scwd^2 REGIONAL SEAWATER DESALINATION PROJECT
BIOTIC RESOURCES SURVEY REPORT

Prepared for:

City of Santa Cruz and Soquel Creek Water District
Santa Cruz, California

Prepared by:

URS CORPORATION
San Jose, CA

May 2013

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Acronyms

BR	Biotic Resources Report
BSA	Biological Study Area
BMP	Best Management Practices
C	Candidate Species for Federal Listing as Threatened or Endangered
CAA	Clean Air Act
CCA	California Coastal Act
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
Corps	US Army Corps of Engineers
CNDDB	California Natural Diversity Data Base
CRLF	California red-legged frog
CNPS	California Native Plant Society
CSC	California species of special concern
DPS	Distinct Population Segment
EIR	Environmental Impact Report
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
F	Fahrenheit
FE	Federal Endangered
FESA	Federal Endagered Species Act
FPT	Federal Proposed Threatened
FT	Federal Threatened
FYLF	Foothill yellow-legged frog

GIS	Geographical Information System
HDD	Horizontal Directional Drilling
HCP	Habitat Conservation Plan
IWP	Integrated Water Plan
LCP	Local Coastal Program
MBTA	Migratory Bird and Treaty Act
NBSB	Natural Bridges State Beach
NCCPA	Natural Community Conservation and Community Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NOP	Notice of Preparation
RPW	Relatively Permanent Water
ROW	Right-of-way
RWQCB	Regional Water Quality Control Board
SCWD	Santa Cruz Water Department
CE	State Endangered
SWPPP	Storm Water Pollution Prevention Plan
CT	State Threatened
CP	State Fully-Protected Species
TNW	Traditional Navigable Water
UCSC	University of California, Santa Cruz
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

The City of Santa Cruz (City) and Soquel Creek Water District (District) have partnered to implement the **scwd^2** Desalination Program. This program proposes to construct and operate a seawater reverse osmosis desalination plant and related facilities to provide up to 2.5 million gallons per day (mgd) of water to reduce District pumping in the Soquel-Aptos area to allow coastal groundwater levels to recover and to help the City meet its water needs during periods of water supply shortages. The City and District propose to cooperatively operate the desalination plant to provide water to each agency during different times to meet the different objectives and needs of the two agencies. The proposed desalination project would consist of:

1. A seawater intake and conveyance system consisting of an intake structure, intake pipeline, pump station, and transfer piping;
2. A seawater desalination plant that would provide for pre-treatment processing, desalination treatment and energy recovery, post-treatment processing and distribution, brine storage and disposal, residuals handling and disposal, chemical systems, and their associated support facilities;
3. A brine disposal and conveyance system consisting of brine storage at the desalination plant, a new pipeline to the City's Wastewater Treatment Facility outfall, and outfall improvements;
4. Potable water distribution system improvements, consisting of a new connection to the City distribution system and a new intertie system between the City and District service areas, including new pipelines and pump station improvements; and,
5. Environmental design, construction, and operational features, consisting of various features of the components of the project and the project overall that would be implemented to avoid, reduce, or minimize environmental effects.

Construction of the Project will require a discretionary permit from the United States Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). This Biotic Resources Survey Report has been prepared to support the preparation of the environmental impact analysis for terrestrial biology in the Environmental Impact Report for the Project.

This Biological Resources Report is organized into seven sections. Section 2 describes the proposed project. Section 3 describes the regulatory framework and history for the project. The methods used to develop the information provided in this assessment are summarized in Section 4. The existing vegetation and habitat conditions, including waters and wetlands are described in Section 5. Regional special-status species and their potential to occur in the project area are described in Section 6. Section 7 includes literature and references cited in the report.

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Figure 1
Regional and Project Vicinity Map

2.1 DESALINATION PROGRAM

2.1.1 Seawater Intake and Conveyance System Location

The seawater intake and conveyance system, consisting of an intake structure, intake pipeline, pump station, and transfer piping, would be located between an offshore location in the Pacific Ocean and a desalination plant site.

A number of alternative intake structure and pipeline locations near the Municipal Wharf and along West Cliff Drive are being considered. Each of these locations would extend from potential pump station locations. A number of alternative locations for the seawater intake and conveyance system are being considered on or near the Municipal Wharf, along West Cliff Drive, and on sites that are on or near the alternative desalination plant sites. The transfer pipeline would run from the pump station locations through the City's rights-of-way to the desalination plant (Figure 2a).

2.1.2 Desalination Plant Facilities

The IWP Program EIR contemplated three potential areas for a desalination plant site (Figure 2a), all of which were located on the west side of the City of Santa Cruz within the SCWD's service area. The three areas were selected based on proximity to possible intake locations and brine disposal facilities at the City's Wastewater Treatment Facility, distribution system infrastructure, and power supply; adequate space requirements; and consistency with surrounding land uses.

Since the certification of the IWP Program EIR in 2005, the potential sites for the desalination plant have been further narrowed down. The Shaffer Road/Antonelli Pond Area (Area B) was eliminated from further consideration, as it is unlikely that enough land area would be available for the plant site when taking into consideration environmental constraints and regulatory requirements. The Terrace Point/Marine Science Campus Area (Area C) was eliminated from further consideration, as the UCSC Marine Science Campus Coastal Long Range Development Plan does not contemplate a desalination plant on that site.

The Industrial Park Area (Area A) continues to be considered and three alternative plant site locations within this area are evaluated in this report. The 4- to 8-acre sites are located on undeveloped private land. These sites are generally bounded by the Santa Cruz Branch Rail Line tracks on the north, Natural Bridges Drive on the west, Delaware Avenue on the south, and the realigned Arroyo Seco (Canyon) Creek on the east. The three plants sites are further described below in **Table 2-1**.

Table 2-1. Summary of Plant Site Location Alternatives

Plant Site #	Description	Approximate Acreage[1]		
		Plant Site	Additional Paving & Conveyance	Total
A-1	All or portions of 4 contiguous parcels located in the northwestern corner of Area A	3.9	0.8	4.7
A-2	All or portions of 5 contiguous parcels located in the southwestern corner of Area A; Does not include riparian area (1.0 acre).	3.4	0.7	4.1
A-3	All or portions of 3 contiguous parcels in mostly the northeastern corner Area A, but access would extend into the southwestern corner of Area A. Two subareas of the site are connected by a utility corridor.	5.9	1.5	7.4

Source: Derived from Appendix L, Desalination Plant Preliminary Design Report, October 2012.

Notes:

1. The total acreages for each of the plant sites vary due to the characteristics and orientation of each site and related access requirements. Plant Site A-3 is substantially larger than the other two plant sites to account for the need to provide access and utility connections between the two subareas.

2.1.3 Water Supply Delivery System

The pipeline to convey the product water to the existing City potable water distribution system will run from the potential desalination plant sites to the existing adjacent City potable water distribution pipe located within Delaware Avenue, directly south of the potential desalination plant sites, or within Natural Bridges Drive, directly west of the potential desalination plant sites (Figure 2a). The new intertie system between the City and the District service areas, consisting of new pipelines, replacement of existing water storage tanks, and pump station improvements, will run from Ocean Street or Morrissey Boulevard in the City of Santa Cruz to the DeLaveaga water storage tanks, then through portions of unincorporated Santa Cruz County to Park Avenue in the City of Capitola (Figure 2b). Alternatively, the existing Morrissey Pump Station may be upgraded; allowing water to enter the station through existing lines, and then water would be carried to the DeLaveaga tanks in a new pipeline that would be located along either of two alternative alignments.

Construction activities associated with the placement of all the water transmission mains includes demolition of a portion of the pavement within the existing street, excavation of underlying soils, collocation of the new pipe with or adjacent to other subsurface utilities, backfilling, and repaving of the street.

2.2 PROJECT AREA AND BIOLOGICAL STUDY AREA

The project area is defined as the area where actual permanent and temporary impacts may occur from construction activities during construction of the project, including stockpile areas, construction laydown areas, pipe stringing and construction areas and staging areas. The biological study area (BSA) is a larger area where all resource surveys were conducted which encapsulates and includes the project area. In portions of the project area that occur in paved roadways or other developed areas, the project area is synonymous with the BSA. The BSA is larger than the project area in the undeveloped portions of the project area where soils and vegetation occur.

Existing Waste Water Treatment Facility (WWTF) Effluent Outfall Pipeline; new valves to be installed on diffuser ports

Brine Discharge Alternatives; includes brine discharge pipeline and brine discharge/WWTF outfall point of connection

Raw Water Transfer Pipeline Alternatives

Seawater Intake (SI) Alternatives; includes pump station (PS), intake pipeline, and intake structure

Desalination Plant Site Alternatives

- A-1
- A-2
- A-3

N

0 1,000 2,000

FEET

Base map source:
Microsoft Bing Maps

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Figure 2a
Area of Potential Effects - Desalination System Area

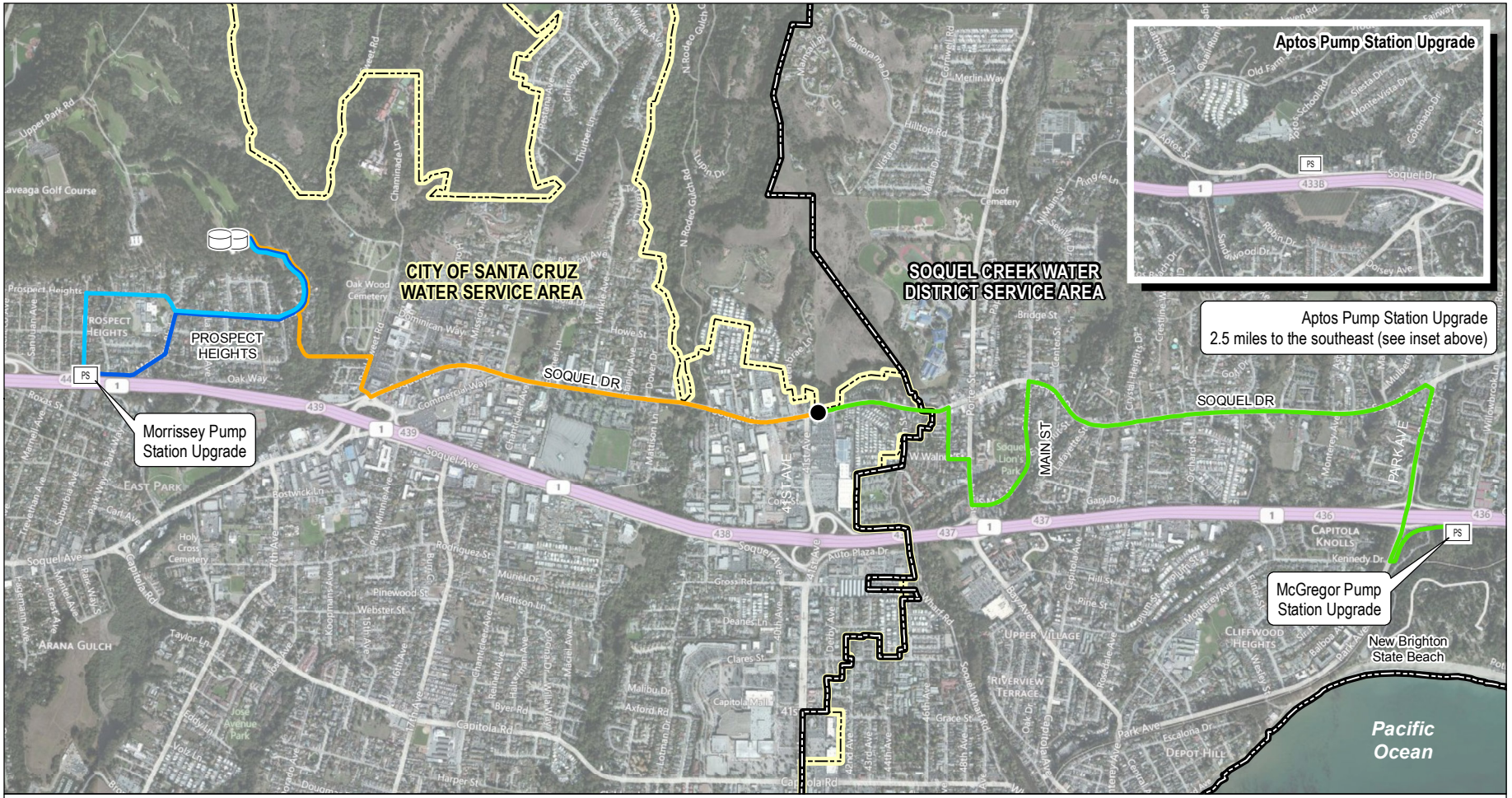

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Figure 2b
Area of Potential Effects - City-District Intertie System Area

3.1 REGULATORY HISTORY

The Santa Cruz Water Department Integrated Water Plan (IWP) Program EIR was certified in 2005 (City 2005).

The 2005 IWP Program EIR identified three different alternative locations for the proposed Desalination Plant Site. In part, based on comments received from the United States Fish and Wildlife Service (USFWS) and California Coastal Commission (CCC), after release of the current projects Notice of Preparation (NOP) in the fall of 2010, and other constraints, two of the previously considered alternatives have been eliminated from the project. The current project environmental analysis including this report and the environmental impact report analyzes potential impacts from three water treatment plant alternatives (A-1, A-2, and A-3) that are all located in the industrial park property within the alternative Desalination Plant Site A identified in the IWP and this project's NOP. This area has been identified by the IWP analysis, and from agency comments on the NOP, as the least environmentally sensitive location for the water treatment plant.

3.2 REGULATORY SETTING

The following subsections describe the applicable regulations that are relevant to the subsequent evaluation of terrestrial biological resource impacts. The regulations are provided below relevant to special-status species, waters and wetlands, and local plans, policies, and regulations.

3.2.1 Federal Endangered Species Act

The FESA (16 USC 1531-1544) provides protection for endangered and threatened species and requires conservation of the habitat upon which those species depend. An "endangered" species is a species in danger of extinction throughout all or a significant portion of its range. A "threatened" species is one that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. Other special-status species include "proposed" and "candidate" species. Proposed species are those that have been officially proposed (in the Federal Register) for listing as threatened or endangered. Candidate species are those for which enough information is on file to propose listing as endangered or threatened. A "delisted" species is one whose population has reached its recovery goal and is no longer in jeopardy.

The FESA is administered by the USFWS and the NMFS. In general, NMFS is responsible for protection of FESA-listed marine species and anadromous fishes, while other species are under USFWS jurisdiction.

FESA Section 9 prohibits the "take" of listed species. Taking is defined by FESA [Section 3(19)] to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulations, take is defined further to include habitat modification or degradation where it actually results, or is reasonably expected to result, in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Projects that would result in "take" of any federally listed threatened or endangered species are required to obtain authorization from the USFWS or NMFS through either Section 10 (a) (incidental take permit) or Section 7 (Interagency Consultation) of FESA, depending on whether or not the federal government is involved in permitting or funding the project. The Section 10(a) process allows a person to obtain the right to engage in "incidental take" of listed species or their habitat with respect to non-federal activities. Section 7 requires a federal agency contemplating an action that may affect a listed species to undertake formal consultation with USFWS or NMFS. The two agencies must then determine whether the proposed action would jeopardize the listed species, or destroy or adversely modify designated critical habitat. If the project will involve instream work at Arana Creek at Brookwood Drive, then formal Section 7 consultation with NMFS for potential impacts to central California coast DPS steelhead would need to be conducted in order to obtain a biological opinion for the project.

3.2.2 California Endangered Species Act

Similar to FESA, the CESA (California Fish and Game Code 2050-2116), authorizes the California Fish and Game Commission to designate, protect, and regulate the taking of special-status species in the State of California. CESA defines "endangered species" as those whose continued existence in California is jeopardized. State-listed "threatened" species are those not currently threatened with extinction, but which may become endangered if their environments change or deteriorate.

Section 2080 of the California Fish and Game Code generally prohibits the taking of state-listed plants and animals. Under Section 86 of the Fish and Game Code, take is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under California Fish and Game Code Section 2081, CDFW may "authorize, by permit, the take of endangered species, threatened species, and candidate species if...the take is incidental to an otherwise lawful activity" and if certain other requirements are met.

State agencies, moreover, have additional obligations. Each state lead agency was formerly required to consult with CDFW to ensure that any action it undertakes is not likely to jeopardize the continued existence of any endangered or threatened species, or result in destruction or adverse modification of essential habitat. This requirement expired on January 1, 1999, however, because the original legislation creating it had a sunset date of the end of 1998. Even so, every

state agency remains subject to a statutory duty "to seek to conserve endangered species and threatened species." In addition, all state agencies remain subject to the command that they "should not approve projects as proposed which would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy." However, "in the event specific economic, social, or other conditions make infeasible such alternatives, individual projects may be approved if appropriate mitigation and enhancement measures are provided" (Fish and Game Code, Sections 2053 and 2054.)

In addition to listed species, the CDFW also maintains a list of "Species of Special Concern," most of which are species whose breeding populations in California may face extirpation (local extinction). To avoid the future need to list these species as endangered or threatened, the CDFW recommends consideration of these species, which do not as yet have any legal status, during analysis of the impacts of proposed projects.

3.2.3 Federal Clean Water Act, Section 404

Under Section 404 of the Clean Water Act, the USACE regulates the discharge of dredged and fill materials into "Waters of the United States." These jurisdictional waters of the U.S. include intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, and wetlands adjacent to any water of the U.S. (33 CFR § 328). In areas subject to tidal influence, Section 404 jurisdiction extends to the high-tide line. Certain waters of the U.S. are considered "special aquatic sites" because they are generally recognized as having particular ecological value. Such sites include sanctuaries and refuges, mudflats, wetlands, vegetated shallows, coral reefs, and riffle and pool complexes. Special aquatic sites are defined by the U.S. Environmental Protection Agency (EPA) and may be afforded additional consideration in the permit process for a project.

USACE also regulates navigable waters under Section 10 of the Rivers and Harbors Act as "… those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce" (33 CFR § 322.2).

Projects that impact jurisdictional wetlands and non-wetland waters of the U.S. require a permit from USACE. There are two types of permits: individual permits and nationwide permits. Nationwide permits are issued by USACE for specific types of activities that have minimal individual or cumulative adverse environmental impacts. Individual permits are required for more complex projects that exceed the impact threshold for a nationwide permit.

3.2.3.1 Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers

On January 9, 2001, the U.S. Supreme Court issued a decision in *Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers*. The case involved the filling of hydrologically isolated waters that had formed from remnant excavation ditches on a 533-acre parcel. In the decision, the Court denied USACE jurisdiction over isolated water bodies, which USACE had previously regulated using the "Migratory Bird Rule" established in 1986. The Court defined isolated waters as any body of water that is non-navigable, intrastate, and lacking any significant nexus to navigable bodies of water (Pooley 2002).

Isolated seasonal wetlands (i.e. wetlands that are not hydrologically connected with other jurisdictional wetlands or non-wetland waters of the U.S.) are generally considered non-jurisdictional.

3.2.3.2 Rapanos v. United States and Carabell v. Army Corps of Engineers

Two cases recently brought before the U.S. Supreme Court, *Rapanos v. United States* (No. 04-1034) and *Carabell v. Army Corps of Engineers* (No. 04-1384) (hereafter referred to as "Rapanos")**,** challenged USACE interpretation of waters of the U.S. (USACE 2007a). The USACE had interpreted the CWA 33 U.S.C. 1362(7) to regulate wetland areas that are separated from a tributary of a navigable water by a narrow, constructed berm, where evidence of an occasional hydrologic connection existed between the wetland and the tributary. Also, the case questioned Congress' authority under the Commerce Clause to apply the CWA to the wetlands at issue.

On June 19, 2006, the Court held 5 to 4 in favor of tightening the definition of "waters of the United States." According to the opinion, a water or wetland constitutes "navigable waters" under the CWA if it possesses a "significant nexus" to waters that are currently navigable or could feasibly be made navigable.

USACE and the EPA issued a joint memorandum on June 5, 2007, issuing new guidelines for establishing whether or not wetlands or other waters of the U.S. fall within USACE jurisdiction (USACE 2007a). As a result, the agencies assert jurisdiction over traditional navigable waters (TNW), wetlands adjacent to traditional navigable waters, non-navigable tributaries to TNWs that are relatively permanent waters (RPW), and wetlands that abut RPWs. The agencies may take jurisdiction over non-navigable tributaries that are not RPWs, wetlands that are adjacent to non-RPWs, and wetlands adjacent to but not directly abutting a relatively permanent non-navigable tributary. The agencies will generally not assert jurisdiction over swales, erosional features or ditches excavated wholly in and draining only uplands and that don't carry a relatively permanent flow of water.

3.2.4 California Coastal Act and City of Santa Cruz Local Coastal Program

Wetlands in California's Coastal Zone are regulated under the California Coastal Act (CCA) of 1976, which is administered by the CCC. For purposes of local coastal programs in which CCC retains coastal development permit jurisdiction after program certification, CCA Section 30121 defines "wetlands" as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."

In the California Code of Regulations (CCR), wetlands are defined as follows (14 CCR 13577(b)):

> . . . land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated soil at some time during each year and their location within, or adjacent to, vegetated wetland or deepwater habitats.

The CCC has developed a wetland identification and delineation approach that relies on a single parameter indicative of wetland conditions to determine the presence of a wetland. A positive wetland determination is dependent on either a predominance of hydrophytic vegetation or the presence of hydric soils. CCC staff use methodology developed by the USACE, which is described in the following sections. In addition, situations are encountered where the indicators described do not provide conclusive wetland indicator information while using the CCC criteria and methods.

Wetlands in the City of Santa Cruz coastal zone are regulated by the City's Local Coastal Program. The City of Santa Cruz's approved City-wide Creeks and Wetlands Management Plan, which is an approved part of the City's Local Coastal Program, defines wetlands as follows:

Wetlands are defined as transitional areas between upland and aquatic areas. These areas have a water table usually at or near the surface or the land is covered by shallow water periodically or permanently. The City's definition of wetlands in the City's General Plan /LCP includes estuaries, lagoons and ponds, as well as seasonal wetlands that may occur as depressions within otherwise upland areas.

The City's Creeks and Wetlands Management Plan requires that wetlands be delineated both according to the USACE methodology and the CCC methodology for those areas in the coastal

zone. The management plan also outlines setback and permit requirements for development in and adjacent to wetlands.

3.2.5 Clean Water Act, Section 401, and Porter-Cologne Act

The Regional Water Quality Control Boards (RWQCBs) protect the beneficial uses of surface water and groundwater in California under the Porter-Cologne Act, and Section 401 of the Clean Water Act, with a focus on water quality. The RWQCBs regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. A RWQCB may exercise jurisdiction over discharges into waters of the state pursuant to the Porter-Cologne Act in cases where the waters are excluded from regulation under the federal CWA. Currently, there is no formal protocol for delineating waters of the state.

A Section 401 Water Quality Certification is necessary when a project requires a 404 permit from the USACE, and under other special circumstances. This certification by the RWQCB is required before or concurrent with requesting a Section 404 permit. A Section 401 Water Quality Certification permit from the Central Coast RWQCB would be required because of the potential for impacts to RWQCB jurisdictional waters or waters of the state and because a Section 404 permit would be required.

A waste discharge identification number would also need to be obtained from the State Water Resources Control Board. The construction contractors would need to comply with all of the terms and conditions of the construction permit in relation to the Porter-Cologne Water Quality Control Act, and would need to develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for the project.

3.2.6 California Fish and Game Code Sections 1600-1616

A Lake or Streambed Alteration Agreement with the CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The CDFW regulates activities that would alter the flow, bed, channel, or bank of streams and lakes under the authority of the Lake and Streambed Alteration Agreement, Section 1600 of the Fish and Game Code. In riparian areas, CDFW jurisdictional limits are usually delimited by the tops of the stream bank or the outer edge of contiguous riparian vegetation, whichever is wider.

3.2.7 The Migratory Bird Treaty Act

Migratory birds and their occupied nests are protected by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. Section 703 Supp. I 1989). This applies to all wild birds except the house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), and some game species. The MBTA specifically prohibits the take of birds or bird nests. “Take”

is defined in 50 CFR 10.12 as means to pursue or attempt to pursue to hunt, shoot, wound, kill, trap, capture, or collect. Only "collect" applies to nests (USFWS 2003).

According to the MBTA, if a construction activity will result in the take of an active nest, a depredation permit will be required, or legal action could be invoked. However, an applicant will only receive a permit if they have demonstrated "every effort" to avoid having to take the nest (or birds). The decision to issue a permit is subjective and is evaluated on a "case by case" basis. Mitigation (such as habitat improvement in adjacent areas) for the take of the nest can be proposed but does not ensure the issuance of a permit.

In order to comply with the MBTA, all areas that may contain nests (trees, shrubs, herbaceous vegetation, burrows, etc.) must be removed outside of the nesting season prior to nesting (assumed to be February 15 through August 31). If this is not possible, a pre-construction nest survey must be conducted by a qualified biologist to determine the presence of any active nests. If an active nest is identified within the project area, it must be immediately protected until (1) a depredation permit is obtained to "take" the nest (and the birds) or (2) the young have fledged from the nest. If a depredation permit is not obtained, work can commence in adjacent areas, but an appropriate "no-occupancy" buffer zone must be established to protect the nest and its inhabitants until fledging. The size of the buffer zone is species and habitat dependent, and should be determined in coordination with the local CDFW office. Minimum buffer zones are typically 50 feet, and they may be larger for sensitive species.

3.2.8 Bald Eagle Protection Act

The federal Bald Eagle Protection Act prohibits persons within the United States (or other places subject to U.S. jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing and bald eagle or any golden eagle, alive or dead, or any part, nest or egg thereof."

3.2.9 Natural Community Conservation Planning Act

The goal of the Natural Community Conservation Planning Act (NCCPA) (Fish and Game Code § 2800 et seq.) is to provide long-term protection of species and habitats through regional, multi-species planning; the intent is that such planning will obviate the need to list species under CESA. The NCCPA is broader in its orientation and objectives than the California and Federal Endangered Species Acts, and is designed to identify and protect individual species that have already declined in number significantly. The primary objective of the NCCPA program is to conserve natural communities at the ecosystem scale, while accommodating compatible land use. The program seeks to anticipate and prevent the controversies and gridlock caused by species'

listings by focusing on the long-term stability of wildlife and plant communities, and including key interests in the process.

3.2.10 Other California Fish and Game Code Sections

In the 1960s, before CESA was enacted, the California Legislature identified species for specific protection under the California Fish and Game Code. Fully protected species are described in Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code. These *fully protected* species may not be taken or possessed at any time, and no licenses or permits may be issued for their take, except for collecting these species for necessary scientific research, and relocation of the bird species for the protection of livestock. Species designated as fully protected or protected may or may not be listed as endangered or threatened.

Bird nests are protected in California under Section 3503 of the California Fish and Game Code. Section 3503 states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by CDFW. CDFW may issue permits authorizing a take. Section 3503.5 of the California Fish and Game Code specifies that "it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

3.2.11 CEQA Guidelines Section 15380

As indicated, Section 15380 of the CEQA Guidelines defines "endangered" and "rare" animal and plant species for purposes of CEQA. Species are considered rare or endangered if it can be demonstrated that the species meets the specific criteria established in the CEQA Guidelines Section 15380(b) for a rare or endangered species. Listed species qualify per se, but some unlisted species also come within the definitions. **Section 6** describes the various categories and lists of species that qualify as special status.

3.2.12 Local Policies, Plans and Regulations

The subsections below describe local policies, plans, and regulations pertinent to biological resources for the City of Santa Cruz, Santa Cruz County, and Capitola.

City of Santa Cruz

General Plan Policies

Various City plans, policies, and regulations protect a number of biological resources, including water ways, wetlands, and heritage trees. The City's General Plan 2030, Natural Resources and Conservation Element, includes policies relating to biological resources (City, 2012c). Relevant policies include protection of creeks and wetlands; provision of setbacks; and protection of sensitive habitat areas and important vegetation communities, as further described below:

NRC 1.1	Protect the city's river and wetland areas while increasing and enhancing public access where appropriate.
NRC 1.1.1	Require setbacks and implementation of standards and guidelines for development and improvements within the city and adjacent to creeks and wetlands as set forth in the Citywide Creeks and Wetlands Management Plan.
NRC 2.1.3	Evaluate development for impacts to special-status plant and animal species.
NRC 2.1.4	Implement strategies to reduce or minimize impacts.
NRC 2.2	Protect sensitive habitat areas and important vegetation communities and wildlife habitat
NRC 2.2.1	As part of the CEQA review process for development projects, evaluate and mitigate potential impacts to sensitive habitat (including special-status species) for sites located within or adjacent to these areas.
NRC 2.2.2	Protect coastal roosts and rookeries in the course of activities that could disturb or disrupt breeding or result in loss of habitat, such as construction activities, recreational activities, or special events.
NRC 2.2.4	Minimize the impact of grading and filling on sensitive habitat areas.
NRC 2.3.1	Restrict the use of barriers that can hamper wildlife movement through corridors and buffers.
NRC 2.4	Protect, manage, and enhance tree groves and understory that provide

sensitive habitat features.

LCP Policies

Although the City's General Plan 2030 has been updated and adopted, the Local Coastal Program (LCP) embodied in the City's prior General Plan and Local Coastal Program 1990-2005 remains in force in the Coastal Zone portion of the City (City, 2003). There are various LCP policies and programs that protect a number of biological resources including water ways, wetlands, and sensitive habitats, as outlined below:

EQ 4.2 Preserve and enhance the character and quality of riparian and wetland habitats, as identified on Maps EQ-8 and EQ-11, or as identified through the planning process or as designated through the environmental review process.

EQ 4.2.2 Minimize the impact of development upon riparian and wetland areas through setback requirements of at least 100 feet from the center of a watercourse for riparian areas and 100 feet from a wetland.[3]

EQ 4.2.2.1 Require that all development within 100 feet of these areas be consistent with the applicable management plan provisions under EQ 4.2.1 (management plans) and L 3.4, if one has been established.

EQ 4.5 Continue the protection of rare, endangered, sensitive and limited species and the habitats supporting them as shown in Map EQ-9 or as identified through the planning process or as designated as part of the environmental review process. (See Map EQ-9)

EQ 4.5.3.2 Require development in the vicinity of designated Monarch sites to undergo environmental impact analysis and for development affecting sites prepare a management plan addressing preservation of the habitat that includes criteria such as:

- Prohibiting the cutting, thinning, pruning or removal of any tree or shrub (especially nectar plants used by Monarchs) except as necessary for safety of homes or persons and requiring replacement of comparable vegetation;
- Prohibiting pesticide use and keeping all water sources clean;
- Allowing construction only during the months when Monarchs are not present; and

- Keeping smoke from infiltrating Monarch roosting sites.

Creeks and Wetlands Management Plan

The City-wide Creeks and Wetlands Management Plan, a component of the City's certified LCP, recommends specific setback requirements based on biological, hydrological, and land use characteristics for various watercourse types in the City (City, 2008a). In order to determine the level of permit review required for the variety of watercourse types within the City, all watercourse reaches are categorized as an "A," "B," or "C" watercourse. These categories are based on the quality, continuity, and enhancement potential of the riparian habitat associated with the watercourse, the potential for the watercourse to support special-status species, and the ability of the habitat to be expanded, based upon existing development.

The recommended setbacks in a designated management area include a riparian corridor, a development setback area, and an additional management area that extends from the outward edge of the development area. The riparian corridor is adjacent to the watercourse and is the width of the riparian and/or immediate watercourse influence area. The development setback area is the area outward from the edge of the designated riparian corridor where development is restricted, providing a buffer between the riparian corridor and development. The management area, riparian corridor, and development setback area distances vary depending on the watercourse area and its categorization. All distances are measured from the centerline of the watercourse outward.

The Creeks and Wetlands Management Plan and Municipal Code Chapter 24.08, Part 21 establish the requirements for obtaining a Watercourse Development Permit, and specifies uses permitted in the designated management area, development setback area, and riparian corridor.

Wildlife Habitats

Section 24.14.080 of the City's Municipal Code includes provisions applied to wildlife habitat areas as identified in Maps EQ-8 and EQ-9 of the Environmental Quality Element of the Coastal Land Use Plan or as designated as part of an environmental review process. The section indicates that the precise boundaries (except for areas defined by the City-wide Creeks and Wetlands Management Plan) shall be determined on a case-by-case basis by a biologist. The section permits construction, grading or removal of vegetation within wildlife habitats where: (a) development is in conformance with the Creeks and Wetlands Plan and supporting zoning regulations; (b) existing vegetation is preserved to the maximum extent possible; (c) the integrity of the area as a habitat is not compromised; (d) landscaping is designed to provide a natural buffer and provide native food-bearing plant species to the greatest extent feasible; and

(e) protected species under the federal Endangered Species Act, the California Endangered Species Act, and the California Native Plant Protection Act are not present or jurisdictional permits from the appropriate state or federal agency have been received for their removal.

Heritage Trees

Chapter 9.56 of the City Municipal Code defines heritage trees, establishes permit requirements for the removal of a heritage tree, and sets forth mitigation requirements as adopted by resolution by the City Council. Heritage trees are defined this chapter as "any perennial plant or grove of perennial plants growing on public or private property, having a self-supporting woody main stem or trunk usually characterized by the ability to grow to considerable height and size, and the development of woody branches at some distance above the ground, and meeting criteria set forth in Section 9.56.040." The criteria indicate that the heritage designation shall apply to any tree, grove of trees, shrub or group of shrubs, growing on public or private property within the City which meet(s) the following criteria shall have the "heritage" designation:

- Any tree which has a trunk with a circumference of 44 inches (approximately 14 inches in diameter or more), measured at 54 inches above existing grade.
- Any tree, grove of trees, shrub, or group of shrubs that have historical significance.
- Any tree, grove of trees, shrub, or group of shrubs which have horticultural significance.

A heritage tree permit is required for the removal of heritage trees or shrubs in the City. Preparation and submission of a consulting arborist report is required where three or more heritage trees or three or more heritage shrubs are the subject of any proposed work to be performed. The Director of Parks and Recreation shall make findings upon which the permit shall be granted, conditionally grant the permit specifying mitigation requirements, deny the permit or allow a portion of the proposed work outlined in the permit application to be done. An approved conditional tree removal permit requires mitigation per the approved heritage tree and heritage shrub removal mitigation requirement chart adopted by City Council resolution.

Resolution NS-23,710 adopted by the City Council in April 1998, establishes the criteria for permitting removal of a heritage tree and indicates that one or more of the following findings must be made by the Director:

- The heritage tree or heritage shrub has, or is likely to have, an adverse effect upon the structural integrity of a building, utility, or public or private right of way;

- The physical condition or health of the tree or shrub, such as disease or infestation, warrants alteration or removal; or
- A construction project design cannot be altered to accommodate existing heritage trees or heritage shrubs.

City regulations require tree replacement for removal of a heritage tree to consist of replanting three 15-gallon or one 24-inch box-size specimen for each heritage tree approved for removal. Removal of a heritage tree that is consistent with the criteria, provisions, and requirements set forth in City ordinances is not considered a significant impact.

Santa Cruz County

The *1994 Santa Cruz County General Plan and Local Coastal Program* (County General Plan and LCP) includes a chapter addressing conservation and open space that contains policies for sensitive biological resources (County, 1994). Relevant policies include: the protection of sensitive habitats, such as riparian corridors, wildlife corridors, habitats for special-status species, and habitats adjacent to special-status species locations, as well as provision of a setback of 100 feet from wetlands and 10 feet from edge of riparian corridor, as detailed below. The only location that these policies could apply are at the Brookwood Drive crossing of Arana Creek, because the County's jurisdiction falls on the eastern side of this creek. Relevant policies from the Conservation and Open Space Element are as further described below:

5.2.3 Development activities, land alteration and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception is granted per the Riparian Corridor and Wetlands Protection ordinance. As a condition of riparian exception, require evidence of approval for development from the US Army Corps of Engineers, California Department of Fish and Game, and other federal or state agencies that may have regulatory authority over activities within riparian corridors and wetlands.

5.2.4 Require a buffer setback from riparian corridors in addition to the specified distances found in the definition of riparian corridor. This setback shall be identified in the Riparian Corridor and Wetland Protection ordinance and established based on stream characteristics, vegetation and slope. Allow reductions to the buffer setback only upon approval of a riparian exception. Require a 10 foot separation from the edge of the riparian corridor buffer to any structure.

5.2.5 Prohibit development within the 100 foot riparian corridor of all wetlands. Allow exceptions to this setback only where consistent with the Riparian Corridor and Wetlands Protection ordinance, and in all cases, maximize distance between proposed structures and wetlands. Require measures to prevent water quality degradation from adjacent land uses, as outlined in the Water Resources section.

5.2.7 Allow compatible uses in and adjacent to riparian corridors that do not impair or degrade the riparian plant and animal systems, or water supply values, such as non-motorized recreation and pedestrian trails, parks, interpretive facilities and fishing facilities. Allow development in these areas only in conjunction with approval of a riparian exception.

5.2.9 Require development in or adjacent to wetlands to incorporate the recommendations of a management plan which evaluates: migratory waterfowl use December 1 to April 30; compatibility of agricultural use and biotic and water quality protection; maintenance of biologic productivity and diversity; and the permanent protection of adjoining uplands.

5.2.10 Require development projects in wetland drainage basins to include drainage facilities or Best Management Practices (BMPs) which will maintain surface runoff patterns and water quality, unless a wetland management plan specifies otherwise, and minimize erosion, sedimentation, and introduction of pollutants

The County's Riparian Corridor and Wetland Protection Ordinance (County Code Chapter 16.30) codifies the policies above that pertain to wetlands and riparian habitat.

City of Capitola

Capitola has policies relating to biological resources in the *City of Capitola General Plan* (Capitola, 1989). One relevant policy is the Conservation Element goal of protecting and preserving the natural resources within the Capitola area, including riparian corridors (Policy 10, 11 and 16), and Monarch butterfly roosting habitats (Policy 18). Soquel Creek is addressed in numerous policies, and the Conservation Element policies include preserving natural vegetation, adequate creek flows for fish; and protecting water quality in this creek, other creeks, and wetlands from sedimentation, biochemical degradation, and thermal pollution. These policies are not specified in detail, because they would not apply to the proposed potable water distribution system improvements that would occur in Capitola. These components would be constructed in paved public rights-of-way, or in the already planned and approved McGregor Pump Station building.

Potential impacts of the proposed project on species that are listed, proposed or candidates for listing were evaluated using the methods described in this section.

4.1 LITERATURE REVIEW

This assessment of biological resources is based on a review of existing information relevant to the project, agency consultation, and field surveys. The following sources were reviewed to compile information regarding special-status species that may occur in the project area:

- California Natural Diversity Database (CNDDB) (CDFG 2011), species lists for *Davenport*, *Felton*, *Laurel*, *Santa Cruz* and *Soquel* 7.5 minute U.S. Geological Survey (USGS) quadrangles;
- California Native Plant Society Online Inventory of Rare and Endangered Plants of California (CNPS 2011), species lists for *Davenport*, *Felton*, *Laurel*, *Santa Cruz* and *Soquel* 7.5 minute USGS quadrangles;
- USFWS species list for Santa Cruz County obtained from Ventura Fish and Wildlife Service Office (USFWS 2010);
- City-wide Creek and Wetlands Management Plan (City of Santa Cruz Department of Planning and Community Development 2008);
- USFWS Federal Register publications regarding individual special-status species;
- CDFW and USFWS endangered species websites;
- Biotic Assessment, Lipton Tea Plant Project Site, (Albion Environmental, Inc. 2004); and
- Biotic Assessment, Property at Natural Bridges Drive and Delaware Avenue (John Gilchrist & Associates 2009).
- City of Santa Cruz Operations & Maintenance Habitat Conservation Plan (City in prep., 2012).

Relevant technical information from these documents and background queries is incorporated into this document and referenced as appropriate.

4.2 VEGETATION AND HABITAT SURVEYS

Field surveys for special-status plant and wildlife species, plant communities and terrestrial wildlife habitats in the project area occurred during the months of April, June, July, and September 2011 and February and November 2012. The entire study area was surveyed on foot

or visually inspected from a short distance. The study area was centered on the proposed project facilities and pipeline corridors.

Vegetation community descriptions are based on the vegetation classification presented in the second edition of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf and Evens 2009). The vegetation information was incorporated into a Geographical Information System (GIS) database and the information is provided in Section 5. A list of vascular plant species encountered during the field survey is included in Appendix D. Nomenclature follows the Jepson Manual (Baldwin, 2012).

4.3 FIELD SURVEYS AND PROTOCOL SURVEYS

URS conducted protocol rare plant surveys in the study area as described below in Table 4-1. These were floristic surveys that followed California Native Plant Society (CNPS) and CDFW protocols. Wildlife surveys and habitat assessments, and mapping of potentially jurisdictional waters and/or wetlands were conducted concurrently with these surveys.

Table 4-1. Rare Plant and Wildlife Survey Dates and Personnel

Date	Project Location(s)	Surveyors
April 21, 2011	Water Treatment Plant Alternatives Study Area	Casey Stewman, Joe Bandel
June 1, 2011	Water Treatment Plant Alternatives Study Area, DeLaveaga Tank Site and Pipeline Corridor	Casey Stewman, Joe Bandel
July 20, 2011	Water Treatment Plant Alternatives Study Area, DeLaveaga Tank Site and Pipeline Corridor	Casey Stewman, Joe Bandel
September 30, 2011	DeLaveaga Tank Site and Pipeline Corridor, Proposed Intake Pump Station Sites (Vegetated)	Casey Stewman
February 17, 2012	Water Treatment Plant Alternatives Study Area	Casey Stewman
November 14, 2012	Proposed Intake Station Site S-18 and Pipeline	Joe Bandel

This section first describes the general environmental setting of the project area, including climate and hydrology. The vegetation communities that occur in the project area are then described. Vegetation communities are also referred to as habitat types or vegetation types depending on the context in this document.

5.1 ENVIRONMENTAL SETTING

The project is located in the western portion of central California, in the region known as cismontane California, within the ecological subregion known as the Central California Coast Ranges. This region, in particular, is synonymous with the central coast described in the Jepson Manual (Baldwin 2012). From west to east, the project includes portions of the Santa Cruz and Soquel U.S.G.S. 7.5 minute quadrangles. The proposed desalination project and its various components would be located within the City of Santa Cruz, unincorporated Santa Cruz County, City of Capitola, and offshore in the Pacific Ocean.

The project area is within a Mediterranean climate, which is characterized by warm, dry summers and mild, wet winters. The project area is coastal and the climate is modified by marine influences. Elevations range from sea level to approximately 250 feet above mean sea level within the project area. Average annual precipitation in Santa Cruz is approximately 30 inches (World Climate 2011). Mean annual temperatures are between 44-69 degrees Fahrenheit (ºF). Within the project area, the growing season is year round.

The study area occurs primarily on coastal terraces in developed residential and commercial areas and on the paved streets and bridges of the cities of Santa Cruz and Capitola. Portions of the study area have natural or naturalized vegetation and include a coastal terrace that functions as an industrial park and a dirt road that climbs a hillside to the DeLaveaga water storage tanks.

5.2 SOILS

Soil types occurring in the unpaved and undeveloped portions of the study area are listed in **Table 5-1** along with general properties and the location where they occur in the study area. None of these soils types are listed as hydric soils in California (NRCS 1995)

Table 5-1. Soil Types, Soil Properties and Location in the Study Area

Soil Type	Map Unit Symbol	Soil Properties	Location
Bonny Doon loam, 5 to 30 percent slopes	116	A shallow, well-drained soil found primarily on south-facing side slopes of hills and mountains. It has moderate permeability and is derived from sandstone, mudstone or shale.	Small portions of water treatment plant A-2 and A-3 alternative sites and the pipeline route from intertie to the DeLaveaga Tank site.
Elkhorn sandy loam, 0 to 2 percent slopes	132	A very deep well-drained soil found on old alluvial plains and coastal terraces. Often occurs locally in intensively cultivated areas.	Small portion of water treatment plant A-2 and A-3 alternative sites. Also at the intake pump station alternative SI-16.
Elkhorn Sandy Loam, 2 to 9 percent slopes	133	The parent material consists of marine deposits. This is a well drained soil on alluvial fans, terraces.	At the intake pump station alternative SI-7.
Nisene-Aptos complex, 50 to 75 percent slopes	158	Composed from a mixture of various loams and sandy loams including Felton, Lompico, Aptos, Nisene, Maymen, Ben Lomond and Catelli. Moderately deep, sometimes coarse, loamy well-drained soils of mountain slopes.	Occurs along the pipeline route from the intertie to the DeLaveaga Tank site.
Soquel Loam, 0 to 2 percent slopes	170	Composed of moderately well drained loams found on floodplains and alluvial valleys.	At the intake pump station alternative SI-18
Soquel loam, 2 to 9 percent slopes	171	Composed of moderately well drained loams found on floodplains and alluvial valleys.	Along the intertie pipeline route between the Delaveaga Tanks and the intertie along Brookwood Drive.
Watsonville Loam, 2 to 15 percent slopes	177	Somewhat poorly drained soils from alluvium parent material that occurs on marine terraces.	Along the intertie pipeline route between the Delaveaga Tanks and the intertie along Brookwood Drive.
Watsonville loam, thick surface, 0 to 2 percent slopes	178	A very deep poorly drained soil that occurs on coastal terraces. It has low permeability. Most areas of this soil are in active cultivation.	The majority of the industrial park where the water treatment plant alternatives (A-1, A-2 and A-3) are proposed to be constructed. Also at the intake pump station alternative SI-5.
Watsonville Loam, Thick Surface, 2 to 15 percent slopes	179	Somewhat poorly drained soils from alluvium parent material that occurs on marine terraces.	At the intake pump station alternative SI-4.

5.3 HYDROLOGY

The terrestrial project area for the proposed intake pump stations, facilities and water treatment plant on the west side of Santa Cruz will not have the potential to impact any major surface drainages. The proposed intake pump station at Site 4 near Woodrow Avenue is in proximity to the small urbanized channel of Bethany Creek (Appendix E Photograph 22).

However, the intertie pipeline system to connect the Santa Cruz Water Department and Soquel Creek Water District would require crossing three larger creeks. The Ocean Street to Morrissey Pump Station transmission main on Market Street and Goss Avenue would cross Branciforte Creek, a perennial stream, on the existing Market Street Bridge. The transmission main from the DeLaveaga tanks to the intertie location would cross Arana Creek, a perennial stream, at the Brookwood Drive crossing. This transmission main would also cross Rodeo Creek, a perennial stream, on the existing Soquel Drive Bridge. The proposed transmission main connecting to the Soquel Creek Water District from the intertie location to the McGregor Drive Pump Station would cross Soquel Creek, a perennial stream, at the existing bridges at Porter Street and Main Street in the City of Soquel.

5.4 VEGETATION

Vegetation communities are assemblages of plant species defined by species composition and relative abundance, which occur together in the same area. These natural communities are based on the classification as presented in A Manual of California Vegetation (Sawyer et al. 2009). Botanical nomenclature follows The Jepson Manual (Baldwin 2012). A brief description of these communities and their location within the project area is provided below. The extent of each vegetation community potentially impacted within the project area is presented below in **Table 5-2**. **Figure 4.1, Figure 4.2** and **Figure 4.3** show plant communities, Waters of the U.S., waters of the state and other cover types for the portions of the project area where vegetation occurs. Other portions of the project area occur on paved county roads or in existing developed areas. Additionally, these figures depict potential wetlands and other waters of the U.S., collectively termed Waters of the U.S., waters of the state and potential California Coastal Commission wetlands occurring within the study area.

Ten plant communities were observed in the study area. These communities consisted of primarily non-native or landscaped vegetation including blue gum Eucalyptus forest, a landscaped Monterey cypress wood lot, Monterey pine forest, iceplant, and a ruderal form of wild oat annual grassland. Native vegetation in the study area includes coast live oak woodland, white alder riparian forest and one stand of arroyo willow riparian scrub. Other areas observed included developed areas such as landscaped, commercial, residential and industrial areas. Acreages within the study area for each vegetation type are provided in **Table 5-2.**

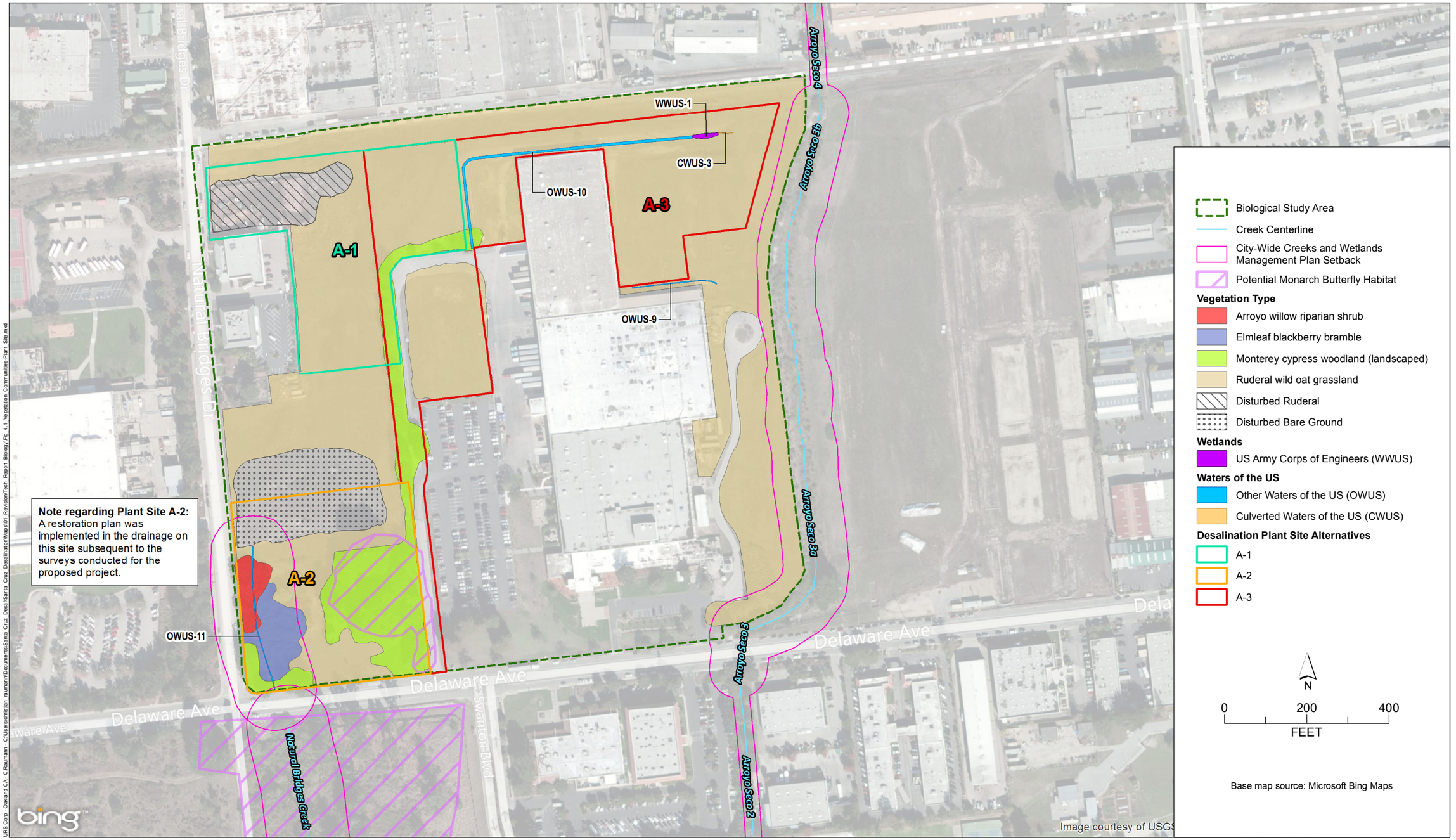
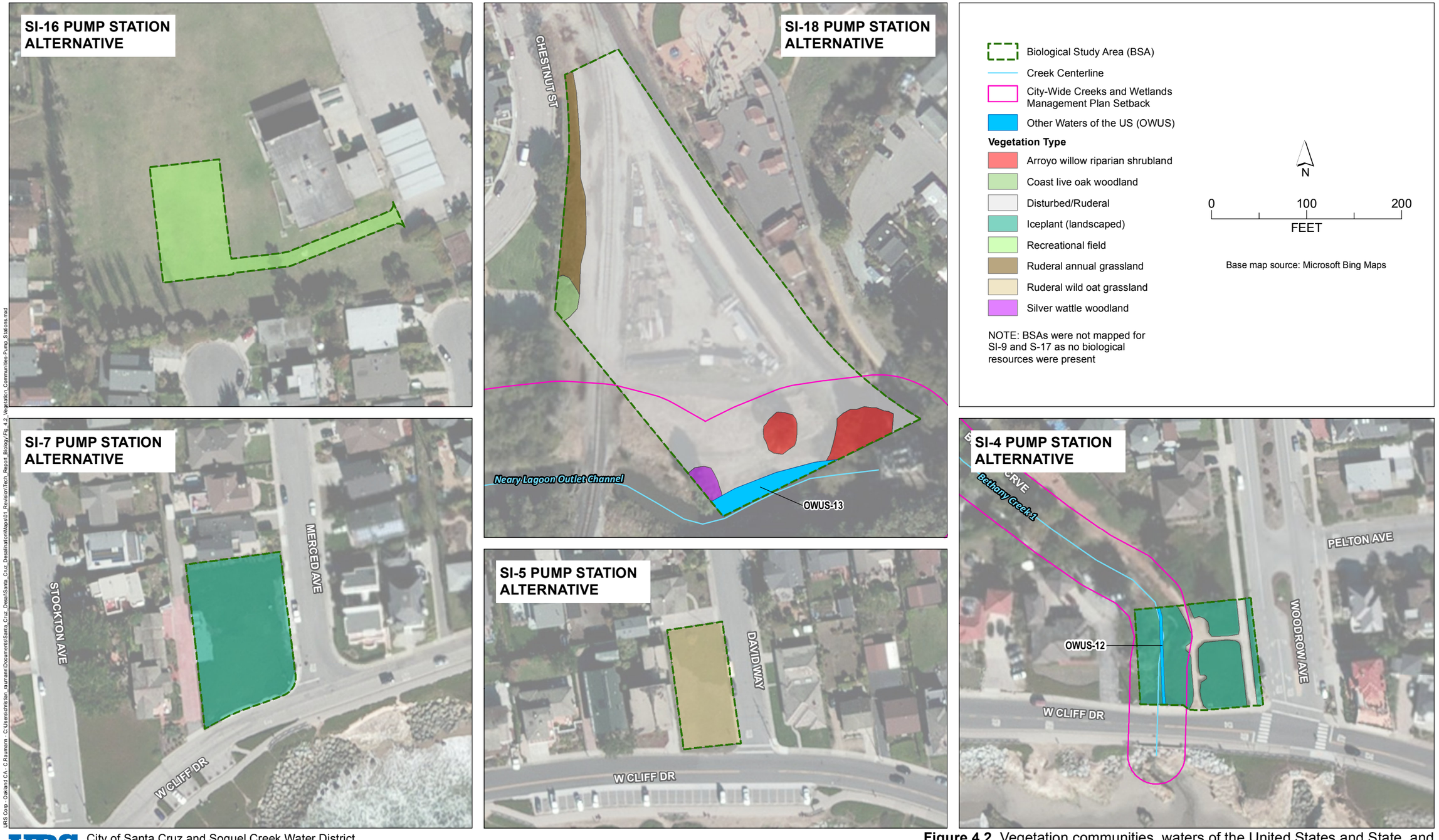


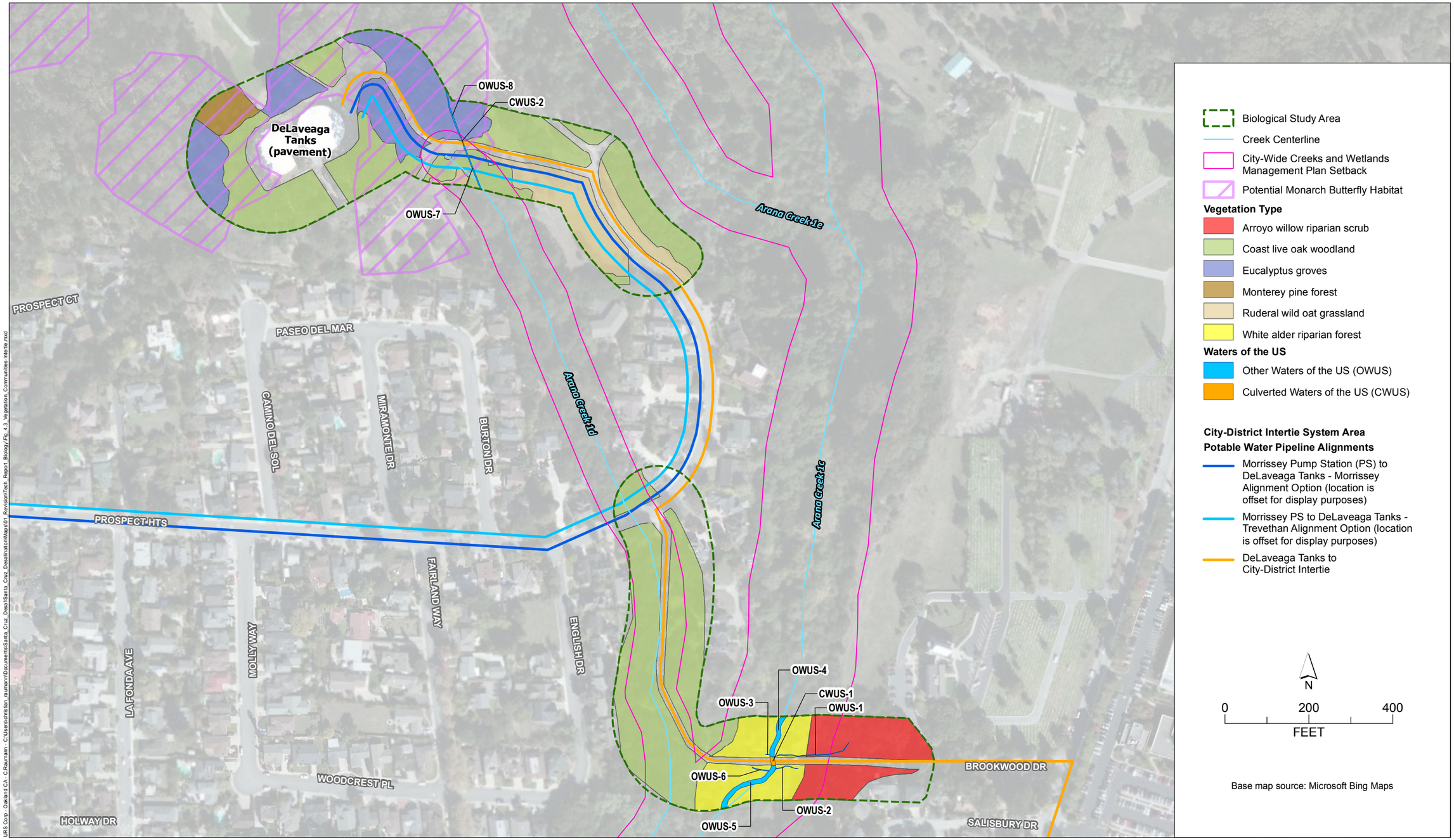
Figure 4.1. Vegetation communities, waters of the United States and State, and other cover types of the study area - Desalination Plant Site Alternatives



URS Corp - Oakland CA - C:\Raumann - C:\Users\christian_raumann\Documents\Santa_Cruz_Desal\Santa_Cruz_Desalination\Maps\01_Revision\Tech_Report_Biology\Fig_4.2_Vegetation_Communities-Pump_Stations.mxd

URS City of Santa Cruz and Soquel Creek Water District
scwd² Regional Seawater Desalination Project

Figure 4.2. Vegetation communities, waters of the United States and State, and other cover types of the study area - Intake Pump Station Site Alternatives



URS Corp - Oakland CA - C:\Users\christian_raumann\Documents\Santa_Cruz_Desal\Santa_Cruz_Desalination\Maps\01_RevisionTech_Report_Biology\Fig_4.3_Vegetation_Communities-Intertie.mxd

URS City of Santa Cruz and Soquel Creek Water District
scwd² Regional Seawater Desalination Project

Figure 4.3. Vegetation communities, waters of the United States and State, and other cover types of the study area - City-District Intertie System Area

Table 5-2. Vegetation Types of the Vegetated Portions of the Biological Study Area by Location

Vegetation Type	Approximate Acres
Desalination Plant Site Alternatives	
Arroyo willow riparian shrubland	0.23
Elmleaf blackberry bramble	0.46
Ruderal wild oat grassland	18.32
Monterey cypress woodland (landscaped)	2.44
Disturbed/ruderal	0.85
Disturbed/bare ground	1.61
Subtotal	*23.92*
City-District Intertie System Area	
Coast live oak woodland	5.64
Eucalyptus groves	1.79
Monterey pine (landscaped)	0.24
Ruderal wild oat grassland	0.99
White alder riparian forest	0.95
Arroyo willow riparian scrub	0.96
Subtotal	*10.53*
Intake Pump Station Site Alternatives(with vegetation)	
Iceplant (Landscaped)	0.62
Ruderal wild oat grassland	0.18
Ruderal annual grassland	0.09
Recreational Field (sod)	0.27
Disturbed/Ruderal	1.73
Arroyo willow riparian shrubland	0.08
Silver wattle woodland	0.02
Coast live oak woodland	0.02
Subtotal	*2.99*
TOTAL	*37.44*

Source: URS Field Survey 2011 and 2012

5.4.1 Upland

5.4.1.1 Grassland

Iceplant (Landscaped)

The alternative intake pump station locations at SI-4 and SI-7 are dominated by non-native landscaped groundcover in the form of iceplant (*Carporbrotus edulis*). Few other plants are associated with these areas, but pampas grass (*Cortaderia jubata*), an invasive species, and a single landscaped Monterey cypress also occur at the pump station location at SI-4.

Wild oat grassland (Ruderal)

A ruderal annual grassland type dominated by wild oat (*Avena barbata*) occurs in portions of the project area, including a significant portion of the potential water treatment plant alternatives industrial park site near Natural Bridges Drive and Delaware Avenue (A-1, A-2, A-3). Other associated annual non-native grasses and forbs include ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), rattlesnake grass (*Briza maxima*), rattail sixweeks grass (*Festuca myuros*), narrowleaf crimson clover (*Trifolium angustifolium*), English plantain (*Plantago lanceolata*) and small-flowered flax (*Linum bienne*). These grasslands occur primarily on previously disturbed commercial and industrial properties that lack a significant component of native plants or a native seedbank.

Disturbed/Ruderal

Previously disturbed and graded areas, dominated by non-native herbaceous species that readily establish in disturbed and compacted soils, occur in portions of the study area. The areas are dominated by non-native species, including English plantain, filaree species (*Erodium spp*.), bristly ox-tongue (*Helminthotheca echioides*), Italian thistle (*Carduus pycnocephalus*), and prostrate knotweed (*Polygonum aviculare ssp. depressum*). These areas lack a significant native plant component.

5.4.1.2 Woodland

Coast live oak woodland

Oak woodlands dominated by coast live oak (*Quercus agrifolia*) occur in limited portions of the project area including along the pipeline alignment from Brookwood Drive to the DeLaveaga tanks. Shrub layers within these woodlands are moderate to heavy and include non-native shrubs such as firethorn (*Pyracantha angustifolia*), cotoneaster (*Cotoneaster pannosa*), French broom (*Genista monspessulana*) and natives such as poison-oak (*Toxicodendron diversilobum*). Herb layers are absent to moderate and include invasive non-natives such as poison hemlock (*Conium maculatum*) and sticky snakeroot (*Ageratina adenophora*), and annual grasses such as wild oat.

Wildlife associated with these woodland habitats are diverse and include San Francisco dusky footed woodrat (*Neotomas fuscipes annectens*), western grey squirrels (*Sciurus griseus*), California quail (*Callipepla californica*) and dark-eyed juncos (*Junco hyemalis*).

Monterey cypress woodland (Landscaped)

A wood lot dominated by planted Monterey cypress (*Hesperocyparis macrocarpus*) occurs in the study area at Plant Site A-2 near Delaware Avenue and the entrance road to the Harmony Foods complex, on Plant Site A-3.

Silver wattle woodland

A silver wattle (*Acacia dealbata*) tree is located on the south end of the site at SI-18 pump station alternative.

5.4.1.3 Forest

Eucalyptus Groves

Non-native forests dominated by blue gum (*Eucalyptus globulus*) occur near the existing DeLaveaga tanks site and along the pipeline alignment from Brookwood Drive to the Delaveaga tanks. Other associated species include landscaped and escaped silver acacia (*Acacia dealbata*), Monterey pine (*Pinus radiata*) and a non-native elm (*Ulmus minor*).

Monterey Pine Forest

A non-native forest dominated by Monterey pine (*Pinus radiata*) occurs near the DeLaveaga Tanks and the northeast side of the tanks. Associated shrub species are predominantly non-native and include cotoneaster and French broom. Native shrubs such as coyote brush (*Baccharis pilularis*), poison oak, and toyon (*Heteromeles arbutifolia*) also occur in places. Herbaceous layers, when present, are composed of predominantly non-native species.

5.4.2 Riparian, Floodplain, and Wetland Communities

Arroyo willow riparian shrubland

One stand of willow riparian scrub dominated by arroyo willow occurs in the western portion of Plant Site A-2, in the unnamed ephemeral drainage near Natural Bridges Drive and Delaware Avenue. This degraded riparian area receives seasonal flow from the adjacent commercial industrial park fields to the north. Arroyo willow scrub also occurs adjacent to the pipeline alignment from the DeLaveaga water storage tanks to the City-District Intertie location, proposed along portions of Brookwood Drive, just east of Arana Creek.

Willow riparian stands in the Santa Cruz region provide habitat for numerous wildlife species including birds such as Wilson's warbler (*Wilsonia pusilla*), Anna's hummingbird (*Calypte anna*), vireos, and California thrasher (*Toxostoma redivivum*). These areas also provide potential

foraging habitat for amphibians and reptiles including western pond turtles (*Emys marmorata*), California red-legged frog *(Rana draytonii*) and garter snakes (*Thamnophis* spp.).

Seasonal Wetland

One discrete seasonal wetland dominated by umbrella sedge (*Cyperus eragrostis*) and water smartweed (*Polygonum persicaria*) occurs in the potential Plant Site A-3a in a depression just off the northeast corner of the Harmony Foods building. The wetland receives stormwater flows from a plastic floodplain culvert associated with a nearby restored creekbed and drains into a concrete lined ditch that drains around the perimeter of the Harmony Foods building and flows to a stormwater culvert that drains back to the same creek.

White alder riparian forest

A riparian forest corridor dominated by white alder occurs along the immediate banks of the main (or eastern) branch of Arana Creek at the Brookwood Drive crossing, where the pipeline alignment for the DeLaveaga water storage tanks to the City-District Intertie is located. Associated canopy trees include coast live oak and arroyo willow, while understory species include natives such as California blackberry (*Rubus ursinus*), and non-natives such as Himalayan blackberry (*Rubus armeniacus*) and Cape ivy (*Delairea odorata*).

Riparian forests provides habitat for many wintering and migrating birds, including ruby-crowned kinglets (*Regulus calendula*), white-crowned sparrows (*Zonotrichia leucophrys*), and Cooper's hawk (*Accipiter cooperii*). Other wildlife associated with these areas include San Francisco dusky footed woodrat, raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), Pacific tree frog (*Pseudoacris regilla*), California slender salamander (*Batrachoseps attenuatus*) and garter snakes.

Creeks and Drainages

Though proposed construction of water transmission mains would cross creeks and drainages, including Arana Creek and Soquel Creek, most stream crossings will not involve instream work or any streambed alterations during construction. The majority of crossings will occur on existing paved roads and bridges. However one perennial creek may be impacted by the project. Arana Creek at the Brookwood Drive crossing may require a culvert replacement and streambed alteration to complete project work. The water transmission main connecting the DeLaveaga Tanks to Intertie on Soquel Drive will cross Soquel Creek on the existing reinforced concrete bridge. The transmission main alternative from the Morrissey Pump Station to DeLaveaga Tanks would require crossing one culverted ephemeral drainage that drains to Arana Creek from the DeLaveaga Park hillside.

A seasonal wetland occurs in a stormwater drainage ditch located several hundred feet north east of the corner of the Harmony Foods building, within Plant Site A-3. This small wetland area is

associated with an ephemeral stormwater drainage ditch that flows along the perimeter of the Harmony Foods building.

Also Bethany Creek, a channelized urban stream located near Woodrow Avenue and West Cliff Drive and just west of the alternative pump station location at SI-4 flows through a culvert under West Cliff Drive to the Pacific Ocean.

5.4.3 Anthropogenic Areas

Anthropogenic areas include urban and commercial roads in the cities of Santa Cruz and Capitola, where water mains would be constructed. Urban areas, classified as developed lands, can be identified by the presence of structures, roads, parking lots, fence lines and landscaped vegetation including iceplant groundcover.

5.4.3.1 Developed Land

Developed land is a blend of urban, industrial, commercial and rural development. The majority of the proposed water main transmission pipeline corridors, pump stations and other facilities are located in developed areas and primarily on paved county roads.

5.5 WATERS OF THE U.S., WATERS OF THE STATE AND COASTAL WETLANDS

The following subsection describes and quantifies potential Waters of the U.S., waters of the state and coastal wetlands that occur in the BSA. **Table 5-3** presents the acreages of potentially jurisdictional features and correlates to feature labels provided in **Figures 4.1** through **4.3**. Names for drainage and stream features correlate to names used for the same features in the City of Santa Cruz creeks and wetlands management plan if they are included in the plan (City of Santa Cruz Planning and Community Development Department 2008). Some drainage features included in field mapping and shown on the figures for descriptive purposes were not within the biological study area and are listed in the table and described but not quantified.

Table 5-3. Potential Waters of the U.S. and Waters of State in the Biological Study Area

Category	Feature Type and Label	Length (feet)	Square Feet	Delineated Acres
Other Waters of the U.S.	Ephemeral Drainage OWUS-1 (Ephemeral Drainage to Arana Creek 1c)	192	219	0.005
	Ephemeral Drainage OWUS-2 (Roadside Ditch to Arana Creek 1c)	58	56	0.001
	Ephemeral Drainage OWUS-3 (Roadside Ditch to Arana Creek 1c)	10	10	<0.001

Table 5-3. Potential Waters of the U.S. and Waters of State in the Biological Study Area

Category	Feature Type and Label	Length (feet)	Square Feet	Delineated Acres
	Perennial Stream OWUS-4 (Arana Creek 1c draining to CWUS-1)	107	1,072	0.025
	Culverted Perennial Stream CWUS-1 (Arana Creek 1c at Brookwood Drive crossing)	21	214	0.005
	Perennial Stream OWUS-5 (Arana Creek 1c below CWUS-1)	170	1,826	0.042
	Ephemeral Drainage OWUS-6 (Roadside Ditch to Arana Creek 1c)	42	71	0.002
	Ephemeral Drainage OWUS-7 (Arana Creek 1d)	117	291	0.007
	Culverted Ephemeral Drainage CWUS-2 (Draining to Arana Creek 1d at Brookwood Drive crossing)	19	20	<0.001
	Ephemeral Drainage OWUS-8 (Draining to CWUS-2 and Arana Creek 1d)	125	313	0.007
	Ephemeral Drainage OWUS-9 (Ditch flowing to stormwater culvert to creek)	208	414	0.010
	Culverted Ephemeral Drainage CWUS-3 (drains swale to WWUS-1)	37	71	0.002
	Ephemeral Drainage OWUS-10 (concrete ditch draining WWUS-1 to stormwater culvert to Arroyo Seco Creek)	770	4,589	0.105
	Ephemeral Drainage OWUS-11 (drains to culvert uner Delaware Avenue to Natural Bridges State Park)	552	1,102	0.025
	Perennial Stream OWUS-12 (Bethany Creek)	102	306	0.009
	Outlet Channel OWUS-13 (Neary Lagoon)	132	2,002	0.046
	SUBTOTAL	**2,662**	**12,577**	**0.289**
Wetlands	Seasonal wetland WWUS-1 (draining to OWUS-17)	65	641	0.015
	SUBTOTAL	**65**	**641**	**0.015**
	TOTAL WATERS OF THE U.S.	**2,727**	**13,218**	**0.304**

Source: URS Delineation (2011)
CWUS = culverted water of the U.S.
OWUS = other water of the U.S.
WWUS = wetland water of the U.S.

5.5.1.1 Other Waters of the U.S.

Ephemeral drainage OWUS-1 (Ephemeral Drainage to Arana Creek 1c): This ephemeral drainage is a roadside ditch on the northeast side of Brookwood Drive that drains to the eastern branch of Arana Creek (Arana Creek 1c).

Ephemeral drainage OWUS-2 (Roadside Ditch to Arana Creek 1c): This ephemeral drainage is a roadside ditch on the northwest side of Brookwood Drive that drains to the eastern branch of Arana Creek (Arana Creek 1c).

Ephemeral drainage OWUS-3 (Roadside Ditch to Arana Creek 1c): This ephemeral drainage is a roadside ditch on the southeast side of Brookwood Drive that drains to the eastern branch of Arana Creek (Arana Creek 1c).

Perennial stream OWUS-4 (Arana Creek 1c): The portion of Arana Creek immediately upstream of CWUS-1.

Culverted perennial stream CWUS-1 (Arana Creek 1c): This culverted perennial stream passes under Brookwood Drive and is the eastern branch of Arana Creek (Arana Creek 1c).

Perennial stream OWUS-5 (Arana Creek 1c): The portion of Arana Creek 1c immediately downstream of CWUS-1.

Ephemeral drainage OWUS-6 (Roadside Ditch to Arana Creek 1c): This ephemeral drainage is a short section of roadside ditch on the southwest side of Brookwood Drive that drains to the eastern branch of Arana Creek (Arana Creek 1c).

Ephemeral drainage OWUS-7 (Arana Creek 1d): This ephemeral drainage drains CWUS-2 just south of Brookwood Drive near the paved access road to the DeLaveaga Tankssite and drains to the eastern branch of Arana Creek (Arana Creek 1c).

Culverted ephemeral drainage CWUS-2: This culverted ephemeral drainage passes under Brookwood Drive near the paved access road to the DeLaveaga Tanks Replacement site and drains to OWUS-7 (Arana Creek 1d).

Ephemeral drainage OWUS-8: This ephemeral drainage drains to CWUS-2 from the forested slopes north of Brookwood Drive near the paved access road to the DeLaveaga Tanks Replacement site.

Ephemeral drainage OWUS-9: (Ditch flowing to stormwater culvert to Arroyo Seco Creek) This concrete stormwater ditch receives surface flows from dirt swales near south side of Harmony Foods building and drains through a stormwater culvert to Arroyo Seco Creek.

Culverted ephemeral drainage CWUS-3: This plastic stormwater culvert drains a shallow grassy swale near the upper historic floodplain of Arroyo Seco Creek (**Appendix E Photograph 9**) and drains down into WWUS-1.

Ephemeral drainage OWUS-10: (Drains to culvert under Delaware Avenue to Natural Bridges State Park) This concrete ephemeral drainage ditch receives flows from WWUS-1 and drains around the perimeter of the Harmony Foods Building before entering a stormdrain culvert that passes under a parking lot before draining to Arroyo Seco Creek.

Ephemeral drainage OWUS-11: (Drains to culvert under Delaware Avenue to Natural Bridges State Park) This ephemeral drainage drains uplands in the industrial park area and flows through a broad swale with arroyo willow and elmleaf blackberry bramble before draining under Delaware Avenue through a metal culvert. A restoration plan was implemented in this drainage subsequent to the surveys conducted for the proposed project.

Perennial stream OWUS-12 (Bethany Creek): This channelized urban stream is located near Woodrow Ave. and West Cliff Drive and just west of the proposed intake pump station 4. It flows through a culvert under West Cliff Drive to the Pacific Ocean.

Outlet Channel OWUS-13 (Neary Lagoon): This outlet channel drains excess stormwater from Neary Lagoon and directs it to a stormwater outlet structure and culverted pipe under the Beach Area that outfalls on Cowell's Beach.

5.6 WETLANDS

A single USACE wetland feature occurs in the BSA and is described below.

5.6.1 Seasonal Wetland (WWUS-1)

One seasonal wetland that functions as a shallow seasonal pool with an earthen bottom, hydric soils and a dominance of hydrophytic vegetation, including nutsedge and water smartweed, occurs off the northeast corner of the Harmony Foods building and receives seasonal flows from CWUS-3 before flowing into OWUS-10.

5.7 COASTAL WETLANDS

No wetlands, as they are defined in the Coastal Act or the City of Santa Cruz Local Coastal Program and City-Wide Creeks and Wetlands Management Plan (City, 2008), occur within that portion of the study area located in the coastal zone. Three watercourse or riparian areas as defined in the City-Wide Creeks and Wetlands Management Plan are located in that portion of the coastal zone in the study area. These include the Neary Lagoon outlet channel (OWUS-13) and neighboring riparian habitat near the intake pump station site for SI-18; Bethany Creek

(Perennial Stream OWUS-12) near the intake pump station site for SI-4; and the ephemeral drainage and surrounding riparian area on Plant Site A-2 (Ephemeral Drainage OWUS-11) (City, 2008; Gilchrist 2011).

This document analyzes the potential impacts of the proposed project upon species listed as endangered or threatened under the federal Endangered Species Act (ESA) and those listed under the California Endangered Species Act (CESA) and proposed species, and all special-status species as defined by Section 15380 of the California Environmental Quality Act (CEQA). Definitions of special-status species are given below.

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts (ESAs) or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are in the following categories:

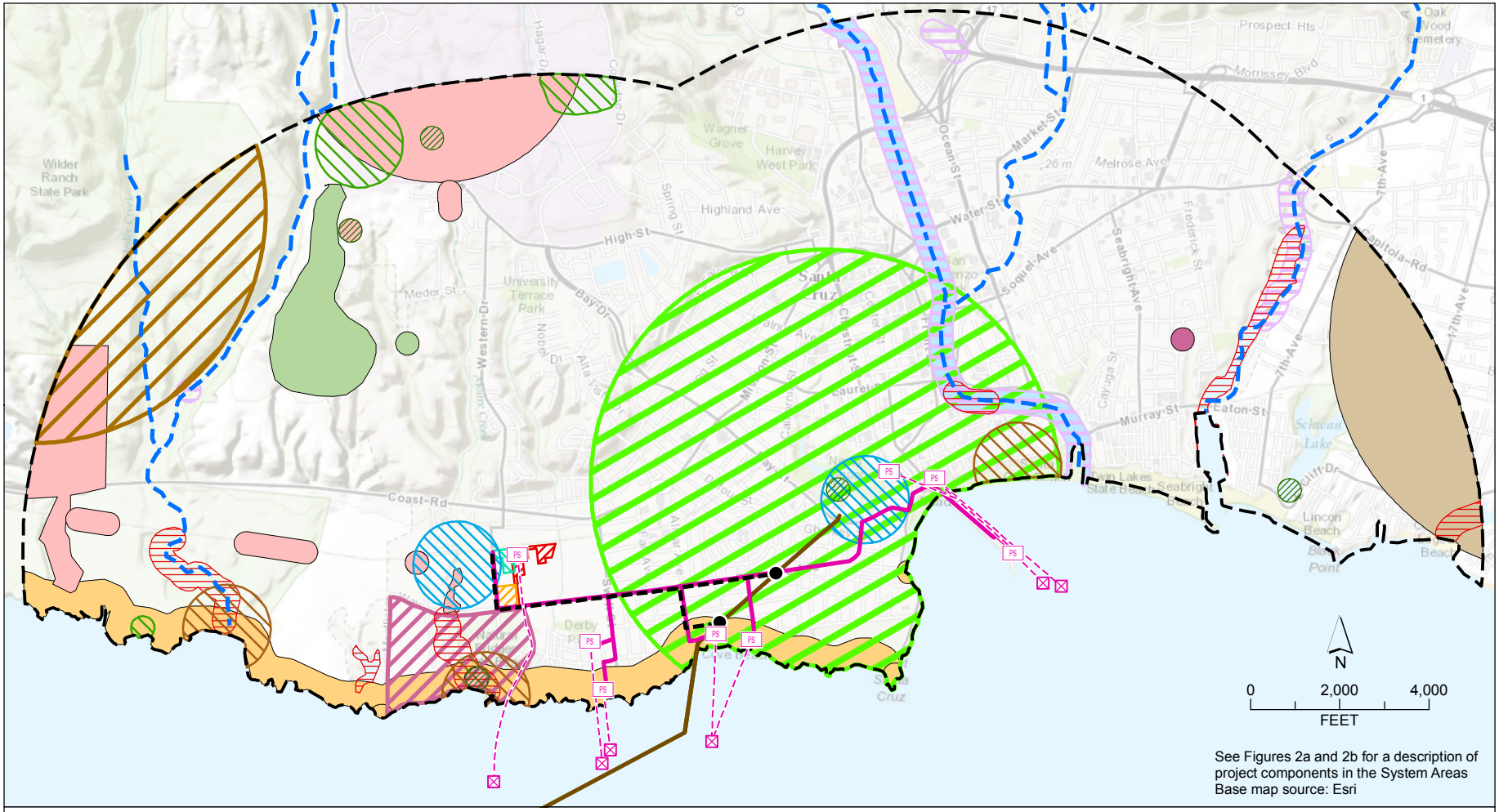
- Plants or animals listed or proposed for listing as threatened or endangered under the federal ESA [50 Code of Federal regulations [CFR 17.12 (listed plants), 17.11 (listed animals) and various notices in the Federal Register (proposed species)]];
- Plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
- Plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations (CCR 670.5));
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
- Plants that meet the definitions of rare and endangered under CEQA (State CEQA Guidelines, Section 15380); plants considered under the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (Lists 1A, 1B, and 2 in CNPS 2001);
- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information;
- Animal species of special concern to CDFW; and
- Animals fully protected in California (California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians).

A literature and database review was conducted to determine which special status species may be present in the project area, as described in Section 4.0 (Methods). Table 6-1 summarizes the special status species identified in this review. Many of these special-status species were determined not to be present based on their historic range or current distribution, and/or the

absence of appropriate habitat in the project area and study area. The table summarizes their preferred habitats, and whether, based on the activities the project proposes, a given species has the potential of being impacted. Species with a medium or higher potential to be impacted by the proposed project are in **bold type** and are described in detail below. The potential for a species to be impacted is generally defined as follows:

- None: The project area and/or immediate vicinity do not provide suitable habitat for a particular species. The project area is outside of the species known range.
- Low Potential: The project area and/or immediate vicinity provides only limited habitat for a particular species. The known range of the species may be outside of the project area.
- Medium Potential: The project area and/or immediate vicinity provide suitable habitat for a particular species, though there are no known sightings in the area.
- High Potential: The project area and/or immediate vicinity provide ideal habitat conditions for a particular species and/or the species is known to occur in the area.

The habitat requirements (i.e., foraging, breeding) of each species were developed based on the available literature and the professional experience of the URS biologists that conducted the review for this project. **Figures 3.1** and **3.2** depict CNDDB species data with a two mile buffer surrounding the terrestrial project area**. Figures 3.1a** and **3.2a** show wildlife species, while **Figures 3.1b** and **3.2b** show plant species.



Special-status wildlife species from the CNDDB

- Santa Cruz kangaroo rat
- burrowing owl
- hoary bat
- steelhead - central California coast
- tidewater goby
- western pond turtle
- western snowy plover
- tricolored blackbird
- sandy beach tiger beetle
- coho salmon - central California coast
- great blue heron
- Ohlone tiger beetle
- pallid bat
- California red-legged frog
- black swift
- Zayante band-winged grasshopper (entire area)
- monarch butterfly (entire area)
- Critical Habitat: steelhead - Central California coast
- 2-mile buffer of system area

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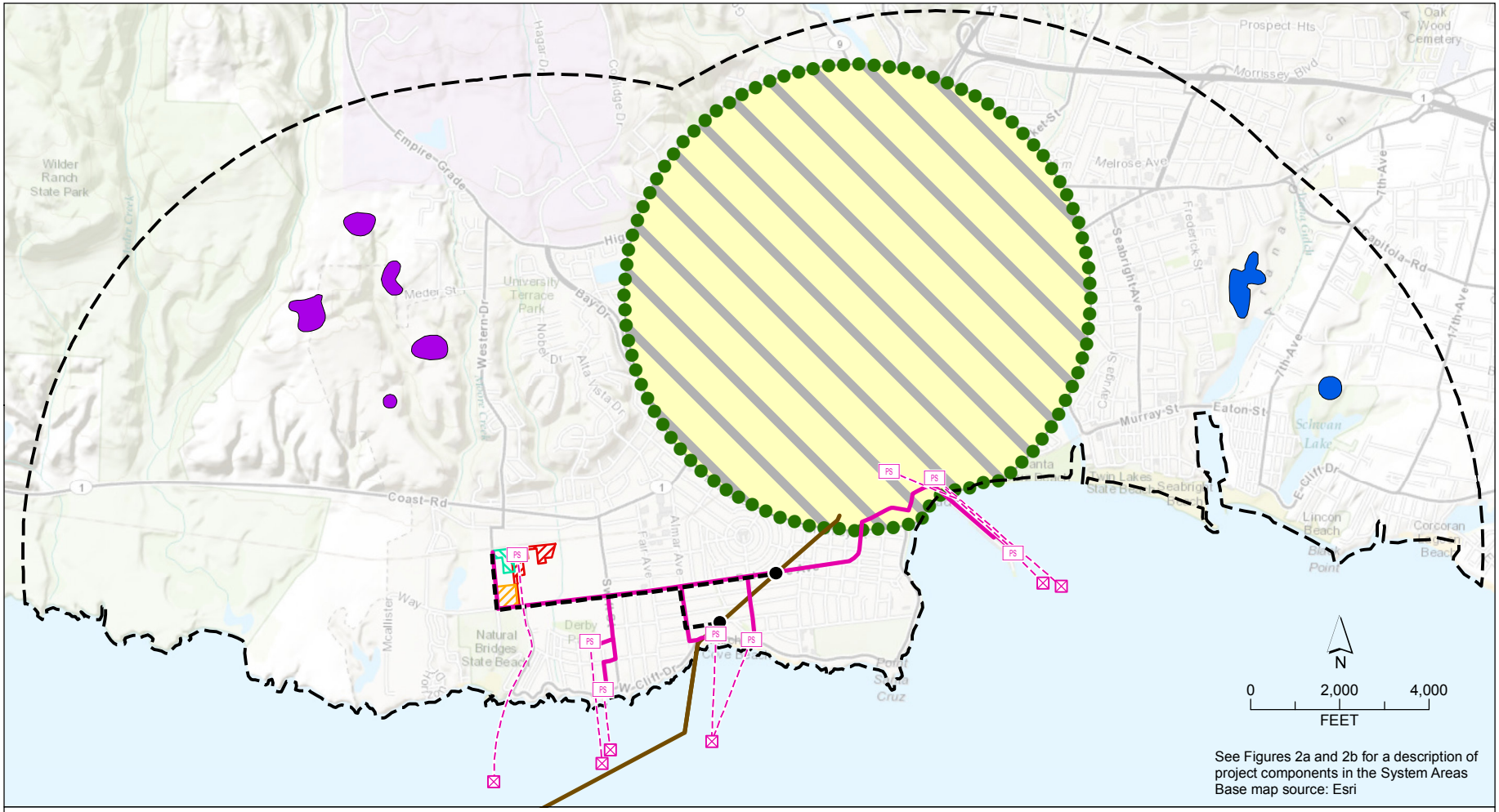
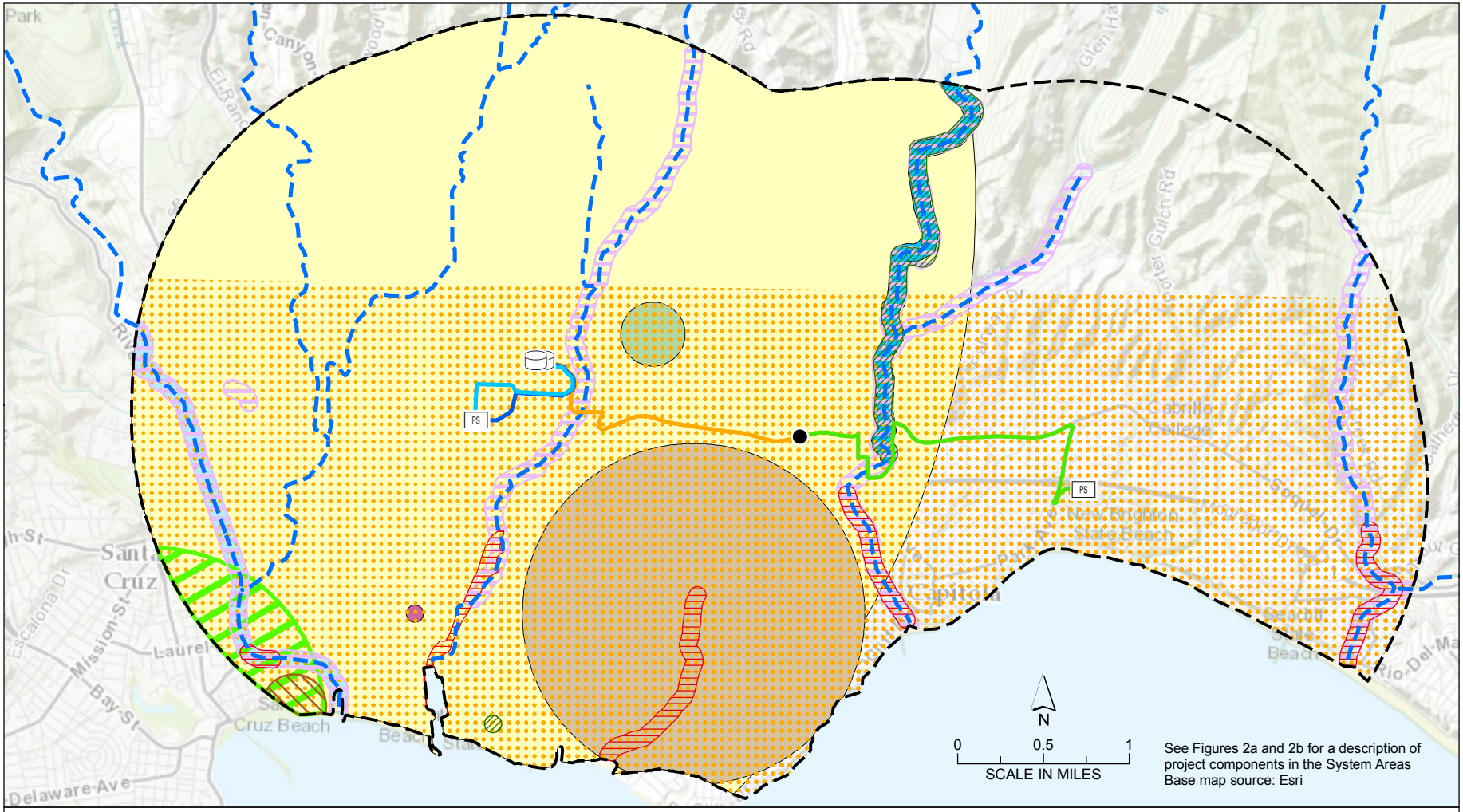
Figure 3.1a
CNDDB wildlife species - Desalination System Area



Special-status plant species from the CNDDB

- maple-leaved checkerbloom
- woodland woollythreads
- Loma Prieta hoita
- San Francisco popcorn-flower
- Santa Cruz tarplant
- white-rayed pentachaeta (entire area)
- 2-mile buffer of system area

Figure 3.1b
CNDDB plant species - Desalination System Area



City of Santa Cruz and Soquel Creek Water District
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Figure 3.2a
CNDDB wildlife species - City-District Intertie System Area

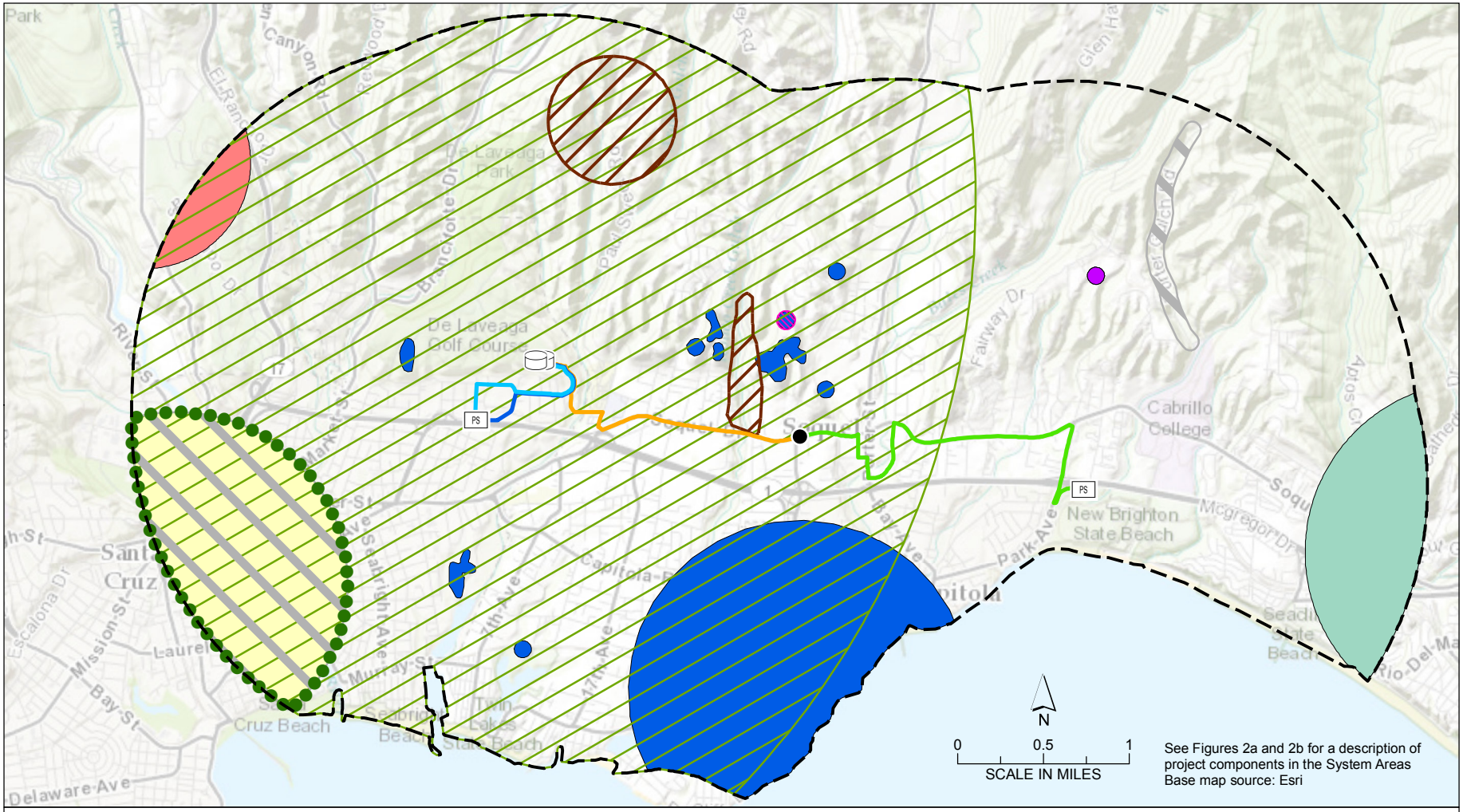

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Figure 3.2b
CNDDB plant species - City-District Intertie System Area

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
LISTED AND PROPOSED SPECIES				
Invertebrates				
Ohlone tiger beetle (*Cicindela ohlone*)	FE/--/--	Remnant native grasslands with California oatgrass and purple needlegrass. Substrate is poorly-drained clay or sandy clay over Santa Cruz mudstone parent material.	None. No suitable habitat present in the study area.	December-May
Mount Hermon June Beetle (*Polyphylla barbata*)	FE/--/--	Sandhill parkland habitat. Known only from the sandhill habitats of Santa Cruz County.	None. No suitable habitat present in the study area.	May-September
Zayante band-winged grasshopper (*Trimerotropis infantilis*)	FE/--/--	Restricted to sandhill parkland, especially ridges and hills within the Zayante sandhills portion of the Santa Cruz Mountains.	None. No suitable habitat present in the study area.	May-October
Smith's blue butterfly (*Euphilotes enoptes smithii*)	FE/--/--	Known from sandy maritime Ponderosa pine woodland of Carbonera Creek and sand dune habitats of Monterey. Host plants are two coastal buckwheat species (*Eriogonum latifolium* and *E. parvifolium*).	None. No suitable habitat present in the study area. Host plants do not occur in the project area.	June-September
Reptiles				
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	FE/--/--	Densely vegetated streams or ponds, often with cattail, bulrush, spikerush or rush. Nearby uplands for sunning and small animal burrows. Feeds on small mammals and amphibians such as California red-legged frog. Restricted to San Mateo County and northern Santa Cruz County (Waddell Creek).	None. No suitable habitat present in the study area. Closest occurrence more than fourteen miles north of study area.	Year-round

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Amphibians				
California red-legged frog *(Rana draytonii)*	**FT/CSC/--**	**Lowlands & foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to refugia habitat.**	**Medium. Species not observed during current or previous biological surveys in the project area. Limited potential foraging and dispersal habitat present in perennial drainages and riparian forests of study area. Species not known from Arana Creek. Riparian areas and surrounding forest terrestrial communities may provide limited upland refugia. Species is known from less than 0.5 mile from the western portion of the project area from historic occurrences at Natural Bridges and Antonelli Pond.**	**April-October**
Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)	FE/CE/--	Inhabits seasonal pond at Valencia Lagoon in Aptos, and elsewhere in Monterey County, for breeding and adjacent upland scrub and woodland areas during the nonbreeding season. Adult Santa Cruz long-toed salamanders leave their upland chaparral and woodland summer retreats at the onset of the rainy season in mid- to late-November or December, and begin their annual nocturnal migration to the breeding pond.	None. Limited potential upland foraging habitat present in study area. No breeding habitat. The species is highly restricted in distribution.	October--March

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Birds				
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	FT/--/--	Nests on mossy upper branches of old growth or large stature coast redwood and Douglas-fir trees. Forages on ocean.	None. No habitat occurs in the study area.	March-August
Yellow-billed cuckoo (*Coccyzus americanus*)	FC/--/--	Riparian thickets, woodlands and forests. Feeds on insects, caterpillars and seeds.	Low. Limited riparian habitat in the study area. Species is not known from the area.	Summer and fall, winters in South America
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/CSC/--	Sandy foredunes, gravel flats and beaches near ocean or water in coastal and inland California and Great Basin standing waters.	None. The project area lacks potential habitat for this species.	Breeding March to September
California least tern (*Sterna antillarum browni*)	FE/--/--	Forages by diving for fish in the ocean and estuaries. Nesting sites usually open tidal flat or beach. Winters off Pacific coast of South America.	None. No habitat occurs in the project area.	April-August
Least Bell's vireo (*Vireo bellii pusillus*)	FE/CE/--	Forages and nests in riparian thickets and forests, often along streams with willow, mulefat or cottonwood.	Low. Limited habitat in study area. Species not known from project area.	March to September
Fish				
Tidewater goby (*Eucyclogobius newberryi*)	FE/CSC/--	Flowing often estuarine waters near coast in California.	None. No potential habitat in study area.	Year-round
Coho salmon (*Oncorhynchus kisutch*)	FE/--/--	Coastal streams with good cover, cool, clear water. Federal listing refers to runs in coastal basins of Central California.	None. The species is known from the San Lorenzo River in the study area, but the River will not be affected by the project.	Year-round

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Steelhead central California coast DPS (*Oncorhynchus mykiss irideus*)	**FT/--/--**	**Coastal streams with good cover, cool, clear water.**	**High. The species is known from Arana (Gulch) Creek in the project area and the creek is also designated NOAA critical habitat for the species (CalFish Database 2011). The inter-tie connection main to Soquel Creek Water District is proposed to cross this stream depending on construction techniques may require culvert and drainage adjustments during construction. Also known from Soquel Creek and Branciforte Creek.**	**Fall-run**
Plants				
Marsh sandwort (*Arenaria paludicola*)	FE/CE/1B.1	Marshes and swamps, freshwater and brackish in sandy openings.	None. No potential habitat. Species restricted in range, not observed during current or previous surveys in project area.	May-August
Monterey spineflower (*Chorizanthe pungens* var. *pungens*)	FT/--/1B.1	Chaparral, woodland, coastal dunes, coastal scrub, grassland, often sandy sites.	Low. Species not observed during current or previous survey efforts. Poor quality potential habitat in project area.	April-June
Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*)	FE/--/1B.1	Maritime ponderosa pine sandhills	None. No potential habitat in project area.	April-July
Scotts Valley spineflower (*Chorizanthe robusta* var. *hartwegii*)	FE/--/1B.1	Sandy meadows and seeps, mudstone and Purisima outcrop grasslands.	None. Species not observed during current or previous survey efforts. Poor quality potential habitat in project area.	April-July
Robust spineflower (*Chorizanthe robusta* var. *robusta*)	FE/--/1B.1	Maritime chaparral, woodland openings or sandy coastal dunes and scrub.	Low. Species not observed during current or previous survey efforts. Limited poor quality potential habitat in project area.	April-September

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Santa Cruz cypress (*Hesperocyparis* (*Cupressus*) *abramsiana*)	FE/CE/1B.2	Sandstone and granitic outcrops in closed –cone lower montane coniferous forests.	None. Species restricted in range, not occurring in project area.	Year-round
Ben Lomond or Santa Cruz wallflower (*Erysimum teretifolium*)	FE/CE/1B.1	Maritime ponderosa pine woodland or chaparral on marine sands.	None. Species restricted in range, not occurring in project area.	March-July
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/CE/1B.1	Coastal prairie, coastal scrub, grasslands, often on sandy clay.	Low. Poor potential habitat. Species restricted in range, not observed during current or previous surveys in project area.	June-October
Tidestrom's lupine (*Lupinus tidestromii*)	FE/CE/1B.1	Coastal dunes of Monterey, Marin and Sonoma	None. Poor potential habitat. Species restricted in range, not observed during current or previous surveys in project area.	April-June
White-rayed Pentachaeta (*Pentachaeta bellidiflora*)	FE/CE/1B.1	Oak woodland and grassland, often on serpentinite.	None. Poor potential habitat. Species restricted in range, not observed during current or previous surveys in project area.	March-May
San Francisco popcorn flower (*Plagiobothrys diffusus*)	--/CE/1B.1	Coastal prairie and grasslands.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current survey effort. Species known from several populations in coastal meadows approximately 1 mile north of project area.	March-June
Scotts Valley polygonum (*Polygonum hickmanii*)	FE/CE/1B.1	Known from two occurrences in grasslands on mudstone and sandstone near Scotts Valley	None. No potential habitat. Species restricted in range, not observed during current or previous surveys in project area.	May-October
CANDIDATE AND OTHER SPECIAL-STATUS SPECIES				
Invertebrates				
Sandy beach tiger beetle (*Cicindela hirtticollis gravida*)	--/CSC/--	Sandy beaches next to large bodies of fresh or saltwater.	None. No potential habitat in the study area. Known from Natural Bridges State Beach	May-August

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Monarch butterfly (roosting habitat) (*Danaus plexippus*)	**--/--/--**	**In pring and summer, the habitat for monarch butterfly is open fields and meadows with milkweed. In winter it can be found on the coast of central and southern California, often roosting in wind-protected Eucalyptus groves or pine or cypress trees, and at high altitudes in central Mexico.**	**Medium. Species is not known to roost in project area but roosts approximately 550 feet south of project area at Natural Bridges State Beach. Several trees at Plant Site A-2 provides secondary wind break and nectar for nearby roosting site. Individuals of the species may disperse through industrial park and wood lot near Delaware Avenue and Natural Bridges Drive. While the species is not listed by the USFWS or CDFW, California law (AB 167) recognizes monarch butterfly over-wintering colonies as "special resources" in California. CDFW lists monarch butterfly winter roost sites as sensitive habitats.**	**February-November**
Reptiles				
Western Pond Turtle (*Emys marmorata*)	--/CSC/--	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg laying.	Low. Limited potential creek and riparian habitat in the study area. No large pools or ponds. Species not known from Arana Creek.	Year -round

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Amphibians				
Foothill yellow-legged frog *(Rana boylii)*	**--/CSC/--**	**Fast-moving rivers and streams in chaparral, forests, and woodlands. Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Require cobble-sized substrate for egg-laying preferably where water is calmer. Need at least 15 weeks to metamorphose.**	**Medium. Potential foraging and dispersal habitat is present in the project area in eastern branch of Arana (Gulch) Creek and associated riparian forest near Brookwood Drive. The species is not known from these areas but the species is known from two occurrences 1 to 1.5 miles northeast of the project area.**	**February-September**
Birds				
Tri-color blackbird (nesting colony) (*Agelaius tricolor*)	--/CSC/--	Nests in colonies within vicinity of fresh water/ marshy areas. Colonies prefer heavy growths of cattails and tules.	Unlikely. No nesting habitat for this species occurs in the project area. The species was not observed during current or previous surveys. The species is known from a nearby occurrence at Antonelli Pond less than 0.5 mile north of the project area. (CNDDB 2011).	Year-round
Cooper's hawk (*Accipiter cooperii*)	**--/CP/--**	**Male establishes a territory of 1-2 miles in patchy deciduous and coniferous woods. Nest sites are found on forest edges, near agricultural lands, fields, and forest clearings. They feed in open areas and woodlots away from the nest site.**	**Medium. Potential nesting and foraging habitat present in the project area in riparian forest and woodland habitats near the DeLaveaga Tank site and connection pipelines and the species is known from nearby occurrences.**	**Year-round**

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Great blue heron (rookery) (*Ardea herodias*)	--/CSC/--	Marsh, swamp, wetlands, and open fields. Commonly found on shore near shallow water.	Low. Limited foraging and nesting habitat for this species in the project area. The closest known occurrence is 0.2 miles southeast of a proposed water main. No rookery sites observed in project area during current or previous survey efforts.	Year-round
burrowing owl (*Athene cunicularia*)	--/CSC/--	Inhabits open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Often uses ground squirrel burrows for nesting.	Low. No potential nesting and limited potential foraging habitat observed in study area. Species not observed during current or previous surveys. Species known from few miles north of project area in Wilder Ranch.	Year-round
Northern harrier *(Circus cyaneus)*	**--/CSC**	**Nests in freshwater and saltwater marshes and grasslands; forages in grasslands, agricultural fields, and marshes.**	**Medium. Potential foraging habitat in project area. Species not observed or known to nest in study area.**	**Year-round**
Yellow warbler (*Dendroica petechial brewsteri*)	**--/CSC**	**Riparian vegetation particularly willows and cottonwoods in close proximity to water along streams and in wet meadows;**	**Medium. Potential suitable habitat is present in riparian areas in the study area.**	**Year-round**
White-tailed kite (*Elanus leucurus)*	**--/CP/--**	**Nests in dense oak, willow, or other tree stands near open grassland meadows, farmlands, and emergent wetlands.**	**Medium. Potential foraging habitat in project area. Species not observed or known to nest in study area.**	**Year-round**
California horned lark (*Eremophila alpestris actia*)	--/CSC/--	Open grassland habitats of the Central Valley and Coast Ranges.	Low. Marginal suitable habitat located in project area.	March-September

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Prairie falcon (*Falco mexicanus*)	--/CSC/--	Nests on cliff ledges. Forages in open grasslands, dry plains, and other uplands.	Low. No nesting and limited potential foraging habitat in project area. Species not known from study area or observed during current or previous surveys.	Year-round
Saltmarsh common yellow throat *(Geothlypis trichas sinuosa)*	--/CSC/--	Brackish and freshwater marshes surrounding northern and southern San Francisco Bay Area. Associated with stands of tall wetland vegetation.	Unlikely, known breeding range extends to northern edge of Santa Cruz County, outside project area. No habitat occurs in project area.	Year-round
Loggerhead shrike (*Lanius ludovicianus*)	**--/CSC/--**	**Nests in dense shrubs and brush near open foraging areas such as grasslands.**	**Medium. The species has potential to occur in the study area.**	**Year-round**
Mammals				
Pallid bat (*Antrozous pallidus*)	--/CSC/--	Roosts in rock crevices, caves, mine shafts, under bridges, in buildings and tree hollows.	Low. Limited potential habitat within project area.	Year-round
Pacific / Townsend's western big-eared bat *(Corynorhinus townsendii townsendii)*	--/CSC/--	Mesic habitats, roosting in caves, mines, tunnels, and buildings.	Low. Limited potential habitat within project area. May use project area for foraging.	April-October
Santa Cruz kangaroo rat (*Dipodomys venustus venustus*)	--/CSC/--	Restricted to sand chaparral habitats of sandhill parkland in Santa Cruz County.	None. There are no known occurrences in the vicinity of the study area. Appropriate habitat is absent in the study area.	Year-round
Hoary bat (*Lasiurus cinereus*)	--/CSC/--	Prefers open habitats or habitat mosaics, with access to trees for roosting & open areas or habitat edges for feeding.	Low. Potential roosting and foraging habitat in project area. Specie snot known from study area.	

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)	**--/CSC/--**	**Upland forest and woodland areas in San Mateo and Santa Cruz counties.**	**High. A nest of this species was observed in coast live oak woodland during the current survey effort near the DeLaveaga Tank Replacement Site. Potential habitat located within project area.**	**Year-round**
American badger (*Taxidea taxus*)	--/CSC/--	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Need sufficient food, friable soils, and open, uncultivated ground. Prey on burrowing rodents. Dig burrows.	Unlikely, suitable habitat is absent from the study area. The study area lies within an urbanized area with limited access to suitable prey species.	Year-round
Candidate and Special-Status Plants				
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Coastal bluff scrub, woodlands and grasslands	Low. Limited potential habitat in the study area. Species not observed during current survey effort.	March-June
Coast rock cress (*Arabis blepharophylla*)	--/--/4.3	Rocky sites in broadleaf forest, coastal scrub and coastal prairie.	None. No potential habitat in the study area. Species not observed during current survey effort.	February-May
Anderson's manzanita (*Arctostaphylos andersonii*)	--/--/1B.2	Broadleaf forests, chaparral, and openings and edges of coniferous forests, especially in the Santa Cruz Mountains of Santa Clara, San Mateo and Santa Cruz counties.	None. No potential habitat in the study area. Species not observed during current survey effort.	November-May
Schreiber's manzanita (*Arctostaphylos glutinosa*)	--/--/1B.2	Closed cone coniferous forests and chaparral on diatomaceous shale (The Chalks)	None. No potential habitat in the study area. Species not observed during current survey effort.	March-April
Ohlone manzanita (*Arctostaphylos ohloneana*)	--/--/1B.1	Closed cone coniferous forests and coastal scrub on siliceous shale.	None. No potential habitat in the study area. Species not observed during current survey effort.	February-March

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Pajaro manzanita (*Arctostaphylos pajaroensis*)	--/--/1B.1	Sandy chaparral.	None. No potential habitat in the study area. Species not observed during current survey effort.	December-March
Bonny Doon manzanita (*Arctostaphylos silvicola*)	--/--/1B.2	Closed cone coniferous forest, chaparral and coniferous forests on inland marine sands.	None. No potential habitat in the study area. Species not observed during current survey effort.	February-March
Marsh sandwort (*Arenaria paludicola*)	--/--/1B.1	Freshwater and brackish marshes and swamps in sandy openings.	None. No potential habitat in the study area. Species not observed during current survey effort.	May-August
Large-flowered mariposa lily (*Calochortus uniflorus*)	--/--/4.2	Coastal prairie, coastal scrub, seeps and grassland.	Unlikely. Project area has low quality potential habitat. Species not observed during current survey effort.	April-June
Santa Cruz pussypaws (*Calyptridium parryi* var. *hesseae*)	--/--/1B.1	Chaparral and woodland, on sandy or gravel openings above 1000 feet.	None. No potential habitat in the study area. Species not observed during current survey effort.	May-August
Swamp harebell (*Campanula californica*)	--/--/1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, marshes and swamps, wet sites.	Low. Limited marginal potential habitat in study area. Species not observed during current survey effort.	June-October
Bristly sedge (*Carex comosa*)	--/--/2.1	Coastal prairie, marshes, swamps, lake margins and grassland.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	May-September
Deceiving sedge (*Carex saliniformis*)	--/--/1B.2	Coastal prairie, coastal scrub, seeps, marshes and swamps, including coastal salt	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	June-July
Johnny-nip (*Castilleja ambigua* var. *ambigua*)	--/--/4.2	Coastal scrub and bluff scrub, coastal prairie, swamps and marshes, vernal pool edges and grassland.	Unlikely. Project area has low quality potential habitat. Species not observed during current survey effort.	March-August
San Francisco Collinsia (*Collinsia multicolor*)	--/--/1B.2	Closed-cone coniferous forests, coastal scrub, sometimes on serpentinite.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	March-May

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
California bottle-brush grass (*Elymus californicus*)	--/--/4.3	Woodland, broadleaf forest, coniferous forest, riparian woodland.	Unlikely. Project area has low quality potential habitat. Species not observed during current survey effort.	May-August
Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*)	--/--/1B.1	Sandy chaparral, woodland, and maritime ponderosa pine sandhills.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	June-October
San Francisco gumplant (*Grindelia hirsutula* var. *maritima*)	--/--/1B.2	Coastal bluff scrub and grasslands on sandy or serpentinite soils.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	June-September
Loma Prieta hoita (*Hoita strobilina*)	--/--/1B.1	Chaparral, woodlands and riparian woodlands, usually on seasonally wet serpentinite locations.	Unlikely. Limited marginal potential habitat in study area. No serpentinite occurs in study area. Species not observed during current or previous survey efforts.	May-July
Kellogg's horkelia (*Horkelia cuneata* var. *sericea*)	--/--/1B.1	Closed-cone coniferous forest, maritime chaparral, coastal dunes and coastal scrub, sandy or gravelly openings.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	April-September
Pt. Reyes Horkelia (*Horkelia marinensis*)	--/--/1B.2	Coastal dunes, coastal prairie, coastal scrub, sandy sites.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	May-September
Large-flowered leptosiphon (*Leptosiphon grandiflorus*)	--/--/4.2	Coastal scrub, coastal prairie, coastal dunes, grassland, often on sandy sites.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	April-August
Smooth lessingia (*Lessingia micradenia* var. *glabrata*)	--/--/1B.2	Serpentinite chaparral, woodland, often along ditches or roadsides.	None. No potential suitable serpentinite habitat in the study area. Species not observed during current survey effort.	July-November

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Arcuate bush-mallow (*Malacothamnus arcuatus*)	--/--/1B.2	Chaparral and woodland.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	April-September
Mt. Diablo cottonweed (*Micropus amphibolus*)	--/--/3.2	Broadleaf forest, chaparral, woodland, and grassland, on rocky sites	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	March-May
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Closed-cone coniferous forest, woodland, coastal scrub, and grassland.	Unlikely. Limited woodland and degraded grassland potential habitat in project area. Species not observed during current or previous survey efforts.	April-June
Woodland woolythreads (*Monolopia gracilens*)	--/--/1B.2	Broadleaf forest and coniferous forest openings, woodland, and grassland, on serpentine.	None. No potential suitable serpentinite habitat in the study area. Species not observed during current survey effort.	March-July
Dudley's lousewort (*Pedicularis dudleyi*)	--/CR/1B.2	Maritime chaparral, woodland, coniferous forest.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	April-June
Santa Cruz Mountains beardtongue (*Penstemon rattanii* var. *kleei*)	--/--/1B.2	Chaparral, coniferous forest.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	May-June
Monterey Pine (*Pinus radiata*)	--/--/1B.1	Known from three native populations: Monterey Peninsula, Ano Nuevo and Waddell Creek in Santa Cruz County and Cambria in San Luis Obispo County.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	Year-round
White-flowered rein orchid (*Piperia candida*)	--/--/1B.2	Broadleaf forest and coniferous forest, sometimes on serpentinite.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	May-September

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Choris's popcorn flower (*Plagiobothrys chorisianus* var. *chorisianus*)	--/--/1B.2	At least seasonally wet sites of chaparral, coastal prairie and coastal scrub below 600 feet elevation.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	March-June
Spiny milkwort (*Polygala subspinosa*)	--/--/2.2	Great Basin scrub, pinyon and juniper woodland, rocky sites above 4000 feet elevation.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	May-August
Pine rose (*Rosa pinetorum*)	--/--/1B.2	Closed-cone coniferous forest.	None. No potential suitable habitat in the study area. Species not observed during current survey effort.	May-July
Maple-leaved checkerbloom (*Sidalcea malachroides*)	--/--/4.2	Broadleaf forest, coastal prairie, coastal scrub, coniferous forest, riparian woodlands, often in disturbed areas.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	April-August
San Francisco campion (*Silene verecunda* ssp. *verecunda*)	--/--/1B.2	Coastal bluff scrub, chaparral, coastal prairie and grassland, sandy or rocky sites.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	March-June
Santa Cruz microseris (*Stebbinsoseris decipiens*)	--/--/1B.2	Broadleaf forest, closed-cone coniferous forest, chaparral, coastal prairie, grassland, coastal scrub, sometimes on serpentinite.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	April-May
Santa Cruz clover (*Trifolium buckwestiorum*)	--/--/1B.1	Broadleaf forest, woodland, coastal prairie, on gravelly margins.	Unlikely. Limited marginal potential habitat in study area. Species not observed during current or previous survey efforts.	April-October

Table 6-1. List of Regionally Occurring Special-Status Species

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period

SOURCE: CDFG, 2011; CNPS, 2011; USFWS, 2010

United States Fish and Wildlife Service classifications:
FE = Species in danger of extinction throughout all or significant portion of its range.
FT = Species likely to become endangered within foreseeable future throughout all or significant portion of its range.
PE = Species proposed endangered.
PT = Species proposed threatened.
FC = Candidate information now available indicates that listing may be appropriate with supporting data currently on file.
FSC = Species of concern.

California Department of Fish and Game classifications:
CE = State listed as endangered. Species who's continued existence in California is jeopardized.
CT = State listed as threatened. Species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CR = State listed as rare. Plant species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CSC = California species of special concern. Animal species with California breeding populations that may face extinction in the near future.
CP = Fully protected by the State of California under Section 3511 and 4700 of the CDFG Code.

California Native Plant Society classifications:
List 1A = Plants that are presumed extinct in California.
List 1B = Plants that are Rare, Threatened, or Endangered in California and elsewhere.
List 2 = Plants that are Rare, Threatened or Endangered in California but more common elsewhere.
List 3 = Plants for which more information is needed.
List 4 = Plants of limited distribution.

BOLD TEXT IN ENTRIES = SPECIES WITH MEDIUM OR HIGH POTENTIAL FOR OCCURRENCE IN THE STUDY AREA AND POTENTIAL FOR IMPACT FROM THE PROPOSED PROJECT.

Federal and State Listed Wildlife

Two federal and state listed wildlife species have potential to occur in the project area and are described below.

Central California Coast Steelhead

The Steelhead (*Oncorhynchus mykiss irideus*) that may occur within Arana Creek, Branciforte Creek and Soquel Creek are within the Central California Coast Distinct Population Segment (DPS). This DPS was listed as a federally threatened species on August 18, 1997; threatened status was reaffirmed on January 5, 2006. The central California coast steelhead DPS occupies river basins from the Russian River, Sonoma County, CA, (inclusive) to Aptos Creek, Santa Cruz County, CA, (inclusive), and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), Napa County, CA. The Sacramento-San Joaquin River Basin in

the Central Valley of California is excluded. Critical habitat has been designated for the Central California Coast DPS steelhead and includes stream channels within designated stream reaches and a lateral extent as defined by the ordinary high-water line (NMFS, 2005). Arana Creek, Branciforte Creek and Soquel Creek are included in this critical habitat designation.

In general, adult steelhead return to rivers and creeks in the region from October to April. Spawning takes place in the rivers from December to April with most spawning activity occurring between January and March. Juvenile steelheads remain in fresh water for 1 to 4 years before they out-migrate into the open ocean during spring and early summer. However, juveniles can spend up to 7 years in freshwater before moving downstream (Busby et al, 1996). Steelhead can spend up to 3 years in saltwater before returning to freshwater to spawn. Because juvenile steelhead remain in the creeks year-round, adequate flows, suitable water temperatures, and an abundant food supply are necessary throughout the year in order to sustain steelhead populations. The most critical period is in the summer and early fall when these conditions become limiting. Potential spawning areas require gravel bottoms and specific water conditions. Spawning habitat conditions are strongly affected by water flow and quality, especially temperature, dissolved oxygen, and silt load, all of which can greatly affect the survival of eggs and larvae (CDFG 1995).

Migratory corridors start downstream of the spawning areas and allow the upstream passage of adults and the downstream emigration of out-migrant juveniles and adults. Man-made objects, such as culverts, bridge abutments and dams are often significant barriers. The box culvert at the Paul Sweet Road crossing with associated concrete debris below its entrance is such a barrier.

Some barriers may completely block upstream migration, but many partial barriers in coastal streams are passable at higher streamflows. If the barrier is not absolute, some adult steelhead are usually able to pass in most years, since they can time their upstream movements to match peak flow conditions. However, in drought years when storms are delayed, these partial barriers may become serious impediments to migrating spawners and may make adults more vulnerable to predation or to angling mortality (Arana Gulch Watershed Alliance, 2002). Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their out-migration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition and function may be affected by annual and seasonal flow, sediment loads and temperature characteristics but is most strongly affected by cover, food supply, and available pool habitat (Arana Gulch Watershed Alliance, 2002).

The study area for the proposed project is located in paved public rights-of-way in existing reinforced concrete bridges over Branciforte Creek and Soquel Creek and does not extend into these creeks. However, the study area does extend into Arana Creek at the Brookwood Drive crossing. Arana Creek contains habitat for the species in the form of shallow pools, riffles, runs

and glides with the preferred habitat being the pools where there is escape cover. Electrofishing sampling in Arana Creek has shown the stream contains densities of juvenile steelhead above and below the Brookwood Drive crossing (Arana Gulch Watershed Alliance, 2002). The CDFW CalFish database indicates the stream has "fair" rearing habitat and "unknown" spawning habitat (CalFish 2011). Steelhead habitat in Arana Creek is impaired largely due to high sedimentation in the stream and the existence of partial barriers downstream. One partial barrier occurs at the Capitola Road crossing with Arana Creek, which includes two 7-foot-diameter culverts, approximately 85 feet long. The crossing was determined to meet fish passage criteria for adult steelhead and juveniles 2 years old or older, but failed fish passage criteria for younger juveniles (Ross Taylor and Associates, 2004).

The study area, which includes a metal culvert under Brookwood Drive, does not contain suitable spawning habitat. Resident and adult steelhead are expected to use the Brookwood Drive culvert primarily as a migratory corridor to more suitable upstream spawning, foraging or rearing habitat, and for limited juvenile rearing during emigration. Habitat within the study area consists of a culvert beneath a paved road and within a forested riparian corridor with relatively cool but shallow water and a bottom composed primarily from a layer of sand and fine sediments deposited over gravel. Overtopping sand and fine sediments do not allow steelhead eggs to receive adequate oxygen and water circulation. Steelhead require cool, clean water and gravel or larger sized substrates for spawning; therefore, steelhead spawning may occur intermittently in the upper reaches of Arana Creek near the Brookwood Drive culvert but is not expected to occur within the metal-lined culvert itself. Resident, juvenile or adult steelhead may migrate through the study area.

An analysis conducted during site visits has determined that the existing Brookwood Drive culvert at Arana Creek is fully passable to resident, adult and juvenile steelhead. This assessment was conducted using the California Salmonid Stream Habitat Restoration Manual, which includes a standard protocol for the analysis of fish passage at water crossings (CDFG 2010). The channel underneath the bridge is low gradient, with a substrate of native sediment. The crossing is well lit. There are no hydraulic drops present.

California Red-Legged Frog

The California red-legged frog (*Rana draytonii*) (CRLF) was federally listed as a threatened species on May 20, 1996 (CDFG 2004a). Critical habitat has been designated for this species by the U.S. Fish and Wildlife Service (USFWS) within Santa Cruz County (USFWS 2011). However, no portion of the study area is within designated critical habitat for CRLF. The CRLF is also a California species of special concern as defined in the section on the California Endangered Species Act (CESA) in the Regulatory Framework section.

This frog typically occurs in areas of low-velocity stream flow having pools two to three feet deep with adjacent dense emergent or riparian vegetation (Jennings and Hayes 1988). Adult frogs move seasonally between their egg-laying sites and foraging habitat. Riparian habitat containing willows (*Salix* spp.) and emergent vegetation such as cattails (*Typha* spp.) are preferred red-legged frog habitats, though not necessary for this species to be present. CRLF populations may be reduced in size or eliminated from some ponds that have non-native predators such as bullfrogs (*Rana catesbeiana*), centrarchid fish species, including bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*) and other introduced species including signal and red swamp crayfish (*Pacifastacus leniusculus* and *Procambarus clarkii*, respectively).

CRLF are generally confined to aquatic habitats, such as streams, ponds and hillside seeps that maintain pool environments or saturated soils throughout the summer months. However, CRLF are known to migrate more than 2.5 miles from breeding sites regardless of topography. CRLF was not observed during the biological field surveys of the study area conducted for the proposed project. Additionally, the species is not known to occur in the study area, based on the literature review conducted for the proposed project. However, in the vicinity of the study area, the species is known to occur in several locations within a 0.5 mile south or west of the plant site alternative locations. A previous occurrence of one adult was observed in 1996 from wetlands in upper Antonelli Pond, a perennial pond. Less than 20 adults and a few juveniles were observed in 1995 at a seasonal pond in Natural Bridges State Beach (NBSB), within the monarch Eucalyptus grove that is within the same drainage as the ephemeral drainage (OWUS-18) of the study area, located on Plant Site A-2. CRLF were observed in 1997 and during a follow-up survey in 2008 from a wetland ditch at the northern edge of the UCSC Marine Science Campus property, closer to Wilder Ranch.

Subsequent surveys at the Natural Bridges seasonal pond documented that bullfrogs had further colonized the pond and failed to locate CRLF. No sightings of CRLF have been made at the Natural Bridges pond since the late 1990's according to communications with local State Park ecologist Tim Hyland (John Gilchrist & Associates 2009). Further surveys at Antonelli Pond located large populations of bullfrogs and bluegill, predators of CRLF, but have failed to relocate CRLF (John Gilchrist and Associates 2011, CDFG 2011). These surveys also documented another CRLF predator, largemouth bass, in Antonelli Pond. The presence of reproducing fish and bullfrog within Antonelli Pond indicates successful breeding of CRLF in the pond is unlikely. Due to the aquatic predators within Antonelli Pond, the pond may serve as a "sink" habitat for CRLF dispersing from other nearby locations along the west side of Santa Cruz, but isn't currently considered viable breeding habitat. Other populations of CRLF have been documented in the upper watershed of Moore Creek less than 2 miles from the alternative plant site locations.

The ephemeral drainage swale on Plant Site A-2 and adjacent industrial park fields are surrounded by potential movement barriers including regularly travelled paved roads, maintained commercial and industrial grounds, buildings, active railroad tracks and other poor quality or restrictive habitats. CRLF dispersing into the drainage swale or industrial park area would be most likely to use existing wildlife movement corridors to first disperse from wildlands near Shaffer Road and Moore Creek into Antonelli Pond or NBSB before entering Area A. The culvert under Delaware Avenue connecting the drainage in Area A to the downstream drainage and seasonal pond in NBSB may be the most likely dispersal route into the study area for any potential dispersing CRLF. However, the drainage swale represents low quality habitat for CRLF because it lacks the hydrology to provide dispersing frogs access to breeding or long-term refugia habitat and doesn't remain wet beyond the duration of the ephemeral flows of surface runoff occurring during wet season storms from the adjacent industrial park property. The ephemeral hydrology of the swale dissipates quickly following the termination of rainfall events because there is not connectivity of this runoff to groundwater.

The arroyo willow and elm leaf blackberry dominated swale associated with the ephemeral drainage in Area A does not provide any breeding habitat, but does offer potential low quality dispersal habitat for potential but unlikely CRLF movements between other nearby populations further north or west. The revegetated portions of the Arroyo Seco Creek drainage just east of the Area A portion of the study area may also provide a movement corridor for these populations. However, based on surrounding land uses, habitat quality and existing movement corridors for the species, including the upper highly culvertized portion of Arroyo Seco Creek, CRLF would be more likely to move down into the wetlands of Antonelli Pond from the Moore Creek or Wilder Ranch populations west or northwest of the project area rather than dispersing to other lower quality habitat satellite areas, such as those in the Area A portion of the study area. This observation, coupled with the lack of CRLF sightings in more than a decade in Antonelli Pond, the seasonal pond at NBSB, or Area A, likely indicate reduced potential for the species to disperse through the Area A portion of the study area.

No other nearby occurrences of CRLF are reported on or near any other portions of the study area, including the City-District Intertie System portion of the study area. Very few CRLF records exist from the San Lorenzo River basin, and no records exist for this species in the City's urban aquatic habitats (i.e., San Lorenzo River mouth, Neary Lagoon, Arana Creek), according to the City of Santa Cruz Operations & Maintenance HCP (City in prep, 2012). The City-wide Creeks and Wetlands Management Plan (City, 2008), which lists sensitive species associated with creek and wetland features, indicates CRLF does not occur in Arana Gulch. The closest known occurrence of the species to these project locations are the previously described west-side occurrences that are more than three miles west and across numerous movement barriers represented by the urban landscape of the City, more than 5 miles northwest in Bull Creek near

Felton, or more than 7 miles northeast in the upper watershed forests of Soquel Creek and associated tributaries (CDFG 2011).

Other Special-Status Wildlife Species

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens)* is a species of special concern to California. Woodrats are common to abundant in forest habitats of moderate canopy and moderate to dense understory and can be abundant in chaparral and scrub habitats. Nests are built of sticks and leaves at the base of, or in a tree, around a shrub, or at the base of a hill. Nests may measure up to 8 feet in height and 8 feet in diameter and are often multigenerational dwellings. Woodrats feed mainly on woody plants, especially live oak, maple, coffeeberry, alder, and elderberry when available. They also eat fungi, flowers, grasses and acorns. Highly nocturnal, woodrats are common prey for owls, coyotes, bobcats, hawks, and snakes. Other small mammals, amphibians and reptiles are known to use woodrat nests. A San Francisco dusky-footed woodrat nest was observed during the field surveys near the DeLaveaga water storage tanks and habitat for the species occurs in the study area.

Foothill Yellow-Legged Frog

Foothill yellow-legged frog (*Rana boylii*) (FYLF) is a California species of concern. No known occurrences of FYLF are known from in or near the study area. No FYLF were observed during the biological surveys conducted for the proposed project. However, two occurrences of the species are known from portions of Soquel Creek and tributaries approximately 1 to 1.5 miles northeast of where the study area crosses Arana Creek at Brookwood Drive along the pipeline alignment location between the DeLaveaga tanks and the City-District Intertie location. The species prefers swiftly flowing perennial or intermittent streambeds and is often associated with rocky or gravelly areas along the stream course where it can hide and breed. The FYLF is a species that is not known to disperse long distances from water and typically occurs immediately along stream or riparian habitats. Potential habitat for this species occurs only in the portion of the study area where Brookwood Drive crosses Arana Creek.

Cooper's Hawk

The Cooper's hawk (*Accipiter cooperii*) is a California species of special concern. This bird is a breeding resident throughout most of the wooded portion of California. It typically nests in trees that are 20 to 50 feet (6 to 15 meters) tall. Nests are constructed on horizontal branches, in the main crotch, often just below the lowest live limbs. The nest is a stick platform lined with bark. The Cooper's hawk typically nests near streams and breeds from March through August with peak activity from May through July (CWHR 2002). Suitable nest trees for this species occur on

Plant Site A-2 and in any riparian areas or woodlands occurring in or near the study area, such as near Arana Creek, along Brookwood Drive, or near Branciforte Creek, Rodeo Gulch or Soquel Creek.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a species of special concern in California. This bird is found in lowlands and foothills throughout California. This species prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. The loggerhead shrike feeds mostly on large insects, but it also eats small birds, mammals, amphibians, reptiles, fish, carrion, and various other invertebrates and is known for catching prey by skewering it on thorns, sharp twigs and barbed wire fencing (CWHR 2002). The study area contains foraging and potential nesting habitat for this species, especially in the grasslands and other areas associated with the alternative plant sites.

Northern Harrier

The northern harrier (*Circus cyaneus*) is a large raptor species that hunts while hovering low over grasslands and hillsides. It is a California species of special concern. Harriers forage in open grasslands, pastures, hayfields and wetlands. These birds nest on the ground in marshes, grasslands and rolling hills in the Central Valley and throughout California. Populations of these birds have declined significantly due to loss of habitat, changes in land management and urban development (CWHR, 2002). The study area contains foraging and potential nesting habitat for this species, especially in the grasslands and other areas associated with the alternative plant sites.

White-Tailed Kite

The white-tailed kite (*Elanus leucurus*) is a fully protected species in California. This bird is an uncommon, year-long resident in coastal and valley lowlands and is rarely found away from agricultural areas. It makes a nest of loosely piled sticks and twigs and lined with grass, straw, or rootlets. The nest is typically located near the top of dense oak, willow, or other tree stand. The white-tailed kite is mostly non-migratory in California. Typical prey of this raptor includes voles and other small, diurnal mammals, although the white-tailed kite occasionally preys on birds, insects, reptiles, and amphibians. The white-tailed kite forages in open grasslands, meadows, farmlands and emergent wetlands. This kite species breeds from February to October. The study area contains foraging and potential nesting habitat for this species, especially in the grasslands and other areas associated with alternative plant sites and the pipeline alignments up to and down from the DeLaveaga water storage tanks.

Yellow Warbler

The yellow warbler (*Dendroica petechial brewsteri*) is a California species of concern and a USFWS Migratory Nongame Bird of Management Concern that nests in riparian habitats and prefers willow and cottonwood forests near water. Yellow warblers typically begin nesting between April and May and complete nesting and complete their migration to winter habitats from southern California through South America during July to September, following the fledging of young. Insects and insect larvae are the main food source for the species, especially during the nesting period. The study area contains foraging and potential nesting habitat for this species, especially in the grasslands and other areas associated with the alternative plant sites and the pipeline alignments up to and down from the DeLaveaga water storage tanks.

Coastal Bird Rookeries

The City's General Plan 2030 EIR (City, 2012a) provides a description of coastal birds and rookeries that existing along the shoreline and Municipal Wharf, which is summarized below. The bluffs, cliffs, seastacks, and rock outcrops, and small coastal islands along the shoreline from Cowell's Beach to Younger Lagoon provide roosting and perching, foraging, and breeding habitat for numerous coastal bird species (City, 2012a). Structures on the Santa Cruz Municipal Wharf provide communal roosting habitat, while other shorebirds nest in the trees and scrub that line the City's aquatic environments.

A number of bird species are known to roost and breed within the coastal habitats of the City including the following special-status birds: double-crested cormorant (*Phalacrocorax auritus*), black-crowned night heron (*Nycticorax nycticorax*), and black oystercatcher (*Haemotopus bachmani*). Other seabirds include other cormorant and heron species, gulls, the great egret, the common merganser, and the pigeon guillemot. The biological review conducted for the General Plan 2030 EIR identified 28 nest colonies and communal roost locations. Thirteen of the sites observed in 2006 support breeding seabirds. The remaining sites were observed to support roosting seabirds. Roosting and breeding habitat in the project area for one or more of these birds was found at the Municipal Wharf, along the shoreline from Cowell's Beach to NBSB, Neary Lagoon, and Arana Gulch.

Monarch Butterfly Overwintering Habitat

The monarch butterfly (*Danaus plexippus*) is known to roost south of Plant Site A-2 across Delaware Avenue in NBSB. While monarch butterfly is not listed by the USFWS or California Department of Fish and Wildlife (CDFW[1]) as threatened or endangered, the California Natural

1 Prior to December 31, 2012, the California Department of Fish and Wildlife (CDFW) was known as the California Department of Fish and Game (CDFG). Throughout this report and supporting documentation, the name CDFW is used to refer to interactions with the organization since December 31, 2012, while the name CDFG is used to refer to interactions with (or documentation produced by) the organization prior to this date. The Legislature did not change the name of the California Fish and Game Code, however, so many of the statutes governing the duties of the CDFW are still found in a Code that reflects the agency's original name.

Diversity Database (CNDDB) ranks the monarch butterfly as having a restricted range and being rare statewide, but worldwide is commonly found throughout its range (Rank G5S3)(CDFG, 2011b). Overwintering sites for monarch butterfly are considered sensitive habitats in the *City's General Plan and Local Coastal Program 1990-2005* and in *City of Santa Cruz General Plan 2030* (General Plan 2030) (City, 2003; City, 2012a). Monarch butterflies are known for their vast, seasonal, multi-generational migrations. North America's western population of monarch butterfly overwinters along the California coast and breeds during the summer west of the Rocky Mountains. Along the Santa Cruz County coastline, there are several locations where monarchs form winter roosts between Moore Creek and Watsonville, including Moran Lake County Park.

Overwintering roost sites are sheltered groves of trees where adult monarchs spend the winter in more or less dense clusters on branches. Favored trees for monarch roosts include eucalyptus, Monterey pine, and Monterey cypress, although other types of trees can be utilized. The overall overwintering habitat for the monarch consists of roost trees (where the clusters of monarchs form), as well as surrounding trees that provide primary and secondary wind protection, shade, as well as sources of nectar and water. Sufficient water and nectar sources may occur within roost sites or monarchs may fly some distance from the roost trees to obtain nectar and water, including into residential and developed areas.

Biological studies conducted as part of the General Plan 2030 mapped areas as "potential monarch butterfly habitat," which includes tree stands that potentially could or are known to host overwintering monarch butterfly roosts or temporary roosts (i.e., roosting for periods of a few days to a month) based on previous observations, known current or historic roost sites, and reconnaissance surveys to determine the presence of suitable habitat conditions. If a project is within or adjacent to these mapped areas, further project specific studies must be conducted to confirm whether monarchs are, in fact, using the area for roosting and if the project would have impacts to any overwintering sites.

The General Plan 2030 EIR maps delineate the following portions of the project area as potential monarch butterfly habitat: (1) the lower portion of the proposed desalination Plant Site A-2; (2) the area south of Delaware Avenue in NBSB; and (3) several areas in the vicinity of the DeLaveaga water tanks (City, 2012a). The lower portion of Plant Site A-2 also is located within a circle that is labeled Monarch Butterfly habitat in the LCP (Map EQ-9). The LCP indicates that these monarch habitat locations "are depicted in very general areas" and that further study is needed to determine more precise habitat areas. Entomologist Dr. Richard Arnold conducted a habitat assessment for the entire project area to determine if any portions of the project sites function as winter roosting sites or would affect overwintering habitat for the monarch butterfly.

Desalination Plant Site A-2 is located approximately 70 feet north of a large tree stand in NBSB that supports a known monarch butterfly overwintering roost site. Delaware Avenue separates

Nor did the Legislature change the name of the Fish and Game Commission, an entity separate from CFDW that takes legislative actions such as setting hunting and fishing seasons.

the NBSB overwintering site from a tree stand (mostly cypress) on the lower portion of Plant Site A-2. Plant Site A-2 is not developed with any buildings and is vegetated with trees, shrubs, and herbaceous vegetation, including nectar species typically used by monarch butterflies for foraging. Northeastern portions of the site have been periodically used for construction staging and storage.

No monarch butterflies were observed roosting in the trees located at Plant Site A-2 during the assessment conducted for the proposed project, and the trees at the this site do not have a spatial configuration appropriate for a monarch roost site. However, trees on Plant Site A-2 could potentially provide secondary wind break protection to the monarch butterfly roost site in NBSB. Winds in the Santa Cruz area come from all directions. Before, during, and after storm events, winds often come from the west, northwest, and north. In order to assess whether and to what extent these trees are providing secondary wind break protection to the NBSB roost, anemometers and other weather instruments would need to be placed at various locations at Plant Site A-2 and within NBSB throughout the monarch's overwintering period. This would need to be combined with a detailed study of trees, topography, and monarch activity within and adjacent to NBSB and Plant Site A-2. In the absence of such an extensive and time sensitive study, the analysis in this document assumes the worst-case impact scenario that the tree stand on A-2 is potentially providing secondary wind break protection to the NBSB roost.

Plant Sites A-1 and A-3 are approximately 415 feet and 325 feet, respectively, from the tree stand at NBSB where monarch butterflies are known to overwinter. Plant Sites A-1 and A-3 are not currently developed with any buildings and are primarily characterized by ruderal grassland that is periodically mowed. Portions of both sites are periodically used for firewood storage and construction staging and storage. A row of trees line a driveway on the edge of Plant Sites A-1 and A-3. No monarch butterflies were observed roosting on Plant Sites A-1 and A-3 during the assessment conducted for this project. Additionally the spatial arrangements of trees on these sites do not provide suitable conditions for roosting or wind break protection to the NBSB overwintering site. While highly disturbed, there are nectar plants on these plant sites that could potentially be used by monarchs for foraging.

Historically, two Monarch roost sites were also located in the southern portion of DeLaveaga Park, near a portion of the proposed City-District intertie pipeline alignment off of Brookwood Drive. Monarch butterflies were not observed in the vicinity of either historical roost site during the assessment conducted for the proposed project. However, it is still possible that roosting could occur at these sites given previous observations. Various nectar plants for the monarch occur widely throughout the park and as landscaping in the yards of neighboring residences.

The proposed project would involve upgrades to the McGregor Pump Station, which is currently planned and approved for construction as part of the District's current Capital Improvement Plan. The pump station will be located northwest of and adjacent to New Brighton State Beach, where monarchs were observed roosting in the 1980s. No monarch butterflies were observed roosting at these locations during the assessment conducted for this project. Additionally, the immediate

area where the pump station is proposed is characterized by a dense mix of trees that does not have sheltered openings where monarchs could roost.

Special-Status Plants

No special-status plant species were identified during the surveys. Surveys were conducted during the bloom period or period of identification for all of the regionally occurring special-status plants. The vegetation within the study area was dominated by urban landscaping and escaped or invasive non-native species, with native plants restricted to oak woodland along the intertie pipeline alignment along Brookwood Drive and arroyo willow riparian habitat at Plant Site A-2, the pump station site for SI-18, and the intertie pipeline near the Brookwood Drive crossing of Arana Gulch. The habitats of Area A where the plant site is proposed have been degraded since before the 1920's from agricultural, residential, commercial and industrial land uses (John Gilchrist & Associates 2011, Albion Environmental 2004). This area lacks a significant native plant seedbank and is dominated by non-native, escaped and landscaped species.

Other portions of the study area, including the proposed intake pump stations locations and water pipeline alignment locations are dominated by ice plant, paved public roads or previously developed urban sites. The study area provides low quality potential habitat for rare plant species of grasslands and woodlands, in the form of ruderal annual grassland, and a small section of coast live oak woodland slope with invasive shrubs in the understory. As a result of the above conclusion, special-status plants will not be addressed further in this section.

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Appendix A

USFWS Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2011-CPA-0027

December 23, 2010

Heidi Luckenbach
Water Department
City of Santa Cruz
212 Locust Street, Suite C
Santa Cruz, California 95060

Subject: Comments on the Notice of Preparation of an Environmental Impact Report for the City of Santa Cruz and Soquel Creek Water District Regional Seawater Desalinization Project, Santa Cruz County, California

Dear Ms. Luckenbach:

This letter provides the U.S. Fish and Wildlife Service's (Service) comments on the Notice of Preparation of an Environmental Impact Report for the City of Santa Cruz and Soquel Creek Water District Regional Seawater Desalinization Project (NOP). A copy of the NOP was received in our office on November 15, 2010. The City of Santa Cruz and Soquel Creek Water District regional seawater desalinization project (project) would involve construction of a seawater intake structure, seawater desalinization plant (with capacity to deliver up to 2.5 million gallons of water per day), brine disposal and conveyance system, and water supply delivery system improvements. The project would be located in Santa Cruz County, including facilities in the cities of Santa Cruz and Capitola, California.

The Service's responsibilities include administering the Endangered Species Act of 1973, as amended (Act), including sections 7, 9, and 10. Section 9 of the Act prohibits the taking of any federally listed endangered or threatened species. Section 3(18) of the Act defines "take" to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species. Exemptions to the prohibitions against take may be obtained through coordination with the Service in two ways. If a project is to be funded, authorized, or carried out by a Federal agency, and may affect a listed

species, the Federal agency must consult with the Service pursuant to section 7(a)(2) of the Act. If a proposed project does not involve a Federal agency but may result in the take of a listed animal species, the project proponent should apply to the Service for an incidental take permit pursuant to section 10(a)(1)(B) of the Act. We understand from the NOP (page 41) that implementation of the project would likely require Federal authorizations(s) from the U.S. Army Corps of Engineers and/or the National Oceanic and Atmospheric Administration.
As it is not our primary responsibility to comment on documents prepared pursuant to the California Environmental Quality Act (CEQA), our comments on the NOP will not constitute a full review of project impacts, nor do they represent consultation with the Service. Rather, they address concerns regarding potential impacts of the proposed project on federally listed species, provide recommendations to reduce the potential for those impacts, and provide recommendations for which aspects of the project should be further analyzed under the Environmental Impact Report. We offer the following information and recommendations to aid in the conservation of sensitive wildlife habitats and federally listed species that could occur in the project area, and as a means to assist you in complying with pertinent Federal statutes.

We note that the proposed Environmental Impact Report would include the results of "biological field studies to identify any habitat for, or occurrences of, special status species" (NOP page 22). We support these proposed surveys. We have included a list of federally listed species that may occur in Santa Cruz County, below, for your information. You may wish to visit our website (http://www.fws.gov/ventura/speciesinfo/index.html) for survey protocols and guidelines.

The seawater desalinization plant is proposed for one of two locations (NOP page 12), identified as Area A (bounded by the Santa Cruz branch rail line to the north, Natural Bridges Drive on the west, Delaware Avenue on the south, and Arroyo Seco Canyon Creek on the east) and Area B (south of the Santa Cruz branch rail line, north of Delaware Avenue, east of Shaffer Road, and west of Antonelli Pond). Area A consists mostly of existing development and non-native vegetation. Area B is undeveloped, is adjacent to and between two known localities of the federally threatened California red-legged frog (*Rana draytonii*) (Antonelli Pond and a seasonal wetland west of Shaffer Road), and is upstream of a known locality of the federally endangered tidewater goby (*Eucyclogobius newberryi*) (CNDDB 2010). As discussed above, the proposed Environmental Impact Report will include surveys to assess the potential of proposed project areas to be inhabited by listed species. However, currently available information indicates that construction and operation of the facility at Area A would be less likely to adversely affect federally listed species.

The NOP (page 6) indicates that the proposed desalinization plant would be operated at capacity only during dry/drought conditions, with surface water continuing to be the primary water source for the city of Santa Cruz the remainder of the time. We recommend that the Environmental Impact Report evaluate the potential positive effects on surface water bodies (and associated listed species, such as the California red-legged frog and tidewater goby) of operating the plant at capacity year-round (which we assume would allow decreased diversions of surface water).

Various types of seawater intakes are being considered for the proposed project. These intakes can be generally placed in two categories: sub-seafloor intakes and open-ocean intakes. The proposed Environmental Impact Report should consider the potential effects of construction and operation of seawater intakes on federally threatened southern sea otters (*Enhydra lutris nereis*), including effects on their prey. The NOP states that sub-seafloor intake systems "may provide passive protection of marine organisms from entrainment." Thus, operation of sub-seafloor intakes may be less likely to adversely affect southern sea otters relative to open-ocean intakes.

The NOP (page 30) indicates that some of the proposed seawater intake options could affect water levels in the San Lorenzo River. The lower San Lorenzo River is a known locality of the tidewater goby. The effects of seawater intake type and location on the tidewater goby should be evaluated in the proposed Environmental Impact Report.

We appreciate the opportunity to provide comments on the NOP. If you have any questions, please contact Jacob Martin of my staff at (831) 464-2950, extension 27, or (805) 644-1766.

Sincerely,

Roger P. Root

Roger P. Root
Assistant Field Supervisor

LISTED, PROPOSED, AND CANDIDATE SPECIES
WHICH MAY OCCUR IN
SANTA CRUZ COUNTY, CALIFORNIA

Mammals		
Southern sea otter	*Enhydra lutris nereis*	T
Birds		
Western snowy plover	*Charadrius alexandrinus nivosus*	T, CH
California least tern	*Sterna antillarum browni*	E
Marbled murrelet	*Brachyramphus marmoratus marmoratus*	T, CH
Least Bell's vireo	*Vireo bellii pusillus*	E
Yellow-billed cuckoo	*Coccyzus americanus*	C
Reptiles		
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	E
Amphibians		
California red-legged frog	*Rana draytonii*	T, CH
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	E
California tiger salamander	*Ambystoma californiense*	T
Fish		
Tidewater goby	*Eucyclogobius newberryi*	E, CH
Steelhead	*Oncorhynchus mykiss*	*
Coho salmon	*Oncorhynchus kisutch*	*
Invertebrates		
Mount Hermon June beetle	*Polyphylla barbata*	E
Zayante band-winged grasshopper	*Trimerotropis infantilis*	E, CH
Ohlone tiger beetle	*Cicindela ohlone*	E
Plants		
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	T, CH
Ben Lomond spineflower	*Chorizanthe pungens* var. *hartwegiana*	E
Scotts Valley spineflower	*Chorizanthe robusta* var. *hartwegii*	E, CH
Robust spineflower	*Chorizanthe robusta* var. *robusta*	E, CH
Santa Cruz cypress	*Cupressus abramsiana*	E
Ben Lomond wallflower	*Erysimum teretifolium*	E
Tidestrom's lupine	*Lupinus tidestromii*	E
White-rayed pentachaeta	*Pentachaeta bellidiflora*	E
Santa Cruz tarplant	*Holocarpha macradenia*	T, CH
Scotts Valley polygonum	*Polygonum hickmanii*	E, CH

Key:
E - Endangered T - Threatened CH - Critical habitat
C - Candidate species for which the Fish and Wildlife Service has on file sufficient information on the biological vulnerability and threats to support proposals to list as endangered or threatened.

* Species for which the National Marine Fisheries Service has responsibility. For more information, call the Santa Rosa Field Office at (707) 575-6050 or go to http://swr/ucsd.edu

Appendix B

CDFG Species List

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
scwd2 Regional Seawater Desalination Project - Santa Cruz and Soquel quads

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
2	Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	AAAAA01082	Endangered	Endangered	G5T1	S1	
3	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
4	Arctostaphylos andersonii Anderson's manzanita	PDERI04030			G2	S2?	1B.2
5	Ardea herodias great blue heron	ABNGA04010			G5	S4	
6	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
7	Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened		G4T3	S2	SC
8	Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered		G2T1	S1.1	1B.1
9	Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101			G5T2	S1	
10	Cicindela ohlone Ohlone tiger beetle	IICOL026L0	Endangered		G1	S1	
11	Cypseloides niger black swift	ABNUA01010			G4	S2	SC
12	Dacryophyllum falcifolium tear drop moss	NBMUS8Z010			G1	S1	1B.3
13	Danaus plexippus monarch butterfly	IILEPP2010			G5	S3	
14	Dipodomys venustus venustus Santa Cruz kangaroo rat	AMAFD03042			G4T1	S1	
15	Emys marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
16	Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered		G3	S2S3	SC
17	Fissilicreagris imperialis Empire Cave pseudoscorpion	ILARAE5010			G1	S1	
18	Hoita strobilina Loma Prieta hoita	PDFAB5Z030			G2	S2	1B.1
19	Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1.1	1B.1
20	Lasiurus cinereus hoary bat	AMACC05030			G5	S4?	
21	Linderiella occidentalis California linderiella	ICBRA06010			G3	S2S3	
22	Lytta moesta moestan blister beetle	IICOL4C020			G2	S2	
23	Meta dolloff Dolloff Cave spider	ILARA17010			G1	S1	

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	Monolopia gracilens woodland woollythreads	PDAST6G010			G2G3	S2S3	1B.2
25	Neochthonius imperialis Empire Cave pseudoscorpion	ILARAD1010			G1	S1	
26	North Central Coast Drainage Sacramento Sucker/Roach River	CARA2623CA			G?	SNR	
27	Oncorhynchus kisutch coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
28	Oncorhynchus mykiss irideus steelhead - central California coast DPS	AFCHA0209G	Threatened		G5T2Q	S2	
29	Pedicularis dudleyi Dudley's lousewort	PDSCR1K0D0		Rare	G2	S2.2	1B.2
30	Pentachaeta bellidiflora white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1.1	1B.1
31	Plagiobothrys diffusus San Francisco popcorn-flower	PDBOR0V080		Endangered	G1Q	S1.1	1B.1
32	Rana boylii foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
33	Rana draytonii California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
34	Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0			G3G4	S3S4.2	4.2
35	Stygobromus mackenziei Mackenzie's Cave amphipod	ICMAL05530			G1	S1	
36	Taxidea taxus American badger	AMAJF04010			G5	S4	SC
37	Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0			G1	S1.1	1B.1
38	Trimerotropis infantilis Zayante band-winged grasshopper	IIORT36030	Endangered		G1	S1	
39	Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040			G2G3	S2S3	

Appendix C

Wildlife Observed in the Study Area

Wildlife Species Observed During the scwd² Desalination Project Surveys

Scientific Name	Common Name
Amphibians	
Order: Anura (Frogs and Toads)	
Family: Hylidae (Tree Frogs)	
Pseudacris regilla	Pacific tree frog
Birds	
Order: Anseriformes (Ducks, Geese, Swans)	
Family: Anitidae (Ducks, Geese, Swans)	
Ana platyrhynchos	Mallard
Order: Ciconiiformes (Egrets, Herons, Sandpipers, Vultures)	
Family: Ardeidae (Bitterns, Egrets, Herons)	
Ardea herodias	Great blue heron
Order: Charadiformes (Plovers)	
Family: Charadidae (Plovers)	
Charadrius vociferus	Killdeer
Order: Falconiformes (Hawks and Falcons)	
Family: Accipitridae (Eagles and Hawks)	
Buteo jamaicensis	Red-tailed hawk
Buteo lineatus	Red-shouldered hawk
Elanus leucurus	White tailed kite
Family: Falconidae (Falcons)	
Falco columbarius	Merlin
Order: Columbiformes (Doves and Pigeons)	
Family: Columbidae (Doves and Pigeons)	
Columba livia	Rock Dove (feral pigeon)
Streptopelia decaocto	Eurasian collared dove
Zenaida macroura	Mourning dove

Wildlife Species Observed During the scwd² Desalination Project Surveys

Scientific Name	Common Name
Order: Galliformes	
Family: Odontophoridae (Quail)	
Callipepla californica	California quail
Order: Apodiformes (Hummingbirds)	
Family: Trochilidae (Hummingbirds)	
Calypte anna	Anna's hummingbird
Order: Passeriformes (Passerines)	
Family: Corvidae (Jays)	
Aphelocoma coerulescens	Western scrub jay
Corvus brachyrhynchos	American crow
Cyanocitta stelleri	Steller's jay
Family: Hirundinidae (Swallows)	
Hirundo rustica	Barn swallow
Petrochelidon pyrrhonota	Cliff swallow
Tachycineta bicolor	Tree swallow
Family: Icteridae (Blackbirds)	
Agelaius phoeniceus	Red-winged blackbird
Euphagus cyanocephalus	Brewer's blackbird
Family: Frigillidae (Finches)	
Carpodacus mexicanus	House finch
Family: Sturnidae (Starlings)	
Sturnus vulgaris	European starling
Family: Turdidae (Thrushes)	
Turdus migratorius	American robin
Family: Mimidae (Mockingbirds and Thrashers)	
Mimus polyglottos	Northern Mockingbird
Toxostoma redivivum	California Thrasher

Wildlife Species Observed During the scwd² Desalination Project Surveys

Scientific Name	Common Name
Family: Tyrannidae (Flycatchers)	
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird
Family: Paridae (chickadees and titmouse)	
Poecile rufescens	Chestnut backed chickadee
Family: Emberizidae (Sparrows and Towhees)	
Junco hyemalis	Dark eyed junco
Melozone crissalis	California towhee
Pipilo maculatus	Spotted towhee
Wilsonia pusilla	Wilson's warbler
Zonotrichia leucophrys	White-crowned sparrow
Invertebrates	
Order: Lepidoptera	
Family: Nymphalidae	
Vanessa cardui	Painted lady butterfly
Mammals	
Order: Lagomorpha	
Family: Leporidae	
Sylvilagus bachmani	Brush rabbit
Reptiles	
Order: Squamata	
Family: Colubridae	
Coluber constrictor mormon	Western yellow bellied racer

Appendix D

Vascular Plants Observed in the Study Area

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
Aceraceae	*Acer macrophyllum*	big-leaf maple	tree	native
Aceraceae	*Acer negundo*	box elder	tree	native
Anacardiaceae	*Toxicodendron diversilobum*	Pacific poison oak	shrub	native
Apiaceae	*Conium maculatum*	poison hemlock	biennial	Cal-IPC Moderate
Apiaceae	*Hydrocotyle verticillata*	whorled pennywort	perennial	native
Apiaceae	*Foeniculum vulgare*	sweet fennel	perennial	Cal-IPC High
Apiaceae	*Sanicula crassicaulis*	Pacific sanicle	perennial	native
Apiaceae	*Torilis arvensis*	meadow parsley	annual	non-native
Apocynaceae	*Nerium oleander*	oleander	shrub	non-native
Apocynaceae	*Vinca major*	periwinkle	perennial	non-native
Aquifoliaceae	*Ilex aquifolium*	English Holly	shrub	Cal-IPC Moderate
Araceae	*Zantedeschia aethiopica*	calla lily	perennial	non-native
Araliaceae	*Hedera helix*	English Ivy	vine	Cal-IPC High
Arecaceae	*Washingtonia robusta*	Washington fan palm	tree	Cal-IPC Moderate
Asteraceae	*Achillea millefolium*	common white yarrow	perennial	native
Asteraceae	*Ageratina adenophora*	ageratina	perennial	non-native
Asteraceae	*Artemisia douglasiana*	mugwort	perennial	native
Asteraceae	*Aster chilensis*	California aster	perennial	native
Asteraceae	*Baccharis pilularis*	coyote brush	shrub	native
Asteraceae	*Bellis perennis*	English daisy	perennial	non-native
Asteraceae	*Calendula arvensis*	field-marigold	annual	non-native
Asteraceae	*Carduus pycnocephalus*	Italian thistle	annual	Cal-IPC Moderate
Asteraceae	*Centaurea calcitrapa*	purple star-thistle	annual	Cal-IPC Moderate
Asteraceae	*Chamomilla suaveolens*	pineapple weed	annual	non-native
Asteraceae	*Cirsium vulgare*	bull thistle	biennial	non-native
Asteraceae	*Conyza canadensis*	Canada horseweed	annual	native
Asteraceae	*Delairea odorata*	Cape ivy	perennial	Cal-IPC High
Asteraceae	*Euthamia occidentalis*	western goldenrod	perennial	native
Asteraceae	*Filago gallica*	narrowleaf cottonrose	annual	non-native
Asteraceae	*Gnaphalium californicum*	California cudweed	annual	native
Asteraceae	*Gnaphalium canescens* ssp. *beneolens*	cudweed	biennial	native
Asteraceae	*Gnaphalium luteo-album*	weedy cudweed	annual	non-native

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
Asteraceae	*Hypochaeris radicata*	hairy cat's ear	annual	Cal-IPC Limited
Asteraceae	*Lessingia filaginifolia*	California aster	perennial	native
Asteraceae	*Madia sativa*	coast tarweed	annual	native
Asteraceae	*Picris echioides*	bristly ox-tongue	annual	Cal-IPC Limited
Asteraceae	*Senecio vulgaris*	common groundsel	annual	non-native
Asteraceae	*Sonchus asper*	spiny sowthistle	annual	non-native
Asteraceae	*Sonchus oleraceus*	common sowthistle	annual	non-native
Asteraceae	*Taraxacum officionale*	common dandelion	annual	non-native
Asteraceae	*Xanthium strumarium*	rough cocklebur	annual	native
Betulaceae	*Corylus cornuta*	hazelnut	shrub	native
Blechnaceae	*Woodwardia fimbriata*	giant chain fern	perennial	native
Boraginaceae	*Borago officinalis*	Borage	annual	non-native
Boraginaceae	*Myosotis discolor*	forget-me-not	annual	non-native
Brassicaceae	*Brassica nigra*	black mustard	annual	Cal-IPC Moderate
Brassicaceae	*Brassica rapa*	French breakfast mustard	annual	Cal-IPC Limited
Brassicaceae	*Capsella bursa-pastoris*	shepherd's purse	annual	non-native
Brassicaceae	*Hirschfeldia incana*	hoary mustard	perennial	Cal-IPC Moderate
Brassicaceae	*Lepidium nitidum* var. *nitidum*	Shining pepperweed	annual	native
Brassicaceae	*Raphanus raphinastrum*	wild radish	biennial	non-native
Brassicaceae	*Raphanus sativus*	charlock radish	biennial	Cal-IPC Limited
Caprifoliaceae	*Lonicera hispidula*	honeysuckle	vine	native
Caprifoliaceae	*Sambucus mexicana*	blue elderberry	shrub	native
Caryophyllaceae	*Cerastium glomeratum*	mousear chickweed	annual	non-native
Caryophyllaceae	*Silene gallica*	catchfly	annual	non-native
Caryophyllaceae	*Spergula arvensis*	spurrey	annual	non-native
Caryophyllaceae	*Stellaria media*	common chickweed	annual	non-native
Convolvulaceae	*Convolvulus arvensis*	field bindweed	perennial	non-native
Cucurbitaceae	*Marah fabaceus*	California manroot	vine	endemic
Cupressaceae	*Cupressus macrocarpa*	Monterey cypress	tree	horticultural
Cyperaceae	*Carex densa*	dense sedge	perennial	native
Cyperaceae	*Carex deweyana*	sedge	perennial	native
Cyperaceae	*Carex tumulicola*	hilltop sedge	perennial	native
Cyperaceae	*Cyperus eragrostis*	umbrella sedge	perennial	native

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
Dennstaedtiaceae	*Pteridium aquilinum*	bracken fern	perennial	native
Dryopteridaceae	*Athyrium filix-femina*	lady fern	perennial	native
Dryopteridaceae	*Dryopteris arguta*	wood fern	perennial	native
Dryopteridaceae	*Polystichum munitum*	sword fern	perennial	native
Equisetaceae	*Equisetum arvense*	common horsetail	perennial	native
Euphorbiaceae	*Euphorbia peplus*	petty spurge	annual	non-native
Fabaceae	*Acacia baileyana*	Cootumandra wattle	tree	non-native
Fabaceae	*Acacia dealbata*	silver wattle	tree	Cal-IPC Moderate
Fabaceae	*Acacia melanoxylon*	black wattle	tree	Cal-IPC Limited
Fabaceae	*Genista monspessulana*	French broom	shrub	Cal-IPC High
Fabaceae	*Lathyrus odoratus*	sweet pea	perennial	non-native
Fabaceae	*Lotus corniculatus*	birdfoot trefoil	perennial	non-native
Fabaceae	*Lotus purshianus*	Spanish trefoil	annual	non-native
Fabaceae	*Lupinus bicolor*	miniature lupine	annual	native
Fabaceae	*Lupinus variicolor*	varied-colored lupine	perennial	native
Fabaceae	*Medicago polymorpha*	bur clover	annual	Cal-IPC Limited
Fabaceae	*Spartium junceum*	Spanish broom	shrub	Cal-IPC High
Fabaceae	*Trifolium angustifolium*	narrowleaf crimson clover	annual	non-native
Fabaceae	*Trifolium dubium*	small hop clover	annual	non-native
Fabaceae	*Trifolium hirtum*	rose clover	annual	non-native
Fabaceae	*Trifolium microcephalum*	clover	annual	native
Fabaceae	*Trifolium repens*	creeping clover	perennial	non-native
Fabaceae	*Trifolium subterraneum*	subterranean clover	annual	non-native
Fabaceae	*Vicia benghalensis*	purple vetch	annual	non-native
Fabaceae	*Vicia tetrasperma*	vetch	annual	non-native
Fabaceae	*Quercus agrifolia*	coast live oak	tree	native
Geraniaceae	*Erodium botrys*	storksbill	annual	non-native
Geraniaceae	*Erodium cicutarium*	redstem filaree	annual	Cal-IPC Limited
Geraniaceae	*Erodium moschatum*	musky stork's bill	annual	non-native
Geraniaceae	*Geranium dissectum*	cutleaf geranium	annual	Cal-IPC Moderate
Geraniaceae	*Geranium molle*	woodland geranium	annual	non-native
Hippocastinaceae	*Aesculus californica*	California buckeye	tree	endemic

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
Hydrophyllaceae	*Nemophila parviflora*	small flowered nemophila	annual	native
Iridaceae	*Sisyrinchium bellum*	blue-eyed grass	perennial	native
Juncaceae	*Juncus bufonius*	toad rush	annual	native
Juncaceae	*Juncus capitatus*	dwarf rush	annual	native
Juncaceae	*Juncus effusus* var. *pacificus*	Pacific rush	perennial	native
Juncaceae	*Juncus occidentalis*	western rush	perennial	native
Juncaceae	*Juncus patens*	common rush	perennial	native
Lamiaceae	*Mentha spicata*	spearmint	perennial	non-native
Lamiaceae	*Satureja douglasii*	yerba buena	perennial	native
Lamiaceae	*Stachys bullata*	hedgenettle	perennial	native
Lauraceae	*Umbellularia californica*	California bay	tree	native
Liliaceae	*Brodiaea terrestris ssp. Terrestris*	earth brodiaea	perennial	native
Liliaceae	*Chlorogalum pomeridianum var. divaricatum*	soap plant	perennial	native
Liliaceae	*Chlorogalum pomeridianum var. pomeridianum*	soap plant	perennial	native
Liliaceae	*Triteleia ixioides ssp. Ixioides*	golden brodiaea	perennial	native
Linaceae	*Linum bienne*	small-flowered flax	annual	non-native
Lythraceae	*Lythrum hyssopifolium*	hyssop loosetrife	annual	Cal-IPC Moderate
Malvaceae	*Malva nicaeensis*	bull mallow	annual	non-native
Malvaceae	*Malva parviflora*	cheeseweed mallow	annual	non-native
Malvaceae	*Sidalcea malvaeflora ssp. laciniata*	checker mallow	perennial	native
Myrtaceae	*Eucalyptus globulus*	blue gum	tree	Cal-IPC Moderate
Onagraceae	*Epilobium canum*	California fuschia	perennial	native
Onagraceae	*Epilobium ciliatum*	fireweed	annual	native
Papaveraceae	*Eschscholzia californica*	California golden poppy	annual	native
Papaveraceae	*Fumaria parviflora*	Fumitory	annual	non-native
Pinaceae	*Pinus radiata*	Monterey pine	tree	horticultural
Plantaginaceae	*Plantago coronopus*	cut-leaf plantain	annual	non-native
Plantaginaceae	*Plantago lanceolata*	European plantain	annual	non-native
Poaceae	*Agrostis viridis*	whorled bent grass	perennial	non-native
Poaceae	*Aira caryophyllea*	European silver hair	annual	non-native

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
		grass		
Poaceae	*Arundo donax*	Giant reed grass	perennial	Cal-IPC high
Poaceae	*Avena barbata*	slender wild oats	annual	Cal-IPC Moderate
Poaceae	*Avena fatua*	common wild oats	annual	Cal-IPC Moderate
Poaceae	*Brachypodium distachyon*	false brome	annual	non-native
Poaceae	*Briza maxima*	rattlesnake grass	annual	non-native
Poaceae	*Briza minor*	little quaking grass	annual	non-native
Poaceae	*Bromus carinatus var. carinatus*	California brome	perennial	native
Poaceae	*Bromus catharticus*	Rescue grass	perennial	non-native
Poaceae	*Bromus diandrus*	ripgut brome	annual	Cal-IPC Moderate
Poaceae	*Bromus hordeaceus*	soft brome	annual	Cal-IPC Limited
Poaceae	*Bromus madritensis* ssp. *rubens*	redtop brome	annual	Cal-IPC High
Poaceae	*Bromus stamineus*	Chilean brome	perennial	Cal-IPC High
Poaceae	*Cortaderia jubata*	Jubata grass	perennial	Cal-IPC high
Poaceae	*Cynodon dactylon*	Bermuda grass	perennial	non-native
Poaceae	*Dactylis glomerata*	Orchard grass	perennial	non-native
Poaceae	*Danthonia californica*	California oatgrass	perennial	native
Poaceae	*Ehrharta erecta*	panic veldt grass	perennial	Cal-IPC High
Poaceae	*Elymus glaucus*	blue wildrye	perennial	native
Poaceae	*Festuca arundinacea*	tall fescue	perennial	non-native
Poaceae	*Festuca pratensis*	meadow fescue	perennial	non-native
Poaceae	*Gastridium ventricosum*	nit grass	annual	non-native
Poaceae	*Holcus lanatus*	velvet grass	perennial	non-native
Poaceae	*Hordeum marinum* var. *gussoneanum*	seaside barley	annual	Cal-IPC Moderate
Poaceae	*Hordeum murinum*	foxtail barley	annual	Cal-IPC Moderate
Poaceae	*Leymus triticoides*	creeping ryegrass	perennial	native
Poaceae	*Lolium multiflorum*	Italian ryegrass	annual	Cal-IPC Moderate
Poaceae	*Melica imperfecta*	small-flowered melic	perennial	native
Poaceae	*Nassella pulchra*	purple needlegrass	perennial	native
Poaceae	*Piptatherum milieaceum*	smilo grass	perennial	Cal-IPC Limited
Poaceae	*Phalaris aquatica*	Harding grass	perennial	Cal-IPC Moderate
Poaceae	*Poa annua*	annual bluegrass	annual	non-native

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
Poaceae	*Polypogon interruptus*	ditch beard grass	perennial	non-native
Poaceae	*Polypogon monspeliensis*	rabbitsfoot grass	annual	non-native
Poaceae	*Triticum aestivum*	common wheat	annual	non-native
Poaceae	*Vulpia myuros*	rattail fescue	annual	Cal-IPC Moderate
Polygonaceae	*Polygonum amphibium* var. *emersum*	water smartweed	perennial	native
Polygonaceae	*Polygonum arenastrum*	common knotweed	annual	non-native
Polygonaceae	*Rumex acetosella*	sheep sorrel	perennial	Cal-IPC Limited
Polygonaceae	*Rumex conglomeratus*	dock	perennial	non-native
Polygonaceae	*Rumex crispus*	curly dock	perennial	Cal-IPC Limited
Polygonaceae	*Rumex pulcher*	fiddle dock	perennial	non-native
Polypodiaceae	*Polypodium californicum*	California polypody	perennial	native
Portulacaceae	*Calandrinia ciliata*	red maids	annual	native
Portulacaceae	*Claytonia perfoliata*	miner's lettuce	annual	native
Primulaceae	*Anagallis arvensis*	scarlet pimpernel	annual	non-native
Pteridaceae	*Pentagramma triangularis*	goldback fern	perennial	native
Rhamnaceae	*Rhamnus californica*	coffeeberry	shrub	native
Rosaceae	*Aphanes occidentalis*	ladys mantle	annual	native
Rosaceae	*Cotoneaster pannosa*	cotoneaster	shrub	non-native
Rosaceae	*Fragaria vesca*	woodland strawberry	perennial	native
Rosaceae	*Heteromeles arbutifolia*	toyon	shrub	native
Rosaceae	*Pyracantha angustifolia*	Firethorn	shrub	Cal-IPC Limited
Rosaceae	*Rosa gymnocarpa*	wood rose	shrub	native
Rosaceae	*Rubus discolor*	Himalaya berry	shrub	Cal-IPC High
Rosaceae	*Rubus ulmifolius*	Elm leaf blackberry	shrub	non-native
Rosaceae	*Rubus ursinus*	California blackberry	perennial	native
Rubiaceae	*Galium aparine*	goose grass	annual	native
Rubiaceae	*Galium parisiense*	wall bedstraw	annual	non-native
Rubiaceae	*Galium porrigens* var. *porrigens*	climbing bedstraw	perennial	native
Salicaceae	*Salix babylonica*	weeping willow	tree	non-native
Salicaceae	*Salix laevigata*	red willow	tree	native
Salicaceae	*Salix lasiolepis*	arroyo willow	tree	native
Scrophulariaceae	*Mimulus aurantiacus*	golden sticky	shrub	native

Vascular Plants of City of Santa Cruz Desalination Plant Project Study Area

Family	Scientific Name	Common Name	Life history	Status
		monkeyflower		
Scrophulariaceae	*Scrophularia californica*	California bee plant	perennial	native
Simaroubaceae	*Ailanthus altissimus*	tree of heaven	tree	Cal-IPC Moderate
Solanaceae	*Solanum americanum*	nightshade	annual	native
Taxodiaceae	*Sequoia sempervirens*	coast redwood	tree	horticultural
Tropaeloaceae	*Tropaeolum majus*	garden nasturtium	perennial	non-native
Ulmaceae	*Ulmus americana*	American elm	tree	non-native
Urticaceae	*Hesperocnide tenella*	western dwarf nettle	annual	native
Urticaceae	*Urtica dioica* ssp. h*olosericea*	stinging nettle	perennial	native
Verbenaceae	*Verbena lasiostachys*	California vervain	perennial	native

Appendix E

Representative Photographs of the Study Area

Photograph 1. Ephemeral flow channel from industrial park to willow stand near Natural Bridges Drive and Delaware Avenue industrial park property

Photograph 2. Disturbed, compacted bare ground area of industrial park property with landscaped Monterey cypress in background

Photograph 3. Mowed ruderal wild oat grassland field at industrial park property looking north

Photograph 4. Mowed annual grassland with cypress wood lot on right, looking north from Delaware Avenue

Photograph 5. Elmleaf blackberry bramble in swale with ephemeral drainage (OWUS-16) and with arroyo willow thicket in background

Photograph 6. Monterey cypress woodlot near entrance to Harmony Foods

Photograph 7. Inundated seasonal wetland draining to ditch (OWUS-17) off northeast corner of Harmony Foods building in industrial park area with water smartweed

Photograph 8. Seasonal wetland later in season with flowering nutsedge

Photograph 9. Stormwater culvert draining from Arroyo Seco Creek floodplain to seasonal wetland

Photograph 10. Concrete stormwater drainage ditch below seasonal wetland draining to stormdrain

Photograph 12. Arana Creek at Brookwood Drive

Photograph 13. Arana Creek upstream of Brookwood Drive crossing

Photograph 14. Iceplant landscaping and gravel trail at proposed SI-4 Intake Pump Station at West Cliff Drive and Woodrow Avenue

Photograph 15. Bethany Creek channel near SI-4 Intake Pump Station

Photograph 16. Ruderal wild oat grassland at proposed SI-5 Intake Pump Station at West Cliff Drive and David Way

Photograph 17. Iceplant landscaping at proposed SI-7 Intake Pump Station at West Cliff Drive and Merced Avenue

Photograph 18. Recreational field at proposed SI-16 Intake Pump Station at Pacific Collegiate School

Photograph 19. Equipment yard between railroad tracks at proposed SI-18 Intake Pump Station