagunitas Road Bridge has been modified and degraded by past human action but is still capable of supporting movement of fish under certain flow conditions (Love, 2007). Once migrating Steelhead pass the fish ladder, Unit 4 provides suitable access to upstream reaches that are utilized for spawning and rearing.

The concrete channel below the existing fish ladder acts as a velocity barrier for migrating adult salmonids during high-flow times because of limited low-velocity areas. The concrete channel may also act as a thermal barrier to smolts as they swim downstream to the ocean (Town of Ross, 2009, in USACE 2010). As a result, the concrete flood control channel has severely reduced access to the creek for spawning runs of these species (Friends of Corte Madera Creek, 2008). Steelhead have often been observed attempting to pass through the existing fish ladder. The fish ladder was constructed as a temporary solution to provide fish passage over the bulkhead until the Unit 4 project could be constructed. Although repairs to this ladder in 2005 reportedly improved its performance, the ladder still fails to provide suitable passage at higher flows that are more common during the period of migration (Love, 2007).

Rearing juvenile Steelhead also conduct local movements related to foraging for food, defending territories, or seeking improved water quality. These movements would typically occur in Unit 4 due to the presence of suitable habitat in that reach. Rearing juvenile Steelhead may also temporarily inhabit the existing fish-migration pools within the concrete channel but would attempt to move upstream as water quality conditions deteriorate during the summer months. These concrete channel rearing fish would have their upstream movements inhibited by the fish ladder.

Wildlife Travel

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (i.e., juvenile animals from natal areas or individuals extending range distributions); (2) seasonal migration; and (3) local movements related to home-range activities (i.e., foraging for food or water, defending territories, or searching for mates, breeding areas, or cover). Although a variety of terms have been used to discuss wildlife movement across the landscape, this discussion focuses on travel routes. Travel routes are determined by features on the landscape that provide food, water, and shelter while also connecting areas of suitable habitat.

Riparian and aquatic habitats can provide food, water, and cover for wildlife, and the habitats can be important travel routes. In the case of terrestrial species, most truly migratory species that use the riparian corridor in the project area are migratory birds. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals as the floodwalls present substantial barriers to movement.

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The reconnaissance survey and review of aerial photos of the project area indicate that urban development has encroached into the riparian habitat. Modifications of the riparian area include construction of houses and related structures, riparian vegetation removal and landscaping, and channel stabilization work. Channelization, alteration, and encroachment into what were riparian areas in Units 2 and 3 have removed most of the riparian habitat. The result is that areas downstream of Unit 4 would not provide a substantial terrestrial wildlife movement corridor. However, evidence was observed that otters and racoons use the concrete channel for foraging. Even though urbanization and other actions have also degraded the riparian area in Unit 4, a more natural channel form and riparian vegetation remain. Unit 4 does not serve as a connection between natural habitats and, therefore, may not be considered as a functioning migration corridor. However, it does provide habitat for localized wildlife movement within the riparian corridor and dispersal opportunities for wildlife that may be within the surrounding urban landscape. As a result, Unit 4 has greater value than the downstream units with respect to local wildlife movement and likely supports species adapted to survival in urbanized settings.

Habitat Conservation Plans and Natural Community Conservation Plans

There are no federal habitat conservation plans or State Natural Community Conservation Plans within Marin County. Therefore, this issue will not be discussed further in this EIR.

Critical Habitat

Corte Madera Creek contains designated critical habitat for CCC coho salmon and CCC steelhead.

The five essential habitat types for CCC coho salmon include (1) juvenile summer and winter rearing areas, (2) juvenile migration corridors, (3) areas for growth and development to adulthood, (4) adult migration corridors, and (5) spawning areas. Corte Madera Creek contains areas 1, 2, 4, and 5. Growth and development to adulthood (area 3) occurs primarily in near- and off-shore marine waters; however, final maturation takes place in freshwater tributaries when the adults return to spawn.

The physical or biological features (PBF) of critical habitat that are essential for the conservation of CCC Steelhead are the following: (1) freshwater spawning sites, (2) freshwater migration corridors, (3) estuarine areas, (4) near-shore marine areas, and (5) offshore marine areas. The CCC steelhead PBF within the project area include items 1 through 3.

The project area does not contain any designated critical habitat for plants or wildlife.

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3.3.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Federal Endangered Species Act

FESA protects listed fish and wildlife species from harm or “take,” which is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury to a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are legally protected from take under FESA if they occur on federal lands or if a project requires a federal action, such as a Clean Water Act Section 404 fill permit.

The USFWS has jurisdiction over federally listed threatened and endangered species, and the National Marine Fisheries Service (NMFS, also called NOAA Fisheries) has jurisdiction over federally listed, threatened, and endangered marine and anadromous fish such as salmon and steelhead. These two agencies also maintain lists of species proposed for listing. Species on these lists are not legally protected under the FESA but may become listed in the near future; these agencies often include them in their review of a project. Designated critical habitats for FESA-listed species are also regulated and protected by these agencies.

Clean Water Act/Waters of the United States

Areas meeting the regulatory definition of “Waters of the United States” (Waters of the U.S.) (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (such as intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds), all impoundments of waters otherwise defined as Waters of the U.S., tributaries of waters otherwise defined as Waters of the U.S., the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to Waters of the U.S. (33 Code of Federal Regulations [CFR] Section 328.3).

Impacts to jurisdictional Waters of the U.S. are regulated under Section 404 of the Clean Water Act, for which the USACE and the U.S. Environmental Protection Agency (USEPA) have enforcement responsibility. The water-quality-related aspects of the Clean Water Act have been delegated to the California Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs); those regulations are discussed below.

Federal Migratory Bird Treaty Act

The federal MBTA (16 United States Code [U.S.C.] § 703) prohibits the pursuit, hunting, take, capture, or killing of migratory birds in the United States, including nests and eggs of migratory birds during the breeding season. The current U.S. Department of the Interior interpretation of the MBTA (memorandum M-37050 in December 2017) does not prohibit or penalize take of

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migratory birds that results from incidental take during operations. Taking of nests from construction activity remains prohibited under MBTA.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) is the primary law governing marine fisheries management in U.S. federal waters. One objective of the act is to conserve Essential Fish Habitat. A consultation with NMFS is required whenever a federal agency permits, funds, or implements a project that could affect essential fish habitat. Corte Madera Creek and its upstream tributaries, including San Anselmo Creek and Fairfax Creek, are designated as Essential Fish Habitat for several species of salmonids. Thus, consultation with NMFS, concurrent with its FESA consultation, is likely to be required.

State and Regional Regulations and Agencies

California Endangered Species Act and Other Special-Status Species Regulations

CESA prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. The CESA definition of take differs from the FESA definition. Under CESA, take is defined as hunting, pursuing, catching, capturing, or killing or attempting to do any of those things. There is also no state-level equivalent of critical habitat for listed species.

In accordance with the CESA, the CDFW has jurisdiction over state-listed species (Fish and Game Code §2070). CDFW also maintains lists of species of special concern that are defined as species that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats. CDFW also regulates fully protected animals, a classification which was the state's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Most, but not all, fully protected animals also have been listed as threatened or endangered species under the more recent state and federal endangered species laws and regulations. CDFW can authorize take of listed species, except fully protected animals, under CESA Sections 2080.1 and 2081 and 2089.2-2098.26, which allow CDFW to issue Consistency Determinations, Incidental Take Permits (ITPs), and Safe Harbor Agreements, respectively.

Fish and Game Code Sections 1602

CDFW implements Section 1602 of Fish and Game Code through the Lake and Streambed Alteration Agreement process, under which it regulates changes in non-tidal aquatic habitats and the riparian corridors that often surround them. The Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit debris, waste, or other materials that could pass into any river, stream, or lake (CDFW, 2018). A Lake and Streambed Alteration Agreement (LSAA) covers activities that would result in the modification of the bed, bank, or channel of a stream, river, or lake, including water diversion and damming and removal of vegetation from the floodplain to the landward extent of the riparian zone. It governs both activities that modify the physical characteristics of the stream

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and activities that may affect fish and wildlife resources that use the stream and surrounding habitat (i.e., the riparian vegetation or wetlands). A Section 1602 LSAA will often require mitigation, such as revegetation or replanting of riparian trees or other compensatory mitigation, for impacts to these resources.

Fish and Game Code Sections 3503 and 3513

Under California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Fish and Game Code Section 3503.5 protects all birds of prey (raptors) and their eggs and nests, and under Section 3513, it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Conservation measures incorporated into the project will assure compliance with these Fish and Game Code sections.

Clean Water Act Section 401/San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB has primary authority for implementing Section 401 of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act, which pertains to waters of the State of California. These statutes regulate water quality conditions by establishing processes for developing and implementing planning, permitting, and enforcement authority for waste discharges to land and water. The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) establishes beneficial uses for surface and groundwater resources and sets regulatory water quality objectives that are designed to protect those beneficial uses (RWQCB, 2011).

Under the current Basin Plan, designated beneficial uses for Corte Madera Creek include commercial and sport fishing, navigation, and contact and noncontact recreation; warm freshwater fish habitat; cold freshwater fish habitat; wildlife habitat; preservation of rare and endangered species; migration of aquatic organisms; and spawning, reproduction, and/or early development of fish. The Basin Plan provides a program of actions designed to preserve and enhance water quality and to protect beneficial uses. It meets the requirements of the USEPA and establishes conditions related to discharges that must be met at all times. The implementation portion of the Basin Plan includes descriptions of specific actions to be taken by local public entities and industries to comply with the Basin Plan's policies and objectives. These actions include measures for urban runoff management and wetland protection.

Native Plant Protection Act

The Native Plant Protection Act (NPPA; CFG Code Section 1900 et seq.) designates 64 species, subspecies, and varieties of native California plants as rare. NPPA prohibits take of rare native plants but includes some exceptions for agricultural and nursery operations, emergencies, and

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after proper notification of CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Oak Woodland Protection

Public Resources Code Section 21083.4

This section defines requirements under CEQA for evaluating project impacts on oak woodlands. Each county is required to determine whether a project in its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the following oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands:

- (1) Conserve oak woodlands through the use of conservation easements.
 - (2)(A) Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees.
 - (B) The requirement to maintain trees pursuant to this paragraph terminates seven years after the trees are planted.
 - (C) Mitigation pursuant to this paragraph shall not fulfill more than one-half of the mitigation requirement for the project.
 - (D) The requirements imposed pursuant to this paragraph also may be used to restore former oak woodlands.
 - (3) Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements, as specified under paragraph (1) of subdivision (d) of that section and the guidelines and criteria of the Wildlife Conservation Board. A project applicant that contributes funds under this paragraph shall not receive a grant from the Oak Woodlands Conservation Fund as part of the mitigation for the project.
 - (4) Other mitigation measures developed by the county.

California Rare Plant Ranks

Special-status plants in California are assigned to one of five CRPR by a group of over 300 botanists in government, academia, non-governmental organizations, and the private sector. This effort is jointly managed by the CDFW and CNPS. The five CRPRs currently recognized by the CNDDDB include the following:

- Rare Plant Rank 1A – presumed extinct in California
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2 – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed

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- Rare Plant Rank 4 – a watch list of plants of limited distribution

Substantial impacts to plants ranked 1A, 1B, and 2 are typically considered significant based on Section 15380 of the CEQA Guidelines, depending on the policy of the lead agency. Plants ranked 3 and 4 may be evaluated by the lead agency on a case-by-case basis to determine significance thresholds under CEQA.

Local Regulations

Marin County Municipal Code

The following codes in the Marin County Municipal Code are relevant to the project (Marin County, 2020).

Chapter 22.27 Native Tree Protection and Preservation

Section 22.27.030 Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.62.040 (Exemptions), and as provided for in Chapter 22.62 (Tree Removal Permits). (Ord. No. 3577, 2012)

Chapter 22.62 Tree Removal Permits

Section 22.62.040 Exemptions. The removal of any protected or heritage tree on a lot is exempt from the requirements of this Chapter if it meets at least one of the following criteria for removal:

- A. The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful;
- B. The tree is infected by a pathogen or attacked by insects that threaten surrounding trees as determined by an arborist report or other qualified professional;
- C. The tree is a potential public health and safety hazard due to the risk of its falling and its structural instability cannot be remedied;
- D. The tree is a public nuisance by causing damage to improvements, such as building foundations, retaining walls, roadways/driveways, patios, sidewalks and decks, or interfering with the operation, repair, or maintenance of public utilities;
- E. The tree has been identified by a Fire Inspector as a fire hazard;
- F. The tree was planted for a commercial tree enterprise, such as Christmas tree farms or orchards;
- G. Prohibiting the removal of the tree will conflict with CC&R's which existed at the time this Chapter was adopted;
- H. The tree is located on land which is zoned for agriculture (A, ARP, APZ, C-ARP or C-APZ) and that is being used for commercial agricultural purposes. (This criterion is provided to recognize the agricultural property owner's need to manage these large properties and continue their efforts to be good stewards of the land.);

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- I. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break;
- J. The tree removal is on a developed lot and: 1) does not exceed two protected trees within a one-year timeframe; 2) does not entail the removal of any heritage trees; and 3) does not entail the removal of any protected or heritage trees within a Stream Conservation Area or a Wetland Conservation Area.

It is recommended that a property owner obtain a report from a licensed arborist or verify the status of the tree with photographs to document the applicability of the criteria listed above to a tree which is considered for removal in compliance with this section. (Ord. No. 3577, 2012)

Chapter 22.130 Definition

22.130.030 Definitions of Specialized Terms and Phrases

Protected Tree and Heritage Tree. Any one of the following as indicated in the table below:

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Arroyo willow	<i>S. lasiolepis</i>	6 inches	18 inches
Big-leaf maple	<i>Acer macrophyllum</i>	10 inches	30 inches
Bishop pine	<i>Pinus muricata</i>	10 inches	30 inches
Blue oak	<i>Q. douglasii</i>	6 inches	18 inches
Box elder	<i>A. negundo var. californicum</i>	10 inches	30 inches
California bay	<i>Umbellularia californica</i>	10 inches	30 inches
California black oak	<i>Q. kelloggii</i>	6 inches	18 inches
California buckeye	<i>Aesculus californica</i>	10 inches	30 inches
California nutmeg	<i>Torreya californica</i>	10 inches	30 inches
Canyon live oak	<i>Q. chrysolepis</i>	6 inches	18 inches
Chaparral oak	<i>Q. wislizeni</i>	6 inches	18 inches
Coast live oak	<i>Quercus agrifolia</i>	6 inches	18 inches
Coast redwood	<i>Sequoia sempervirens</i>	10 inches	30 inches

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Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Douglas-fir	<i>Pseudotsuga menziesii</i>	10 inches	30 inches
Giant Chinquapin	<i>Castanopsis chrysophylla</i>	10 inches	30 inches
Hawthorn	<i>Crataegus douglasii</i>	10 inches	30 inches
Mountain-mahogany	<i>Cercocarpus betuloides</i>	10 inches	30 inches
Narrow leaved willow	<i>Salix exigua</i>	6 inches	18 inches
Oak	<i>Q. parvula var. shrevei</i>	6 inches	18 inches
Oregon ash	<i>Fraxinus latifolia</i>	10 inches	30 inches
Oregon oak	<i>Q. garryana</i>	6 inches	18 inches
Pacific madrone	<i>Arbutus menziesii</i>	6 inches	18 inches
Pacific yew	<i>Taxus brevifolia</i>	10 inches	30 inches
Red alder	<i>A. rubra</i>	10 inches	30 inches
Red elderberry	<i>Sambucus callicarpa</i>	10 inches	30 inches
Red willow	<i>S. laevigata</i>	6 inches	18 inches
Sargent cypress	<i>Cupressus sargentii</i>	6 inches	18 inches
Scouler's willow	<i>S. scouleriana</i>	6 inches	18 inches
Service-berry	<i>Amelanchier alnifolia</i>	10 inches	30 inches
Shining willow	<i>S. lucida ssp. lasiandra</i>	6 inches	18 inches
Silk tassel	<i>Garrya elliptica</i>	10 inches	30 inches
Sitka willow	<i>S. sitchensis</i>	6 inches	18 inches
Tanbark oak	<i>Lithocarpus densiflorus</i>	10 inches	30 inches
Valley oak	<i>Q. lobata</i>	6 inches	18 inches

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Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Wax myrtle	<i>Myrica californica</i>	10 inches	30 inches
White alder	<i>Alnus rhombifolia</i>	10 inches	30 inches

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project.

Biological Resources

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local agencies and resource management agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.

Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas.

Policy BIO-1.6: Control Spread of Invasive Exotic Plants. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State’s Noxious Weed List, the California Invasive Plant Council’s list of Exotic Pest Plants of Greatest Ecological Concern in California, and other priority species identified by the agricultural commissioner and California Department of Agriculture.

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Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving “no net loss” of sensitive habitat acreage, values, and function.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.

Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional when development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

Policy BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the CDFW, USFWS, NOAA Fisheries, USACE, USEPA, RWCQB, and BCDC) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected. **Goal BIO-3: Wetland Conservation.** Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

Policy BIO-3.1: Protect Wetlands. Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for

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enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone).

Goal BIO-4: Riparian Conservation. Protect and, where possible, restore the natural structure and function of riparian systems.

Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows sufficient capacity and natural channel migration, and allows reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible. (Details in setbacks and other aspects of stream corridors are in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.5: Restore and Stabilize Stream Channels. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.

Policy BIO-4.6: Control Exotic Vegetation. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in a SCA, and include monitoring to prevent reestablishment.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for: stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Policy BIO-4.8: Reclaim Damaged Portions of SCAs. Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.

Policy BIO-4.9: Restore Culverted Streams. Replace storm drains and culverts in SCAs with natural drainage and flood control channels wherever feasible. Reopening and

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restoring culverted reaches of natural drainages should be considered part of review of development applications on parcels containing historic natural drainages where sufficient land area is available to accommodate both the reopened drainage and project objectives. Detailed hydrologic analysis may be required to address possible erosion and flooding implications of reopening the culverted reach, and to make appropriate design recommendations. Incentives should be provided to landowners in restoring culverted, channelized, or degraded stream segments. Where culverts interfere with fish migration but replacement is not possible, modify culverts to allow unobstructed fish passage.

Policy BIO-4.15: Reduce Wet Weather Impacts. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.

Policy BIO-4.16: Regulate Channel and Flow Alteration. Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.

Policy BIO-4.19: Maintain Channel Stability. Applicants for development projects may be required to prepare a hydraulic and/or geomorphic assessment of onsite and downstream drainage ways that are affected by project area runoff. This assessment should be required where evidence that significant current or impending channel instability is present, such as documented channel bed incision, lateral erosion of banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County. (More details are available in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.20: Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Policy WR-1.2: Restore and Enhance Watersheds. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.

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Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Town of Ross Municipal Code

The following code in the Town of Ross Municipal Code is applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

12.24.020 Definitions.

(5) "Native tree," means a tree native to those lands that now constitute the town of Ross.

(8) "Protected trees," means any tree located within twenty-five feet (25') of the front or side yard property line or within forty feet (40') of the rear yard property line of any parcel, with such tree having a diameter greater than eight inches (8"); and any tree planted as a replacement tree for a tree removed pursuant to this chapter or planted within a required yard setback area pursuant to a landscape plan approved by the town council.

(10) "Significant tree," means any tree having a single trunk diameter greater than twelve inches (12"), or any tree designated to be preserved on plans approved by the town council, or as a condition of approval of a project approved by the town council.

(11) "Tree," means a perennial plant having a permanent, woody, self-supporting main stem or trunk ordinarily growing to a considerable height. As defined herein, a "tree" may include a shrub as well as a tree.

(13) "Unimproved parcel," means any parcel in Ross which does not have a structure on it suitable for human habitation.

12.24.060 Alteration or removal of trees on unimproved parcels. The following provisions apply to the alteration or removal of trees on unimproved parcels:

(1) It is unlawful for any person to alter or remove, or cause to be altered or removed, any tree six inches (6") in diameter or greater on an unimproved parcel in Ross without first obtaining a Tree Alteration or Removal Permit from the Public Works Director.

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(2) Any person desiring to alter or remove a tree on an unimproved parcel must file for a Tree Alteration or Removal Permit following the application procedure as described in Section 12.24.080.

12.24.070 Alteration or removal of trees on improved parcels. The following provisions apply to the alteration or removal of trees on improved parcels:

(1) No protected or significant tree shall be altered or removed without a Tree Alteration or Removal Permit.

(2) Any person desiring a Tree Alteration or Removal Permit must file for approval following the procedure as required by Section 12.24.080.

12.24.080 Tree Alteration or Removal Permits and Appeal. (4) Replacement tree. Unless otherwise specified by the Public Works Director or Town Council, replacement trees shall be required at the following ratios:

(a) A tree in good or excellent condition and structure shall be replaced on a one-to-one trunk diameter basis. (Example: 1 21" dbh tree in good or excellent condition must be replaced with new trees totaling 21" trunk diameter);

(b) A tree in fair or marginal condition or structure shall be replaced on a three-to-one trunk diameter basis. (Example: a 21" dbh tree in fair or marginal condition must be replaced with new trees totaling 7" trunk diameter);

(c) A tree in poor condition or creating a hazard to a building and/or structure, shall be replaced with 2 inches replacement trunk diameter.

Inches of replacement tree may be translated into standard nursery planting sizes using the following formulas:

24" box replacement tree = 2 inch replacement trunk diameter

36" box replacement tree = 3 inch replacement trunk diameter

48" box replacement tree = 4 inch replacement trunk diameter

If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community.

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The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

12.24.100 Tree protection plan. In order to protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a tree protection plan shall be required on sites where Significant or Protected trees may be impacted. The tree protection plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during construction

Town of Ross General Plan

The following policies of the Ross General Plan related to biological resources are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 6. Protecting Creek Habitat and Reducing Flooding Hazards

6.7 Riparian Vegetation. Protect existing creek and riparian vegetation and encourage the use of native species during creek restoration. Assure that modification of natural channels is done in a manner that retains and protects creekside vegetation, integrates fish passage and includes habitat restoration in its natural state.

Marin County Flood Control and Water Conservation District

The Marin County Public Works Department maintains the public infrastructure of Marin County, including its roads, bridges, flood channels, and natural creeks. Within the Public Works Department, the Marin County Flood Control and Water Conservation District (Flood Control District) works to reduce the risk of flooding for the protection of life and property while utilizing sustainable practices. The Flood Control District aims to meet this mission through effective, transparent, and responsive planning, design, construction, operation, and maintenance of facilities such as stormwater pump stations, flood diversion and storage basins, bypass drains, creeks, ditches, and levees. All project elements would be designed to comply with the District's own policies and to obtain and comply with any necessary permits.

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3.3.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

- a. 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 Game or U.S. Fish and Wildlife Service;
- b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan; or

Given the nature and location of the project, impacts are analyzed in this section relative to the following additional threshold:

- g. Introduce a new non-native or invasive species of plant or animal into an area.

Approach to Impact Analysis

The following approach was used to inform the analysis of potential project impacts on biological resources. The potential for special-status species, protected habitats, wetlands, or riparian areas to occur in or near the project area was first assessed (see Section 3.3.3 for this assessment). Next, the project actions were considered to evaluate whether direct or indirect impacts on these resources were likely. Finally, the magnitude of any of those impacts was weighed against the significance criteria. More detail on these steps is presented in the following paragraphs.

Type of Impacts

Direct impacts occur through direct interaction of the resource with construction or operation and maintenance of the project. Direct impacts on plant and wildlife species are caused by loss of habitat in these communities at the time of ground disturbance. Site excavation, grading, filling, and infrastructure construction can also result in direct impacts from death, injury, or

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disturbance (e.g., noise) to individuals to such an extent that the species cannot continue inhabiting or foraging in the area during construction (temporary impact) or over the life of the project operation and maintenance (permanent impact).

Direct impacts on natural communities include removal of these communities and replacement with other land uses. Direct impacts on habitat may be temporary—for example, if construction of the project disturbs a habitat that is subsequently restored, or individuals of a given species are displaced temporarily and then later return to the site. Impacts are considered permanent if the habitat is converted to some other type that no longer provides value to biological resources and the impacts persist past the operational period of the project.

Indirect impacts from a project may occur later in time, at a different location, or as the result of a sequence of related interactions (State CEQA Guidelines Section 15064[d][2] and [3]). Indirect impacts on species may occur when remaining fragments of undeveloped habitat are isolated from larger areas of contiguous habitat and individuals of a species suffer reductions in fitness or reproductive capability in these smaller fragments. Indirect impacts may occur concurrent with project implementation or at a later time due to degraded water quality, changes in hydrology, increased predation or competition, invasive species spread, and other indirect factors.

Significance Thresholds

The threshold for significance for impacts on special-status plants, fish, and wildlife would be any measurable decrease in population. A temporary impact would be significant if it resulted in a measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. For listed fish or wildlife and fully protected species, any loss of individuals would be a significant impact. For habitat modification, a significant impact is any measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. The threshold for significance for adverse effects on natural communities would be any reduction in extent of the community compared with baseline, or a change that could threaten the long-term existence of the community itself. The threshold of significance for wetlands is any net loss of extent. The threshold of significance for species migration would be the permanent interference in or inhibition of movement. The threshold of significance for local ordinances is a violation of any such ordinances. The threshold of significance related to invasive species is the introduction or spread of new non-native or invasive species.

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3.3.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (f):** Implementation of the project would not conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan because there are no adopted HCPs, NCCPs, or other approved conservation plans in the project area.

Impacts Analyzed

Impact 3.3-1: The project would not 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 Game or U.S. Fish and Wildlife Service.	Significance determination
	Construction: Less than significant with mitigation
	Operation and Maintenance: Less than significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Plants

Sixteen special-status plant species have the potential to occur in the riparian corridor in Unit 4 upstream of the existing Denil fish ladder. Construction activities including vegetation removal, tree removal, fence installation, grading, and installation of streambed stabilization measures could result in the direct mortality or damage to special-status plant species. Special-status plants may be present in the areas where construction activities may be performed; without surveys to document these species and measures to adequately protect them, they could be removed and/or habitat would be degraded. The removal of special-status plants or damage to their habitat would be a significant impact. To avoid or minimize this significant impact, the project would implement special-status plant avoidance **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and either avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the direct impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct impacts on special-status aquatic species could occur from channel-bank stabilization (e.g., installation of rock and retaining wall), fish ladder demolition, and in-channel grading as well as dewatering activities in Unit 4. Project construction has been scheduled to allow

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in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are less likely to be present. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Mitigation Measure 3.3-1b specifies the requirements for careful dewatering and aquatic species relocation using approved techniques and qualified personnel to avoid significant impacts on aquatic species, and Mitigation Measure 3.3-1c requires contractor environmental awareness training to avoid working in unauthorized areas, during unauthorized periods, or any unauthorized manner that could cause an impact on special-status aquatic species. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, impacts on special-status aquatic species would be less than significant with mitigation.

Terrestrial Species

There will be no direct impacts on special-status terrestrial species associated with tidal marsh habitats, including California Ridgway's rail or salt marsh harvest mouse, as no habitat for these species occurs in Unit 4. There will be no impact.

White-tailed kite, a fully protected species, could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The peak breeding season for white-tailed kite is May through August. Up to 21 trees will be removed in Unit 4. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Foraging kites and other migratory birds would be in open areas away from the project area and can keep away or disperse from temporary construction activities; therefore, effects to foraging kites and migratory birds are not anticipated. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds; therefore, the impact on white-tailed kite would be less than significant with mitigation.

Unit 3 Frederick Allen Park (Town of Ross)

The Frederick Allen Park construction includes removal of the concrete channel, construction of a retaining wall, construction of short concrete floodwalls (approximately 2 feet tall), and excavation and grading within the channel and park to provide a natural floodplain and meandering low-flow channel, improved fish passage, increased low- and high-flow habitat for salmonids, reduced flood elevations, and natural benches and banks connecting to the park.

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Approximately 144 trees would need to be removed within the Frederick Allen Park grading footprint if the USACE requires a 15-foot setback from the new floodwalls. Approximately 114 trees would be removed if a setback is not required. The improvements also include new landscaping and a realigned multi-use path within the park.

Plants

Ten special-status plant species have the potential to occur in the riparian corridor in Frederick Allen Park. Construction activities including vegetation removal, tree removal, fence installation, and excavation and grading within the park to provide creek-corridor widening could result in the direct mortality or damage to special-status plant species should they occur in the area. Focused special-status plant surveys have not been performed in the Frederick Allen Park area. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded. Removal of a special-status plant or habitat degradation would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct effects on individuals of a special-status aquatic species could arise from construction within the concrete channel. Project construction has been scheduled to allow in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are likely to be absent. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. The District would avoid significant impacts by implementing careful dewatering and fish relocation using approved techniques and qualified personnel following **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and conduct contractor environmental awareness training in accordance with **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species is less than significant with mitigation.

Terrestrial Species

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. There will be no direct impacts on white-tailed kite or special-status terrestrial species associated with tidal marsh habitats (i.e., California Ridgway's rail, saltmarsh common

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yellowthroat, San Pablo song sparrow, or salt marsh harvest mouse) as no habitat for these species occurs in Frederick Allen Park. No impact would occur.

Unit 3 Fish Pool Construction

Unit 3 would be modified to include up to 11 new 11-foot-wide and 24-foot-long fish pools that would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel.

Special-Status Plants and Terrestrial Species

There are no special-status plant species or terrestrial wildlife impacts associated with the proposed fish pools because no habitat for special-status plants or terrestrial wildlife occurs in the concrete channel where the larger fish pools would be constructed. Therefore, no impact on special-status plant species or terrestrial wildlife would occur during fish pool construction.

Aquatic Species

Instream activities would require channel dewatering to allow for equipment access, concrete demolition at specific fish pool locations, and construction of the new fish pools. Adverse impacts of these activities include injury or mortality of any fish species that could be inhabiting Unit 3 at the time of dewatering. As mentioned previously, all in-water work activities have been scheduled to occur between June 15 and October 15, when water levels will be low and aquatic species are less likely to occur in the work area. While the construction schedule reduces the risk on aquatic species, significant impacts could potentially occur if dewatering activities were not properly implemented and individuals were stranded in Unit 3. The project would implement **Mitigation Measures 3.3-1b: Fish Capture and Relocation** to avoid this significant effect. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Granton Park Stormwater Pump Station

Plants

Eight special-status plant species have the potential to occur in the footprint of the stormwater pump station. Construction activities including vegetation clearing and site grubbing, tree removal, fence installation, excavation, and, potentially, floodwall construction could result in the direct mortality or damage to special-status plant species if they occur in the area. Focused surveys for special-status plants have not been performed in the area. Special-status plants may be present in the areas where construction activities may be performed for installation of the floodwalls or stormwater pump station. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided.

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Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

The Unit 3 and Unit 2 floodwalls and the stormwater pump station do not involve work within the channel of Corte Madera Creek. Therefore, construction of the floodwalls and stormwater pump station would have no impact on aquatic species.

Terrestrial Species

White-tailed kite, a fully protected species, could establish nests in riparian trees associated with the Unit 3 and Unit 2 floodwalls and stormwater pump station. Construction activities for the Unit 3 and Unit 2 floodwalls and stormwater pump station include tree and vegetation removal, including removal of approximately eight trees for the stormwater pump station. If the floodwall is constructed as an extension of the existing channel wall, no additional riparian trees will need to be removed. If the USACE requires that the floodwall be set back from the existing floodwall or a 15-foot setback between the new floodwall segment and existing trees, then construction activities for floodwall construction will result in the removal of 157 trees. All native riparian trees removed within the location of floodwalls and project components would be replaced within proximity to the removal location unless it is infeasible to locate replacement trees within District property while maintaining a 15-foot setback from the floodwall to comply with USACE Section 408 requirements.

The peak breeding season for white-tailed kite is May through August. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds. Because the mitigation includes procedures to avoid impacting an active nest of a special-status avian species, the impact on white-tailed kite would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal

The Unit 2 lower College of Marin concrete channel removal project activities includes removal of approximately 625 linear feet of concrete flood-channel wall to create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change.

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Plants

Thirteen special-status plant species have the potential to occur in the Unit 2 concrete channel removal footprint. Construction activities including vegetation clearing, tree removal, and grading could result in the direct mortality or damage to special-status plant species. Surveys for special-status plants have not been completed in the area. Special-status plants may be present in the areas where construction activities may be performed. Without surveys to document special-status plant species and measures to adequately protect them, they could be removed and/or the habitat degraded. The impact from removal of special-status plants or habitat degradation would be significant. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare-plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Grading and Dewatering. Removal of the existing concrete channel and regrading of the creek bed in tidal areas could cause injury or mortality of any fish species that could be inhabiting the Unit 2 work area at the time of construction. The project construction has been timed to limit in-water construction to the period of June 15 to October 15 to avoid the period when special-status fish are more likely to occur in the area. The Unit 2 construction has been timed to limit in-water construction to the period of September 1 to October 31 to avoid the period when special-status fish are more likely to occur in the area and after the Ridgway's rail breeding season. The construction in Unit 2 will require dewatering of the work area, and the dewatering of the intertidal reach could result in significant impacts on special-status aquatic species if not properly implemented.

The upstream extent of tidal action in Corte Madera Creek is in the vicinity of the Kentfield Hospital. However, at low tide channel between Stadium Way and the SMN Bridge would be substantially free of tidal water (Sandra Guldman, pers. comm. December 4, 2020). Construction within this reach would require installation of two cofferdams: one at the Stadium Way Bridge and a sheet pile structure downstream of the Unit 2 concrete channel. Fish species would be removed and relocated from the Unit 2 construction reach as described in the dewatering plan developed by the Friends of Corte Madera Creek (see Appendix D).

The District would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection** to avoid significant impacts on aquatic species. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Mitigation Measure 3.3-1c requires contractor environmental awareness training to ensure all construction personnel follow authorized construction procedures to avoid impacts on special-status species.

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It is expected that the Friends of Corte Madera Creek dewatering plan would reduce the impacts on fish present within the Unit 2 work area. However, depending on the tidal range at the time of construction, tidewaters could be present upstream of the Stadium Way Bridge cofferdam. Installation and closure of the cofferdam for up to eight weeks while potentially fish-bearing tidal water is upstream could result in the stranding and potential mortality of estuarine fish. Therefore, **Mitigation Measure 3.3-1f Intertidal Upstream of Stadium Way Cofferdam** that requires an inspection of the reach upstream of the Stadium Way cofferdam and fish removal would be implemented to avoid significant impacts on estuarine fish upstream of the Unit 2 work area.

Because the mitigation includes procedures to avoid injury or death of special-status fish during dewatering, the impact on special-status aquatic species from grading and dewatering would be less than significant with mitigation.

Noise. The proposed Unit 2 activity also includes pile driving to construct a cofferdam that would temporarily eliminate tidal action in the project reach and facilitate channel modifications. The noise generated during driving the pilings into the sediment of lower Corte Madera Creek has the potential to result in the injury or mortality of juvenile or adult salmonids that may be close to the work area.

The cofferdam would be constructed of sheet piles that would be driven into the substrate upstream of the Tamalpais Creek culvert using a Silent Piler Giken F101 vibratory pile driver. Approximately 175 piles will be driven side-by-side to install the nearly 225-foot-wide cofferdam, 40 feet of which will be located outside of the ordinary high tide line. The remaining pilings may be installed within the wetted low-tide perimeter, but much of the installation would occur during low-tide periods and on dewatered substrate.

The Fisheries Hydroacoustic Working Group (FHWG) has developed agreed-upon injury threshold criteria for listed fish species (FHWG, 2008). The FHWG identified sound pressure levels of 206 dB-peak (peak decibels) as being injurious to fish. Accumulated sound exposure levels (SEL) of 187 dB for fishes that are greater than 2 grams (g), and 183 dB for fishes below that weight, are considered to cause temporary shifts in hearing, resulting in temporarily decreased fitness (i.e., reduced foraging success, reduced ability to detect and avoid predators) (FHWG, 2008). It must be noted that recent research summarized in Popper et al. (2014) suggests that cumulative SEL thresholds for injury may be well above 200 dB.

The Silent Piler that will be used for this project has a noise level of about 63 dB at its fully operational mode. Therefore, the impact of the Unit 2 work and pile driving on fish species is less than significant.

Terrestrial Species

California Ridgway's Rail. California Ridgway's rail is known to occur within 1,000 feet of the furthest downstream portion of Unit 2. Saltmarsh common yellowthroat and San Pablo song sparrow, also special-status species, may nest in the coastal brackish marsh associated with Unit 2 at the downstream end of the project area. Heavy construction associated with the

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concrete channel removal in lower Unit 2 is scheduled to begin after September 1, when California Ridgway's breeding season is complete.

Noise can negatively affect birds by causing them to lose hearing sensitivity temporarily or permanently or by increasing their stress levels by altering the production of stress hormones. Noise can also mask important background signals, thus preventing individuals from receiving important biological information such as sounds of predators or prey or through interfering with acoustic communications between individuals. The latter can interfere with finding mates and/or change how animals select foraging locations (Caltrans, 2016).

Laboratory evidence shows that continuous noise levels above 110 dBA (A-weighted decibels) lasting over 12 to 24 hours, or a single impulsive noise over 140 dBA SPL (125 dBA SPL for multiple blasts), can cause damage and loss of inner ear sensory hair cells, resulting in a large initial permanent threshold shift (PTS) followed by a small (~10–15 dB) lingering threshold shift even after all hair cells have been regenerated (Caltrans, 2016). At continuous noise levels below 110 dBA down to about 93 dBA, birds may experience a temporary threshold shift (TTS) that lasts from seconds to days, depending on the intensity and duration of the noise to which the animal was exposed. In contrast to a PTS, hearing recovers completely from TTS to the level that it was before the exposure. Nevertheless, during this period of TTS, the bird's hearing is temporarily impaired, and this could affect a variety of auditory and vocal communication behaviors, including detection of predators, communication with young, auditory feedback, etc. Received continuous noise levels below 93 dBA SPL are unlikely to cause even TTS in birds (Caltrans, 2016). The noise-masking threshold is approximately 60 dBA.

The Silent Piler that will be used for this project has a noise level of about 63 dB at approximately 53 feet during its fully operational mode. This is barely above the noise-masking threshold and well below the TTS level that could be injurious to birds. The attenuation rate for construction noise is about 6 dB per doubling of distance (Caltrans, 2016). Furthermore, operation of the Silent Piler will occur after September 1, when the nesting season will be complete for special-status bird species. Therefore, the impact of pile driving on Ridgway's rail, saltmarsh common yellowthroat, San Pablo song sparrow, or other bird species is less than significant.

There is the potential for other construction noise to adversely affect special-status bird species, including Ridgway's rail. Heavy equipment operations and concrete channel demolition could generate sound pressure levels that are detrimental to nesting bird species. Bulldozers, excavators, and jackhammers produce noise levels of 85 dBA at 50 feet (Caltrans, 2016). Assuming that the noise attenuation rate is 6 dB per doubling of distance, the decibel level at the nearest observation (600 feet) of Ridgway's rail to the project area would be about 63 dBA. Although this noise level is below the TTS injury threshold, it would result in noise masking, which could make nesting birds and young more susceptible to predation. Therefore, heavy equipment operations involving demolition, grading, or construction of the lower Unit 2 concrete channel removal will commence after September 1 to avoid the nesting season. Impacts

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on special-status birds would be less than significant due to the timing of construction heavy equipment use after September 1.

Salt Marsh Harvest Mouse. Salt marsh harvest mouse has a very low likelihood to occur in the project area. However, because the species is federally and state listed as endangered and fully protected by CDFW, any impact on this species, if it occurred in the area, would be significant. The District will implement **Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse** to avoid impacts on salt marsh harvest mouse. Mitigation Measure 3.3-1g requires the following: environmental training for all crews by a Qualified Biological Monitor, flagging suitable habitat for avoidance, having a biological monitor present for all vegetation removal within 50 feet of wetland habitat, hand removal and salvage of wetland vegetation, installation of salt marsh harvest mouse exclusion fencing to avoid salt marsh harvest mouse from entering the work area, timing work to avoid extreme high tides, and capping pipes or similar objects in mouse habitat. Because the mitigation includes procedures to avoid salt marsh harvest mouse, the impact on salt marsh harvest mouse would be less than significant with mitigation.

Indirect Impacts

Plants

Indirect damage or degradation to special-status plant species or habitat could result from construction activities introducing invasive plant species to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. The project includes planting of riparian vegetation along the creek banks to restore native habitats and seeding areas of temporary construction disturbance with a native seed mix, which would help prevent the establishment of invasive plant species. The proposed planting mix for Frederick Allen Park and lower College of Marin is provided in Appendix B. Native planting would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of special-status plant habitat, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of vehicle and specific requirements to prevent introduction of pathogens and invasive plant species during construction. Because the mitigation includes procedures to avoid introduction of invasive species, the indirect impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Channel stabilization and fish ladder demolition in Unit 4 would result in modification of instream habitat from its current condition. Since its construction, the fish ladder has resulted in ongoing adverse modification of instream habitat in Unit 4 through sediment aggradation upstream. In addition, the presence of the fish ladder has adversely affected fish migration by hindering the ability of adult fish to pass at that location during high flows. Its dilapidated condition, the lack of an entrance pool in the concrete channel, and the narrow range of

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operating flows makes the fish ladder relatively ineffective for fish passage (MLA, 2019). In addition, the fish ladder halts the upstream movement of juvenile Steelhead due to excessive jump height. The project will remove the fish ladder, grade and stabilize Unit 4 upstream of the fish ladder removal with engineered streambed material, install biodegradable fabric-wrapped soil lifts with intervening live willow brush layers, bury a large rock keyway to protect the transition element, and provide a short section of concrete retaining wall to protect the streambank. Unit 3 and Unit 2 of Corte Madera Creek are currently contained within a concrete channel, which contains very poor habitat for migrating and rearing aquatic species. Work within the channel would improve steelhead migration habitat by removing approximately 60,000 square feet of the concrete waterway adjacent to Frederick Allen Park and restoring it to a natural aquatic and riparian condition and installing larger fish resting pools.

The Unit 4 features would together result in approximately 6,375 square feet and 3,625 square feet of temporary and permanent aquatic habitat impacts, respectively. The temporary impact is related to channel grading and streambed stabilization, which would adjust during the following high-flow seasons and continue to provide suitable instream habitat. The permanent impact would occur due to rock keyway placement and the reinforced concrete retaining wall, which would be along the channel margins. Riparian habitat impacts would result from the removal of 21 trees, which would be replaced within Unit 4. Given the limited affected area, riparian vegetation replacement, and improved fish-migration habitat from removal of the fish ladder, the temporary and permanent impact on in-stream and riparian habitat from the project elements in Unit 4 are not expected to adversely affect populations of the special-status aquatic species in the Corte Madera Creek area and has the potential to beneficially affect instream habitat populations due to removal of a fish-migration barrier. Following implementation of the project, the Corte Madera Creek channel would be wider, with increased habitat diversity, such as natural pool/riffle sequences, which would improve habitat conditions for juvenile salmonids and amphibians. The planting of native riparian vegetation (e.g., willows and alders) along the restored channel would increase stream shading and help moderate water temperature conditions. In addition, the removal of concrete and restoration of the natural channel would allow for the interchange of subsurface and surface water, which could also help moderate water temperatures. Therefore, the impact would be less than significant and, ultimately, the project is anticipated to have a beneficial impact on aquatic species. The lower Unit 2 concrete channel removal activities are contained within a concrete-lined channel, which contains very poor habitat for aquatic species. The new tidal, wetland, and riparian habitat created by the project would improve rearing conditions for aquatic species. Therefore, impacts on aquatic species habitat are considered beneficial and less than significant.

Indirect impacts include increased turbidity and suspended sediment within the channel from post-construction rewatering and initial storm runoff. Sediment resuspension may also increase the concentrations in the water column of chemicals sequestered in the sediment with potential toxicity to salmonids and other aquatic species and may result in adverse water quality and biological effects. At high levels, turbidity and suspended sediment in the water column can lower levels of dissolved oxygen. However, after the initial spike in turbidity levels, sediments

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would disperse and background levels would likely be restored within hours of disturbance. Persistent elevated levels of turbidity would constitute a significant impact on aquatic species and habitat. However, implementation of the project's erosion control measures in the Stormwater Pollution Prevention Plan and federal and state regulatory permits (Clean Water Act 404, Clean Water Act 401, etc.) would address this potential effect. Best Management Practices typical for civil construction projects will be implemented, such as straw wattles, silt fences, erosion-control matting, and stabilized construction entrances. Removal of the fish ladder would create long-term benefits for natural sediment processes. Therefore, indirect impacts on aquatic species due to increased turbidity and suspended sediment are less than significant.

Removal of trees and other vegetation in the riparian corridor could also adversely affect perennial stream habitat by reducing overstory shade at the project site, which may reduce habitat quality in downstream areas by increasing water temperatures, increasing algal growth, and lowering dissolved oxygen levels. Substantially depressed oxygen levels may cause respiratory stress to aquatic life and, when levels are depressed enough, may cause mortality. Persistent high water temperatures, algal growth, or low dissolved oxygen levels would constitute a significant impact on aquatic species and habitat. However, very few trees (i.e., seven) would be removed within Unit 4. Project activities in Frederick Allen Park, in the Unit 2 and Unit 3 floodwall installation area, and stormwater pump station would also require the removal of existing native and non-native upland trees to facilitate demolition of the concrete channel and associated restoration grading, installation of floodwalls, and installation of the stormwater pump station. Most of these trees are located away from the top of bank and do not provide shading to the channel. The trees along the top of bank provide minimal shading of the low-flow channel. In addition, the elevated water temperatures occur during the summer months due to the substrate heating of the very shallow water flowing over the hot concrete channel. The high water temperatures create inhospitable conditions for juvenile steelhead and other species. In addition, any trees removed from the riparian area would be replaced. There would not be significant changes in overstory shading and subsequent indirect water quality effects. Therefore, the impact on special-status aquatic species from tree removal is less than significant.

Terrestrial Species

As discussed above, removal of trees and other vegetation in the riparian corridor could reduce the number of trees available to nesting white-tailed kites in Unit 4 upstream of the existing Denil fish ladder, within Frederick Allen Park, and along the floodwalls in Units 3 and 2. Up to 358 trees would be removed. Any trees removed from the riparian area in Unit 4 would be replaced and up to 125 trees would be planted within Frederick Allen Park. Because of the heavy human activity and traffic in Frederick Allen Park, Frederick Allen Park does not currently provide habitat for special-status birds such as white-tailed kite. The removal of trees along the Unit 3 and Unit 2 floodwalls, if required by the USACE, and removal of trees at the stormwater pump station could reduce the number of nesting trees available to white-tailed kite. However, there are similar trees adjacent to the project area on private property available

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to kites that would not be removed. The alteration and creation of riparian habitat would not result in a drop in any population of terrestrial special-status species. Because the project would result in a net increase in riparian habitat and there are numerous trees adjacent to the removed trees that would continue to provide habitat for white-tailed kite, the indirect impact on special-status terrestrial species from Unit 4, Frederick Allen Park, floodwall, and stormwater pump station implementation is less than significant.

The Unit 2 lower College of Marin concrete removal would create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats by removing or lowering approximately 625 lineal feet of concrete flood channel wall. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The new tidal and wetland habitat created by this phase of the project would improve habitat conditions for special-status bird species including Ridgway's rail, saltmarsh common yellowthroat, and San Pablo song sparrow as well as for salt marsh harvest mouse. There would be no adverse impact on special-status terrestrial species. The lower College of Marin concrete channel removal will result in a long-term benefit to special-status terrestrial species.

Operation and Maintenance

Once constructed, the project would require ongoing operations and maintenance activities. Proposed operation and maintenance activities are described in Section 2.7. Vegetation management activities would be implemented to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Unit 4 would likely not require maintenance due to the channel being in its natural state. However, vegetation management within the restored channel adjacent to Frederick Allen Park would be necessary to maintain channel flow capacity and ensure proper establishment of landscaping. Sediment management activities may be periodically required to maintain the constructed fish pools and flood capacity within the Frederick Allen Park channel and floodplain. Sediment management activities could include erosion control and repairs after storm events, particularly in the years immediately following construction while vegetation is establishing.

Plants

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, operation and maintenance activities would have no impact on special-status plant species. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling special-status plant species that may become established after project implementation. Without measures to educate the public, any newly established special-status plants could be impacted and/or the habitat degraded. Several project elements will minimize this potential impact

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including (1) the short wall and split-rail fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. Because of the implementation of the above elements to reduce trampling of riparian vegetation, the impact on special-status plants would be less than significant.

Aquatic Species

Of the four types of maintenance activities, only vegetation management and sediment/debris removal have the potential to affect special-status aquatic species. The floodplain planting plan for Frederick Allen Park will utilize tree species with widely spaced single trunks and shrubs that would bend over during high flows. This would minimize sediment deposition during high flows and the need for maintenance adjacent to Frederick Allen Park. There is the possibility that sediment could deposit in the new fish migration pools; however, sediment removal from fish pools is currently part of the maintenance procedures for the creek within this area, and the removal of sediment by hand would not create new impacts on aquatic species or their habitat. Vegetation management would occur during low-flow periods when treatment areas are not within the wetted perimeter of the creek. If necessary, any sediment management would occur during summer low-flow periods and would occur outside of areas that could be occupied by fish. Therefore, impacts from operation and maintenance of the project would be less than significant.

As stated above, the increase in public access to the restored Frederick Allen Park floodplain could result in trampling of newly planted vegetation, which could retard the development of streambank riparian and aquatic habitat. The project elements (short fence, educational signage, and trash receptacles) would help reduce impactive public access. In addition, CDFW regulations prohibit fishing in Corte Madera Creek. Therefore, this impact would be less than significant.

Improved public access also provides an opportunity for local schools to develop field-based science curriculum that includes investigation into the species and physical and biological processes of Corte Madera Creek.

Terrestrial Species

The stormwater pump station is the only operable project element that would be installed as part of the project. The stormwater pump station would only operate during storm events, and the only noise-producing element of the stormwater pump station is the back-up generator, which would only operate during emergencies and during annual testing. Operation and maintenance of the stormwater pump station would have no impact on special-status terrestrial species.

Maintenance activities, including pump station maintenance and floodwall inspection and maintenance, will be similar to those maintenance activities currently conducted by the District

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in the project area and would not affect special-status terrestrial species. The project will create higher value riparian habitat within Frederick Allen Park that would be suitable for special-status birds. The new habitat would have a beneficial impact on special-status terrestrial species.

Maintenance of the habitat and new recreational access to the channel and riparian habitat could impact nesting birds if they were to occur in areas of vegetation management or human access. The project includes installation of a split-rail fence to restrict access to new habitats and signs educating the public to stay out of the riparian vegetation. The vegetation management and erosion control activities conducted within Frederick Allen Park would be similar to activities conducted by the District in similar habitats throughout the watershed and would follow standard operating protocols and compliance with CDFW maintenance permits to avoid impacts on special-status species. The impact on special-status species would be less than significant.

Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in increased human-wildlife interactions in the creek. However, there would be educational signs that would be installed to educate the public about the importance of riparian areas and need to keep out of restored habitats. In addition, trash receptacles would be placed in Frederick Allen Park to reduce the amount of refuse that could enter the restored habitats and attract corvids (e.g., jays, crows, ravens), which could prey on nesting birds. Therefore, the impact on special-status terrestrial species would be less than significant.

Mitigation: Implement Mitigation Measures 3.3-1a through 3.3-1g.

Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities. Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required.

Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the

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project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided.

If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete.

Mitigation Measure 3.3-1b: Fish Capture and Relocation. If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans for the project, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species.

1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins.
2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures.
3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish

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impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water.

4. The intakes of the cofferdam bypass pipes will be screened in accordance with the NMFS and CDFW fish screen criteria. This will prevent entrainment of fish species in the bypass facilities
5. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.
6. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000).
7. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.
8. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.
9. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.
10. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.

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11. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
12. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection.

All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.

The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference.

The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.

Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.

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Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:

- Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free.
- Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD).
- All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following:
 - As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts.
 - Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas.
 - Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews.
 - Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species.
 - When possible, the District shall conduct work on SOD-infested and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas.
 - If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree

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removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread.

- All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of soil and leaf litter shall be restricted under and around infected trees as spores may be found there.
- Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.

Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux.

Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse. Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer.

All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified.

To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities.

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The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be placed on the inside of the work area. The fencing will be immediately removed upon project completion.

Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area.

To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day.

Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.

Significance after Mitigation: Implementation of Mitigation Measures 3.3-1, 3.3-1b, 3.3-1c, 3.3-1d, 3.3-1e, 3.3-1f, and 3.3-1g would avoid and minimize both direct and indirect significant project impacts on special-status plants, aquatic species, and terrestrial wildlife as described in detail in the impact analysis above. The impact to special-status species would be less than significant with mitigation.

Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Significance Determination
	Construction: Less than Significant with Mitigation
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

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Approximately 0.55 acre of riparian habitat are present within the project in Unit 4 upstream of the existing Denil fish ladder. To avoid and minimize impacts on riparian habitat, the geographic extent of adverse effects on vegetation related to project construction is limited to the construction footprint and the immediate vicinity of the project. Construction activities including vegetation removal, removal of 21 trees, grading, and installation of streambed stabilization measures will temporarily impact 0.54 acre of riparian habitat and permanently impact 0.01 acre of riparian habitat. Areas of temporary impacts will be revegetated with native riparian species through the installation of native plantings. The impact on riparian habitat would be significant if the riparian planting was not successful, causing a net reduction in riparian habitat. The District would implement **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan** to avoid significant impacts on riparian habitat. Mitigation Measure 3.3-2a requires a Habitat Restoration and Monitoring Plan to ensure successful establishment of the proposed habitat restoration in the project area. Impacts would be less than significant with mitigation.

In addition, sensitive natural communities may be present in the riparian areas where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**, **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**, and **Mitigation Measure 3.3-2b: Tree Mitigation**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or minimized disturbance; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore native riparian habitat; and Mitigation Measure 3.3-2b requires mitigation for removal of any native trees. Impacts would be less than significant with mitigation.

Unit 3 Frederick Allen Park

Approximately 1.48 acres of urban/developed habitat are present within Unit 3. The vegetation within Frederick Allen Park consists of ornamental plantings that are maintained as part of the urban park setting, which are separated from the creek by a 10-foot-tall concrete floodwall; however, CDFW considers the trees within the park to be part of the riparian zone because of the proximity of the trees to Corte Madera Creek. Construction activities including vegetation removal, removal of trees (i.e., 113 trees if the USACE does not require a 15-foot setback from new floodwalls or 144 trees if the USACE requires a 15-foot setback from new floodwalls), fence installation, and excavation and grading will have 0.78 acre of temporary impacts to the park's ornamental plantings and no permanent impacts. The impacted vegetation is currently separated from the creek by a 10-foot-tall concrete wall and does not contribute to habitat in the creek. Areas of temporary impacts will be revegetated with fast-growing willows, alders, and other riparian vegetation to establish riparian habitat adjacent to the creek to provide shade over the channel (see planting plan in Appendix B). The impact on riparian habitat will be

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beneficial due to the removal of the concrete channel, creation of native riparian habitat, and reconnection of the creek to its revegetated floodplain.

The construction in Frederick Allen Park will require removal of 68 oak trees. Oak trees are sensitive due to the loss of oak woodlands throughout the state. Even if the oaks are not within habitat defined as a sensitive natural community, the oak trees are considered sensitive within the context of CEQA and are protected under Public Resources Code Section 21083.4. The planting within Frederick Allen Park includes a limited number of oak trees because the created habitats will be riparian and there will be limited area for planting of upland oak trees. The loss of oak trees will be significant. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to avoid significant impacts on oak woodlands. Mitigation Measure 3.3-2b specifies the criteria for mitigation of oak trees and requires replanting of oak trees at a minimum ratio of 4:1 and up to 15:1 based on CDFW guidance. The impact on oak woodland would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

Riparian and ornamental trees occur in the areas where the new floodwall segments will be installed in Units 3 and 2 and within the construction footprint for the stormwater pump station. Construction activities for the stormwater pump station, including vegetation clearing and grubbing, will result in the removal of eight trees. If the floodwall is constructed as an extension of the existing channel wall, no trees may need to be removed. If the USACE requires a setback floodwall or a 15-foot setback from the existing wall to the nearest tree, then construction activities for floodwall construction would result in the removal of up to 157 native and non-native trees. Removal of trees, including up to 50 oak trees, would result in a significant impact on oak woodlands. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-2b: Tree Mitigation**. Mitigation Measure 3.3-2b requires compensatory mitigation of trees that need to be removed as a part of the project, including mitigation planting of oak trees at a minimum 4:1 ratio. The impact on oak woodlands would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal

Approximately 0.23 acre of coastal brackish marsh, which is a sensitive natural community, is present within the area where the concrete channel will be removed in Unit 2. Construction activities including vegetation clearing, the removal of 39 trees, fence installation, concrete removal, and grading will have 0.11 acre of temporary impact and 0.12 acre of permanent impact on coastal brackish marsh. The concrete channel removal will result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats, resulting in a net increase in riparian and tidal marsh communities. Areas of temporary impacts will be revegetated with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. However, sensitive natural communities may be present in the coastal brackish marsh where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To

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avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities** and **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or compensatory mitigation; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore impacted native vegetation. Impacts would be less than significant with mitigation. Ultimately, the proposed project is anticipated to have a beneficial impact on riparian habitat and tidal marsh communities in lower Corte Madera Creek.

Indirect Impacts

Indirect damage or degradation to riparian habitat and/or sensitive natural communities could result from construction activities introducing invasive plant species or pathogens to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. Marsh, riparian, and upland native vegetation would be planted along the creek banks to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of riparian habitat and/or sensitive natural communities, which would result in a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment and use of weed-free seed and revegetation material to avoid introduction of invasive plants. The impact would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and immature trees that have colonized and recruited within the channel, the impact of operation and maintenance activities on riparian habitat or sensitive natural communities is less than significant. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling riparian habitat or sensitive natural communities. Without measures to educate the public, the habitat could be impacted or degraded. Several project elements will minimize this potential impact, including (1) the short wall or fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. The impact on riparian habitat and sensitive natural communities would be less than significant.

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Mitigation: Implement Mitigation Measure 3.3-1a, Mitigation Measure 3.3-1e, Mitigation Measure 3.3-2a, and Mitigation Measure 3.3-2b.

Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan. The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years.

The plan shall include procedures to achieve the following performance criteria and additional requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85 percent survival and vegetative cover shall be a minimum of 80 percent after five years of monitoring. Invasive species cover shall not exceed 1 percent. Additional monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting.

Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting.

The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project.

The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met.

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Mitigation Measure 3.3-2b: Tree Mitigation. To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by resource agencies. Alternatively, the District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with the relevant resource agencies (i.e., CDFW and RWQCB) and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh).

The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of “good” overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.

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Significance after Mitigation: The mitigation measures would avoid loss of sensitive natural communities, address potential indirect impacts from introduction of invasive weeds, ensure successful restoration of riparian areas, and offset impacts on oak trees. Impacts would be less than significant with mitigation.

Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.	Significance Determination
	Construction: Less than Significant with Mitigation
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Protected wetlands occur as waters below the ordinary high-water mark in the creek in Unit 4 upstream of the existing Denil fish ladder. Construction activities including grading and installation of streambed stabilization measures, rip-rap, short cast-in-place concrete walls adjacent to existing concrete walls, engineered streambed material, and creek-toe protection as well as channel dewatering during construction will temporarily impact 0.36 acre of waters and permanently impact 0.04 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and areas of permanent impacts will be offset both by the channel deepening and widening activities (i.e., lower channel floor elevations and approximately 115 feet of widened channel to increase hydraulic conveyance capacity) and planting with wetland-appropriate species, such that the project would result in no net loss of wetlands (or waters) within Unit 4. Due to the temporary nature of project impacts lasting only a few months the project work in Unit 4 would not result in permanent loss of wetlands, the impact on protected wetlands would be less than significant.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park includes waters but no vegetated wetland areas. Construction activities including concrete wall and channel removal as well as channel dewatering during construction will temporarily impact 0.13 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and impacts from the replacement of the concrete channel with natural substrate would widen the channel along the left and right banks, create a low bar or bench inundated by floods, provide a new floodplain bench, and improve aquatic habitat in the larger Corte Madera Creek watershed over the long term such that the project would result in no permanent loss of wetlands within Unit 3

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and an overall increase in wetlands. Therefore, Unit 3 restoration is anticipated to have a beneficial impact on protected wetlands.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., channel widening, floodplain bench) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Fish Pool Construction

The concrete channel in Unit 3 includes waters but no vegetated wetland areas. Construction activities including the addition and enlargement of 11 fish-migration resting pools as well as channel dewatering during construction will temporarily impact 1.74 acres of waters and permanently impact 0.06 acre of waters. Areas of temporary impacts (i.e., dewatering) will return to waters upon completion of construction. Areas of permanent impacts associated with the fish pools are associated with concrete removal and will expand the waters by 0.01 acre such that the project would result in no permanent loss of wetlands within Unit 3 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

The Unit 3 and Unit 2 floodwalls and the stormwater pump station are located in upland areas. No wetlands occur within the construction area for the floodwalls or stormwater pump station. Therefore, there would be no impact on protected wetlands from these activities.

Unit 2 Lower Corte Madera Creek (Phase 2)

Protected wetlands occur as waters below the high-tide line in the creek in Unit 2. Construction activities including concrete channel removal, channel wall removal, and grading as well as channel dewatering during construction will temporarily impact 1.51 acres of waters and permanently impact 0.05 acre of waters, including brackish marsh. Areas of temporary impacts will return to wetlands upon the completion of construction. Areas of permanent impacts will create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location, such that the project would result in no permanent loss of wetlands within Unit 2 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., grading, channel widening, concrete removal) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification

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from the RWQCB. These agencies policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Indirect Impacts

Indirect damage or degradation to protected wetlands could result from increased turbidity or other impacts related to water quality during construction. The project would disturb more than 1 acre and is required to obtain a Construction General Permit and prepare a Stormwater Pollution Prevention Plan (SWPPP), which would identify best management practices for reducing construction water quality impacts, such as erosion and sediment control measures. Indirect impacts to wetlands could occur from introduction of invasive species to wetland habitats. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment to avoid introduction of weed seed on vehicles and planting with weed-free materials to avoid introduction of invasive weeds through vegetation plantings. Impacts from invasive-species introduction to wetlands would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, maintenance of the project would not impact protected wetlands. No routine maintenance, other than potential removal of storm flow or other man-made debris in lower College of Marin concrete channel removal area and, potentially, sediment and debris removal from fish pools is anticipated. The project would create new wetland habitats within Frederick Allen Park where the concrete channel is removed and riparian vegetation is planted and within the lower College of Marin concrete channel removal area where new salt marsh wetlands would be created. This impact would be beneficial because the project would result in a net increase in wetlands. Therefore, the impact on protected wetlands from operation and maintenance is less than significant.

Mitigation: Implement Mitigation Measure 3.3-1e.

Significance after Mitigation: Mitigation Measure 3.3-1e defines procedures to avoid introduction of invasive weeds in site construction and restoration activities. Indirect impacts on wetlands would be less than significant with mitigation.

	Significance Determination
Impact 3.3-4: The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Construction: Less than Significant with Mitigation
	Operation and Maintenance: Less than Significant with Mitigation

Construction

Aquatic Species Movement and Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

3.3 BIOLOGICAL RESOURCES

Unit 4 work includes removal of the inoperable fish ladder and grading to create a smooth transition between Unit 3 and Unit 4. This work will require installation of cofferdams and dewatering of the channel, which will temporarily inhibit migration and use of the reach for rearing by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. Fish would be able to return to the improved Unit 4 and post-fish ladder reach upon completion of construction. In addition, removal of the fish ladder will improve upstream and downstream migration and rearing habitat for salmonid species in the long term. Because the work would occur during periods when fish are not migrating, and the result would be to improve fish passage, this activity would have a less-than-significant impact on migratory fish or use of nursery sites.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park currently presents a migration challenge for upstream migrating adult salmonids and downstream juveniles. This reach does not provide nursery habitat for aquatic species. Demolition of the concrete channel adjacent to the park and reconstruction of a natural channel will require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the restoration of the natural channel will improve upstream and downstream migration for salmonid species. This activity would have a less-than-significant impact on migrating fish.

Unit 3 Fish Pool Construction

Up to 11 larger fish pools would be constructed in lower Unit 3 downstream of Frederick Allen Park. This work would require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the construction of the fish pools will improve upstream and downstream migration for salmonid species. This reach does not provide nursery habitat for aquatic species. Therefore, this activity would have a less-than-significant impact on movement of migratory fish.

Unit 3 and Unit 2 Floodwall and Stormwater Pump Station

These activities would occur outside of the channel. There would be no impact on the movement of migratory fish.

Unit 2 Lower College of Marin Concrete Channel Removal

This portion of the project would remove the existing concrete channel walls and reconstruct natural streambanks. These activities would require installing a cofferdam and dewatering the channel, which would temporarily inhibit movement of migratory fish. This reach does not provide nursery habitat for anadromous salmonids but can be seasonally used by steelhead smolts as they transition from a freshwater to saltwater physiology prior to ocean entry. The construction is scheduled to occur between September and October 15 to avoid the fish

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migration and smolt-transformation periods. The impact on fish migration and nursery habitat would be less than significant.

Wildlife Movement

The project is not expected to interfere substantially with the movement of any native resident wildlife species or with established native resident or migratory wildlife corridors. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals. The project area provides habitat for localized wildlife movement and dispersal opportunities for wildlife that use the surrounding urban landscape, which is expected to remain unchanged.

Use of Native Wildlife Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Non-listed migratory birds or raptors could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The nesting season for migratory birds and raptors is generally from February 1 to August 31. Up to 21 trees would be removed in Unit 4. Direct effects on avian nursery sites may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

Twenty-one would be removed, and any trees removed from the riparian area would be replaced. The alteration of riparian habitat would not result in a substantial decrease in available nesting habitat for migratory birds and raptors. The indirect impact on nesting migratory birds and raptors would therefore be less than significant.

Unit 3 Frederick Allen Park

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. Nevertheless, non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the project. Impacts on nesting birds would be significant if an active nest tree is removed, or nesting is abandoned because of the increased activity associated with construction. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on nursery sites for nesting migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

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The removal of 144 trees from Frederick Allen Park may further reduce nesting opportunities for migratory bird species. The removal of these trees would also increase the potential for edge-effect predation on nests in retained trees. The planting of native riparian vegetation (e.g., willows and alders) along the channel would improve overall habitat conditions for nesting birds by replacing non-native and ornamental landscaping trees with native habitats for nesting birds. The project includes a planting plan (Appendix B) that would revegetate the Frederick Allen Park area with between 88 and 125 trees, depending on whether a 15-foot setback is required from the floodwall. Up to 750 trees would also be planted off site to help offset tree removal and improve native nesting habitat in other areas (**Mitigation Measure 3.3-2b: Tree Mitigation**). Several of the trees that would be removed from Frederick Allen Park are currently unhealthy and many are nonnative and provide more limited habitat value than the trees that are proposed as part of the planting plan. The impact on nursery sites for migratory species from tree removal is less than significant with mitigation.

Unit 3 Fish Pool Construction

These activities would occur inside the concrete channel. There would be no impact on nursery sites for terrestrial birds.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

Non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the Unit 3 and Unit 2 Floodwall and Stormwater Pump Station. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

The project would remove up to 165 trees depending on the approved design for the floodwall in Units 3 and 2, the required setbacks from each floodwall, and construction of the stormwater pump station. The loss of up to 165 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal

The pile driving and concrete removal associated with this element of the project would occur after August 31 to avoid impacts on bird nesting areas. Therefore, impacts on nesting would be less than significant.

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The project would remove up to 39 trees to facilitate the concrete channel removal. The loss of up to 39 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Work within the existing wetland would result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location. This would result in an increase of potential salt marsh harvest mouse nursery habitat at this location. Therefore, this impact would be beneficial.

Operation and Maintenance

Operation and maintenance work would occur primarily within Units 3 and 2. Work within the channel would be limited to vegetation and sediment management. These activities would coincide with the low-flow period and would be very similar to the existing sediment removal and vegetation management activities conducted by the District in the project area and throughout the watershed. This impact would be less than significant.

Mitigation: Implement Mitigation Measure 3.3-1d and Mitigation Measure 3.3-2b.

Significance after Mitigation: Mitigation Measure 3.3-1d defines avoidance buffers for tree removal to avoid disruption of bird nesting activities. Mitigation Measure 3.3-2b ensures successful restoration of riparian areas and offsets impacts on oak trees. Impacts would be less than significant with mitigation.

Impact 3.3-5: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: No Impact

Construction

The objective of the project includes community flood risk reduction with the added benefits of improved fish passage, natural creek processes, and fish and riparian habitat adjacent to the Corte Madera Creek. The project is generally aligned and in conformance with the goals, policies, and codes described in the Marin Countywide Plan, Marin County Municipal Code, Town of Ross General Plan, and Town of Ross Municipal Code (See Section 3.3.4 for details regarding the specific goals, policies, and codes). The project would require removal of up to 165 trees (37 protected and 50 significant trees per the Municipal Code) within the Town of Ross. The District would be planting 89 to 125 trees in Frederick Allen Park. The project would also require removal of up to 47 protected or heritage trees within the unincorporated County. Although the District is exempt from obtaining a County permit for tree removal, the District

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would voluntarily comply with County regulations regarding tree removals and replanting. The District would be required to obtain a tree removal permit from the Town of Ross and provide replacement trees as specified in the Town of Ross Municipal Code. Because the District would obtain a tree removal permit and comply with the Town of Ross tree protection ordinance, the impact from conflict with Town of Ross ordinance for the protection of biological resources would be less than significant. Because the District is exempt from the County tree protection ordinance and would voluntarily comply with the replanting requirements in the tree protection ordinance, the project would not conflict with any policy or ordinance for the protection of biological resources. The impact from conflict with a policy or ordinance for the protection of biological resources is therefore less than significant.

While the impact from conflict with a policy or ordinance for the protection of biological resources would be less than significant, the requirements of **Mitigation Measure 3.3-2b: Tree Mitigation** include tree replacement to comply with both Town of Ross and Marin County guidelines. The mitigation provides further guarantee that the project would not conflict with the Town of Ross or Marin County tree protection ordinances.

Operation and Maintenance

The project would create higher-value habitats that are consistent with the goals and policies for biological resources in the Town of Ross and Marin County. Project operation and maintenance will not require tree removal and will not conflict with any policies or ordinances protecting biological resources. No impact would occur.

Mitigation: None required.

Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	Significance Determination
	Construction: Less Than Significant with Mitigation
	Operation and Maintenance: No Impact

Construction

Project construction could create a favorable environment for invasive non-native species that are highly competitive in disturbed environments. Unintentional introduction of non-native plant or animal species is also possible. Project activities would involve clearing, grubbing, in-water work, and excavation and grading using heavy equipment that could carry invasive non-native species or pathogens from outside sources to the project sites.

Plants

Introduction of new non-native or invasive plant species could result from construction activities. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. Riparian vegetation would be planted to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may

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adversely affect habitat by introducing nonnative plant species and/or pathogens on construction vehicles or equipment, which would be a potentially significant impact on special-status plant species or habitat. Establishment of invasive plants would be a significant impact. To avoid or minimize this significant impact, the District would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment prior to construction and use of weed-free planting materials. The impact would be less than significant with mitigation.

Aquatic species

Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod. This species might have been introduced by adhering to untreated fishing waders, kayaks, or other surfaces that were first used in infested waters and then introduced to Corte Madera Creek. Introduction of invasive aquatic species to the project area during construction and transferring species to other waterbodies after completion would be a significant impact. The District would implement **Mitigation Measure 3.3-6: Invasive Aquatic Species Control** to avoid significant impacts from invasive aquatic species. Mitigation Measure 3.3-6 defines specific requirements to ensure construction equipment and materials are free of invasive aquatic species. The impact from invasive aquatic species would be less than significant with mitigation.

Mitigation Measure 3.3-6: Invasive Aquatic Species Control. All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include:

- Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below.
- Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes.
- Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.

Operation and Maintenance

Plants

The project management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees. These activities would be beneficial to the

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control of non-native and invasive plant species. The operation and maintenance would not increase the frequency of work in Corte Madera Creek or create other factors that could introduce non-native invasive species to terrestrial environments. No impact would occur from introduction of invasive species.

Aquatic species

As stated above, Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod and have the potential to infest other waters. Any equipment used for operations and maintenance that enters the wetted perimeter of the creek shall be decontaminated using the procedures listed in **Mitigation Measure 3.3-6: Invasive Aquatic Species Control**. Implementation of Mitigation Measure 3.3-6 would result in this impact being less than significant with mitigation. Mitigation: Mitigation Measure 3.3-6.

Mitigation: Implement Mitigation Measure 3.3-6.

Significance after Mitigation: Mitigation Measure 3.3-6 requires cleaning of construction equipment prior to entering Corte Madera Creek. This measure also requires decontamination of waders and other materials used in the creek upon completion of operations and before transfer to other areas to avoid introduction and spread of invasive aquatic species. Impacts would be less than significant with mitigation.

3.3.7 References

- A. A. Rich and Associates. (2000, November). Fishery Resources Conditions of the Corte Madera Creek Watershed, Marin County, California . Prepared for Friends of Corte Madera Creek Watershed, San Anselmo, CA.
- Atkins North America, Inc. (2011, December 22). Biological Resources Constraints memorandum Corte Madera Flood Control Project . San Diego, California.
- Barnhart, R. A. (1986). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Steelhead. Biological Report 82 (11. 60). U. S. Fish and Wildlife Service.
- Bulger, J. B., Scott, N. J., & Seymour, a. R. (2003). Terrestrial activity and conservation of adult California red-legged frogs (*Rana aurora draytonii*) in coastal forests and grasslands. *Biological Conservation* 110: 85–95.
- Busby, P. J., Wainwright, T. C., Bryant, G. J., Lierheimer, L. J., Waples, R. S., Waknitz, F. W., & Lagomarsino, a. I. (1996). Status review of west coast Steelhead from Washington, Idaho, Oregon, and California. National Oceanographic and Atmospheric Administration Technical Memorandum NMFS-NWFSC-27. National Marine Fisheries Service, Seattle, Washington. .

3.3 BIOLOGICAL RESOURCES

- Cal-IPC. (2020). *California Invasive Plant Inventory*. Retrieved from Online database by California Invasive Plant Council, Berkeley, California: <https://www.cal-ipc.org/plants/inventory/>
- Caltrans. (2016). Technical Guidance for Assessment and Mitigation of the Effects of Highway and Road Construction Noise on Birds. Guidance Manual Report Number CTHWANP-RT-15-306.04.2, Sacramento, California.
- CDFW . (2020b). Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. .
- CDFW. (2010). Stream inventory report – Corte Madera Creek.
- CDFW. (2018). *Protocols for surveying and evaluating impacts to special-status native plant populations and sensitive natural communities*. (S. C. California Natural Resources Agency, Producer) Retrieved October 2020, from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>
- CDFW. (2020a). *Rarefind* , 5. Retrieved June and August 2020, from California Natural Diversity Database: <https://www.wildlife.ca.gov/data/cnddb/maps-and-data>
- CDFW. (2020c, September). *List of California Sensitive Natural Communities. Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento, California*. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline>
- CDFW. (2020d). *California endangered plant profile for white-rayed Pentachaeta (Pentachaeta bellidiflora)*. Retrieved September 2020, from <https://wildlife.ca.gov/Conservation/Plants/Endangered/Pentachaeta-bellidiflora>
- City of San Francisco & CH2M HILL, 1985. (in Rosenfield and Baxter, 2007). Ocean outfall monitoring program: 1983-1984 annual report. Bureau of Water Pollution Control, San Francisco. *Population dynamics and distribution patterns of Longfin Smelt in the San Francisco estuary*. Transactions of the American Fisheries Society 136:1577-1592.
- CNPS. (2020a). Inventory of rare and endangered plants of California (online edition, v8-03 0.39). *Rare Plant Program*. Sacramento, California: California Native Plant Society .
- CNPS. (2020b). *Manual of California Vegetation, Online Edition*. California Native Plant Society, Sacramento, CA. Retrieved September 2020, from <http://www.cnps.org/cnps/vegetation/>
- Constantine, D. G. (1959). Ecological observations on lasiurine bats in the North Bay Area of California. *Journal of Mammalogy* 40: 13–15.
- Dunk, J. R. (1995). *White-tailed kite (Elanus leucurus)*. In A. Poole, editor. *The Birds of North America Online*. Cornell Lab of Ornithology. Retrieved from <http://bna.birds.cornell.edu/bna/species/178/articles/introduction>

3.3 BIOLOGICAL RESOURCES

- eBird. (2020). *eBird: An online database of bird distribution and abundance*. Retrieved September 2020, from <https://ebird.org/home>
- Erichsen, A. L. (1995). The white-tailed kite (*Elanus leucurus*): nesting success and seasonal habitat selection in an agricultural landscape. Master's thesis. . University of California at Davis.
- Everest, F. H. (1973). Ecology and management of summer Steelhead in the Rogue River. Fishery Research Report No. 7. Oregon State Game Commission, Corvallis. .
- Fellers, G. M., & Kleeman, a. P. (2007). California red-legged frog (*Rana draytonii*) movement and habitat use: implications for conservation. *Journal of Herpetology* 41: 271–281.
- FHWG. (2008, June 12). Agreement in principal for interim criteria for injury to fish from pile driving Activities. Memorandum dated June 12, 2008. . Retrieved from http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf
- Friends of Corte Madera Watershed. (2004, May). Fish and Wildlife in the Corte Madera Creek Watershed.
- Gardali, T., & Evens, a. J. (2008). San Francisco common yellowthroat (*Geothlypis trichas sinuosa*). 246-350. (e. W. D. Shuford and T. Gardali, Ed.) *Western Field Ornithologists*, Camarilla, California and California Department of Fish and Game, Sacramento, California.
- Gertsch, M., DeWater, D. V., & Walton, a. B. (1994). American peregrine falcon. In C. G. Thelander and M. Crabtree, editors. *Life on the edge: a guide to California's endangered natural resources: wildlife*. Biosystems Books, Santa Cruz, California.
- Hermanson, J. W., & O'Shea, a. T. (1983). *Antrozous pallidus*. *Mammalian Species* 213: 1–8.
- Holland, D. C. (1994). The western pond turtle: habitat and history. Final Report. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- Holland, R. (1986). Preliminary descriptions of the terrestrial natural communities of California. Sacramento, California: Unpublished document. California Department of Fish and Game, Natural Heritage Division.
- iNaturalist. (2020). Retrieved September 2020, from <https://www.inaturalist.org>
- Jennings, M. R., & Hayes, a. M. (1994). Amphibian and reptile species of special concern in California. Final Report. California Academy of Sciences, Department of Herpetology, San Francisco, and Portland State University, Department of Biology, Portland, Oregon for California Department of Fish and Game, Inland Fisheriers Division, Rancho Cordova.

3.3 BIOLOGICAL RESOURCES

- Leidy, R. A., & Leidy, a. G. (1984). Life stage periodicities of anadromous salmonids in the Klamath River Basin, northwestern California. U. S. Fish and Wildlife Service, Sacramento, California. .
- Leidy, R. A., Becker, G., & Harvey., a. B. (2005). Historical status of coho salmon in streams of the urbanized San Francisco estuary, California. *California Fish and Game* 91(4):219-254.
- Lewis, S. E. (1994). Night roosting ecology of pallid bats (*Antrozous pallidus*) in Oregon. *American Midland Naturalist* 132: 219–226.
- Love, M. (2007). Corte Madera Creek Flood Control Channel Fish Passage Assessment and Alternatives Analysis. Prepared for Friends of Corte Madera Creek. Mike Love & Associates and Jeff Anderson & Associates, Arcata, California.
- Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.
- Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.
- Marin County. (2020, November 16). Marin County Municipal Code. Retrieved from https://library.municode.com/ca/marin_county/codes/municipal_code
- Marin County Community Development Agency . (2007). Marin Countywide Plan Final EIR. Retrieved from http://www.smwlaw.com/files/Marin_CountyWide_Plan.pdf
- Marin County Community Development Agency. (2004, April). Marin County Watershed Management Plan Administrative Draft.
- Marshall, J. T. (1948, in Spautz & Nur, 2008). Ecologic races of Song Sparrows in the San Francisco Bay region. Part I. Habitat and abundance. *Condor* 50:193–215.
- MLA. (2019). Technical Memorandum - Potential Fish Passage Improvements in Corte Madera Creek Unit 3 by Adding New Resting Pools.
- Moyle, P. B. (2002). *Inland Fishes of California*. Revised and Expanded. Univ. Calif. Press, Berkeley and Los Angeles, CA.
- Nafis, G. (2018). *California Herps – A Guide to the Amphibians and Reptiles of California*.
- NMFS. (2000). Endangered and threatened species: threatened status for one steelhead evolutionarily significant unit (ESU) in California. *Federal Register* 65: 36,074–36,094.
- Nur, N., Zack, S., Evens, J., & Gardali, a. T. (1997). Tidal marsh birds of the San Francisco Bay region: status, distribution, and conservation of five Category 2 taxa. Draft Final Report of the Point Reyes Bird Observatory to the U.S. Geological Survey, Biological Resources Division.

3.3 BIOLOGICAL RESOURCES

- Nussbaum, R. A., Brodie, J. E., & Storm, a. R. (1983). Amphibians and reptiles of the Pacific Northwest. University Press, Moscow, Idaho.
- Oolofson Environmental. (2020). California Ridgway's Rail Surveys for the San Francisco Estuary Invasive Spartina Project 2019. Report to The State Coastal Conservancy. Retrieved from www.spartina.org/project.htm#rail
- Pierson, E. D., & Fellers, a. G. (1998). Distribution and ecology of the big-eared bat, *Corynorhinus townsendii* in California. Prepared for U.S. Geological Service, Species at Risk Program.
- Pierson, E. D., & Rainey, a. W. (2003). Inventory of bat species in Kings Canyon and Sequoia National Parks: 2002 surveys. Draft Contract Report. Prepared for National Park Service, Ash Mountain, California.
- Pierson, E. D., & Rainey, a. W. (2007). Bat Distribution in the forested region of northwestern California. Prepared for California Department of Fish and Game, Sacramento, California.
- Pierson, E. D., Rainey, W. E., & Corben, a. C. (2000). Distribution and status of red bats, *Lasiurus blossevillii* in California. Prepared for California Department of Fish and Game, Species Conservation and Recovery Program, Habitat Conservation Planning Branch, Sacramento .
- Pierson, E. D., Rainey, W. E., & Corben, a. C. (2001). Seasonal patterns of bat distribution along an altitudinal gradient in the Sierra Nevada. Prepared for California Department of Transportation, California State University at Sacramento Foundation, Yosemite Association, and Yosemite Fund.
- Pierson, E. D., Rainey, W. E., & Miller, a. R. (1996). Night roost sampling: a window on the forest bat community in northern California. 151-163. (R. M. Brigham, Ed.) Bats and Forests Symposium, 19–21 October 1995. Victoria, British Columbia, Canada. Working Paper 23/1996. Research Branch, B.C. Ministry of Forests, Victoria, British Columbia.
- Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D., Bartol, S., Carlson, T., . . . and Tavolga, W. N. (2014). W. N. Tavolga. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles. A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI.
- Porter, R. D., White, C. M., & Erwin, a. R. (1973). The peregrine falcon in Utah, emphasizing ecology and competition with the prairie falcon. Brigham Young University Science Bulletin, Biological Series, Provo, Utah.
- Reiser, D., & Bjornn, a. T. (1979). Influence of forest and rangeland management on anadromous fish habitat in the western United States and Canada. U. S. Department of Agriculture Forest Service Technical Report PNW-96.

3.3 BIOLOGICAL RESOURCES

- Rosenfield, J. A., & Baxter, a. R. (2007). Population dynamics and distribution patterns of Longfin Smelt in the San Francisco estuary. *Transactions of the American Fisheries Society* 136:1577–1592.
- Shaffer, H. B., Fellers, G. M., Voss, S. R., Oliver, J. C., & Pauly, a. G. (2004). Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. *Molecular Ecology* 13: 2667–2677.
- Shellhammer, H. S., Jackson, R., Davilla, W., Gilory, A. M., Harvey, H. T., & Simons, a. L. (1982, in LSA, 2012). Habitat preferences of salt marsh harvest mice (*Reithrodontomys raviventris*). *Public Draft Solano County Habitat Conservation Plan. Prepared for the Solano County Water Agency*. *The Wasmann Journal of Biology* 40(1-2):102-114.
- Sherwin, R., & Piaggio, a. A. (2005). *Corynorhinus townsendii* Townsend's big-eared bat. Species account developed for the Western Bat Working Group 1998 Reno Biennial Meeting. updated for the 2005 Portland Biennial Meeting. Western Bat Working Group, Rapid City, South Dakota.
- Sherwin, R., & Rambaldini, a. D. (2005). *Antrozous pallidus pallid* bat. Species account developed for the Western Bat Working Group 1998 Reno Biennial Meeting; updated for the 2005 Portland Biennial Meeting.
- Shump, K. A., & Shump, a. A. (1982). *Lasiurus borealis* . *Mammalian Species* 183: 1–6.
- Spautz, H., & Nur, a. N. (2008). Samuels song sparrow (*Melospiza melodia samuelis*). 412-418. (W. D. Gardali, Ed.) *Western Field Ornithologists*, Camarilla, California and California Department of Fish and Game, Sacramento, California.
- Stebbins, R. C. (2003). *A field guide to western reptiles and amphibians*. Third edition. Houghton Mifflin Company, Boston-New York.
- Stillwater Sciences. (2020). *Draft Preliminary Wetland Delineation for the Corte Madera Creek Flood Risk Management Project, Marin County, California*. Prepared by Stillwater Sciences, Berkeley, California for Marin County Flood Control and Water Conservation District.
- Taylor, Ross and Associates. (2006). *Corte Madera stream crossing inventory and fish passage evaluation –final report*. Prepared for Friends of Corte Madera Creek. McKinleyville, California.
- Town of Ross. (2007, June). *Town of Ross General Plan*.
- Town of Ross. (2018). *Municipal Code. Title 12 Chapter 12.24 Planting, Alteration, Removal or Maintenance of Trees*.

3.3 BIOLOGICAL RESOURCES

- Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from <https://www.townofross.org/administration/page/municipal-code>
- Town of Ross, 2009. (in USACE 2010). Corte Madera Creek Flood Control Study Baseline Report .
- USACE, 1987. (in Friends of Corte Madera Watershed, 2004, May). Fish and Wildlife in the Corte Madera Creek Watershed. .
- USDA NRCS. (2020). *Agricultural Applied Climate Information System (AgACIS) climate data and summary report*. Retrieved August 2020, from National Water and Climate Center, National Weather Service Cooperative Observer Program: <http://agacis.rcc-acis.org/>
- USFWS. (1984). Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan. U.S. Fish and Wildlife Service, Pacific Region, Portland, Oregon. 141 pp. Retrieved from http://ecos.fws.gov/docs/recovery_plan/841116.pdf
- USFWS. (2002). Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for *Holocarpha macradenia* (Santa Cruz Tarplant). Federal Register, Volume 67 Number 200.
- USFWS. (2010, February). Salt marsh harvest mouse (*Reithrodontomys raviventris*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office Sacramento, California. .
- USFWS. (2012). Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the San Francisco Bay- Delta Population of the Longfin Smelt as Endangered or Threatened. Federal Register 77: 19756–19797.
- USFWS. (2020). *Information for Planning and Consultation (IPaC): online project planning tool*. Retrieved July and August 2020, from <https://ecos.fws.gov/ipac/>
- White, C. M., Clum, N. J., Cade, T. J., & Hunt, a. W. (2002). *Peregrine falcon (Falco peregrinus)*. In A. Poole, editor. *The Birds of North America Online*. Cornell Lab of Ornithology, Ithaca, New York. Retrieved from <http://bna.birds.cornell.edu/bna/species/660/articles/introduction>
- Zeiner, D. C., Laudenslayer, W. F., Mayer, J. K., & White, a. M. (1988-1990). California's Wildlife. Volumes I-III. California Department of Fish and Game, Sacramento, California. California Statewide Habitat Relationships System.