

## 4.4 Biological Resources

### 4.4.1 Introduction

This section describes biological resources, with focus on terrestrial and wetland resources, and assesses potential impacts that could occur with implementation of the Russian River Estuary Management Project (Estuary Management Project or proposed project). Fisheries resources are addressed in **Section 4.5, Fisheries**. Terrestrial and wetland resources include terrestrial, wetland, and non-fisheries-related species, sensitive habitats or natural communities, special-status plant and animal species, and protected trees. Impacts on terrestrial and wetland resources are analyzed in accordance with the California Environmental Quality Act (CEQA) significance criteria (CEQA Guidelines, Appendix G). For impacts determined to be either significant or potentially significant, mitigation measures to minimize or avoid these impacts are identified.

### Information Sources and Survey Methodology

The primary sources of information for this analysis are the existing biological resource studies and reports prepared for the Russian River Estuary (Estuary) (Heckel, 1994; Merritt Smith Consulting, 1997, 1998, 1999, 2000; Sonoma County Water Agency [Water Agency; SCWA in references] and Merritt Smith Consulting 2001; SCWA, 2006; SCWA and Stewards of the Coast and Redwoods, 2009). These reports, incorporated by reference, present the methods and results of vegetation classification and mapping, fish and invertebrate sampling, amphibian surveys, and observations of bird and pinniped<sup>1</sup> numbers and behavior, as well as other sampling efforts (e.g., water quality sampling) conducted in the Russian River Estuary.

In addition to the reports listed above, information was obtained from conservation and management plans and planning documents prepared for lands within the project vicinity (Prunuske Chatham, Inc., 2005; California Department of Parks and Recreation [State Parks], 2007), as well as the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service [USFWS], 2010), California Natural Diversity Database (CNDDB) (CDFG, 2010), California Native Plant Society (CNPS) Electronic Inventory (CNPS, 2010), and standard biological literature. Water Agency staff biologists also conducted field surveys in August 2010 to gather additional information on vegetation communities and wildlife habitats.

### Definitions

#### ***Project Area, Estuary Study Area, Project Vicinity***

As previously noted in **Chapter 2.0, Project Description**, the Estuary Study Area comprises the Russian River Estuary (Estuary), which extends approximately seven miles from the mouth of the Russian River upstream to just beyond the confluence of Austin Creek. Although Estuary water levels may backwater as far as Monte Rio when the barrier beach closes the Estuary, as described in **Section 2.2.2** the Estuary is defined as tidally influenced, saline waters extending from the

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<sup>1</sup> Marine mammals including seals, sea lions, fur seals, and walrus.

mouth of the Russian River upstream to the community of Duncans Mills area and below Austin Creek. Therefore, for this analysis, *project area* is defined as the estuarine habitat supporting fish and other wildlife resources within the 9-foot contour line in the lower 7 miles of the Russian River. Included within the *project area* are the lower portions of the several tributaries to the Russian River in the project area, including Willow Creek, Sheephouse Creek, Freezeout Creek, and Austin Creek. This area also includes the mouth of the Russian River at Goat Rock State Beach, as well as the Goat Roack State Beach parking and beach access areas.

The *Estuary Study Area* includes the lands within the project area and immediately adjacent lands within the 14-foot contour line, creating a contiguous area around the project area within which indirect impacts may occur. Under certain closed conditions, the Estuary may backwater to Monte Rio, and as far upstream as Vacation Beach. Where appropriate, discussion of impacts within the Estuary Study Area and the larger *Maximum Backwater Area*, which extends upstream past Austin Creek approximately seven miles to Vacation Beach, is provided (Please refer to **Figure 2-3 in Section 2.0, Project Description**). *Project vicinity* is occasionally used when discussing lands outside the Estuary Study Area, but which may be used by transient wildlife (e.g., birds with large spatial-use patterns).

### ***Wildlife Movement and Nursery Sites***

*Wildlife movement* is defined as movements that generally fall into one of the following three categories: dispersal, seasonal migration, and local movements within a home range<sup>2</sup>. A number of terms have been used in various wildlife movement studies, such as “travel route,” “wildlife corridor”, and “wildlife crossing” to refer to areas in which animals move from one area to another. *Wildlife nursery sites* are areas where animals concentrate for hatching and/or raising young, such rookeries and breeding areas.

### ***Pinniped Haulouts***

Harbor seals (*Phoca vitulina richardsi*), and occasionally California sea lions (*Zalophus californianus*) and northern elephant seals (*Mirounga angustirostris*), collectively referred to as pinnipeds, haulout at the mouth of the Russian River. Haulout is defined is an area where pinnipeds temporarily leave the water for land in between foraging periods to rest and nurse. The Jenner haulout, located at the mouth of the Russian River on Goat Rock State Beach, is considered the largest in Sonoma County. There are also several known haulouts in the Estuary at logs and rock outcroppings.

### ***Special-Status or Sensitive Natural Communities***

*Special-status or sensitive natural communities* are defined as communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status species (as defined below) or their habitat. Sensitive natural communities are usually identified by the California Department of Fish and Game (CDFG) in the CNDDDB and/or by other agencies in local or regional plans, policies

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<sup>2</sup> The extent of area with a defined probability of occurrence of an animal during a specific time period.

or regulations. Furthermore, most types of wetlands and riparian communities are considered special-status or sensitive natural communities due to their limited distribution in California.

### ***Special-Status Plant and Animal Species***

*Special-status plant and animal species* are defined as those species that fall into one or more of the following categories:

1. Officially listed or proposed for listing under the State and/or Federal Endangered Species Acts.
2. State or Federal candidate for possible listing.
3. Species meeting the criteria for listing, even if not currently included on any list, as described in Section 15380 of the CEQA Guidelines.
4. Protected under the Federal Marine Mammal Protection Act.
5. Species considered by the CDFG to be a “Species of Special Concern.”
6. Species that are biological rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.
7. Populations in California that may be on the periphery of a species’ range, but are threatened with extirpation in California.
8. Species closely associated with habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, vernal pools, etc.).
9. Species designated as a special-status, sensitive, or declining species by other state, or federal agencies, or non-governmental organizations.

### ***Sensitive Biological Resources***

*Sensitive biological resources* include special-status or sensitive natural communities, in addition to wetlands and other waters of the U.S. and state as defined by the U.S. Army Corps of Engineers (USACE), CDFG, and the State Water Resources Control Board (SWRCB) (see Section 4.4.3, Regulatory Framework, below), special-status plant and animal species, and protected tree species.

## **4.4.2 Setting**

### **Regional Setting**

As discussed in **Chapter 2, Project Description**, the Estuary is located approximately 60 miles northwest of the San Francisco Bay, near the community of Jenner, Sonoma County, California (see **Figure 2-1** and **Figure 2-2**). The Russian River Watershed encompasses a 1,485 square mile drainage basin, with numerous tributary streams feeding into the main river. The headwaters of the Russian River are in the Potter Valley area of Mendocino County, with the river joining the

Pacific Ocean 110 miles downstream, near Jenner. Warm summers and mild winters characterize the temperate Mediterranean climate of the Russian River Watershed. The watershed landscape generally consists of a series of valleys surrounded by mountain ranges, with elevations ranging from 4,480 feet to sea level. Vegetation communities and wildlife habitats within the Russian River Watershed include a mosaic of herbaceous, shrub, and tree dominated types, as well as aquatic and developed types. Broad vegetative community categories within the watershed include scrubs and chaparrals, oak savannas and woodlands, coniferous forests and woodlands, grasslands, and fresh and saline emergent wetlands (CDFG, 2008). Historically, these communities provided habitat for a rich diversity of terrestrial and wetland plant and animal species. Although many of the species that historically occupied the watershed are still present, some, such as yellow-billed cuckoo (*Coccyzus americanus*) and spotted skunk (*Spilogale gracilis*), are now non-existent or extremely rare, or have had their numbers substantially reduced (SCWA and Circuit Rider Productions, 1998). Such loss or reduction in species diversity has been attributed to habitat loss, ocean conditions, and a variety of other complex factors (SCWA and Circuit Rider Productions, 1998).

## Local Setting

The Estuary extends from the mouth of the Russian River at Goat Rock State Beach upstream approximately seven miles between the community of Duncans Mills and Austin Creek. The Estuary is as narrow as 75 feet near the upstream end and gradually widens to over 249 feet near the mouth, and water depths vary but generally increase closer to the mouth (SCWA 2006). As illustrated in **Figure 2-3 in Chapter 2.0, Project Description**, the Estuary is divided into three reaches, including the lower reach (sandbar to upper Penny Island), middle reach (upper Penny Island to Sheephouse Creek), and upper reach (Sheephouse Creek to below Austin Creek). The general climate pattern of this area is dominated by the westerly flow of marine air from the ocean, and is characterized by rainy winters with some clear sunny days and dry, cool summers with many foggy or overcast days. The general landscape in the vicinity of the Estuary is characterized by large, rolling hills and coastal terraces that slope down toward the ocean. As described in more detail below, the Estuary and surrounding area support various vegetation communities and wildlife habitats and plant and animal species.

## Vegetation Communities and Wildlife Habitats

The vegetation communities identified in the Estuary Study Area are broadly classified as general units (e.g., beach and dune, coastal scrub, grassland, etc.). However, whenever possible, a natural community described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986) and vegetation alliance or association described in *A Manual of California Vegetation* (Sawyer et al., 2009) is identified within these broader categories based on descriptions provided in existing biological resources studies and observations by Water Agency staff, as both classification systems are currently recognized by the CDFG (identified below by their California name and numeric code). In some cases, it was not possible to apply Sawyer et al. (2009) classification because the level of detail required to do so was beyond the scale of the studies that are part of this analysis. Also, some of the general units were identified as habitats because they are defined as much by their physical conditions as by their plant species

composition or lack of plants (i.e., beach and dune, seasonal and perennial waters and wetlands). The Water Agency recently mapped all vegetation communities within and adjacent to the Estuary, up to 14 feet in elevation. The vegetation communities and wildlife habitats, and their location with the Estuary Study Area are described below and illustrated in **Figures 4.4-1 – 4.4-5**.

### **Beach and Dune**

Extensive beach and dune communities occur at the mouth of the Russian River near its confluence with the Pacific Ocean. These communities are generally dynamic, high-energy habitats that are shaped and influenced by multiple and interdependent abiotic (non-living) factors, such as sand movement, salt spray, and wind speed (Barbour et al. 2007). Beach habitat lies at the interface between terrestrial and marine communities. Because of intense wave action, rapid rate of sand movement, strong winds, and presence of sea water, as well as a number of other abiotic factors, plants are generally unable to successfully colonize this habitat, particularly directly along the shoreline and, therefore, little or no vegetation is present within the beach habitat in the Estuary Study Area.

Coastal dune habitat occurs further away from the immediate shoreline and is more protected from the effects of sand movement, wind, and salt spray. This habitat may also have more abundant groundwater (Holland, 1986). Such conditions allows for some patches of prostrate, herbaceous plants to establish. In the Estuary Study Area, this habitat is generally characterized by virtually mono-specific stands of European beach grass (*Ammophila arenaria*) and stands comprised of yellow sand-verbena (*Abronia latifolia*), sea rocket (*Cakile maritima*), beach morning-glory (*Calystegia soldanella*), beach bursage (*Ambrosia chamissonis*), coastal buckwheat (*Eriogonum latifolium*), dune sagebrush (*Artemisia pycnocephala*), seashore bluegrass (*Poa douglasii*), seaside woolly sunflower (*Eriophyllum staechadifolium*), yellow bush lupine (*Lupinus arboreus*), and beach primrose (*Camissonia cheiranthifolia*).

CDFG-recognized natural communities and/or vegetation alliances present within the Estuary Study Area that most closely match the beach and dune habitats broadly described above include Active Coastal Dunes (21.010.00), Coastal Foredues (21.020.00), and Northern Dune Scrub (21.100.08)<sup>3</sup>.

Compared to other habitats, beaches and dunes may appear to support few animal species. However, these communities are complex habitats and support many species of animals unique to shorelines, several of which are too small to notice. Successful animal inhabitants of beaches and dunes include benthic invertebrates that live between sand grains and annelid worms that burrow into the sand. Various bivalve and snail species, as well as many species of small crustaceans, also inhabit these habitats. Many bird species, as well as many species of mammals, use beaches and dunes as feeding and resting areas. Shorebirds and wading birds feed on prey that either wash out of the sand due to wave action, or come close enough to the shore to be captured. Others, prefer to nest or rest on bare sands within these habitats. Marine mammals, such as harbor seal, also give birth and molt here.

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<sup>3</sup> CDFG-recognized natural communities and/or vegetation alliances referenced by general type and numerical coding system.

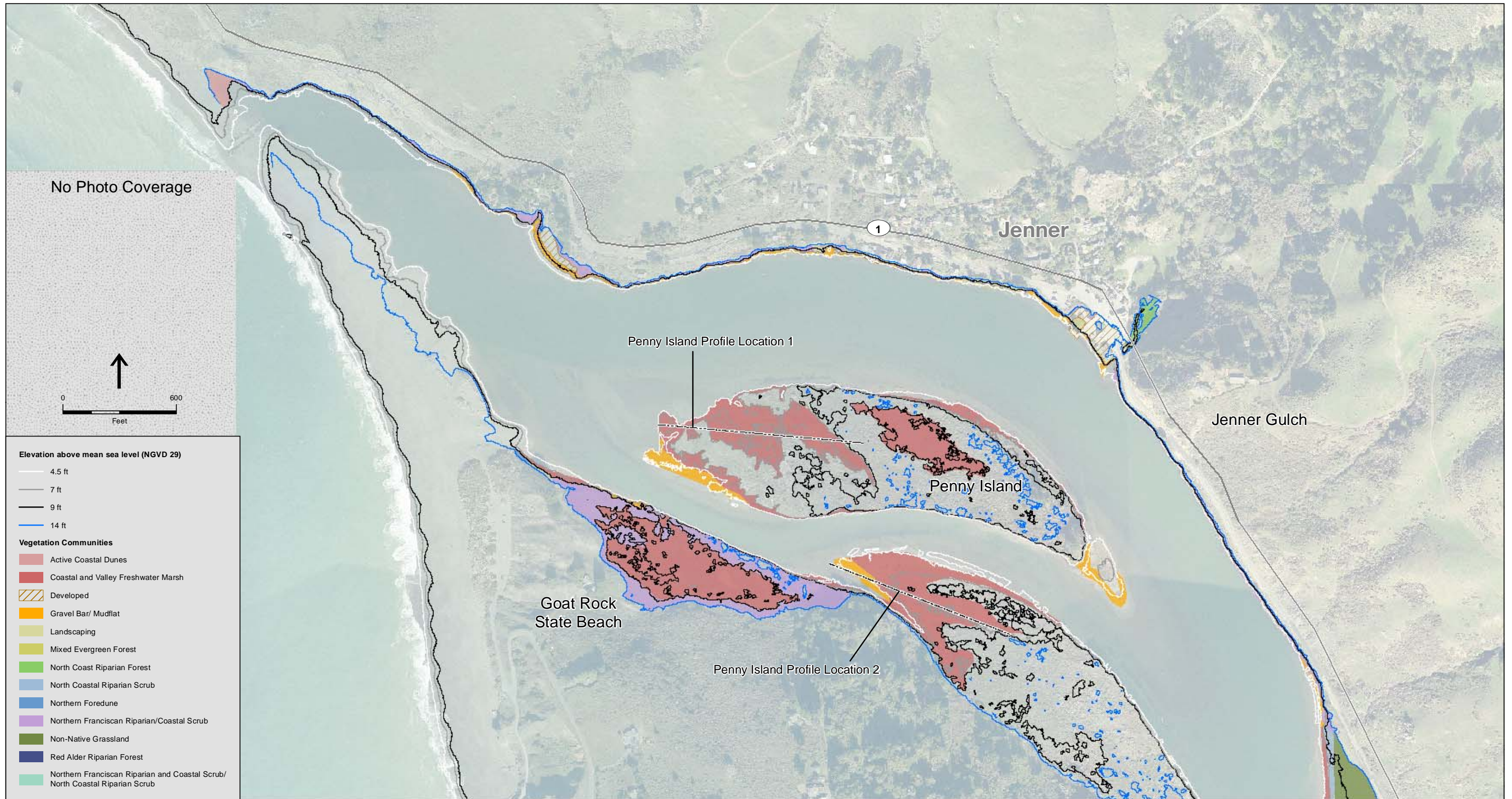
### Coastal Scrub

Although coastal scrub is found in both northern and southern California, the form and plant species composition varies greatly between the two regions (Barbour et al. 2007). This variation is mainly a result of the shift from cooler-moister climates in the north to warmer-drier climates in the south. Coastal scrub occupies lands throughout the Estuary Study Area, particularly within the vicinity of the lower and middle reaches of the Estuary. This community is generally characterized by stands of coyote brush (*Baccharis pilularis*) and a somewhat indistinct assemblage of shrub and herbaceous understories. Understory species composition is influenced by light penetration through the canopy, as canopies vary from dense and closed with sparse understories to discontinuous with dense herbaceous understories. Common associated species include grasses and forbs, such as those found in the surrounding grassland communities (see below), as well as shrub species, such as California coffeeberry (*Rhamnus californicus*), California blackberry (*Rubus ursinus*), sticky monkeyflower (*Mimulus aurantiacus*), and poison oak (*Toxicodendron diversilobum*). This coastal scrub community most closely matches the Coastal Scrub (32.000.00) natural community and the Coyote brush scrub (32.060.00) vegetation alliance recognized by CDFG.

Animal species inhabiting coastal scrub habitats are predominantly those that have adapted to dry conditions, such as insects, spiders, and reptiles. There are also many birds and mammals that are associated with this habitat, but most are not restricted to coastal scrub and occur in the surrounding habitats. Typical mammals found in coastal scrub habitat include species such as black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and striped skunk (*Mephitis mephitis*). Resident birds include such species as Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), and California towhee (*Pipilo maculatus*). Coastal scrub habitat also provides year-round hunting grounds for many birds of prey, such as red-tailed hawk (*Buteo jamaicensis*) and turkey vulture (*Cathartes aura*). Reptiles such as western fence lizard (*Sceloporus occidentalis*), and western rattlesnake (*Crotalus viridis*) are also typically found in this habitat.

### Grassland

Grassland communities, including those dominated by stands of non-native species, occupy lands throughout the Estuary Study Area. These grasslands occur primarily as distinct communities, but also as understory within openings in the various other communities present in the Estuary Study Area. In areas that have been altered, particularly along the Russian River for the purpose of conversion to various land uses (e.g., farming, grazing, and logging), the grassland community is characterized by stands comprised of primarily non-native grass species, such as wild oat (*Avena* spp.), brome (*Bromus* spp.), Italian ryegrass (*Lolium multiflorum*), velvet grass (*Holcus lanatus*), and canarygrass (*Phalaris aquatica*), and forb species, such as wild radish (*Raphanus sativa*), bull thistle (*Cirsium vulgare*), milk thistle (*Silybum marianum*), English plantain (*Plantago lanceolata*), and filaree (*Erodium* spp.). In addition to the non-native forbs mentioned above, native species may form a small percentage of the herbaceous cover within these stands, including grasses such as purple needlegrass (*Nassella pulchra*), Pacific reedgrass (*calamagrostis nutkaensis*), California oatgrass (*Danthonia californica*), tufted hairgrass (*Deschampsia cespitosa*), and forbs such as Douglas iris (*Iris douglasiana*), cow parsnip (*Heracleum lanatum*), yarrow (*Achillea millefolium*), California buttercup (*Ranunculus californicus*), California poppy (*Eschscholzia californica*), Pacific cinquefoil (*Potentilla anserina* ssp. *pacifica*), seaside daisy (*Erigeron*



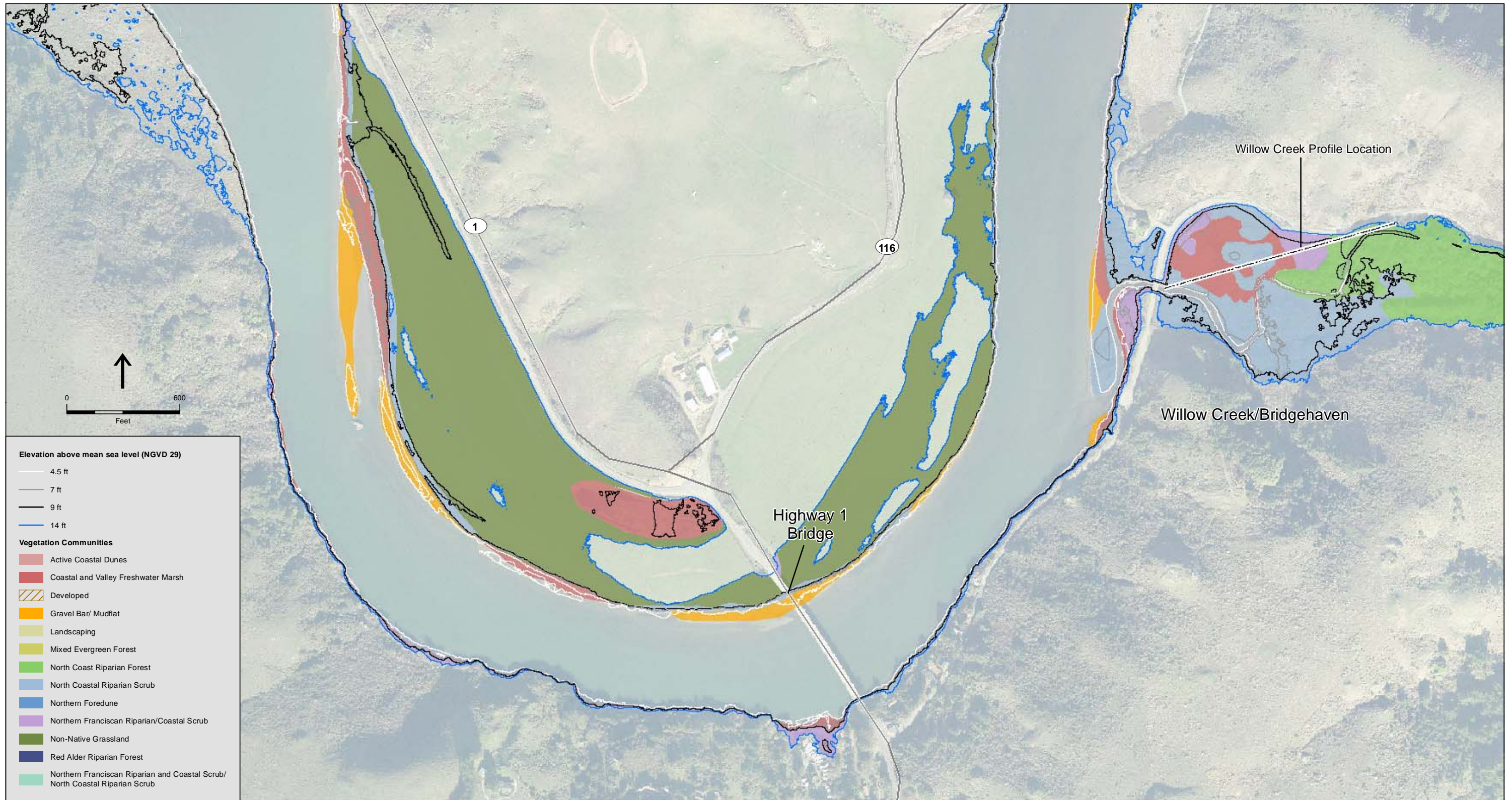
SOURCE: EDS, 2009; SCWA, 2010; (aerial photo, 2008)

Note: Elevations show for display purposes only



Russian River Estuary Management Project. 207734.01

**Figure 4.4-1**  
Estuary Study Area: Vegetation Communities  
Within the 14 foot elevation (NGVD) Study Area



SOURCE: EDS, 2009; SCWA, 2010; (aerial photo, 2008)

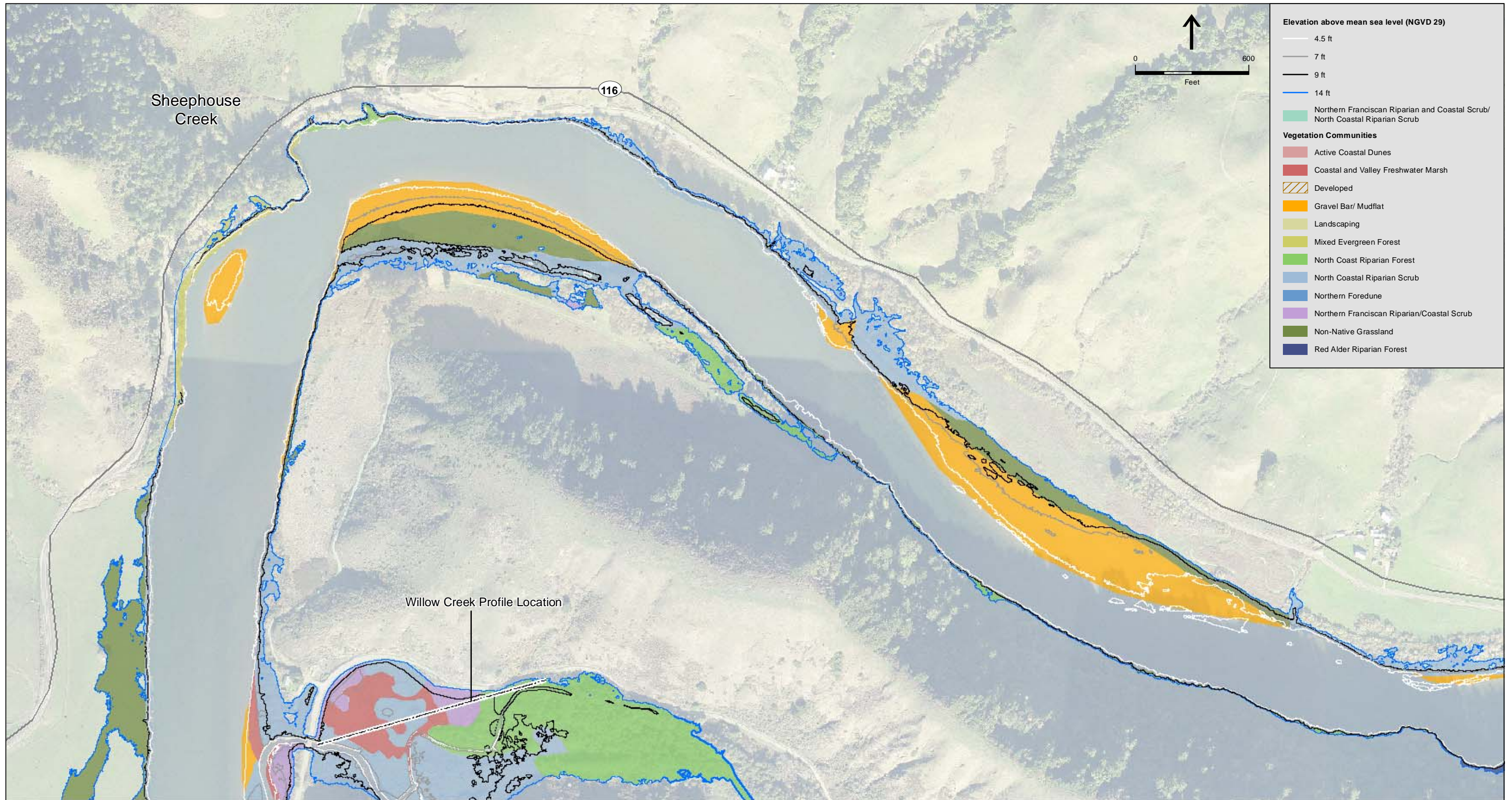
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Russian River Estuary Management Project. 207734.01

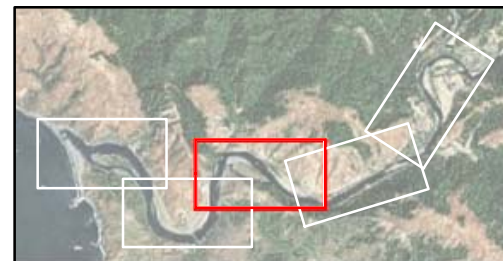
**Figure 4.4-2**  
Estuary Study Area: Vegetation Communities  
Within the 14 foot elevation (NGVD) Study Area





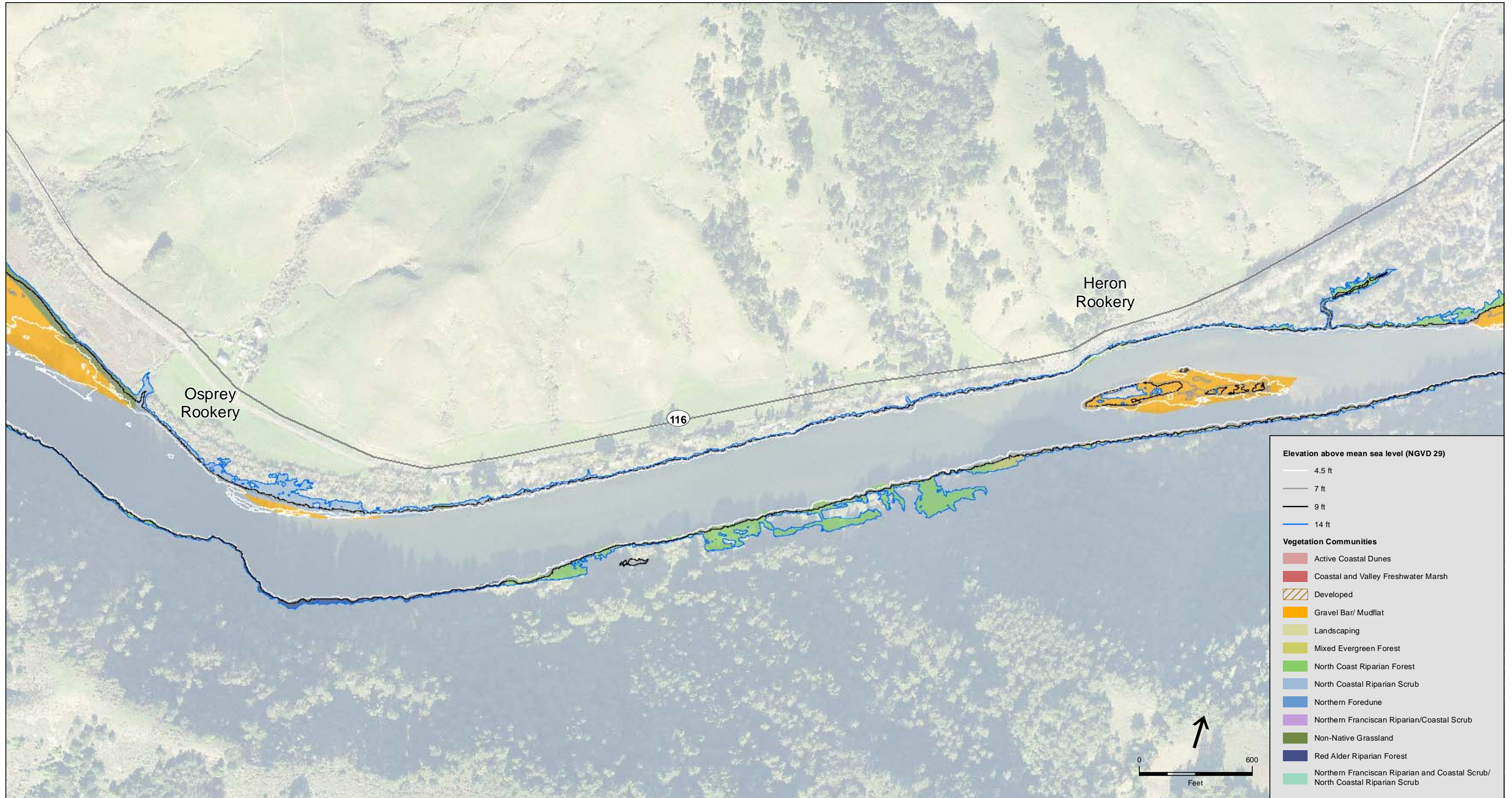
SOURCE: EDS, 2009; SCWA, 2010; (aerial photo, 2008)

Note: Elevations show for display purposes only



Russian River Estuary Management Project. 207734.01

**Figure 4.4-3**  
Estuary Study Area: Vegetation Communities  
Within the 14 foot elevation (NGVD) Study Area



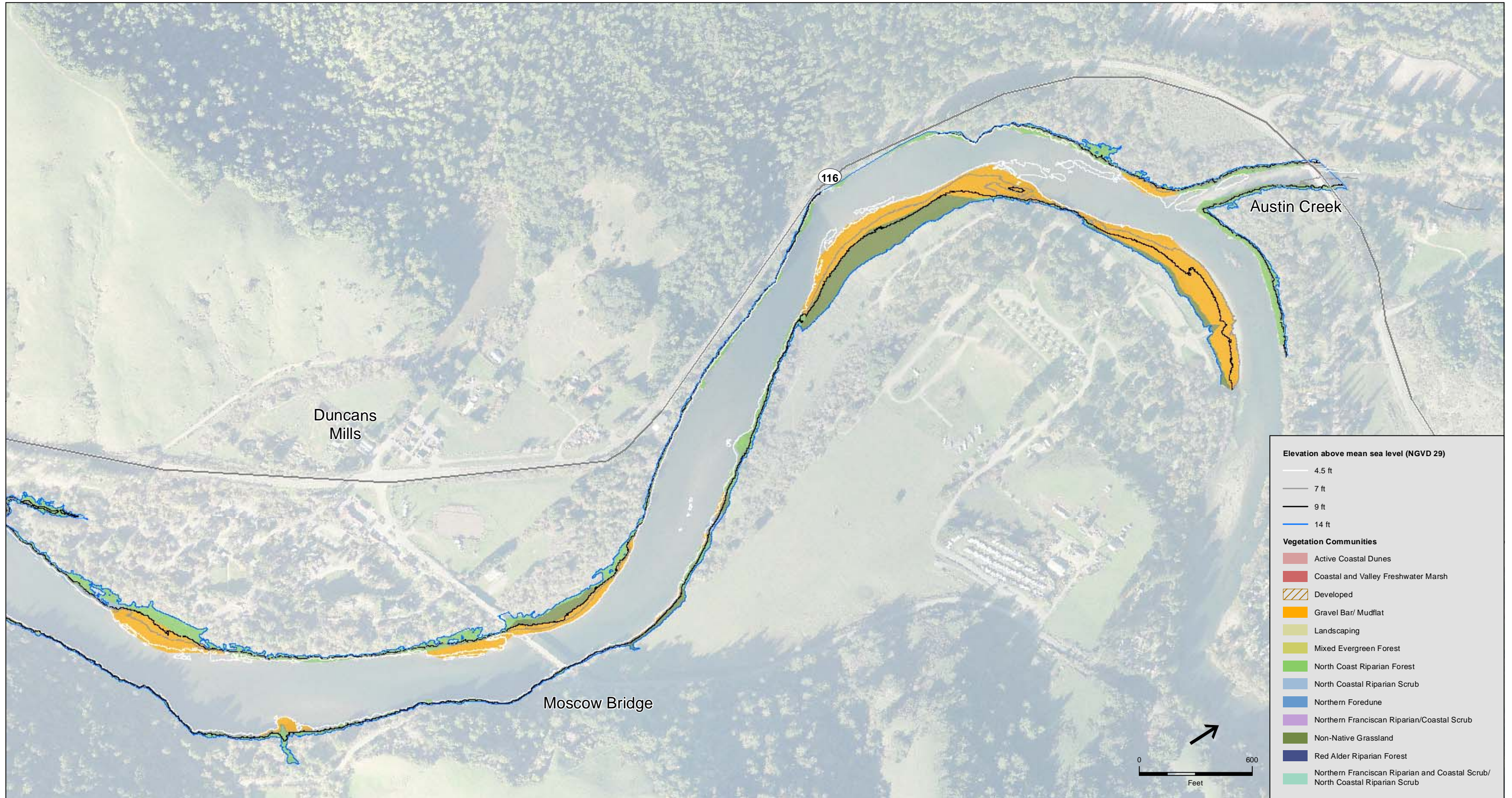
SOURCE: EDS, 2009; SCWA, 2010; (aerial photo, 2008)

Note: Elevations show for display purposes only



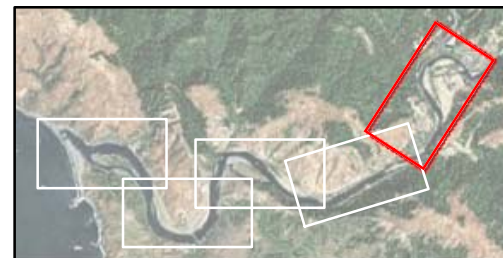
Russian River Estuary Management Project. 207734.01

**Figure 4.4-4**  
 Estuary Study Area: Vegetation Communities  
 Within the 14 foot elevation (NGVD) Study Area



SOURCE: EDS, 2009; SCWA, 2010; (aerial photo, 2008)

Note: Elevations show for display purposes only



Russian River Estuary Management Project. 207734.01

**Figure 4.4-5**  
 Estuary Study Area: Vegetation Communities  
 Within the 14 foot elevation (NGVD) Study Area

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*glaucus*), beach strawberry (*Fragaria chiloense*), and many-colored lupine (*Lupinus variicolor*). This grassland community most closely matches the California Annual Grassland (42.040.00) natural community recognized by the CDFG.

Animal species that typically inhabit grasslands are those that have adapted to dry conditions. These are grazing species, burrowing species, and their predators; insects and spiders are abundant. Some of these species forage in grasslands and retreat to the protective cover of the surrounding habitats (e.g., coastal scrub, upland forest) for shelter and nesting, while others disperse through this habitat. Animal species typically found in annual grasslands habitats include mammals, such as black-tailed jackrabbit, California ground squirrel (*Spermophilus beecheyi*), coyote, deer mouse (*Peromyscus maniculatus*), and mule deer (*Odocoileus hemionus*), and birds, such as, golden eagle (*Aquila chrysaetos*), red-tailed hawk, and western meadowlark (*Sturnella neglecta*). Reptiles are also frequently found within annual grassland habitat, such as gopher snake (*Pituophis catenifer*), western rattlesnake, and western fence lizard. In addition, grassland habitats that border wetlands provide habitat for amphibians, such as Sierran treefrog (*Pseudacris sierra*)<sup>4</sup> and western toad (*Bufo boreas*).

### Seasonal and Perennial Waters and Wetlands

In addition to the perennial open water habitat and gravel bars and mudflats of the Russian River, which is addressed in **Section 4.5, Fisheries**, several streams and wetlands are located throughout the Estuary Study Area. The streams include unnamed and named tributary drainages to the Russian River that are seasonal and perennial in nature. Coastal scrub, grassland, riparian forest and woodland, and upland forest and woodland communities border these streams. Most of the streams originate at some elevated source, such as a seepage area, and flow downward to higher order streams or wetlands in the valley bottoms.

Freshwater marsh is present within the Estuary Study Area in shallow, standing, or slow-moving water at the edge of the river, as well as the tributary streams. Large expanses of freshwater marsh are located in and around Penny Island and at the mouth of Willow Creek near its confluence with the Russian River. The freshwater marsh habitat is dominated by stands of perennial, emergent plants, such as bulrush (*Schoenoplectus* spp.), rushes (*Juncus* spp.), sedges (*Carex* spp.), and cattails (*Typha* spp.). Other smaller hydrophytic species, such as water plantain (*Alisma platago-aquatica*), horsetails (*Equisetum* spp.), water mudwort (*Limosella aquatica*), and whorled marsh pennywort (*Hydrocotyle verticillata*) are also present. The freshwater marsh habitat described here most closely matches the Coastal and Valley Freshwater Marsh (52.100.01) natural community recognized by CDFG.

In addition to the freshwater marsh habitat mentioned above, seasonal wetlands may be present in the various vegetation communities within the Estuary Study Area in the form of depressions, seeps, and swales. These features typically dry before the summer, and support wetland-adapted plants, such as annual broad-leaf plants, rushes, and sedges.

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<sup>4</sup> Sierran treefrog (also know as Pacific chorus frog and Pacific tree frog) could occur within wetlands bordering grassland habitats; grasslands within the project area are within the approximate range of the species.

The habitat value of seasonal and perennial waters and wetlands is generally considered to be high, due to the available surface water, abundance of insects, algae, and vascular plant forage, and protective cover of emergent vegetation when present. Although such habitats are usually too wet to support mammals, various birds, reptiles, and amphibians are often abundant. Animal species typically found in seasonal and perennial water and wetland habitats include birds, such as great blue heron (*Ardea herodias*), mallard (*Anas platyrhynchos*), marsh wren (*Cistothorus palustris*), and red-winged blackbird (*Agelaius phoeniceus*), reptiles, such as common garter snake (*Thamnophis sirtalis*), and amphibians, such as California newt (*Taricha torosa*), Sierran treefrog, and western toad.

### **Riparian Forest and Woodland**

Warner and Hendrix (1984) generally define riparian vegetation as that which occupies lands adjacent to streams, creeks, and rivers, and is the interface between terrestrial and aquatic communities with soil moisture sufficiently in excess of that otherwise available through local precipitation to support the growth of mesic plants. The composition of riparian vegetation is greatly influenced by the physical processes of the adjacent aquatic habitat; species that are found in the active channel are usually not the same as those found on the floodplain.

In active channel areas (i.e., areas which are regularly flooded), plants are adapted to high levels of flood disturbance, often with substantial velocity and scour, during the winter, while tolerating the dry conditions of the gravel bars during the summer. Species occupying such areas within the Estuary Study Area include alder (*Alnus* spp.), willow (*Salix* spp.), stream dogwood (*Cornus sericea* var. *sericea*), mulefat (*Baccharis salicifolia*), and Pacific wax myrtle (*Myrica californica*). The riparian community in the active channel also supports herbaceous species similar to those mentioned above in the freshwater marsh description.

Floodplains are at higher elevations than the active channel and characterized by many more species and greater substantial structure (e.g., canopy layer, shrub layer, vine layer, and herbaceous layer) than the active channel. Such plants are adapted to flood scour and do not require as much summer moisture. Species occupying the floodplains within the Estuary Study Area include California bay laurel (*Umbellularia californica*), coast redwood (*Sequoia sempervrens*), poison oak (*Toxicodendron diversilobum*), and snowberry (*Symphoricarposa albus* var. *laevigatus*).

The CDFG-recognized natural community and vegetation alliance present within the Estuary Study Area that most closely match the riparian communities broadly described above include North Coast Riparian Scrub (63.901.00), Mixed Riparian Forest and Woodland (61.900.00) and Red Alder Riparian Forest (61.410.03).

Riparian habitats are extremely productive and have diverse values for animal species. The availability of water, the diversity and abundance of plant life, and the complex vegetation structure provide a number of animal species with food and water, cover, and movement corridor, as well as breeding and resting sites. Animals typically found in riparian habitats include birds, such as Bewick's wren (*Thryomanes bewickii*), common yellow throat (*Geothlypis trichas*), and wrentit (*Chamaea fasciata*), mammals, such as brush rabbit (*Sylvilagus bachmani*), deer mice, dusky footed woodrat

(*Neotoma fuscipes*), and raccoon (*Procyon lotor*), and amphibians, such as California slender salamander (*Batrachoseps attenuatus*) and Sierran treefrog.

### **Upland Forest**

Upland forest communities occupy lands throughout the Estuary Study Area in a mosaic-like pattern and are generally characterized by dense to open canopy stands comprised of Douglas fir (*Pseudotsuga menziesii*), coast redwood, or coast live oak (*Quercus agrifolia*) as the dominant tree species. When present, common understory plants in Douglas-fir forests include species such as sword fern (*Polystichum munitum*), pink flowering currant (*Ribes sanguineum*), California figwort (*Scrophularia californica*), coyote brush, and poison oak. California huckleberry (*Vaccinium ovatum*), redwood sorrel (*Oxalis oregona*), strawberry (*Fragaria vesca*), and whipplevine (*Whipplea modesta*) are common understory plants in coast redwood forests.

The CDFG-recognized natural communities and/or vegetation alliances present within the Estuary Study Area that most closely match the upland forest communities broadly described above include Upland Douglas-Fir Forest (82.200.68), Upland Redwood Forest (86.100.15), and Mixed Evergreen Forest (82.000.01).

Upland forests support a high abundance of animal species. Birds typical of these habitats include species such as acorn woodpecker (*Melanerpes formicivorus*), ash-throated flycatcher (*Myiarchus cinerascens*), varied thrush (*Ixoreus naevius*), northern flicker (*Colaptes auratus*), and western scrub jay (*Aphelocoma californica*). California ground squirrel, mule deer, and western gray squirrel (*Sciurus griseus*) also use these habitats, as well as many species of reptiles and amphibians.

### **Developed and Landscaped**

Developed and landscaped areas do not consist of one type of habitat. Examples of unique habitats within developed and landscaped areas include campgrounds, residential yards, and business and parking areas. In general, developed and landscaped areas are those that have been transformed to better meet the need of humans. In the Estuary Study Area, developed and landscaped areas include roadways, campgrounds, and residences and businesses, mostly associated with the communities of Jenner and Duncans Mills.

Given the extent of the developed and landscaped areas within the Estuary Study Area and the connectivity with natural habitats, many of the animal species using these habitats likely also forage, nest, roost, and disperse through the developed and landscaped areas.

### **Wildlife Movement and Nursery Sites**

Due to the location and diversity of the vegetation communities and habitats present, the Estuary Study Area supports various types of wildlife movement (i.e., dispersal, seasonal migration, and local movements within home ranges). Terrestrial mammals, such as mule deer, use the cover of the riparian forests and woodlands for protection from predators as they move between foraging areas. Similarly, amphibians and reptiles use the protective cover of this habitat as they disperse

from their aquatic breeding sites. Migratory waterfowl use the waters and wetlands for their lush food supplies during their seasonal migration.

In addition to facilitating wildlife movement, the vegetation communities and habitats present in the Estuary Study Area support wildlife nursery sites. A great blue heron (*Ardea herodias*) rookery is present within the upper reach of the Estuary along the Russian River, roughly one mile downstream of Duncans Mills (CDFG, 2010). Also, the beach habitat at the mouth of the Russian River is a pupping site for harbor seals (SCWA, 2009). See **Section 3.0, Project Background and Environmental Setting** for more detail regarding seal pupping activity within the Estuary Study Area.

### ***Pinniped Haulouts***

Harbor seals haulout at the mouth of the Russian River. California sea lions and northern elephant seals are occasionally observed. The Jenner haulout,<sup>5</sup> located at the mouth of the Russian River on Goat Rock State Beach, is considered the largest in Sonoma County (SCWA, 2009a). There are also several known haulouts in the Estuary at logs and rock outcroppings (**Figure 4.4-6**). The first known records for the harbor seal haulout were established in 1972 and their numbers at the site have steadily grown (Hanan and Beeson 1994, Mortenson and Twohy 1994 in SCWA 2009a).

Historically, pinniped monitoring at the Jenner haulout has been conducted by Stewards of the Coast and Redwoods (Stewards) volunteers, California State Parks volunteer docents, local individuals, and Water Agency staff. The Seal Watch Public Education Program was established in 1985 to provide public outreach and volunteer at the river mouth to encourage visitors to comply with the 50-foot buffer around the harbor. Today, Stewards (California State Parks Volunteer Docents) volunteers assist the public in safeguarding the harbor seal haulout. These volunteers, either independently or under the guidance of the Stewards, have recorded the seal population, as well as recreational visitors, present on the beach on weekends from March through Labor Day. Dr. Joe Mortenson began his ongoing monthly seal counts at the Jenner haulout and Bodega Rock in 1987, with nearby haulouts added to the counts thereafter. Ms. Elinor Twohy began daily counts of seals and people at the Jenner haulout, including photographing the haulout, in 1989. Her daily counts are taken at different times on successive days to determine if there were diurnal patterns in use of the haulout (Mortenson and Twohy 1993 in SCWA 2009a).

**Figure 4.4-7** summarizes the average daily seal counts recorded by Seal Watch Program volunteers, by month, from 1993 to 2005 (DeAngelis in SCWA 2010a). As demonstrated by the data, the number of harbor seals at the haulout varies throughout the year. Data demonstrates the number of harbor seals at the Jenner haulout peaks in the late winter (February and March); at other harbor seal haulouts, peaks are typically observed during the pupping and molting season (spring and summer). Observations indicate pups were usually first seen at the Jenner haulout in late March, with maximum counts in May. In this study, pups were not counted separately from

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<sup>5</sup> Haulout is defined as an area where pinnipeds (harbor seals) temporarily leave the water for land in between foraging periods.



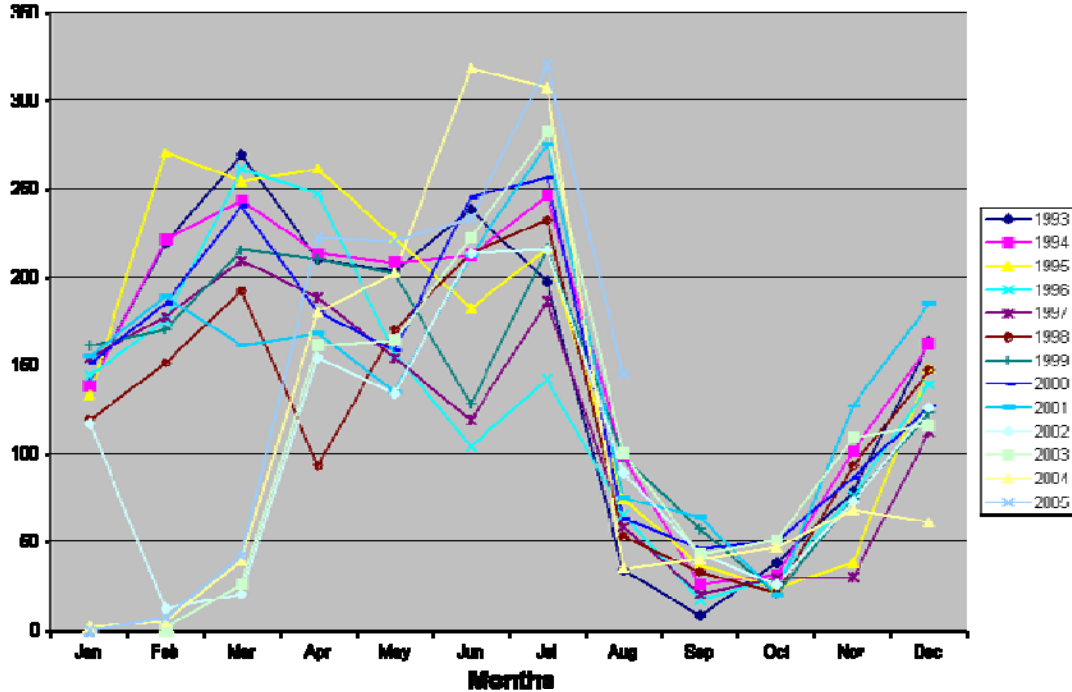


SOURCE: SCWA; Mortenson, 2008.

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**Figure 4.4-6**  
Pinniped Haulouts for the Russian River  
Estuary Management Project in the  
Russian River Estuary and Surrounds

**Average daily numbers of seals at Goat Rock Beach 1993  
 2005**



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SOURCE: DeAngelis in SCWA, 2010a

**Figure 4.4-7**  
 Average Daily Numbers of Seals 1993 to 2005

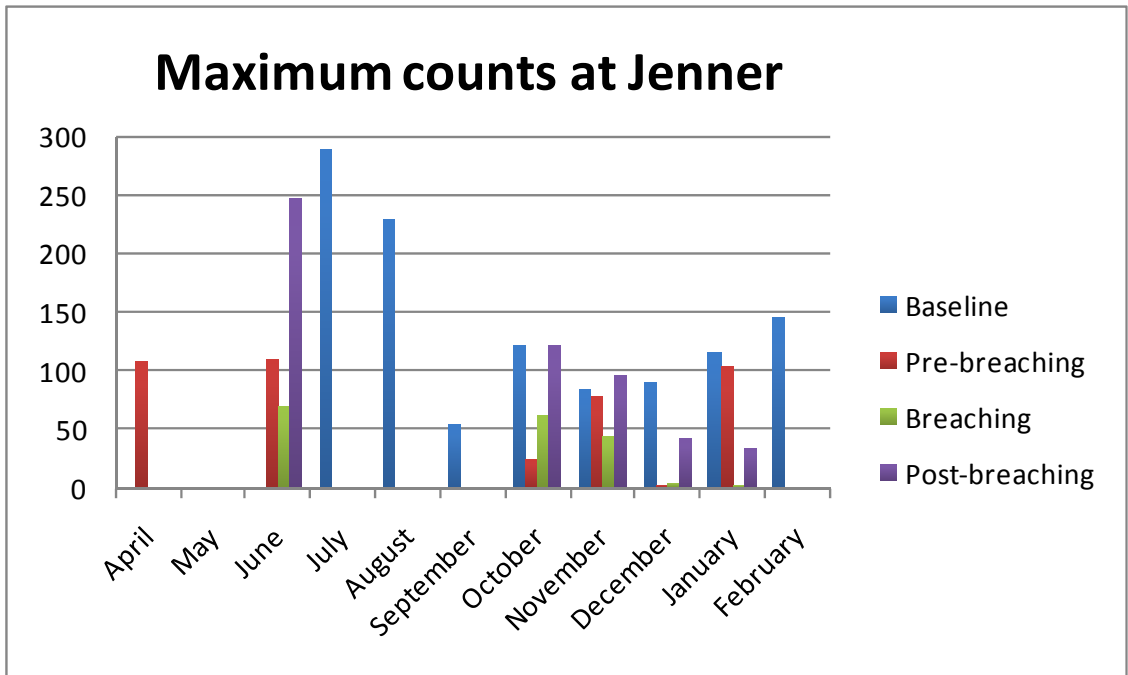
other age-classes at the haulout after August due to the difficulty in discriminating pups from small yearlings (Mortenson, 1996 in SCWA 2009a). This corresponds with the peaks observed at Point Reyes, where the first pups are born around the first to second week of March and the peak is the last week of April to early May (Mortenson and Allen in SCWA 2009a).

During the months from September to November, the number of harbor seals hauling out at Jenner declines significantly. The harbor seals normally return in greater numbers during the late winter (February and March) or early spring (April), and remain at the river mouth in great numbers until the end of July. Although the number of harbor seals at this haulout has fluctuated from year to year, average counts show a steady rise in population trend. During recent State censuses, the number of harbor seals observed during the single-day summer counts has continued to steadily increase above the baseline study, with nearly 350 seals observed in 1993 (Mortenson and Twohy 1994 in SCWA 2009a) and 315 in 2004, although over 500 animals have been recorded (Mortenson and Twohy 1994 in SCWA 2009a).

Data results indicate that the Jenner haulout is atypical in terms of the time of day seal count peaks are observed. At other harbor seal haulouts, daily peaks are typically observed at mid-afternoon low tides regardless of the season. Although daily harbor seal numbers at the Jenner haulout do peak at midday during the winter (November 16 to March 30) and in the

pupping and molting seasons (April/May and June/July/August, respectively), a midday peak is not observed during the fall (Mortenson and Twohy 1994 in SCWA 2009a).

The Water Agency monitored biological and water quality conditions before, during, and after artificial breaching events from 1996 to 2000. Pinniped responses to the Water Agency’s artificial breaching activities were extensively monitored during that time period (Merritt-Smith Consulting 1997, 1998, 1999, 2000; SCWA and Merritt-Smith Consulting, 2001). **Figure 4.4-8** presents the average numbers of pinnipeds at the Jenner haulout before and after an artificial breach. **Table 4.4-1** shows the average number of harbor seals observed at the Jenner haulout during bar-closed conditions by month during monitoring of artificial breaching activities from 1996 to 2000.



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SOURCE: SCWA, 2010a

**Figure 4.4-8**  
 Maximum Harbor Seal Counts at Jenner Haulout  
 Pre- and Post-Breaching:1996 to 2000

**TABLE 4.4-1**  
**AVERAGE NUMBER OF HARBOR SEALS OBSERVED AT THE JENNER HAULOUT, GOAT ROCK STATE BEACH, CLOSED CONDITIONS, BY MONTH DURING MONITORING OF ARTIFICIAL BREACHING ACTIVITIES FROM 1996 TO 2000**

April	May	June	July	August	September	October	November
173	103	100	75	17	5	22	11

SOURCE: Merritt Smith Consulting 1997, 1998, 1999 and 2000; SCWA and Merritt Smith Consulting, 2001.

In all five years of monitoring, the number of pinnipeds hauled out at the mouth of the Estuary declined when the barrier beach was closed and increased soon after it was breached (SCWA and Merritt Smith Consulting 2001). Seals at the haulout responded most negatively to human disturbances on the beach (typically beach visitors approaching the haulout). When approaching the breaching location, Water Agency crews walked ahead of the bulldozer to ensure that no pinnipeds were harmed on the beach. Most pinnipeds usually abandoned the haulout prior to the bulldozer reaching the breaching location due to disturbance from visitors prior to crews arriving onsite. The remaining pinnipeds typically moved to the water as the crew approached the breaching location ahead of the heavy equipment. Once breaching was completed, equipment and crews left the beach and pinnipeds returned to the haulout within a day.

Trends in data indicate that the number of seals present at the Jenner haulout declined during closed barrier beach conditions (Mortenson 1996 in SCWA 2009a). The Water Agency's pinniped monitoring from 1996 to 2000 focused on the barrier beach artificial breaching activities and its effects on the Jenner haulout. Harbor seal counts and disturbances were recorded one to two days prior to breaching, the day of breaching, and the day after breaching (Merritt Smith Consulting 1997, 1998, 1999, 2000; SCWA and Merritt Smith Consulting, 2001). In each year, the trend observed was that harbor seal numbers declined during a beach closure (occasionally, the numbers rose again and then declined again during a closure) and increased the day following an artificial breaching event. Observations of disturbances to the Jenner haulout show that the numbers of seals at the haulout (during barrier beach closures) were higher in the morning than later in the day. While seals often alerted to distant sources of disturbance, such as the sound of trucks braking on Highway 1 nearby, seals primarily fled the haulout as a result of disturbances on the beach. The number of harbor seals declined during the day due to disturbances by people on the beach or kayakers/boaters approaching the haulout. Disturbances on the beach typically increased as the morning progressed (greater number of visitors on the beach in the late mornings and early afternoons).

The current pinniped monitoring program includes haulouts at North Jenner and Odin Cove, to the north, and Pocked Rock, Kabemali, and Rock Point, to the south, and Jenner logs, Patty's Rock, and Chalanchawi in the Estuary to define possible relationships between the use of the Jenner haulout and other nearby locations. **Figures 4.4-9** and **4.4-10** present previous data comparison between average seal counts between the Jenner haulout, other coastal haulouts, and river haulouts.

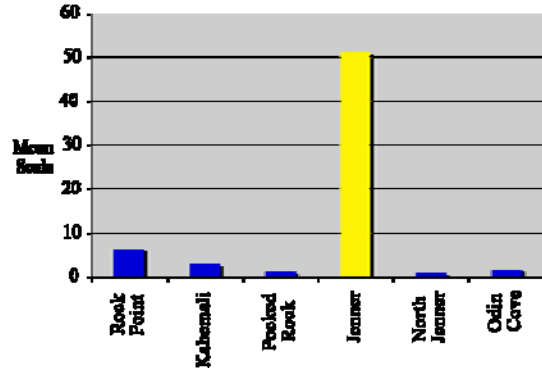
### ***Special-Status or Sensitive Natural Communities***

The CNDDDB was searched by U.S. Geological Survey (USGS) 7.5-minute quadrangles for special-status or sensitive natural community occurrences recorded in the project vicinity. The quadrangles used for the proposed project included Arched Rock, Duncans Mills, Camp Mecker, Cazadero, Guerneville, Fort Ross, Bodega Head, and Valley Ford. Based on the search of these quadrangles, the following four sensitive natural communities are recorded in the project vicinity: Coastal Terrace Prairie, Northern Coastal Salt Marsh, Coastal Brackish Marsh, and Coastal and Valley Freshwater Marsh (CDFG, 2010). The CNDDDB includes only the later two communities, Coastal Brackish Marsh and Coastal and Valley Freshwater Marsh, within the Estuary Study Area. However, Coastal and Valley Freshwater Marsh is the only sensitive community included in the



SOURCE: Stewards and SCWA, 2010a.

**Figure 4.4-9**  
 Average Seal Numbers at Jenner Haulout versus River Haulouts (July 2009 through February 2010)



**Figure 4.4-10**  
 Average Seal Numbers at Jenner Haulout versus Regional Haulouts (July 2009 through February 2010)

CNDDDB that is present in the Estuary Study Area. The Coastal Brackish Marsh included in the Estuary Study Area by CNDDDB was based on the USFWS National Wetland Survey Maps of 1982. Recent vegetation mapping conducted by the Water Agency (SCWA, 2010c) classified this area as freshwater marsh. Additionally, although not included within the project vicinity in the CNDDDB, Northern Dune Scrub is also present in the Estuary Study Area. The Northern Dune Scrub and Coastal and Valley Freshwater Marsh communities are known or believed to be rare within the state.

In addition to the sensitive natural communities mentioned above, the regulatory and resource agencies consider oak woodlands, waters and wetlands, and riparian woodlands and forests sensitive (see Regulatory Framework section below). As discussed above, these communities and habitats, with the exception of oak woodlands, are present within the Estuary Study Area.

**Special-Status Plant and Animal Species**

The potential occurrence of special-status plant and animal species in the Estuary Study Area was initially evaluated by developing a list of special-status species that are known to or have the potential to occur in the project vicinity. This list was primarily derived from a search of the CNDDDB (CDFG, 2010) and CNPS Electronic Inventory (CNPS, 2010) for special-status species occurrences recorded on the Arched Rock, Duncans Mills, Camp Mecker, Cazadero, Guerneville, Fort Ross, Bodega Head, and Valley Ford USGS 7.5-Minute Quadrangles, and review of the USFWS list of federal endangered and threatened species for the Arched Rock and Duncans Mills USGS 7.5-Minute Quadrangles. Other sources used included existing biological resources studies and reports for the Russian River Estuary (Nielsen and Light, 1994; Merritt Smith Consulting, 1997, 1998, 1999, 2001; SCWA and Merritt Smith Consulting 2001, SWCA, 2005; SCWA, 2006; SCWA and Stewards of the Coast and Redwoods, 2009), and conservation and management plans and planning documents for lands within the project vicinity (Prunuske Chatham, 2005; State Parks, 2007). The potential for occurrence of those species included on the list

were then evaluated based on the habitat requirements of each species relative to the observed existing conditions, and results of previous biological resources studies.

**Tables 4.4-2 and 4.4-3** present those special-status plant and animal species, respectively, that are known to or have the potential to occur in the project vicinity, as well as each species' regulatory status, habitat requirements, and ranking of potential for occurrence in the Estuary Study Area and **Figures 4.4-11 and 4.4-12** illustrate the identity and location of known occurrences of special-status species in the project vicinity.

### **Special-Status Plants**

Based on review of the databases and other information sources, 64 special-status plant species and two special-status moss species have been documented as occurring or potentially occurring in the vicinity of the Estuary Study Area. Forty-one of these plants and one of the moss are considered unlikely to occur or to have a low potential to occur within the Estuary Study Area for reasons such as absence of essential habitat requirement for the species, the distance to known occurrences and/or the species distributional range, or the species not being detected during past or present field surveys. These species are not discussed further in this section. The remaining 23 plants and one moss are considered to have moderate to high potential to occur within the Estuary Study Area, based on known occurrences and availability of suitable habitat. These species are discussed below.

**Pink Sand-Verbena.** Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*) is a CNPS List 1B.1 species. This prostrate perennial herb has a round inflorescence composed of 8 to 27 small pink flowers and is a member of four o'clock family (Nyctaginaceae). The blooming period for this species occurs between June and October. The pink sand-verbena occupies coastal dune and coastal strand habitats at elevations between 0 and 30 feet. This species is found along the coast in the Pacific Northwest. In California, its range extends along the coast from Del Norte County south to Marin County.

The beach and dune habitat within the Estuary Study Area provides potentially suitable habitat for the pink sand-verbena. Although there are no CNDDDB occurrence records for this plant within five miles of the Estuary Study Area, it is known from the South Salmon Creek and Doran Beaches in Bodega Bay, approximately six miles south of Estuary Study Area. This species has a moderate potential to occur within the Estuary Study Area due to presence of suitable habitat and known occurrence records in similar habitat.

**Blasdale's Bent Grass.** Blasdale's bent grass (*Agrostis blasdalei*) is a CNPS List 1B.2 species in the grass family (Poaceae). It is a rhizomatous herb found in coastal bluff scrub, coastal dunes, and coastal prairie habitats between 15 and 490 feet in elevation. This coastal species is endemic to California and occurs within Mendocino, Sonoma, Marin, San Mateo and Santa Cruz counties. It produces slender, dense inflorescences between May and July.

**TABLE 4.4-2  
SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

<b>Common Name Scientific Name</b>	<b>Status</b>	<b>Phenology<sup>a</sup></b>	<b>Flowering Period</b>	<b>Habitat</b>	<b>Potential to Occur</b>
Pink sand-verbena <i>Abronia umbellata</i> ssp. <i>breviflora</i>	CNPS 1B.1	Perennial herb	Jun – Oct	Coastal dunes. Elevation 0 to 30 feet.	Moderate. Potentially suitable habitat present at Estuary Study Area. Present in the South Salmon Creek Beach area, approximately six miles south of Estuary Study Area.
Blasdale's bent grass <i>Agrostis blasdalei</i>	CNPS 1B.2	Perennial herb (rhizomatous)	May – Jul	Coastal bluff scrub, coastal dunes, and coastal prairie. Elevation 15 to 490 feet.	High. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within five miles of Estuary Study Area; nearest location less than ¼ mile south of Estuary Study Area.
Franciscan onion <i>Allium peninsulare</i> var. <i>franciscanum</i>	CNPS 1B.2	Perennial herb (bulbiferous)	May – Jun	Cismontane woodland and valley and foothill grassland associated with clay soil; often on serpentine. Elevation 170 to 980 feet.	Low. Range above Estuary Area elevations and suitable substrate generally not present in Estuary Study Area. Present on roadside ocean cliffs approximately three miles north of Bodega Bay.
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE CNPS 1B.1	Perennial herb	May – Jul	Freshwater marshes and swamps and riparian scrub. Elevation 15 to 1,200 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present at Duncans Mills Marsh area; location less than ¼ mile north of Estuary Study Area.
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	CNPS 1B.2	Shrub (deciduous)	Apr – Jul	Chaparral, cismontane woodland, and openings in broadleaved upland forest. Elevation 390 to 6,560 feet.	Low. Range above Estuary Study Area elevation. Known from vicinity of Monte Rio within maximum backwater area; historical observation on road between Guernville and Monte Rio.
Baker's manzanita <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i>	CR CNPS 1B.1	Shrub (evergreen)	Feb – Apr	Broadleaved upland forest and chaparral. Often on serpentine soil. Elevation 250 to 980 feet.	Low. Range above Estuary Study Area elevation and suitable substrate not generally present in Estuary Study Area. Present north of Dutch Bill Creek, approximately two miles south of Estuary Study Area.
The Cedars manzanita <i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i>	CR CNPS 1B.2	Shrub (evergreen)	Feb – May	Closed-cone coniferous forest and chaparral associated with serpentine seeps. Elevation 610 to 2,490 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Vine Hill Manzanita <i>Arctostaphylos densiflora</i>	CE CNPS 1B.1	Shrub (evergreen)	Feb – Apr	Chaparral on acid marine sand. Elevation 160 to 390 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Rincon Ridge Manzanita <i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i>	CNPS 1B.1	Shrub (evergreen)	Feb – Apr	Chaparral and cismontane woodland. Elevation 245 to 1,215 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
The Cedars fairy-lantern <i>Calochortus raichei</i>	CNPS 1B.2	Perennial herb (bulbiferous)	May – Aug	Closed-cone coniferous forest and chaparral associated with serpentine seeps. Elevation 660 to 1,600 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Coastal bluff morning-glory <i>Calystegia purpurata</i> ssp. <i>saxicola</i>	CNPS 1B.2	Perennial herb	May – Sep	Coastal dunes, coastal scrub, and North Coast coniferous forest. Elevation 30 to 340 feet.	High. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within five miles of Estuary Study Area; Nearest location less than ¼ mile south of the Estuary Study Area.

**TABLE 4.4-2 (Continued)**  
**SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

<b>Common Name Scientific Name</b>	<b>Status</b>	<b>Phenology<sup>a</sup></b>	<b>Flowering Period</b>	<b>Habitat</b>	<b>Potential to Occur</b>
Swamp harebell <i>Campanula californica</i>	CNPS 1B.2	Perennial herb (rhizomatous)	Jun – Oct	Bogs and fens, meadows and seeps, freshwater marsh and swamps, and mesic closed-cone coniferous forest, coastal prairie, and North Coast coniferous forest. Elevation 3 to 1,330 feet.	High. Potentially suitable habitat present in Estuary Study Area. Present at Duncans Mills Marsh area; location less than ¼ mile north of Estuary Study Area.
Sonoma white sedge <i>Carex albida</i>	FE CE CNPS 1B.1	Perennial herb (rhizomatous)	May – Jul	Bogs and fens and freshwater marshes and swamps. Elevation 50 to 295 feet.	Low. Range above Estuary Study Area elevation. Present in vicinity of Sebastopol, nearly 10 miles southeast of Estuary Study Area.
Bristly sedge <i>Carex comosa</i>	CNPS 2.1	Perennial herb (rhizomatous)	May – Sep	Coastal prairie, valley and foothill grassland, and margins of marshes and swamps. Elevation 0 to 2,050 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Historically documented in vicinity of Guerneville, approximately two miles northeast of Estuary Study Area.
Deceiving sedge <i>Carex saliniformis</i>	CNPS 1B.2	Perennial herb (rhizomatous)	Jun	Coastal salt marshes and swamps, meadows and seeps, and mesic coastal prairie and coastal scrub. Elevation 10 to 755 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present near Russian Gulch and Meyers Grade, between State Route 1 and the ocean; location less than one mile north of Estuary Study Area.
Rincon Ridge ceanothus <i>Ceanothus confusus</i>	CNPS 1B.1	Shrub (evergreen)	Feb – Jun	Closed-cone coniferous forest, chaparral, and cismontane woodland associated with volcanic or serpentine soil. Elevation 250 to 3,490 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Holly-leaved ceanothus <i>Ceanothus purpureus</i>	CNPS 1B.2	Shrub (evergreen)	Feb – Jun	Chaparral and cismontane woodland associated with rocky, volcanic soil. Elevation 390 to 2,100 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Dwarf soaproot <i>Chlorogalum pomeridianum</i> var. <i>minus</i>	CNPS 1B.2	Perennial herb (rhizomatous)	May – Aug	Chaparral on serpentine soil. Elevation 1,000 to 3,280 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
San Francisco Bay spineflower <i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	CNPS 1B.2	Annual herb	Apr – Jul	Coastal dunes and sandy coastal bluff scrub, coastal scrub, and coastal prairie. Elevation 10 to 705 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Historically documented in the vicinity of Bodega Head, approximately eight miles south of Estuary Study Area.
Woolly-headed spineflower <i>Chorizanthe cuspidata</i> var. <i>villosa</i>	CNPS 1B.2	Annual herb	May – Jul	Coastal dunes, and sandy coastal prairie and coastal scrub. Elevation 10 to 200 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in the vicinity of Bodega Head, approximately eight miles south of Estuary Study Area.
Sonoma spineflower <i>Chorizanthe valida</i>	FE CE CNPS 1B.1	Annual herb	Jun – Aug	Sandy coastal prairie. Elevation 30 to 1,000 feet.	Low. Potentially suitable habitat present in Estuary Study Area. However, last documented from Fort Ross area; may be extinct in Sonoma County.
Franciscan thistle <i>Cirsium andrewsii</i>	CNPS 1B.2	Perennial herb	Mar – Jul	Mesic broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Sometimes on serpentine soil. Elevation 0 to 490 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Historically documented from Bodega Head, approximately eight miles south of Estuary Study Area.



**TABLE 4.4-2 (Continued)**  
**SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Phenology <sup>a</sup>	Flowering Period	Habitat	Potential to Occur
Point Reyes bird's-beak <i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	CNPS 1B.2	Annual herb (hemiparasitic)	Jun – Oct	Coastal salt marshes and swamps. Elevation 0 to 30 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Pennell's bird's-beak <i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>	FE CR CNPS 1B.2	Annual herb (hemiparasitic)	Jun – Sep	Closed-cone coniferous forest and chaparral on serpentine. Elevation 150 to 1,000 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Baker's larkspur <i>Delphinium bakeri</i>	FE CE CNPS 1B.1	Perennial herb	Mar – May	Often mesic broadleaved upland forest, coastal scrub, and valley and foothill grassland on decomposed shale. Elevation 260 to 1,000 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area
Golden larkspur <i>Delphinium luteum</i>	FE CR CNPS 1B.1	Perennial herb	Mar – May	Rocky chaparral, coastal prairie, and coastal scrub. Elevation 0 to 330 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within 10 miles of Estuary Study Area; nearest location approximately six miles south of Estuary Study Area.
Norris' beard moss <i>Didymodon norrisii</i>	CNPS 2.2	Moss		Intermittently mesic cismontane woodland and lower montane coniferous forest on rock. Elevation 1,970 to 6,470 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Western leatherwood <i>Dirca occidentalis</i>	CNPS 1B.2	Shrub (deciduous)	Jan – Mar	Riparian forest and woodland, and mesic broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, and North Coast coniferous forest. Elevation 160 feet to 1,295 feet.	Low. Range above Estuary Study Area elevation. Present along Salmon Creek Road, approximately two miles west of Bodega Bay.
Greene's narrow-leaved daisy <i>Erigeron greenei</i>	CNPS 1B.2	Perennial herb	May – Sep	Chaparral on serpentine or volcanic soil. Elevation 260 to 3,300 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Serpentine daisy <i>Erigeron serpentinus</i>	CNPS 1B.3	Perennial herb	May – Aug	Chaparral associated with serpentine seeps. Elevation 200 to 2,200 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
The Cedars buckwheat <i>Eriogonum cedrorum</i>	CNPS 1B.3	Perennial herb	Jun – Sep	Closed-cone coniferous forest on serpentine soil. Elevation 1,200 to 1,800 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Snow Mountain buckwheat <i>Eriogonum nervulosum</i>	CNPS 1B.2	Perennial herb (rhizomatous)	Jun – Sep	Chaparral on serpentine soil. Elevation 980 to 6,910 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Coast fawn lily <i>Erythronium revolutum</i>	CNPS 2.2	Perennial herb (bulbiferous)	Mar – Jul	Bogs and fens, and mesic broadleaved upland forest and North Coast coniferous forest. Often associated with streambanks. Elevation 0 to 4,430 feet.	Low. Suitable habitat generally not present in Estuary Study Area. Nearest location over 45 miles north of Estuary Study Area.
Fragrant fritillary <i>Fritillaria liliacea</i>	CNPS 1B.2	Perennial herb (bulbiferous)	Feb – Apr	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Often on serpentine soil. Elevation 10 to 1,345 feet.	Low. Suitable substrate not generally present in Estuary Study Area. Present in vicinity of Camp Meeker, approximately six miles southeast of Estuary Study Area.
Blue coast gilia <i>Gilia capitata</i> ssp. <i>chamissonis</i>	CNPS 1B.1	Annual herb	Apr – Jul	Coastal dunes and coastal scrub. Elevation 10 to 660 feet.	High. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within ten miles of Estuary Study Area, including a location at Goat Rock State Beach.

**TABLE 4.4-2 (Continued)**  
**SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

<b>Common Name Scientific Name</b>	<b>Status</b>	<b>Phenology<sup>a</sup></b>	<b>Flowering Period</b>	<b>Habitat</b>	<b>Potential to Occur</b>
Woolly-headed gilia <i>Gilia capitata</i> ssp. <i>tomentosa</i>	CNPS 1B.1	Annual herb	May – Jul	Rocky coastal bluff scrub on outcrops. Elevation 50 to 510 feet.	Low. Range above Estuary Study Area elevation and suitable substrate not generally present in Estuary Study Area.
Dark-eyed gilia <i>Gilia millefoliata</i>	CNPS 1B.2	Annual herb	Apr – Jul	Coastal dunes. Elevation 10 to 100 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in the vicinity of Bodega Head, approximately eight miles south of Estuary Study Area.
Pale yellow hayfield tarplant <i>Hemizonia congesta</i> ssp. <i>congesta</i>	CNPS 1B.2	Annual herb	Apr - Nov	Valley and foothill grassland. Sometimes along roadsides. Elevation 70 to 1,840 feet.	Low. Range above Estuary Study Area elevation. Historically documented from along State Route 1 approximately four miles north of Jenner.
Short-leaved evax <i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	CNPS 1B.2	Annual herb	Mar – Jun	Coastal dunes and sandy coastal bluff scrub. Elevation 0 to 705 feet.	High. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within five miles of Estuary Study Area; nearest location approximately ½ mile south of Estuary Study Area.
Point Reyes horkelia <i>Horkelia marinensis</i>	CNPS 1B.2	Perennial herb	May – Sep	Coastal dunes and sandy coastal prairie and coastal scrub. Elevation 20 to 1,150 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in the vicinity of Bodega Head, approximately eight miles south of Estuary Study Area.
Thin-lobed horkelia <i>Horkelia tenuiloba</i>	CNPS 1B.2	Perennial herb	May – Jul	Broadleaved upland forest, chaparral, and valley and foothill grassland in mesic, sandy openings. Elevation 160 to 1,640 feet.	Low. Range above Estuary Study Area elevation. Present in vicinity of Bohemian Grove, approximately three miles southwest of Estuary Study Area.
Baker's goldfields <i>Lasthenia californica</i> ssp. <i>bakeri</i>	CNPS 1B.2	Perennial herb	Apr – Oct	Coastal scrub, meadows and seeps, marshes and swamps, and openings in closed-cone coniferous forest. Elevation 200 to 1,710 feet.	Low. Range above Estuary Study Area elevation. Historically documented in vicinity of Johnson Gulch, approximately 7 miles south of Estuary Study Area.
Perennial goldfields <i>Lasthenia californica</i> ssp. <i>macrantha</i>	CNPS 1B.2	Perennial herb	Jan – Nov	Coastal dunes, coastal bluff scrub, and coastal scrub. Elevation 20 to 1,710 feet.	High. Present in multiple locations, including a location in the Estuary Study Area.
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE CNPS 1B.1	Annual herb	Mar – Jun	Vernal pools and mesic cismontane woodland, valley and foothill grassland and alkaline playas. Elevation 0 to 1,540 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Jepson's leptosiphon <i>Leptosiphon jepsonii</i>	CNPS 1B.2	Annual herb	Mar- May	Chaparral and cismontane woodland. Usually on volcanic soil. Elevation 330 to 1,640 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Rose leptosiphon <i>Leptosiphon rosaceus</i>	CNPS 1B.1	Annual herb	Apr – Jul	Coastal bluff scrub. Elevation 0 to 330 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area.
Crystal Springs lessingia <i>Lessingia arachnoidea</i>	CNPS 1B.2	Annual herb	Jul – Oct	Often along roadsides in cismontane woodland, coastal scrub, and valley and foothill grassland on serpentine soil. Elevation 200 to 660 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Sebastopol meadowfoam <i>Limnanthes vincularis</i>	FE CE CNPS 1B.1	Annual herb	Apr – May	Vernal pools, meadows and seeps, and vernal mesic valley and foothill grassland. Elevation 50 to 1,000 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.

**TABLE 4.4-2 (Continued)**  
**SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Phenology <sup>a</sup>	Flowering Period	Habitat	Potential to Occur
Tidestrom's lupine <i>Lupinus tidestromii</i>	FE CE CNPS 1B.1	Perennial herb (rhizomatous)	Apr – Jun	Coastal dunes. Elevation 0 to 330 feet.	High. Present within the Estuary Study Area, but outside the project area, in sand dunes north and east of the Goat Rock State Beach.
Marsh microseris <i>Microseris paludosa</i>	CNPS 1B.2	Perennial herb	Apr – Jun	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation 20 to 1,800 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area.
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	CNPS 1B.2	Perennial herb (rhizomatous)	Jun – Jul	Valley and foothill grassland, cismontane woodland, coastal scrub, and openings in broadleaved upland forest and chaparral. Elevation 330 to 3,000 feet.	Low. Range above Estuary Study Area elevation. Present east of Bodega Bay, nearly 10 miles south of Estuary Study Area.
White-flowered rein orchid <i>Piperia candida</i>	CNPS 1B.2	Perennial herb	May – Sep	Broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest. Sometimes on serpentine soil. Elevation 100 to 4,300 feet.	Low. Range above Estuary Study Area elevation and suitable substrate not generally present in Estuary Study Area. Present in vicinity of Cazadero, approximately five miles north of Estuary Study Area.
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	CT CNPS 1B.1	Perennial herb (rhizomatous)	Apr – Jun	Meadows and seeps and mesic openings in broadleaved upland forest and North Coast coniferous forest. Elevation 30 to 2,200 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area.
Oregon polemonium <i>Polemonium carneum</i>	CNPS 2.2	Perennial herb	Apr – Sep	Coastal prairie, coastal scrub, and lower montane coniferous forest. Elevation 0 to 6,000 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in the vicinity of Bodega Bay, approximately eight miles south of Estuary Study Area.
Point Reyes checkerbloom <i>Sidalcea calycosa</i> ssp. <i>rhizomata</i>	CNPS 1B.2	Perennial herb (rhizomatous)	Apr – Sep	Freshwater marshes and swamps near the coast. Elevation 10 to 250 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present at Duncans Mills Marsh area; location less than ¼ mile north of Estuary Study Area.
Marin checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>viridis</i>	CNPS 1B.3	Perennial herb	May – Jun	Chaparral on serpentine soil. Elevation 160 to 1,410 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Purple-stemmed checkerbloom <i>Sidalcea malviflora</i> ssp. <i>purpurea</i>	CNPS 1B.2	Perennial herb (rhizomatous)	May – Jun	Broadleaved upland forest and coastal prairie. Elevation 0 to 100 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within five miles of Estuary Study Area; nearest location less than ½ miles south of Estuary Study Area.
Hoffman's bristly jewel-flower <i>Streptanthus glandulosus</i> var. <i>hoffmanii</i>	CNPS 1B.3	Annual herb	Mar – Jul	Rocky chaparral, cismontane woodland, and serpentine valley and foothill grassland. Elevation 390 to 1,560 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Three Peaks jewel-flower <i>Streptanthus morrisonii</i> ssp. <i>elatus</i>	CNPS 1B.2	Perennial herb	Jun – Sep	Chaparral on serpentine soil. Elevation 295 to 2,670 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Dorr's Cabin jewel-flower <i>Streptanthus morrisonii</i> ssp. <i>hirtiflorus</i>	CNPS 1B.2	Perennial herb	Jun	Chaparral and closed-cone coniferous forest on serpentine soil. Elevation 610 to 2,690 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.

**TABLE 4.4-2 (Continued)**  
**SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Phenology <sup>a</sup>	Flowering Period	Habitat	Potential to Occur
Morrison's jewel-flower <i>Streptanthus morrisonii</i> ssp. <i>morrisonii</i>	CNPS 1B.2	Perennial herb	May – Sep	Rocky, serpentine chaparral. Elevation 390 to 1,920 feet.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Two-fork clover <i>Trifolium amoenum</i>	FE CNPS 1B.1	Annual herb	Apr – Jun	Coastal bluff scrub and valley and foothill grassland. Sometimes on serpentine soil. Elevation 20 to 1,360 feet.	Low. Suitable substrate not generally present in Estuary Study Area. Present approximately five miles south of Estuary Study Area.
Santa Cruz clover <i>Trifolium buckwestiorum</i>	CNPS 1B.1	Annual herb	Apr – Oct	Margins of gravelly broadleaved upland forest and cismontane woodland. Elevation 340 to 2,000 feet.	Low. Range above Estuary Study Area elevation and suitable substrate not generally present in Estuary Study Area.
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	CNPS 1B.2	Annual herb	Apr – Jun	Vernal pools, marshes and swamps, and mesic alkaline valley and foothill grassland. Elevation 0 to 980 feet.	Low. Suitable substrate not generally present in Estuary Study Area. Historically documented in the vicinity of Occidental.
San Francisco owl's-clover <i>Triphysaria floribunda</i>	CNPS 1B.2	Annual herb	Apr – Jun	Coastal prairie, coastal scrub, and valley and foothill grassland. Usually on serpentine soil. Elevation 30 to 525 feet.	Low. Suitable substrate not generally present in Estuary Study Area.
Coastal triquetrella <i>Triquetrella californica</i>	CNPS 1B.2	Moss		Coastal bluff scrub and coastal scrub. Elevation 30 to 330 feet.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in the vicinity of Bodega Head, approximately eight miles south of Estuary Study Area.

<sup>a</sup> Phenology is the study of periodic occurrences in nature, such as the ripening of fruit, and their relation to climate.

CODES:

FE: Federally listed as Endangered  
 FT: Federally listed as Threatened  
 CE: State of California listed as Endangered  
 CT: State of California listed as Threatened  
 CR: State of California listed as Rare

CNPS = California Native Plant Society  
 1A: Presumed extinct in California  
 1B: Rare, Threatened, or Endangered in California and elsewhere  
 2: Rare, Threatened, or Endangered in California, but more common elsewhere

POTENTIAL TO OCCUR

Unlikely = Habitat not present in the Estuary Study Area and/or species is not known to occur in the Estuary Study Area based on CNDDDB occurrences, recent field surveys or species distribution information.

Low = Habitat not present in the Estuary Study Area and/or few occurrence in the region.

Moderate = Marginal habitat present in the Estuary Study Area and/or some occurrences in the region.

High = Good habitat present in the Estuary Study Area and nearby occurrences or species is known to occur in the Estuary Study Area based on CNDDDB occurrences or recent field surveys.

SOURCES: CDFG, 2010; CNPS, 2010

**TABLE 4.4-3  
SPECIAL-STATUS ANIMAL SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Habitat	Potential to Occur
<b>Invertebrates</b>			
San Bruno elfin butterfly <i>Callophrys mossii bayensis</i>	FE	Coastal mountainous areas with chaparral and grassland habitats, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is stonecrop ( <i>Sedum spathulifolium</i> ).	Unlikely. Estuary Study Area located outside the normal range for this species; colonies are all restricted to the coastal mountains of northern San Mateo County.
Monarch butterfly <i>Danaus plexippus</i>	SA	Winter roost sites extend along the coast of California from Marin County in the north to San Diego County in the South. Roosts are usually wooded areas dominated by eucalyptus trees, Monterey pines, and Monterey cypresses, and are located in sheltered bays or farther inland.	Low. Potentially suitable winter roosts not generally present in Estuary Study Area. Nearest documented roost located at Wrights Beach Campground, approximately four miles south of Estuary Study Area.
Black abalone <i>Haliotis cracherodii</i>	FE	Rocky intertidal and subtidal habitats from Point Arena, California to Bahia Tortugas and Isla Guadalupe, Mexico.	Unlikely. Estuary Study Area located outside the normal range for this species; considered rare north of San Francisco. Furthermore, potentially suitable habitat not present in Estuary Study Area.
White abalone <i>Haliotis sorenseni</i>	FE	Open low and high relief rock and boulder habitat from Point Conception, California to Runta Abreojos, Baja California.	Unlikely. Estuary Study Area located outside the normal range for this species. Furthermore, potentially suitable habitat not present in Estuary Study Area.
Behren's silverspot butterfly <i>Speyeria zerene behrensii</i>	FE	Early successional coastal terrace prairie habitat extending along the northern coast of California, from the mouth of the Russian River (north bank) in Sonoma County northward to the vicinity of Point Arena in Mendocino County. May also inhabit coastal sand dune systems. Larval host plant is western dog violet ( <i>Viola adunca</i> ).	High. Specimens collected near Jenner, at the mouth of the Russian River are unclear, possibly an intermediate zone with Myrtle's silverspot butterfly (see below).
Myrtle's silverspot <i>Speyeria zerene myrtleae</i>	FE	Coastal dunes, coastal scrub, and coastal prairie habitat extending along the northern coast of California, from the mouth of the Russian River (south bank) in Sonoma County southward to Point Ano Nuevo in San Mateo county. Larval host plant is western dog violet ( <i>Viola adunca</i> ).	High. Present in multiple locations within five miles of Estuary Study Area, including a 1975 occurrence from the Estuary Study Area.
California freshwater shrimp <i>Syncaris pacifica</i>	FE CE	Endemic to low-elevation and low gradient perennial freshwater streams in Marin, Sonoma, and Napa Counties, California.	High. Known from Austin Creek within the maximum backwater area. Also has a moderate potential to occur within the Estuary Study Area.
<b>Fish</b>			
(See Section 4.5, Fisheries)			
<b>Amphibians</b>			
Foothill yellow-legged frog <i>Rana boylei</i>	CSC	Partially shaded, low-gradient streams and riffles with a rock substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying and, at least, 15 weeks to attain metamorphosis.	High. Present in multiple locations within five miles of Estuary Study Area, including a location in the Estuary Study Area.
California red-legged frog <i>Rana draytonii</i>	FT CSC	Lowlands and 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 aestivation habitat.	High. Potentially suitable habitat present in Estuary Study Area. Present in multiple locations within five miles of Estuary Study Area; nearest location approximately ½ mile southeast of the Estuary Study Area along Willow Creek.

**TABLE 4.4-3 (Continued)**  
**SPECIAL-STATUS ANIMAL SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Habitat	Potential to Occur
<b>Reptiles</b>			
Western pond turtle <i>Actinemys marmorata</i>	CSC	Variety of aquatic habitats, both permanent and intermittent, with suitable aerial and aquatic basking sites. Needs upland habitats for nesting, overwintering, and aestivating.	High. Present in multiple locations in Estuary Study Area.
Loggerhead turtle <i>Caretta caretta</i>	FT	Globally distributed, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Occupies the terrestrial, oceanic, and neritic zones during their lives.	Unlikely. Potentially suitable habitat not present in Estuary Study Area; juveniles mostly documented off the coast of California.
Green turtle <i>Chelonia mydas</i>	FT	Globally distributed, occurring generally in the tropical and subtropical waters. In the eastern North Pacific, occurs from Baja California to southern Alaska. Occupies the terrestrial, oceanic, and neritic zones during their lives.	Unlikely. Estuary Study Area located outside the normal range for this species.
Leatherback turtle <i>Dermochelys coriacea</i>	FE	Globally distributed. Known as a pelagic species, but also forages in coastal waters.	Unlikely. Estuary Study Area located outside the normal range for this species. Furthermore, potentially suitable habitat not present in Estuary Study Area.
Olive ridley sea turtle <i>Lepidochelys olivacea</i>	FT	Globally distributed, occurring throughout the tropical regions of the South Atlantic, Pacific, and Indian Oceans. Known as a pelagic species, but has been known to inhabit coastal areas, including bays and estuaries.	Unlikely. Estuary Study Area located outside the normal range for this species.
<b>Birds</b>			
Tricolored Blackbird (Nesting colony) <i>Agelaius tricolor</i>	CSC	Highly colonial species, most numerous in the Central Valley and San Francisco Delta regions; largely endemic to California. Requires open water, protected nesting substrate, and suitable foraging area providing adequate inset prey within a few miles of the nesting colony.	Moderate. Potentially suitable habitat present in Estuary Study Area. May occur as a seasonal non-breeding resident or as a transient.
Great blue heron (Rookery site) <i>Ardea herodias</i>	SA	Variety of habitats near sources of water. Nests commonly high in tops of secluded large snags or live trees.	High. Rookery site present in Estuary Study Area.
Burrowing owl (Burrowing sites and some wintering sites) <i>Athene cunicularia</i>	CSC	Primarily a grassland species, but thrives in some environments highly altered by human activity. Requires burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	Moderate. Potentially suitable habitat present in Estuary Study Area. May occur as a seasonal non-breeding resident or as a transient. Present in vicinity of Bodega Bay, south of Coleman Valley Road.
Marbled murrelet (Nesting) <i>Brachyramphus marmoratus</i>	FT CE	Feeds near-shore; nests inland along coast in California, from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth forests, characterized by large trees, multiple canopy layers, and moderate to high canopy closure. Forests are located close enough to the marine environment for the birds to fly to and from nest sites.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present offshore of Arched Rock, approximately one mile south/southwest of Estuary Study Area.
Rhinoceros auklet (Nesting colony) <i>Cerorhinca monocerata</i>	SA	Undisturbed islands with friable soil for digging burrows and productive, pelagic waters near breeding colony for foraging.	Low. Potentially suitable nesting habitat not present in Estuary Study Area; however, may forage offshore.
Western snowy plover (Nesting) <i>Charadrius alexandrinus nivosus</i>	FT CSC	Nests primarily above the high tide line on coastal beach habitats. In winter, found on many of the beaches used for nesting, as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats.	Moderate. Potentially suitable nesting and foraging habitat present in Estuary Study Area. Present at Salmon Creek Beach during spring and fall, but no nesting documented.

**TABLE 4.4-3 (Continued)**  
**SPECIAL-STATUS ANIMAL SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Habitat	Potential to Occur
<b>Birds (cont.)</b>			
Western yellow-billed cuckoo (Nesting) <i>Coccyzus americanus occidentalis</i>	FC CE	Requires patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50 percent in both the understory and overstory; nests typically in mature willows.	Low. Estuary Study Area located outside the normal breeding range for this species; may occur as a transient. Nearest documented location nearly 7 miles south of the Estuary Study Area.
Northern harrier (Nesting) <i>Circus cyaneus</i>	CSC	Marshes, meadows, grasslands, and cultivated fields. Nests on ground commonly near low shrubs, in tall weeds or reeds.	High. Suitable habitat present in Estuary Study Area.
Black swift (Nesting) <i>Cypseloides niger</i>	CSC	Breeding known from three distinct areas in California, including central coast, central and southern Sierra Nevada, and San Bernardino and San Jacinto Mountains. Breeds in small colonies behind or beside permanent or semipermanent waterfalls, on perpendicular cliffs near water, and in sea caves. Forages far from nest and over a wide variety of habitats to locate insect prey.	Unlikely. Estuary Study Area located outside the normal breeding range for this species.
White-tailed kite <i>Elanus leucurus</i>	FPS	Savanna, open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland habitats. Nests in trees, often near marshes.	Moderate. Potentially suitable nesting and foraging habitat present in Estuary Study Area. Nearest documented nesting site nearly 10 miles northwest of Estuary Study Area.
American peregrine falcon <i>Falco peregrinus anatum</i>	FD CE FPS	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, and mounds, as well as human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	High. Potentially suitable foraging habitat present in Estuary Study Area. Historical nest sites near Goat Rock.
Tufted puffin (Nesting colony) <i>Fratercula cirrhata</i>	CSC	Breed on offshore rocks and island or, rarely, steep mainland cliffs that are largely free from mammalian predators and human disturbance.	Low. Potentially suitable nesting habitat not present in Estuary Study Area; however, may forage offshore.
Osprey (Nesting) <i>Pandion haliaetus</i>	SA	Occurs in ponderosa pine and mixed conifer habitats along seacoasts, lakes, and rivers. Foraging areas require large snags and open trees near large, clear, open water.	High. Suitable nesting and foraging habitat present in Estuary Study Area. Several nest sites present in the upper Estuary.
California brown pelican (Nesting colony and communal roosts) <i>Pelecanus occidentalis californicus</i>	FD CD	Breeding restricted to islands in the Gulf of California and along the outer coast from Baja California to West Anacapa and Santa Barbara Island in Southern California. Roosting and loafing sites include offshore rocks and islands, river mouths with sand bars, breakwaters, pilings, and jetties along the Pacific Coast and San Francisco Bay.	High. Suitable roosting and loafing sites present in Estuary Study Area.
Double-crested cormorant (Rookery site) <i>Phalacrocorax auritus</i>	SA	Colonial nester on coastal cliffs and offshore islands, and along inland lake margins located near foraging areas.	High. Suitable foraging and nesting habitat present in Estuary Study Area; rookery site documented at Russian River Rocks, located north of Russian River mouth.
Short-tailed albatross <i>Phoebastria albatrus</i>	FE CSC	Breeding restricted to two small island groups: Izu Island (south of Japan) and Senkaku Islands (northeast of Taiwan). When not on breeding grounds, widespread within regions of high marine productivity in the North Pacific, from Torishima to western and southern Bering Sea, Gulf of Alaska, and southward to California.	Unlikely. Estuary Study Area located outside the normal range for this species.
Bank swallow (Nesting) <i>Riparia riparia</i>	CT	Colonial nester mostly along coastal areas and rivers in northern and central California. Nesting restricted to vertical banks or bluffs with friable soils suitable for burrowing. Vegetation is varied; nesting sites are mostly selected for suitability of the nesting bank.	Moderate. Suitable foraging and nesting habitat present in Estuary Study Area. Historically present in the vicinity of Jenner.

**TABLE 4.4-3 (Continued)**  
**SPECIAL-STATUS ANIMAL SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Habitat	Potential to Occur
<b>Birds (cont.)</b>			
Northern spotted owl <i>Strix occidentalis caurina</i>	FT CSC	Generally found in mature and old-growth forest, supporting the following elements: high canopy closure; a multilayered, multispecies canopy with larger overstory trees; and a presence of broken-topped tree or other nesting platforms.	High. Present in multiple locations within five miles of Estuary Study Area, including known nesting sites in Willow Creek drainage.
<b>Mammals</b>			
Pallid bat <i>Antrozous pallidus</i>	CSC	Arid deserts and grasslands of low elevations in California; often near rocky outcrops and water. Usually roosts in rock crevice or building, less often in cave, tree hollow, mine, etc. Prefers narrow crevices in caves as hibernation sites.	Moderate. Potentially suitable foraging habitat present in Estuary Study Area. Maternity roost documented in vicinity of Occidental, approximately six miles southeast of Estuary Study Area.
Sonoma tree vole <i>Arborimus pomo</i>	CSC	Old growth and other forests, mainly Douglas-fir, redwood, and montane hardwood-conifer habitats along the coast of California, from Sonoma County north to the Oregon border. Restricted to the fog belt.	High. Present in multiple locations in Estuary Study Area.
Guadalupe fur seal <i>Arctocephalus townsendi</i>	FT CT FPS MMPA	Tropical waters of the Southern California/Mexico region.	Unlikely. Estuary Study Area located outside the normal range for this species.
Sei whale <i>Balaenoptera borealis</i>	FE MMPA	Globally distributed, occurring in subtropical to subpolar waters on the continental shelf edge and slope.	Unlikely. Potentially suitable habitat not present in Estuary Study Area
Blue whale <i>Balaenoptera musculus</i>	FE MMPA	Globally distributed, occurring in subtropical to subpolar waters.	Unlikely. Potentially suitable habitat not present in Estuary Study Area
Finback whale <i>Balaenoptera physalus</i>	FE MMPA	Globally distributed, occurring primarily in temperate to subpolar waters.	Unlikely. Potentially suitable habitat not present in Estuary Study Area
Northern fur seal <i>Callorhinus ursinus</i>	MMPA	Across the Pacific Ocean using primarily open ocean and rocky beaches.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	CSC	Occurs in mesic habitats characterized by coniferous and deciduous forest, but occupies a variety of habitats. Maternity and hibernation colonies typically are in caves and mine tunnels. Prefers relatively cold places for hibernation, often near entrances and in well-ventilated areas. Uses caves, buildings, and tree cavities for night roosts	Moderate. Potentially suitable foraging and roosting habitat present in Estuary Study Area. Present near Bodega Bay, approximately eight miles south of Estuary Study Area.
Right whale <i>Eubalaena glacialis</i>	FE MMPA	Inhabit temperate to subpolar waters of the Atlantic Ocean, occurring primarily in coastal or shelf waters.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
Steller sea-lion <i>Eumetopias jubatus</i>	FT CSC MMPA	Prefer colder temperate to sub-arctic waters of the North Pacific. Haulouts and rookeries usually consist of beaches, ledges, and rocky reefs.	Low. Potentially suitable habitat present in Estuary Study Area; tends to remain offshore or haulout in unpopulated areas. Present on offshore rocks near Jenner and Fort Ross.
Western red bat <i>Lasiurus blossevillii</i>	CSC	Associated with riparian habitat. Roosts primarily in the foliage of trees or shrubs, but may also occasionally use caves. Day roosts commonly in edge habitats.	Moderate. Potentially suitable foraging and roosting habitat present in Estuary Study Area. Present in the vicinity of Forestville, approximately six miles east of Estuary Study Area.



**TABLE 4.4-3 (Continued)**  
**SPECIAL-STATUS ANIMAL SPECIES WITH POTENTIAL TO OCCUR IN THE ESTUARY STUDY AREA**

Common Name Scientific Name	Status	Habitat	Potential to Occur
<b>Mammals (cont.)</b>			
Northern elephant seal <i>Mirounga angustirostris</i>	MMPA	Eastern and central North Pacific. Usually in ocean waters but when on land, prefer sandy beaches.	High. Suitable habitat present in Estuary Study Area; occasionally haulout at mouth of Russian River.
Harbor seal <i>Phoca vitulina</i>	MMPA	Inhabit temperate coastal habitats and use rocks, reefs, beaches, and drifting glacial ice as haulout and pupping sites.	High. Suitable habitat present in Estuary Study Area; regularly haulout at mouth of Russian River, as well as other suitable haulout sites within the Estuary.
Sperm whale <i>Physeter catodon</i>	FE MMPA	Globally distributed, primarily occurring in temperate and tropical waters.	Unlikely. Potentially suitable habitat not present in Estuary Study Area.
American badger <i>Taxidea taxus</i>	CSC	Prefers open areas and may also frequent brushlands with little groundcover. When inactive, occupies underground burrows that are elliptical shaped and eight or more inches in diameter.	Moderate. Potentially suitable habitat present in Estuary Study Area. Present in multiple location within 10 miles of Estuary Study Area; nearest location approximately six miles south of Estuary Study Area.
California sea lion <i>Zalophus californianus</i>	MMPA	Eastern Pacific Ocean in shallow coastal and estuarine waters. Preferred haulout sites are sandy beaches, but also use marina docks, jetties, and buoys.	High. Suitable habitat present in Estuary Study Area; occasionally haulout at mouth of Russian River, as well as other suitable haulout sites within the Estuary.

## CODES:

FC: Federal Candidate for listing  
 FE: Federally listed as Endangered  
 FT: Federally listed as Threatened  
 FD Federal Delisted

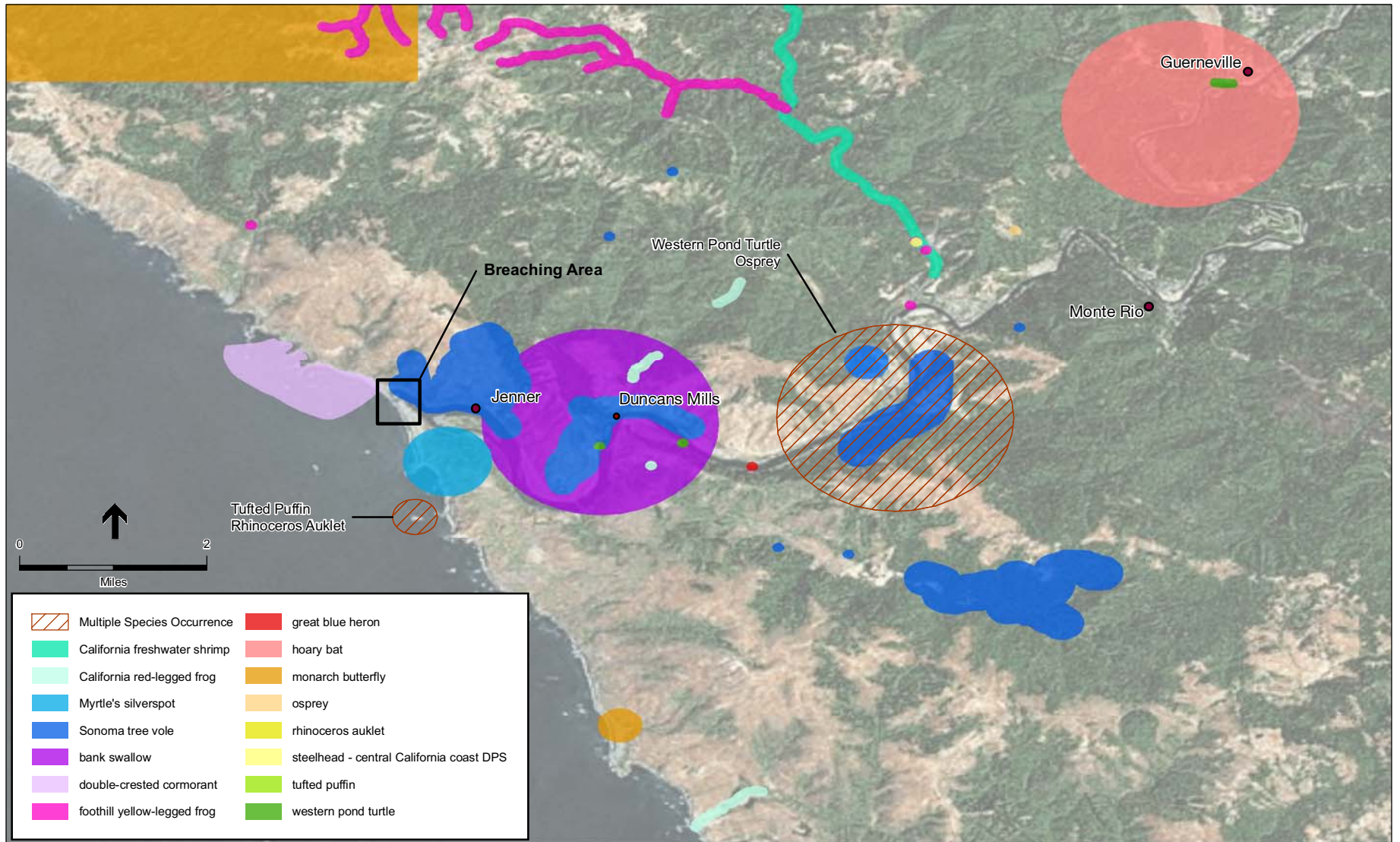
CE: State of California listed as Endangered  
 CT: State of California listed as Threatened  
 CP: State of California Proposed for listing  
 CSC: California Species of Special Concern

CD: State of California Delisted  
 FPS: California Fully Protected Species  
 SA: CDFG Special Animal  
 MMPA: Marine Mammal Protection Act

## POTENTIAL TO OCCUR

Unlikely = Habitat not present in the Estuary Study Area and/or species is not known to occur in the Estuary Study Area based on CNDDDB occurrences, recent field surveys or species distribution information.  
 Low = Habitat not present in the Estuary Study Area and/or few occurrence in the region.  
 Moderate = Marginal habitat present in the Estuary Study Area and/or some occurrences in the region.  
 High = Good habitat present in the Estuary Study Area and nearby occurrences or species is known to occur in the Estuary Study Area based on CNDDDB occurrences or recent field surveys.

SOURCES: CDFG, 2010; Jennings and Hayes, 1994; Shuford and Gardali, 2008; USFWS, 2010; Zeiner et al., 1988, 1990a, and 1990b.

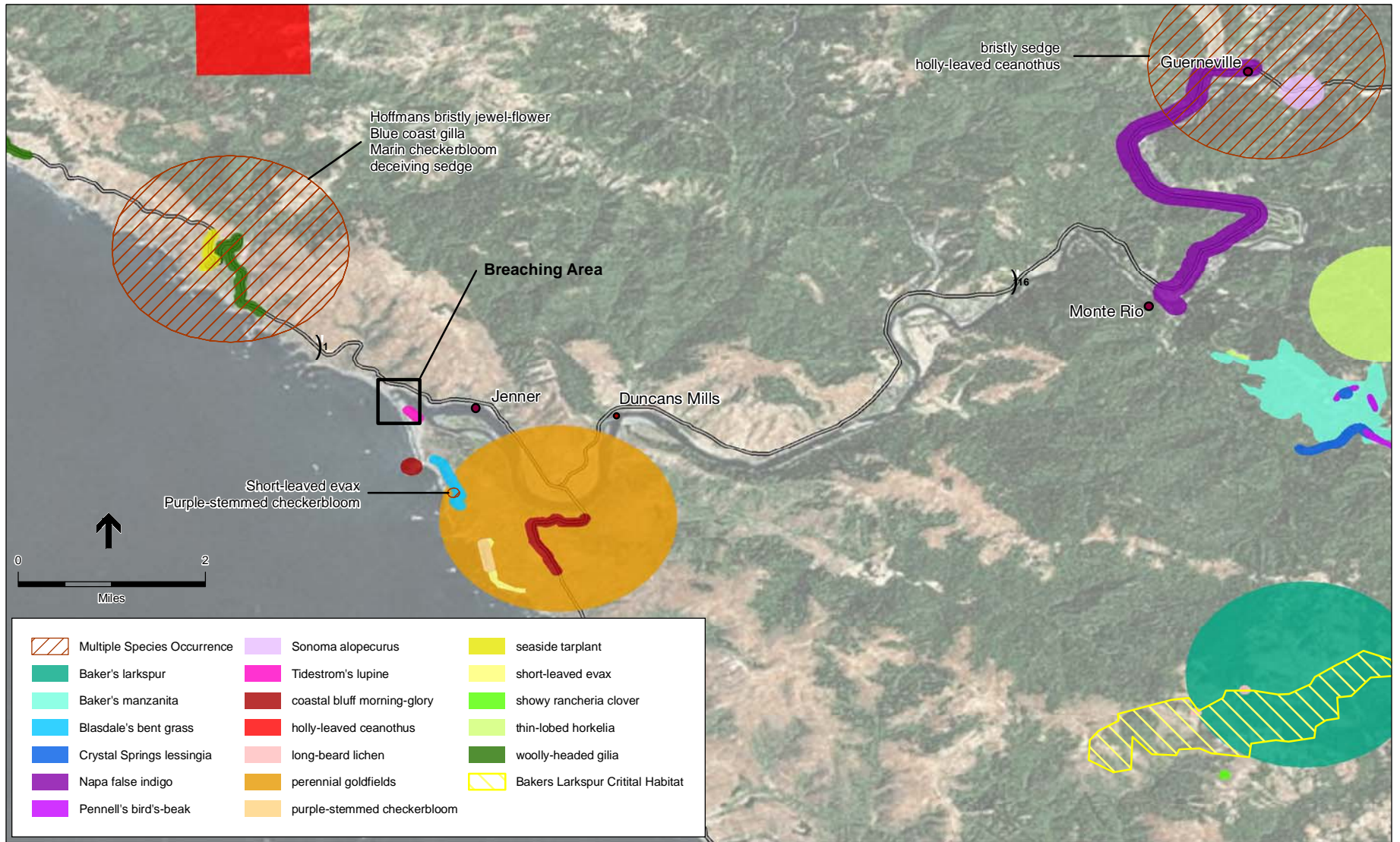


SOURCE:DFG,2010; FWS, 2010

Russian River Estuary Management Project. 207734.01

**Figure 4.4-11**

CNDDDB Special Status Animals



SOURCE:DFG,2010; FWS, 2010

Russian River Estuary Management Project. 207734.01

**Figure 4.4-12**  
 CNDDDB Special Status Plants and  
 Critical Habitat

The beach and dune, coastal scrub, and grassland habitats located within the Estuary Study Area provide potentially suitable habitat for this species. Blasdale's bent grass is known from several locations within five miles of the Estuary Study Area. The closest location is approximately 0.25 miles south of the Estuary Study Area within the coastal bluff habitat of Blind Beach within Sonoma Coast State Beaches. There are several other known locations within the Sonoma Coast State Beach system at Furlong Gulch, Duncans Point, Schoolhouse Beach, and near Salmon Creek. This species has a high potential for occurrence based on the presence of suitable habitat in the Estuary Study Area and known occurrence records in close proximity to the Estuary Study Area.

**Sonoma Alopecurus.** Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*) is a federally listed endangered and CNPS List 1B.1 species. This perennial herb is a member of the grass family (Poaceae). It produces short, compact inflorescences during its May to July blooming season. Spikelets are usually violet-gray at the tip. Sonoma alopecurus occurs in freshwater marshes and swamps and riparian scrub habitats between 15 and 1,200 feet in elevation. It is a California endemic species that is known from Sonoma and Marin counties. Eleven populations have been extirpated<sup>6</sup> and eight natural populations are believed extant<sup>7</sup>.

The freshwater marsh located along the edges of the Russian River and other freshwater wetlands that occur within the Estuary Study Area may provide suitable habitat for the Sonoma alopecurus. This plant is known to occur within Duncans Mills Marsh, less than 0.25 mile from the Estuary Study Area. It is also known from Guerneville Marsh, adjacent to the Russian River, approximately three miles upstream of the Estuary Study Area. There are several other occurrence records for this species over five miles southeast of the Estuary Study Area in marshes near Freestone, Occidental, and Forestville. There is a high potential for this species to occur within the Estuary Study Area due to the presence of suitable habitat and proximity to known populations.

**Coastal Bluff Morning-Glory.** Coastal bluff morning-glory (*Calystegia purpurata* ssp. *saxicola*) is a CNPS List 1B.2 species. It is a perennial herb of the morning-glory family (Convolvulaceae). This bindweed produces weakly climbing stems and large white flowers. The blooming period extends from May through September. This species occurs within coastal dunes and rocky coastal scrub habitats between 30 and 340 feet in elevation. Its range includes the coastal portions of Mendocino, Marin, and Sonoma Counties, with one historical record from Contra Costa County.

The coastal dune and scrub habitats within the Estuary Study Area provide potentially suitable habitat for coastal bluff morning-glory. This plant is known from several locations within five miles of the Estuary Study Area. Coastal bluff morning-glory was photographed at Goat Rock State Beach in 2005. It is also known from a 1930 collection just south of the Estuary Study Area boundary at the southern edge of the Russian River. This species was also collected in 1997, approximately 4.5 miles south of the Estuary Study Area, just south of Schoolhouse Beach. This

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<sup>6</sup> "Extirpated" is defined as removed occurrences.

<sup>7</sup> "Extant" is defined as presumed currently present occurrences.

species has a high potential for occurrence based on the presence of suitable habitat in the Estuary Study Area and known occurrence records in close proximity to the Estuary Study Area.

**Swamp Harebell.** Swamp harebell (*Campanula californica*) is a CNPS List 1B.2 species found in the bellflower family (Campanulaceae). It is endemic to California and extant in Marin, Sonoma, and Mendocino counties, with historical occurrences in Santa Cruz County. It is known to grow at elevations between 3 and 1,330 feet. This harebell is a perennial rhizomatous herb that produces pale blue bell-shaped flowers during its June to October blooming period. Swamp harebell occurs within wetland areas such as bogs and fens, meadows and seeps, freshwater marsh and swamps and can also be found in wetter portions of coastal prairie and closed-cone coniferous forest.

The Estuary Study Area contains potentially suitable habitat to support this species. Freshwater marsh occurs within the edges of the middle and upper reaches of the Russian River Estuary and at the confluence of Willow Creek and the Russian River. Seasonal wetlands, including meadows and seeps, may be present within the Estuary Study Area and could also support this species. The swamp harebell is known from less than 0.25 miles north of the Estuary Study Area in Duncans Mills Marsh. There is a high potential for this species to occur within the Estuary Study Area due to the presence of suitable habitat and known occurrences within the vicinity of the Estuary Study Area.

**Bristly Sedge.** Bristly sedge (*Carex comosa*) is a CNPS List 2.1 species. It is a rhizomatous herb of the sedge family (Cyperaceae) that occurs in marshes and swamps in elevations ranging from 0 to 2,050 feet. Bristly sedge can also occur along lake margins and in valley and foothill grassland. The plant is closely associated with coastal prairie. Bristly sedge is fairly widely distributed, but apparently rarely collected. In California bristly sedge is known from Contra Costa, Lake, Mendocino, Sacramento, San Bernardino, Santa Cruz, San Francisco, San Mateo, Shasta, San Joaquin, and Sonoma counties. It has also been found in Oregon, Washington, Idaho, and elsewhere. The blooming season for bristly sedge is from May to September.

The Estuary Study Area contains marshes and grassland, which are potentially suitable habitat for the bristly sedge. The closest record for this species near the Estuary Study Area is a historical occurrence within the vicinity of Guerneville, approximately two miles northeast of the Estuary Study Area. Bristly sedge has a moderate potential to occur within the Estuary Study Area. The only other CNDDDB occurrence record within ten miles is located approximately six miles southeast of the Estuary Study Area near Bodega Bay, but the record lacks detail on the collection date. The Estuary Study Area contains suitable habitat for this species, and a historical record is known within the vicinity of the Estuary Study Area. For this reason, bristly sedge has a moderate potential to occur within the Estuary Study Area.

**Deceiving Sedge.** Deceiving sedge (*Carex saliniformis*) is a CNPS List 1B.2 species of the sedge family (Cyperaceae). It grows in mesic coastal prairie and scrub, coastal salt marshes and swamps, and meadows and seeps between 10 and 755 feet in elevation. Its range extends along coastal northern California in Humboldt, Mendocino, and Sonoma counties; it is believed extirpated from Santa Cruz County. This perennial, rhizomatous herb blooms in June and less commonly in July.

The Estuary Study Area contains coastal scrub and grassland and a variety of seasonal wetland habitats, which may provide suitable habitat for the deceiving sedge. There is one known occurrence record for the deceiving sedge within ten miles of the Estuary Study Area. The exact location of this record is unknown, but it is within the vicinity of Meyers Grade, between Highway 1 and the Pacific Ocean, approximately one mile northwest of the Estuary Study Area. Deceiving sedge has a moderate potential to occur within the Estuary Study Area given the presence of suitable habitat and proximity to an occurrence record.

**San Francisco Bay Spineflower.** The San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*) is a CNPS List 1B.2 of the knotweed family (Polygonaceae). This species is known from Sonoma, Marin, San Francisco, and San Mateo counties and believed extirpated from Alameda County. Suitable habitats for this species include coastal bluff scrub, sandy coastal scrub, coastal dunes, and coastal prairie between 10 and 705 feet in elevation. This spineflower has pink-red stems and small flowers held in tight inflorescences. It blooms from April through July and uncommonly into August.

The Estuary Study Area contains coastal dunes and coastal scrub, which are potentially suitable habitat for this species. There is only one CNDDDB occurrence record in Sonoma County. It is from a 1930 collection located approximately eight miles south of the Estuary Study Area within the vicinity of Bodega Head. Although there is only one historical record in Sonoma County, the Estuary Study Area contains suitable habitat. Therefore, the San Francisco Bay spineflower has a moderate potential for occurrence.

**Woolly-Headed Spineflower.** Woolly-headed spineflower (*Chorizanthe cuspidata* var. *villosa*) is a CNPS List 1B.2 species. It is an annual herb of the knotweed family (Polygonaceae) found in coastal Marin and Sonoma counties. This small buckwheat species produces small white and pink flowers in tight inflorescences. Suitable habitat for this species includes sandy coastal scrub, coastal dunes, and coastal prairie between 10 and 200 feet in elevation. The blooming period for this species extends from May through July and uncommonly into August.

Coastal dune and scrub and grassland habitats within the Estuary Study Area provide potentially suitable habitat for the woolly-headed spineflower. The closest known occurrence record is from approximately eight miles south of the Estuary Study Area in a sandy draw of Bodega Head; this record is from 1962. There is another record over ten miles south of the Estuary Study Area within coastal bluff scrub along Dillon Beach; 20 plants were observed as recently as 2004. Due to the presence of suitable habitat in the Estuary Study Area and known records of this species in coastal Sonoma County, the woolly-headed spineflower has a moderate potential to occur within the Estuary Study Area.

**Franciscan Thistle.** Franciscan thistle (*Cirsium andrewsii*), is a CNPS List 1B.2 species and a member of the sunflower family (Asteraceae). This perennial herb produces dark red-purple and densely cobwebby inflorescences from March through July. Franciscan thistle occurs in broadleafed upland forest, coastal bluff scrub, coastal prairie, mesic coastal scrub, and sometimes on serpentinite coastal scrub habitats at 0 to 490 feet in elevation. This species is endemic to California and its range extends from Sonoma south to San Mateo County.

The Estuary Study Area contains coastal scrub, grassland, and upland forest habitats, which are potentially suitable habitat for the Franciscan thistle. The closest occurrence record is from Bodega Head, approximately eight miles south of the Estuary Study Area. There are no current reports from this record, and the occurrence may be extirpated. There is a moderate potential for Franciscan thistle to occur within the Estuary Study Area due to the presence of suitable habitat and historical records within coastal Sonoma County.

**Golden Larkspur.** Golden larkspur (*Delphinium luteum*) is a federally-listed endangered, state-listed rare, and CNPS List 1B.1 species. This perennial herb is a member of the buttercup family (Ranunculaceae). Golden larkspur produces bright yellow flowers during its March through May blooming period. It is known from fewer than 20 occurrences within Sonoma and Marin counties. Typical habitats for this species include moist rocky habitats, particularly rocky coastal scrub, coastal prairie and chaparral between 0 and 330 feet in elevation.

Coastal scrub and grassland habitats within the Estuary Study Area provides potentially suitable habitat for this species. There are several occurrence records for the golden larkspur within ten miles of the project site. Most records are located between five and 9 miles south of the Estuary Study Area within the vicinity of Bodega Bay, with one historical record approximately eight miles southeast of the Estuary Study Area. All records within the vicinity of Bodega Bay are described as occurring within rock outcrops or other rocky habitats. There is a moderate potential for the golden larkspur to occur within the Estuary Study Area due to the presence of potential habitat and known distribution in Sonoma County.

**Blue Coast Gilia.** Blue coast gilia (*Gilia capitata* ssp. *chamissonis*) is a CNPS List 1B.1 species. This annual herb is a member of the phlox family (Polemoniaceae). As its name suggests, the blue coast gilia has bright blue-violet flowers that bloom between April and July. This species occurs in coastal dunes and coastal scrub at elevations between 10 and 660 feet. Its range includes Sonoma, Marin and San Francisco counties.

The Estuary Study Area contains coastal dunes and coastal scrub habitats, which are potentially suitable habitats for the blue coast gilia. There are also several known occurrence records for this species within ten miles of the Estuary Study Area. This species is present within the coastal dunes of Goat Rock State Beach, approximately 0.25 miles north of the Estuary Study Area (State Parks, 2007). There is one record located less than one mile northwest of the Estuary Study Area, however this population is presumed extirpated. The remaining records are located between five and eight miles south of the Estuary Study Area in the vicinity of Bodega Bay; these are all historical records that are presumed extant. There is a high potential for blue coast gilia to occur within the Estuary Study Area due to the presence of potential habitat and close proximity of known occurrences.

**Dark-Eyed Gilia.** Dark-eyed gilia (*Gilia millefoliata*) is a CNPS List 1B.2 species of the phlox family (Polemoniaceae). This annual herb produces clusters of two to six small purple flowers within its April through July blooming period. In California, it grows in stable coastal dune habitats within Del Norte, Humboldt, Mendocino, and Sonoma counties and is believed extirpated from San Francisco County. Its range extends from 10 to 100 feet in elevation.

The Estuary Study Area contains coastal dune habitat, which is potentially suitable habitat for the dark-eyed gilia. There are three CNDDDB occurrence records for this species within ten miles of the Estuary Study Area. One is from a collection near Fort Ross, approximately six miles north of the Estuary Study Area, although the date of collection is unknown. The remaining two records are approximately eight miles south of the Estuary Study Area in the vicinity of Bodega Head. The dark-eyed gilia has moderate potential for occurrence based on the presence of suitable habitat within the Estuary Study Area and known records within coastal Sonoma County.

**Short-leaved evax.** Short-leaved evax (*Hesperevax sparsiflora* var. *brevifolia*) is a CNPS List 1B.2 species of the sunflower family (Asteraceae). It is an annual herb with small, woolly leaves and small flowers. The short-leaved evax has a March through June blooming period. This species occurs in sandy coastal bluff scrub and coastal dune habitat along the coast from Oregon south to San Mateo County between 0 and 705 feet in elevation.

The Estuary Study Area contains coastal dune and coastal scrub habitat, which is potentially suitable habitat for the short-leaved evax. There are also several occurrence records for this species within one mile of the Estuary Study Area. Multiple plants were observed at Blind Beach, Furlong Gulch, and at a beach south of Peaked Hill, which are all beaches within the Sonoma Coast State Beach system. There is a high potential for short-leaved evax to occur within the Estuary Study Area based on the presence of suitable habitat and existing populations less than one-mile from the Estuary Study Area.

**Point Reyes horkelia.** Point Reyes horkelia (*Horkelia marinensis*) is a CNPS List 1B.2 species and a member of the rose family (Rosaceae). This perennial herb is endemic to California and its range extends from Mendocino south to Santa Cruz County. It grows in sandy coastal scrub, coastal prairie and coastal dune habitats at elevations between 20 and 1,150 feet. This small plant produces flowers with narrow, white petals during its May through September blooming period.

Coastal dune, scrub, and grassland habitats within the Estuary Study Area provide potentially suitable habitat for the Point Reyes horkelia. The closest known occurrence records for this species are within the vicinity of Bodega Head, approximately eight miles south of the Estuary Study Area. Point Reyes horkelia has a moderate potential to occur within the Estuary Study Area based on the presence of potentially suitable habitat and known records within coastal Sonoma County.

**Perennial goldfields.** Perennial goldfields (*Lasthenia californica* ssp. *macrantha*) is a CNPS List 1B.2 species of the sunflower family (Asteraceae). It is a perennial herb that produces yellow inflorescences during its January through November blooming period. Perennial goldfields grow within coastal dune, coastal bluff scrub, and coastal scrub habitats between 20 and 1,710 feet in elevation. This is a California endemic species whose range includes coastal Mendocino, Sonoma, Marin, San Mateo, and San Luis Obispo counties.

Perennial goldfields have been documented within the Estuary Study Area boundary and at several locations within the vicinity of the Estuary Study Area. There is one historical CNDDDB occurrence record within the vicinity of the mouth of the Russian River, south of Jenner. This



species has also been observed at several locations within Sonoma Coast State Beaches (State Parks, 2007). There are also multiple CNDDDB records between six and 9 miles south of the Estuary Study Area near Bodega Bay and one known record eight miles north of the Estuary Study Area north of Windermere Point.

**Rose leptosiphon.** Rose leptosiphon (*Leptosiphon rosaceus*) is a CNPS List 1B.1 species. It is an annual herb of the phlox family (Polemoniaceae). It produces small pink or white flowers within its April through July blooming period. This species is found within coastal bluff scrub in Marin and San Mateo counties and believed extirpated from San Francisco and Sonoma Counties. It occurs at elevations between 0 and 330 feet.

The Estuary Study Area contains coastal scrub habitat, which is potentially suitable habitat for the rose leptosiphon. This species is historically known from Sonoma County. There is one CNDDDB record for rose leptosiphon within ten miles of the Estuary Study Area; plants were observed within coastal bluff habitat near Fort Ross, but are believed extirpated. This species has a moderate potential to occur within the Estuary Study Area based on the presence of suitable habitat and historical presence within coastal Sonoma County.

**Tidestrom's lupine.** Tidestrom's lupine (*Lupinus tidestromii*) is a federal and state-listed endangered and CNPS List 1B.1 species. It is a perennial, rhizomatous herb of the legume family (Fabaceae) with silvery leaves. This species grows in coastal dune habitats in Marin, Sonoma, and Monterey counties between 0 and 330 feet in elevation. It produces light blue to lavender-colored flowers during its April through June blooming period.

Tidestrom's lupine is known within the Estuary Study Area. Plants have been observed within the stabilized dunes north and east of Goat Rock State Beach as recently as 2005, though they occur outside the project area. They were found in association with other stabilized dune species such as San Francisco wallflower (*Erysimum franciscanum*) and coastal sagewort (*Artemisia pycnocephala*), and the population is monitored by State Parks, which issues a Temporary Use Permit each year for breaching activities.

**Marsh microseris.** Marsh microseris (*Microseris paludosa*) is a CNPS List 1B.2 species and a member of the sunflower family (Asteraceae). This species produces bright yellow inflorescences during its April through June blooming period. It grows within a variety of habitats including closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Its range includes Mendocino, Sonoma, Marin, Santa Cruz, San Benito, Monterey, and San Luis Obispo counties between 20 and 1,800 feet in elevation. It is believed extirpated from San Francisco and San Mateo Counties.

The Estuary Study Area contains coastal scrub, grassland, and forest habitats, which are potentially suitable habitat for marsh microseris. There are no occurrence records for this species within ten miles of the project site. The closest known record for this species is from a 1921 collection, near Windsor, approximately 12 miles northeast of the project site. There is a moderate potential for this species to occur within the project site based on the presence of suitable habitat and known occurrence records in Sonoma County.

**North Coast semaphore grass.** North Coast semaphore grass (*Pleuropogon hooverianus*) is a state-listed threatened and CNPS List 1B.1 species and member of the grass family (Poaceae). This rhizomatous grass grows in meadows and seeps and within mesic<sup>8</sup> openings in broadleaved upland forest and North Coast coniferous forest. Its range includes Mendocino, Sonoma, and Marin counties at elevations between 30 and 2,200 feet. The blooming period for this species extends from April through June.

The Estuary Study Area contains forests, as well as meadows and seeps, which provide potentially suitable habitat for the North Coast semaphore grass. There is one CNDDDB occurrence record for this species within ten miles of the Estuary Study Area. Plants were observed within a ditch in 1974, but may have been extirpated by road creation. There is a moderate potential for the North Coast semaphore grass to occur within the Estuary Study Area due to the presence of suitable habitat and records from Sonoma County.

**Oregon polemonium.** Oregon polemonium (*Polemonium carneum*) is a CNPS List 2.2 species of the phlox family (Polemoniaceae). This perennial herb grows in coastal prairie, coastal scrub, and lower montane forests between 0 and 6,000 feet in elevation. Its range includes Del Norte, Siskiyou, Humboldt, Sonoma, Marin, Alameda, and San Mateo counties. Oregon polemonium produces pale pink to purple flowers during its April through September blooming period.

Coastal scrub, grassland and forest habitats within the Estuary Study Area provide potentially suitable habitat for Oregon polemonium. There is one occurrence record for this species within ten miles of the project; it was observed in 1935 near Bodega Bay, approximately eight miles south of the Estuary Study Area. There is a moderate potential for this species to occur within the Estuary Study Area due to the presence of potentially suitable habitat and known occurrence within coastal Sonoma County.

**Point Reyes checkerbloom.** Point Reyes checkerbloom (*Sidalcea calycosa* ssp. *rhizomata*) is a CNPS List 1B.2 species of the mallow family (Malvaceae). This perennial, rhizomatous herb produces pale purple flowers during its blooming period, which occurs April through September. It can be found in coastal freshwater marshes and swamps between 10 and 250 feet in elevation. Its range extends from Mendocino County south to Marin County.

The Estuary Study Area contains freshwater marsh along the edges of the Russian River, which is potentially suitable habitat for the Point Reyes checkerbloom. There is one known occurrence record for this species within ten miles of the Estuary Study Area. This record is from an 1882 collection in the vicinity of Duncans Mills Marsh, less than 0.25 miles north of the Estuary Study Area. This species has a moderate potential to occur within the Estuary Study Area based on the presence of suitable habitat and occurrence record near the Estuary Study Area.

**Purple-stemmed checkerbloom.** Purple-stemmed checkerbloom (*Sidalcea malviflora* ssp. *purpurea*) is a CNPS List 1B.2 species and a member of the mallow family (Malvaceae). This

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<sup>8</sup> In ecology, the term mesic refers to a habitat type that is characterized by, related to, or requires a moderate amount of moisture.

plant produces bright pink-rose colored flowers with white veins. It is a perennial, rhizomatous herb that blooms between May and June. The purple-stemmed checkerbloom grows in coastal prairie, meadows, and broadleaved upland forest between 0 and 100 feet in elevation. It is a California endemic species known from Mendocino, Sonoma, and Marin counties.

The Estuary Study Area contains coastal bluff, grassland, and forest habitats, which are potentially suitable habitats for the purple-stemmed checkerbloom. There are multiple occurrence records for this species within five miles of the Estuary Study Area. The records are within Sonoma Coast State Beaches from 0.5 to 2.5 miles south of the Estuary Study Area. There is a moderate potential for this species to occur within the Estuary Study Area due to the presence of suitable habitat and known occurrence within 0.5 miles of the Estuary Study Area in similar habitat.

**Coastal triquetrella.** Coastal triquetrella (*Triquetrella californica*) is a CNPS List 1B.2 species. It is a moss that grows within ten miles of the coast in coastal scrub, coastal bluff scrub, and valley and foothill grasslands. It has also been observed in open gravels on roadsides, hillsides, and rocky slopes. This species has been documented in Del Norte, Mendocino, Sonoma, Marin, San Francisco, San Mateo, and San Diego counties.

Coastal scrub and grassland within the Estuary Study Area provide potentially suitable habitat for coastal triquetrella. There is one CNDDDB occurrence record for this species within ten miles of the Estuary Study Area. It was collected in 2002 near the Bodega Marine Laboratory of the University of California, approximately eight miles on the hillside. Coastal triquetrella has a moderate potential to occur within the Estuary Study Area based on the presence of suitable habitat and known records within coastal Sonoma County.

### **Special-Status Animals**

Based on review of the databases and other information sources, 50 special-status animal species have been documented as occurring or potentially occurring in the vicinity of the Estuary Study Area, and have varying potential for occurrence within the habitats present in the Estuary Study Area. Twenty-one of these special-status animal species are considered unlikely to occur or to have a low potential to occur in the Estuary Study Area for reasons such as absence of essential habitat required for the species, the distance to known occurrences and/or the species distributional range, or the species not being detected during past or present field surveys. These species are not discussed further in this section. The remaining 26 special-status animal species are considered to have moderate to high potential to occur within the Estuary Study Area, based on occurrences and availability of suitable habitat. These species are discussed below.

#### ***Invertebrates***

**Behren's Silverspot Butterfly and Myrtle's Silverspot Butterfly.** There are two subspecies of *Speyeria zerene* that occur within Sonoma County: Behren's silverspot butterfly (*Speyeria zerene behrensii*) and Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*). Both are federally listed as endangered (Federal Register, 1992a and 1997) and neither have designated critical habitat. The western dog violet (*Viola adunca*), as well as other violets (*Viola* spp.), are host plants for both

of these butterflies. Both occur within coastal habitats, but the USFWS generally considers the Behren's silverspot distribution as north of the Russian River and Myrtle's as south (USFWS, 2003).

Behren's silverspot occurs in coastal terrace prairie and coastal dune habitats. It was historically found within six locations from the City of Mendocino, Mendocino County, south to Salt Point State Park, Sonoma County, with an additional potential occurrence record near Jenner at the mouth of the Russian River.

Myrtle's silverspot butterfly is restricted to areas immediately adjacent to the coast, which include dunes, scrub, and grasslands (Essig Museum of Entomology, 2006). Historically, the Myrtle's silverspot butterfly was found along the coast, from the mouth of the Russian River in Sonoma County south to San Mateo County (Federal Register, 1992a). Extant populations are reported to occur only in Sonoma and Marin counties (CDFG, 2010). No butterflies have been observed at the historical population sites near Pacifica and San Mateo in San Mateo County since before 1992 (Federal Register, 1992a).

There is one occurrence record for Myrtle's silverspot butterfly within the Estuary Study Area, although this is the potential occurrence record for the Behren's silverspot (CDFG, 2010). This record is from a 1975 collection near Jenner, south of the Russian River. This species was recorded as a Myrtle's silverspot, but the collected species exhibited characteristics of Behren's silverspot. There has been considerable debate if the Jenner metapopulation is closer to Myrtle's or Behren's or an intermediate zone where the two subspecies overlap. There are multiple known occurrence records for Myrtle's silverspot within five miles of the Estuary Study Area; all are at least four miles south of the Estuary Study Area.

There are no occurrence records for the Behren's silverspot within ten miles of the Estuary Study Area. The Estuary Study Area contains coastal dune and scrub habitats, which are potentially suitable habitats for this butterfly. Due to the presence of suitable habitat and a potential occurrence record within the Estuary Study Area, Behren's silverspot butterfly has a high potential to occur within the Estuary Study Area.

**California Freshwater Shrimp.** California freshwater shrimp (*Syncaris pacifica*) is a federal and state-listed endangered species (Federal Register, 1988; CDFG 2009). This shrimp occurs in low gradient freshwater streams with exposed roots, undercut banks, overhanging woody debris, or overhanging vegetation. It can tolerate a broad range of water temperature conditions within small, perennial coastal streams. In the winter, the shrimp is often found beneath undercut banks with overhanging vegetation, while in the spring and summer it prefers submerged leafy braches. The California freshwater shrimp is endemic to Marin, Sonoma and Napa counties, although it is only found in 17 stream segments within these counties (USFWS, 1998). It is known in several stream segments that are tributary to the lower Russian River.

California freshwater shrimp is known from several streams within ten miles of the Estuary Study Area, including Austin Creek and East Austin Creek, which are tributary to the lower Russian River. According to the CNDDDB, shrimp were detected in Austin Creek during surveys

conducted in 1990 (CDFG, 2010). The southern end of this occurrence record is located within the maximum backwater area. Shrimp have also been detected within East Austin Creek above its confluence with Austin Creek (CDFG, 2010). Within the Estuary Study Area, the perennial tributaries to the lower Russian River provide potentially suitable habitat for this shrimp. The California freshwater shrimp is known within the maximum backwater area and has a moderate potential to occur within the Estuary Study Area due to the presence of suitable habitat and known occurrence in Austin Creek.

### **Amphibians**

**Foothill Yellow-legged Frog.** Foothill yellow-legged frog (*Rana boylei*) is a California species of special concern (CDFG, 2009). This species inhabits foothill and mountain streams in the Coast Ranges from sea level to about 6,000 feet from the Oregon border southward to the Transverse Mountains in Los Angeles County, in most of northern California west of the Cascade crest, and along the western flank of the Sierra Nevada southward to Kern County. Most records are for occurrences below 3,500 feet. The foothill yellow-legged frog is found in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types (Zeiner et al., 1988).

Home ranges are small, but these frogs may move several hundred yards to spawning habitat. Adult frogs congregate at suitable spawning sites as spring runoff declines when water temperatures reach 12 to 15 degrees Celsius (C) (usually any time from mid-March to May, depending on local water conditions). The breeding season at any locality is usually about two weeks for most populations. Spawning frogs favor low to moderately steep-gradient streams (0 to 8 degrees). Females deposit eggs in shallow edge-water areas with water velocities less than 4 inches per second (Seltenrich and Pool, 2002). Egg masses are often attached to the downstream sides of cobbles and boulders, or to gravel, wood, or other materials. Eggs hatch in approximately a few weeks. Tadpoles transform in three to four months and stay for a time in breeding habitat, but eventually disperse. They feed on diatoms or algae on the surface of the substrate (Stebbins, 1951). Tadpoles favor calm, shallow water. Juvenile and adult frogs bask on midstream boulders or in terrestrial sites along riffles, cascades, main channel pools, and plunge-pools, often in dappled sunlight near low overhanging vegetation. They are relatively strong swimmers and prefer faster water habitat than do other foothill frog species such as the exotic bullfrog (*Rana catesbeianus*) or the California red-legged frog. Post-metamorphic foothill yellow-legged frog prey almost exclusively on terrestrial insects and arachnids (Van Wagner, 1996).

Foothill yellow-legged frog is known within the Estuary Study Area. In September 2005, one juvenile foothill yellow-legged frog was observed along a gravel bar at the confluence of Austin Creek and the Russian River (CDFG, 2010). Foothill yellow-legged frog egg masses were also observed within Austin Creek in 2008, less than 0.1 mile upstream of the maximum backwater area and less than 0.5 mile north of the Estuary Study Area. Foothill yellow-legged frog have been observed at several other locations within five miles of the Estuary Study Area including Blue Jay Creek, approximately 4.5 miles north of the Estuary Study Area; Kidd Creek, a tributary

of Austin Creek located approximately 2.5 miles north of the Estuary Study Area; and in Russian Gulch, approximately 1.5 miles north of the Estuary Study Area.

**California Red-legged Frog.** California red-legged frog (*Rana [aurora] draytonii*) is federally listed as threatened (Federal Register, 1996a) and is a California species of special concern (CDFG, 2009). The USFWS released a recovery plan in 2002 (USFWS, 2002), and critical habitat for the California red-legged frog was designated in 2010 after several legal and regulatory actions (Federal Register, 2010). The Estuary Study Area is not within designated critical habitat for the California red-legged frog.

The California red-legged frog ranges from coastal mountains from southern Mendocino County southward to northern Baja California, and inland to the Sierra Nevada foothills (Jennings et al., 1992; Shaffer et al., 2004). The frog has been apparently extirpated from approximately 70% of its historic range (USFWS 2002). California red-legged frogs are usually confined to aquatic habitats such as creeks, streams, and ponds, and occur primarily in areas that have pools about 3 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, but they rarely move long distances from their aquatic habitat. At one site in Santa Cruz County, 78 to 89 percent of adult frogs remained resident at their breeding location year-round, moving less than 425 feet from water (Bulger et al., 2003). Long-distance movement of more than two miles between aquatic sites has been reported (Bulger et al., 2003), but is likely a relatively rare event. California red-legged frogs breed from November to March. Egg masses are attached to emergent vegetation (Jennings and Hayes, 1994) and hatch within about two weeks. Metamorphosis generally occurs between July and September.

California red-legged frog is known from multiple locations within five miles of the Estuary Study Area, including two tributaries of the Russian River. One adult and two juvenile California red-legged frogs were observed in Willow Creek in 1999, less than 0.5 miles upstream of the Estuary Study Area. One adult California red-legged frog was observed within Sheephouse Creek, less than 0.25 miles north of the Estuary Study Area, as recently as 2007, and another adult was observed within the same creek in 1996, just over one mile upstream of the Estuary Study Area (CDFG, 2010). Willow Creek, as well as other tributary drainages, within the Estuary Study Area contain potentially suitable habitat for the California red-legged frog, and there is a high potential for California red-legged frog to occur here.

### **Reptiles**

**Western Pond Turtle.** Western pond turtle (*Actinemys marmorata*) is a California species of special concern and is uncommon to common in suitable aquatic habitats throughout California, west of the Sierra-Cascade crest and absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries (CDFG, 2008). Western pond turtles are associated with a variety of aquatic habitats, both permanent and intermittent, including rivers, creeks, small lakes and ponds, marshes, irrigation ditches, and reservoirs. They may also occur in brackish to saltwater (Stebbins, 2003). Although pond turtles spend much of their lives in water, they require terrestrial habitats for nesting. They also may overwinter on land and may spend part of the

warmest months in aestivation on land. Use of terrestrial habitats for overwintering and aestivation may vary considerably with latitude and habitat type, as some turtles do not leave aquatic habitat (Stebbins, 2003).

In general, nesting occurs between late April and early August (Jennings and Hayes, 1994). Females typically leave the water in late afternoon or early evening and travel to an upland location that may be a considerable distance from aquatic habitat. Eggs are deposited in the flask-shaped nest excavated by the female. Because digging the nest may require several hours, the female commonly remains on or near the nest site overnight (Jennings and Hayes, 1994). The young hatch and may overwinter in the nest, emerging from the nest site and moving to the aquatic habitat in the spring. Hatchlings spend much of their time feeding in shallow water that typically has a relatively dense vegetation of submergents or short emergents. Threats to western pond turtle include impacts to nesting habitat from agricultural and grazing activities, human development of habitat, and increased predation pressure from native and non-native predators as a result of human-induced landscape changes (Jennings and Hayes, 1994).

Western pond turtle is known from multiple locations within the Estuary Study Area. One turtle was observed in the Estuary, 0.6 miles upstream of Sheephouse Creek confluence, in 2004 (CDFG, 2010). Another turtle was observed on the same date within the Estuary, 0.7 miles upstream from the Highway 1 Bridge. There is also a California Academy of Sciences specimen record for western pond turtle within the vicinity of Duncans Mills, although the collection date is unknown.

### **Birds**

**Tricolored Blackbird.** Tricolored blackbird (*Agelaius tricolor*) is a California species of special concern that is largely endemic to California. Tricolored blackbird is found mostly throughout the Central Valley and San Francisco Bay Delta regions (Hamilton, 2004) and is highly gregarious, foraging and nesting in flocks. Tricolored blackbirds forage in annual grasslands; wet and dry vernal pools and other seasonal wetlands; and croplands. They also forage occasionally in riparian scrub habitats and along marsh borders. Tricolored blackbirds nest near freshwater marshes. The three basic requirements for nesting sites include open accessible water; a protected nesting substrate, including either flooded or thorny or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting site (Hamilton et al., 1995; Beedy and Hamilton, 1997, 1999). The breeding season generally extends from mid-March into mid-July (Hamilton, 2004). Nests built of mud and plant material are usually located a few feet over, or near, freshwater, but may be hidden on the ground among low vegetation. Primary threats to tricolored blackbirds are the direct loss and alteration of habitat, but other human activities and predation also threaten tricolored blackbirds.

There are no CNDDDB occurrence records for the tricolored blackbird within ten miles of the Estuary Study Area, and the Estuary Study Area is outside of the known breeding range for this species. However, potentially suitable foraging habitat for this species is present. The margins of the Russian River Estuary contain freshwater marsh, dominated by bulrush and cattail, which may serve as foraging and roosting habitat for the tricolored blackbird. Additionally, tricolored

blackbirds may forage and roost in a variety of habitats present in the Estuary Study Area including grasslands and seasonal wetlands. Since the Estuary Study Area is outside of the known breeding range for the tricolored blackbird, but does contain potential foraging habitat, this species has a moderate potential to occur within the Estuary Study Area as a seasonal non-breeding resident or as a transient.

**Great Blue Heron.** Great blue heron rookery sites are protected by the CDFG. The great blue heron is fairly common all year throughout most of California and is found in a wide variety of habitats near sources of water, including sheltered, shallow bays and inlets, sloughs, marshes, wet meadows, and shores of lakes, and rivers (Zeiner et al, 1990a). The great blue heron usually breeds in colonies containing a few to several hundred pairs. Breeding generally occurs from March to May. Nests are usually placed in the tops of secluded large snags or live trees, usually among the tallest available (Zeiner et al, 1990a).

One great blue heron rookery has been recorded in the Estuary Study Area (CDFG, 2010). At least 7 individual heron nests were observed at this rookery in 2004 in mature Douglas fir trees along the Russian River, approximately 1.4 miles southwest of Duncan's Mills. The lower, middle, and some upper reaches of the Russian River support foraging habitat for great blue heron, and other rookeries could occur in large trees adjacent to the river.

**Burrowing Owl.** The western burrowing owl is a California species of special concern. The burrowing owl was once fairly common and widespread throughout western North America. However, populations of owls have declined, or in some cases disappeared altogether, primarily due to habitat loss from land conversions for agricultural and urban development, and habitat degradation and loss due to reductions of burrowing mammal populations (Klute et al. 2003). Burrowing owl is a resident of open habitats (e.g., annual and perennial grasslands and deserts and arid scrublands with bare ground or low-growing vegetation) and requires burrows for protection, cover, and nesting. It typically uses burrows made by fossorial mammals, such as California ground squirrels or American badger (*Taxidea taxus*), but will also use man-made structures, such as culverts, concrete, asphalt, and wood piles. The burrowing owl may use a site for breeding, wintering, foraging, and/or migratory stopovers, and the breeding season generally occurs between February and August (Zeiner et al, 1990a). Although burrowing owl is often seen during the day, most of its time searching for prey is during the night. Prey items include a broad array of arthropods (i.e., centipedes, spiders, beetles, crickets, and grasshoppers), small rodents, birds, amphibians, reptiles, and carrion (Klute et al. 2003).

Three adults were observed at burrow sites approximately five miles north of the Russian River in mixed annual and native grassland habitat (CDFG, 2010). While Sonoma County is not within the current breeding range of the burrowing owl, grasslands within the Estuary Study Area could still support foraging and wintering burrowing owls. For these reasons, burrowing owl has a moderate probability of being found in the project area.

**Marbled Murrelet.** Marbled murrelet (*Brachyramphus marmoratus*) is federally listed as threatened (Federal Register, 1992b) and is state listed as endangered. Murrelets occupy the near-shore environment in the ocean and feed on zooplankton, squid, and fish, primarily Pacific sand



lance, northern anchovy, Pacific herring, smelt, and Pacific sardine. At sea, their distribution appears to vary between seasons (USFWS, 1997).

In California, this murrelet nests along the coast in two areas: from Eureka to the Oregon border and from Half Moon Bay to Santa Cruz, although its breeding range extends north into British Columbia, southern Alaska, and the Aleutian Islands (USFWS, 1997). Nesting habits remained an ornithological mystery until 1974, when a tree trimmer found a nestling high in an old-growth Douglas fir tree in Big Basin Redwoods State Park, located in the Santa Cruz Mountains of central California. This tree nesting habit is unique among diving seabirds. Murrelets lay a single egg high in old-growth trees on large horizontal limbs. Most nest sites are located in large intact stands of old-growth forest, but some nest sites have been found in smaller stands of large trees, or in areas where a few old-growth trees still exist in a second-growth landscape. The nesting season for this species runs from late March through mid-September (USFWS, 1997).

There is a moderate potential for marbled murrelet to be present within the Estuary Study Area. Murrelets could potentially nest within stands of old-growth Douglas fir or redwoods in the middle or upper reaches of the Russian River. Critical habitat for marbled murrelet was designated in 1996 (Federal Register, 1996b). No critical habitat units are located in the Estuary Study Area, but Critical Habitat Unit CA-08-b is approximately six miles north of the Estuary Study Area, and Critical Habitat Unit CA-08-a is approximately 10 miles northwest of the Estuary Study Area.

**Western Snowy Plover.** The western snowy plover (*Charadrius alexandrinus nivosus*) breeds on the Pacific coast from southern Washington to southern Baja California, Mexico, and in interior areas of Oregon, California, Nevada, and several other western states. The Pacific Coast population of the snowy plover is a federally threatened species and a California species of special concern. Snowy plovers nest primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries (USFWS, 2007). Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. The breeding season on the California coast occurs from March through September, with peak activity from mid-April to mid-June (USFWS, 2007). Nests consist of shallow scrape or depression line with beach debris (e.g., small pebbles, shell fragments, plant debris, and mud chips). Although the majority of snowy plovers are site-faithful, returning to the same nesting site in subsequent breeding season, some also disperse within and between years (USFWS, 2007). While some snowy plovers remain in their coastal breeding areas year-round, others migrate south or north for winter. They feed on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry, sandy areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons (USFWS, 2007).

Two snowy plover occurrences were reported approximately eight miles south of the Estuary Study Area at Bodega Bay, and plovers have been observed at Salmon Creek Beach, but no nesting has been observed (CDFG, 2010). Snowy plovers found at Salmon Creek have been absent during May and June, typical breeding months for the species (DRP, 2007). Sandy beaches

at the mouth of the Russian River, as well as on banks of the lower Estuary, could support nesting and foraging snowy plovers. Due to potentially suitable habitat within the Estuary Study Area and observations of plovers at nearby beaches, there is a moderate potential for western snowy plover to occur here.

**Northern Harrier.** Northern harrier (*Circus cyaneus*) is a California species of special concern (CDFG, 2009). This species is a permanent resident of northeastern California, coastal California, and the Central Valley, preferring open habitats such as grasslands, meadows, desert sinks, and freshwater and saltwater emergent wetlands (Zeiner et al., 1990a). Northern harrier is a widespread winter resident where suitable habitat is available. The breeding season for northern harrier extends from April to September, and nesting typically takes place on the ground in shrubby vegetation at the edges of marshes or along rivers and lakes. This species may also nest in grasslands, grain fields, and sagebrush flats. Northern harrier forages in low flights over open ground, feeding primarily on voles and other small mammals. However, northern harrier will also prey on birds, frogs, reptiles, crustaceans, insects, and even (rarely) on fish (Zeiner et al., 1990a).

Northern harriers are known from the Estuary Study Area, and are not uncommon in open fields near marshes in northern California. Suitable habitat includes both shrubby vegetation and grasslands adjacent to marshes for nesting and foraging.

**White-tailed Kite.** The white-tailed kite (*Elanus leucurus*) is not listed under the Federal or State Endangered Species Acts, but is considered a fully protected species by the state of California. White-tailed kite occupy nearly all areas of California up to the western Sierra Nevada foothills and southeast deserts, inhabiting low elevation, open grasslands, savannah-like habitats, but are rarely found away from agricultural areas (Zeiner et al, 1990a). They nest in trees, usually with a dense canopy, but nest trees can vary from single, isolated trees to trees within large woodlands. Habitat elements that influence nest site selection and nesting distribution include habitat structure (usually a dense canopy) and prey abundance and availability. The breeding season occurs from approximately January to October, with peak activity occurring from May through August (Zeiner et al., 1990a). Nests are constructed of loosely piled sticks and twigs that are lined with grass, straw, or rootlets, and are placed near the top of a dense oak, willow, or other tree.

White-tailed kite has been recorded approximately ten miles northeast of the Estuary Study Area, in oak savannah habitat north of Guerneville. Large tree stands within the vicinity of open areas or agricultural fields along the Russian River could support nesting or foraging kites, and patches of these habitats are present within the Estuary Study Area. White-tailed kite has a moderate potential to occur within the Estuary Study Area.

**American Peregrine Falcon.** American peregrine falcon (*Falco peregrinus anatum*) is state listed as endangered and is a California fully protected species (CDFG, 2009). This species was formerly federally listed as endangered (Federal Register, 1970a, 1970b), but was delisted in 1999 (Federal Register, 1999). This medium-sized bird breeds from non-Arctic portions of Alaska and Canada, southward to Baja California (except on the coast of southern Alaska and in British Columbia), and locally in central Arizona and Mexico. American peregrine falcons usually winter in their breeding range. The primary nesting habitat for American peregrine falcon

tends to be cliffs or series of cliffs that dominate the surrounding landscape. However, suitable nesting sites can also be found in river cutbanks, trees, and man-made structures, including tall towers and the ledges of tall buildings. American peregrine falcons hunt their prey in the air, usually over open habitat types such as waterways, fields, and wetland areas, diving at speeds of up to 200 miles per hour to strike their targets. Jays, flickers, meadowlarks, pigeons, starlings, shorebirds, waterfowl, and other readily available species make up the American peregrine falcon's diet. This species may travel 10 to 12 miles from their nests in search of prey. Breeding takes place in later March and April, with a usual clutch size of three to four eggs. Adults continue to feed fledglings for up to two months after the fledglings leave the nest.

Peregrine falcons were observed within Sonoma Coast State Park, north of Jenner in 2003 (DRP 2007), and more recently at Haystack Rock (also known as Babe Rock) at the mouth of the Russian River in 2009 (Martini-Lamb, 2010). Peregrine falcons also historically nested south of Goat Rock. There is no suitable nesting habitat within the Estuary Study Area. However, the open water Estuary, grassland, coastal dune, and coastal scrub habitats serve as potentially suitable foraging habitat for this species. These habitats are occupied by a variety of prey species including common passerines and waterfowl. Due to the documented occurrences and presence of suitable habitat, American peregrine falcons have a high potential to forage within the Estuary Study Area.

**Osprey.** Osprey (*Pandion haliaetus*) is a California species of special concern (CDFG, 2009). This species is found primarily in ponderosa pine and mixed conifer habitats along seacoasts, lakes, and rivers. It preys mostly on fish at or below the water surface, but will also take small mammals, birds, reptiles, amphibians, and invertebrates. Foraging areas require large snags and open trees near large, clear, open waters. Ospreys typically swoop from flight and hover or perch to catch prey. The species breeds primarily in northern California and typically builds nests in large conifers, but may also use artificial platforms as nesting areas. The breeding season is from March to September. Nests are built on platforms of sticks at the top of large snags, dead-topped trees, on cliffs, or on human-made structures. A nest may be as much as 250 feet above ground and is usually within 1,000 feet of fish-producing water. Osprey need tall, open-branched "pilot trees" nearby for landing before approaching the nest and for use by young for flight practice. Typically, this species migrates in October southward along the coast and the western slope of the Sierra Nevada to Central and South America (Zeiner et al., 1990a).

Osprey have been recorded within the Estuary Study Area. In 1971, two young were observed in a redwood within the vicinity of Duncans Mill; at that time the nest was reported to be at least 50 years old (CDFG, 2010). Additionally, there are a number of nests located on the south side of the Estuary in the upper reach, near the Heron Rookery (Martini-Lamb, 2010). Other nest sites are also known in the vicinity of the Estuary Study Area, including one from approximately 0.5 miles northeast of the Estuary Study Area at Villa Grande. In 2009, one adult was observed within the nest, which was located within a decayed Douglas fir. The Douglas fir and coast redwood dominated forests within the Estuary Study Area provide nesting habitat for osprey and the open water Estuary serves as optimal hunting habitat for this species.

**California Brown Pelican.** The brown pelican (*Pelecanus occidentalis californicus*) is a large, shore-dwelling bird found in coastal and nearshore marine habitats along the Pacific, Atlantic, and Gulf coasts of North America. Following reproductive failure, severe population declines and colony losses from the 1940s to 1970s, as a result of severe exposure to DDT and other contaminants through consumption of contaminated fish, the brown pelican was federally-listed as endangered by the USFWS in 1970 under the Endangered Species Preservation Act, a precursor to the current FESA of 1974. The California subspecies (one of the two distinct regional populations of brown pelican that occur in North America) was further protected when it was state-listed as endangered by the California Fish and Game Commission in 1971. A recovery plan for the California brown pelican was completed in 1983 (USFWS, 1983). By 1985, Atlantic Coast brown pelicans had recovered significantly, and they were removed from the endangered species list. According to a recent review by the USFWS, pelicans in other places, including California, have recovered too. In November 2009, the USFWS announced the delisting of the brown pelican from the list of threatened and endangered species under the Federal Endangered Species Act. The California Fish and Game Commission has also delisted the California brown pelican from the state endangered species list (CDFG, 2009).

The California brown pelican breeds along the Pacific coast from southern California south to central Mexico (including the Gulf of California) and on the California Channel Islands and the Salton Sea (American Ornithologists' Union, 1998; Sturm, 1998). The breeding season extends from December to early August, peaking usually between February and May (Anderson and Gress, 1983). Specific sites tend to be used year after year until changes in nesting habitat, food availability, or human disturbance induce colony relocation. Much of the post-breeding dispersal occurs northward (as far north as southern British Columbia), and by June many post-breeding pelicans are present in central California. Local abundance in central California usually peaks from August to October (Briggs et al., 1987; Jaques, 1994). Although a small number of non-breeding birds may be found locally year-round, most pelicans return to their southern breeding grounds by January. Roosting is an essential life-history trait for pelicans. Major roosts are found on man-made structures such as piers, breakwater, and jetties, on islands and offshore rocks, and on beaches at the mouth of estuaries. Small, surface-schooling fishes make up the bulk of the diet of pelicans, which they capture by surface plunging.

California brown pelican is known to forage and roost along the Sonoma County coastline; however it does not breed in northern California. California brown pelicans are commonly observed on Goat Rock State Beach (Martini-Lamb, 2010), and have been observed within the Estuary Study Area (Nielsen and Light, 1994). The Estuary provides suitable foraging habitat for the California brown pelican and logs and exposed sand/gravel bars, provide loafing and roosting habitat.

**Double-crested Cormorant.** The double-crested cormorant (*Phalacrocorax auritus*) is a California species of special concern (CDFG, 2009). This species is a yearlong resident along the entire coast of California and on inland lakes, typically in fresh, salt, and estuarine waters. From August to May, this cormorant is fairly common to locally very common along the coast, as well as in estuaries and salt ponds. This species rests in daytime and roosts overnight beside water on

offshore rocks, islands, steep cliffs, dead tree branches, wharfs, jetties, or even transmission lines. Double-crested cormorant must visit perches periodically during the day to dry plumage, and the perching sites must be devoid of vegetation. This species sometimes rests, or even sleeps, on water in daytime. It requires either a considerable stretch of water or an elevated perch for takeoff (Remsen, 1978).

Double-crested cormorants feed mainly on fish, but also on crustaceans and amphibians. They dive from the waters' surface to pursue prey underwater, typically in water that is less than 30 feet deep with a rocky or gravel bottom, but may catch fish as deep as 72 feet (Remsen, 1978). This cormorant requires undisturbed nest sites beside water, on islands or the mainland, for breeding success. For nesting sites, this species prefers to utilize wide rock ledges on the rugged slopes of cliffs, and live or dead trees, especially tall ones (Remsen, 1978).

A known double-crested cormorant breeding colony from 1979 was recorded at Russian River Rocks north of the mouth of the Russian River (CDFG, 2010). Additionally, cormorants are commonly observed on the beach and rocks at the mouth of the Russian River (Martini-Lamb, 2010). Cormorants forage along most of the Russian River within the Estuary Study Area, and exposed rocks and large trees near the Pacific Ocean provide quality breeding habitat for this species.

**Bank Swallow.** The bank swallow (*Riparia riparia*) is state listed as threatened (CDFG, 2009). This species arrives in California from South America in early March and remains until early August, when colonies are abandoned and southern migration begins. Bank swallow is found primarily in riparian and other lowland habitats in California west of the desert, and is a common migrant within the interior of the state while less common along the coast. There are few records of species presence during the winter months in California. During the summer, bank swallow is restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils. Bank swallows breed from early May through July, digging horizontal nesting tunnels and burrowing along the side of stream banks and cliffs. Most colonies contain 100 to 200 nesting pairs. Approximately 75 percent of the current breeding population in California nests along the banks of the Sacramento and Feather Rivers in the northern Central Valley. The species feeds predominantly over open riparian areas, but will also forage over brushland, grassland, wetlands, water, and irrigated cropland. The diet of bank swallows includes a wide variety of aerial and terrestrial soft-bodied insects, including flies, bees, and beetles (Zeiner et al., 1990a).

A bank swallow colony comprised of four burrows was observed near Jenner in 1960 (Madrone Audubon Society, Inc., 1995; CDFG, 2010). This colony's occurrence is within the project area. While there are no breeding records of bank swallow for the *Sonoma County Breeding Bird Atlas* (Madrone Audubon Society, Inc., 1995), according to a study conducted over six nesting seasons beginning in 1986, and there are no other reports of this species in Sonoma County in recent years, potentially suitable nesting habitat is still presumed present for bank swallow along the lower reaches of the Russian River (Madrone Audubon Society, Inc., 1995).

**Northern Spotted Owl.** The northern spotted owl (*Strix occidentalis caurina*) is a federally-listed threatened species and a California species of special concern. It is a large, dark-eyed, round-headed, dark brown owl with white spotting on the head, back, and underparts. It inhabits old-growth forests throughout the Pacific Northwest. The 2008 Northern Spotted Owl Recovery Plan specifies the following vegetation alliances as their preferred nesting habitat: Douglas-fir, western hemlock, grand fir (*Abies grandis*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), Shasta red fir (*Abies magnifica*), mixed evergreen, mixed conifer hardwood, coastal redwood (*Sequoia sempervirens*), Bishop pine (*Pinus muricata*), and mixed evergreen-deciduous hardwood (USFWS, 2008).

Northern spotted owl's current range extends from southeast British Columbia through the Cascade Mountains, coastal ranges, and intervening forested lands in Washington, Oregon, and California, as far south as Marin County, California. Median annual home range for pairs in California, Oregon, and Washington varies from 2,955 to 14,211 acres (USFWS, 2008). Pairs are non-migratory and remain on their home range throughout the year. The northern spotted owl breeding period extends from February, when courtship begins, to September.

Northern flying squirrel (*Glaucomys sabrinus*) is the dominant prey species in the western hemlock/Douglas-fir (*Tsuga heterophylla/Pseudotsuga menziesii*) forests, in their northern range. Dusky-footed woodrat (*Neotoma fuscipes*) is more important in the drier southern, mixed-conifer/mixed-evergreen forests (USFWS, 2008).

The Estuary Study Area contains Douglas fir and redwood forests, which are potentially suitable habitat for northern spotted owl. There are multiple known spotted owl breeding sites and territories known within five miles of the Estuary Study Area (CDFG, 2010). The closest known breeding sites are less than 0.25 miles north of the Estuary Study Area near Orrs Creek, approximately 0.5 miles south near Freezeout Creek, approximately 0.5 miles north of the Estuary Study Area at Sawmill Gulch, and approximately one mile south of the Estuary Study Area near Willow Creek. There is a high potential for northern spotted owl occurrence due to the presence of suitable habitat and known breeding sites within close vicinity of the Estuary Study Area.

### **Mammals**

**Pallid Bat.** The pallid bat, a California species of special concern (CDFG, 2009), occurs throughout California, except in parts of the high Sierra and the northwestern corner of the state (Zeiner et al., 1990b). The pallid bat inhabits a variety of habitats, such as grasslands, shrublands, woodlands, and forests; however, it is most abundant in open, dry habitats with rocky areas for roosting. Pallid bats roost alone, in small groups, or gregariously (Sherwin, 1998). Roosts include caves, crevices in rocky outcrops and cliffs, mines, trees, and various man-made structures (e.g., bridges, barns, porches), and generally have unobstructed entrances/exits and are high above the ground, warm, and inaccessible to terrestrial predators. Year-to-year and night-to-night roost reuse is common; however, bats may switch day roosts on a daily and seasonal basis (Sherwin, 1998). Mating occurs from late October to February, and maternity colonies of up to 100 individuals form in early April (CDFG, 2005). One or 2 pups are usually born May or June, and

are weaned in approximately 6 to 7 weeks. Maternity colonies disperse between August and October (CDFG, 2008).

Three occurrences of pallid bat are present within 10 miles of the Estuary Study Area (CDFG, 2010). Rocky areas and large trees near the Russian River, especially in areas not typically disturbed by humans, provide potentially suitable habitat for this species. For these reasons, this species is considered to have a moderate potential to occur within the Estuary Study Area.

**Sonoma Tree Vole.** The Sonoma tree vole is a California species of special concern (CDFG, 2010), occurring within the fog belt from Sonoma County north to the Oregon border. Sonoma tree voles feed almost exclusively on Douglas fir and Grand fir needles or tender tree bark. Both males and females nest in trees from 6-150 feet above the ground, with females building larger nests up to three feet in diameter (Zeiner et al., 1990b). Sonoma tree voles breed year-round. Typical home range of male voles likely encompasses several trees, while females often live in one tree. The species' main predator is the northern spotted owl.

More than 15 occurrences for the Sonoma tree vole are recorded within ten miles of the Estuary Study Area (CDFG, 2010). A historical occurrence of retained museum specimens is located around the community of Jenner, at the mouth of the Russian River, and a nest was observed in 1996 around Sawmill Gulch approximately 1 mile east of Jenner. Several nests have also been observed within the Estuary Study Area further upstream (CDFG, 2010). Based on these CNDDDB occurrence records and the presence of fir trees within the Estuary Study Area, Sonoma tree vole is presumed present in the Estuary Study Area.

**Townsend's Big-eared Bat.** Townsend's western big-eared bat is a California species of special concern (CDFG, 2009) that typically inhabits caves, buildings, and rock outcrops usually in association with desert scrub and/or pinon-juniper plant communities. While most common in mesic sites, this bat is found in a wide variety of habitats throughout California. Maternity roosts are found in caves, tunnels, mines, and buildings, and most young are born between May and June (Zeiner et al., 1990b). This species requires drinking water, and forages on small moths and soft-bodied insects. Maternity roosting sites are very sensitive to disturbance, and all known nursery colonies in limestone caves have been abandoned (Zeiner et al., 1990b).

The nearest CNDDDB occurrence is located in Bodega Bay, approximately eight miles south of the project area (CDFG, 2010). While no suitable maternity roost are present, potentially suitable foraging and day/night roosting habitat is present within the Estuary Study Area. This species has a moderate potential to occur within the Estuary Study Area.

**Western Red Bat.** The western red bat (*Lasiurus blossevillii*) is a California species of special concern (CDFG, 2009). It is a riparian obligate species (i.e., a species that can exist only in riparian habitat) that is ubiquitous throughout most of California except the northern Great Basin region. They roost individually in dense clumps of tree foliage in riparian areas, orchards, and suburban areas. Western red bats are primarily moth specialists, but will forage for a variety of other insects. Individuals have been observed foraging around street lamps and floodlights in suburban areas (Bolster, 2005).

One occurrence for this species is located approximately six miles east of the Estuary Study Area at a quarry near Guerneville (CDFG, 2010). Western red bats were detected in 2003 within tree cavities in a mixed evergreen forest composed of Douglas fir, madrone, oak, maple, and bay. Potentially suitable foraging habitats, as well as tree cavities for roosting, are present within the Estuary Study Area and could support western red bats.

**Northern Elephant Seal.** Northern elephant seal (*Mirounga angustirostris*) is protected by the Marine Mammal Protection Act of 1972. This seal's range extends along the coast from Alaska south to Mexico. They typically breed in California on protected islands, such as the Channel Islands, or on the mainland. Northern elephant seals spend about 9 months of the year in the eastern and central North Pacific Ocean (NMFS, 2010a). Adult seals return to land between March and August to molt and return in the winter for breeding (SCWA, 2009). The breeding season begins mid-December and extends until March (Zeiner et al. 1990b).

Northern elephant seal is known from the Estuary Study Area. Elephant seals have been observed at the mouth of the Russian River during surveys conducted between 1987 and 1995, and have been observed in other years as well (SCWA, 2009). The numbers of seals observed during these surveys was usually low, with only one to two seals observed at a time. A single male northern elephant seal utilized the Jenner haulout over several years. It is believed the elephant seal utilized the site throughout his development from a juvenile to sub-adult, and was observed harassing harbor seals at the site (SCWA, 2009). See Section 4.4.2, Setting, Pinniped Haulouts, for more detail regarding northern elephant seal presence within the Estuary Study Area.

**Harbor Seal.** The harbor seal is also protected by the Marine Mammal Protection Act of 1972. It is a common, resident marine mammal along the west coast. These seals prefer to stay close to shore in subtidal and intertidal habitats such as bays and estuaries, and sometimes venture into rivers. Groupings of various sizes can haulout on rocks, mudflats, and sandy/cobble coves (Zeiner et al. 1990b). In general, the same sites are used over many years. Harbor seals feed opportunistically in shallow water on fish, crustaceans, and a few cephalopods (CDFG, 2008). Harbor seals haulout on land for a variety of reasons, including rest, thermoregulation, and giving birth (NMFS, 2010b). They mate at sea and, in California, give birth from March to June, although the timing varies geographically and among local populations (CDFG, 2008).

. See Section 4.4.2, Setting, Pinniped Haulouts, for more detail regarding harbor seal presence within the Estuary Study Area.

**American Badger.** American badger (*Taxidea taxus*) is a California species of special concern (CDFG, 2009). This species is an uncommon but permanent resident found throughout most of the state. The badger is active throughout the year in most of its range in California, except in the North Coast area where it enters variable periods of torpor in winter. This species is both nocturnal and diurnal, and frequents drier open stages of most shrub, forest, and herbaceous habitats. Badgers dig burrows in friable soil for cover. They frequently reuse old burrows, although some may dig a new den each night, especially in summer. Home range estimates vary geographically and seasonally. Ranges recorded in other western states varied from 338 to 1,549 acres, with the males usually occupying the larger territories. Badgers mate in summer and



early fall, with young born mostly in March and April in burrows that are usually found in areas with sparse overstory cover (CDFG, 2010).

American badger has been observed at multiple locations within ten miles of the Estuary Study Area. The closest CNDDDB occurrence record for this species is approximately six miles south of the Estuary Study Area (CDFG, 2010). In 2007, at least 20 badger dens were observed within coastal terrace prairie habitat in the vicinity of Bodega Bay. Coastal scrub, grassland, and forest habitats within the Estuary Study Area support potentially suitable habitat for badger. There is a moderate potential for American badger to occur within the Estuary Study Area due to the presence of suitable habitat and observations within ten miles of the Estuary Study Area.

**California Sea Lion.** Like the other marine mammals discussed above, the California sea lion (*Zalophus californianus*) is protected by the Marine Mammal Protection Act. A common, abundant marine mammal, California sea lions are found along the west coast from southern Mexico to British Columbia, Canada. They breed in Southern California and the Channel Islands after which they migrate up the Pacific coast towards the San Francisco Bay. Breeding typically occurs between May and August. California sea lions haulout on offshore rocks, sloping rock outcroppings, sandy and cobblestone beaches, jetties, and buoys (Zeiner et al. 1990b). They are opportunistic and will feed on a variety of aquatic animals including squid, anchovy, rockfish and octopus.

California sea lions are known to occur within the Estuary Study Area. Solitary sea lions have been reliably observed at the mouth of the Russian River and between the mouth of the Russian River and the Jenner Visitor's Center (SCWA, 2009), with reports up to Duncans Mills (Martini-Lamb, 2010). A number of juvenile sea lions were observed in the Estuary and on small rocks at the mouth of the Russian River during the summer and fall 2009 (Martini-Lamb, 2010). See Section 4.4.2, Setting, Pinniped Haulouts, for more detail regarding California sea lion presence within the Estuary Study Area.

### 4.4.3 Regulatory Framework

The following discussion identifies federal, state, and local regulations that serve to protect sensitive biological resources relevant to the CEQA review process.

#### Federal Regulations

##### ***Federal Endangered Species Act***

The Secretary of the Interior (represented by the USFWS) and the Secretary of Commerce (represented by the National Marine Fisheries Service, NMFS) have joint authority to list a species as threatened or endangered under the Federal Endangered Species Act (FESA) (United States Code [USC], Title 16, Section 1533[c]). FESA prohibits the "take" of endangered or threatened fish, wildlife, or plants species in areas under federal jurisdiction or in violation of state law, in addition to adverse modifications to their critical habitat. Under FESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to

attempt to engage in any such conduct.” The USFWS and NMFS also interpret the definition of “harm” to include significant habitat modification that could result in the take of a species.

If an activity would result in the take of a federally listed species, one of the following is required: an incidental take permit under Section 10(a) of FESA, or an incidental take statement issued pursuant to federal interagency consultation under Section 7 of FESA. Such authorization typically requires various measures to avoid and minimize species take, and to protect the species and avoid jeopardy to the species’ continued existence.

Pursuant to the requirements of Section 7 of FESA, a federal agency reviewing a proposed project which it may authorize, fund, or carry out must determine whether any federally listed threatened or endangered species, or species proposed for federal listing, may be present in the project area and determine whether implementation of the proposed project is likely to affect the species. In addition, the federal agency is required to determine whether a proposed project is likely to jeopardize the continued existence of a listed species or any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed or designated for such species (16 USC 1536[3], [4]).

Generally, the USFWS implements FESA for terrestrial and freshwater fish species and the NMFS implements FESA for marine and anadromous fish species. USFWS and/or NMFS must authorize projects where a federally listed species is present and likely to be affected by an existing or proposed project. Authorization may involve a letter of concurrence that the project will not result in the potential take of a listed species, or may result in the issuance of a Biological Opinion that describes measures that must be undertaken to minimize the likelihood of an incidental take of a listed species. A project that is determined by USFWS or NMFS to jeopardize the continued existence of a listed species cannot be approved under a Biological Opinion.

Where a federal agency is not authorizing, funding, or carrying out a project, take that is incidental to the lawful operation of a project may be permitted pursuant to Section 10(a) of FESA through approval of a habitat conservation plan (HCP).

FESA requires the federal government to designate “critical habitat” for any species it lists under the Endangered Species Act. “Critical habitat” is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to the species conservation, and those features that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the regulatory agency determines that the area itself is essential for conservation.

### ***Federal Marine Mammal Protection Act***

The Secretary of Commerce (represented by NMFS) and the Secretary of the Interior (represented by the USFWS) have joint responsibility in protecting marine mammals under the Marine Mammal Protection Act (50 CFR 216). The NMFS is responsible for cetaceans and pinnipeds (other than walrus), and USFWS is responsible for all other marine mammals, including sea otter,

walrus, polar bear, dugong and manatee. The Marine Mammal Protection Act (MMPA) established a moratorium on the taking of marine mammals in U.S. waters. It defines “take” to mean “to hunt, harass, capture, or kill” any marine mammal or attempt to do so. Exceptions to the moratorium can be made through permitting actions for take incidental to commercial fishing and other non-fishing activities, for scientific research, and for public display at licensed institutions.

### ***Federal Migratory Bird Treaty Act***

The federal Migratory Bird Treaty Act (MBTA) (16 USC, Section 703, Supp. I, 1989), as amended by the Migratory Bird Treaty Reform Act, prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. The act addresses whole birds, parts of birds, and bird nests and eggs. For projects that would not cause direct mortality of birds, the MBTA is generally interpreted in CEQA analyses as protecting active nests of all species of birds that are included in the “List of Migratory Birds” published in the Federal Register in 1995 and as amended in 2005. Though the MBTA allows permits to be issued for import and export, banding, scientific collecting, taxidermy, and rehabilitation, among other reasons, there is no provision in the MBTA that allows for species take<sup>9</sup> related to creation or other development (Code of Federal Regulations, Title 50: Wildlife and fisheries Part 21; Migratory Bird Permits).

### ***Federal Bald and Golden Eagle Protection Act***

The Bald and Golden Eagle Protection Act (16 USC 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The act provides criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle...[or any golden eagle], alive or dead, or any part, nest, or egg thereof.” The act defines “take” as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.”

### ***River and Harbor Act and Clean Water Act***

The Secretary of the Army (represented by the Corps of Engineers [USACE]) has permitting authority over activities affecting waters of the United States under Section 10 of the River and Harbors Act (33 USC 403) and Section 404 of the Clean Water (33 USC 1344). Waters of the United States are defined in Title 33 CFR Part 328.3(a) and include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Section 10 of the River and Harbor Act requires a federal license or permit prior to accomplishing any work in, over, or under navigable<sup>10</sup> waters of the United States, or which affects the course, location, condition or capacity of such waters. Section 404 of the Clean Water Act requires a federal license or permit prior to discharging dredged or fill material into waters of the United States, unless the activity is

<sup>9</sup> “Take” is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct.

<sup>10</sup> “Navigable waters of the United States” (33 CFR Part 329) are defined as water that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce up to the head of navigation.

exempt (33 CFR 324.4) from Section 404 permit requirements (e.g., certain farming and forestry activities). To obtain a federal license or permit, project proponents must demonstrate that they have attempted to avoid the resource or minimize impacts on the resource; however, if it is not possible to avoid impacts or minimize impacts further, the project proponent is required to mitigate remaining project impacts on all federally-regulated waters of the United States.

Section 401 of the Act (33 USC 1341) requires any project proponents for a federal license or permit to conduct any activity including, but not limited to, the creation or operation of facilities, which may result in any discharge into navigable waters of the United States to obtain a certification from the state in which the discharge originates or would originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or would originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the creation of any facility must also pertain to the subsequent operation of the facility. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and its 9 Regional Water Quality Control Boards (RWQCBs).

## **State Regulations**

### ***California Endangered Species Act***

Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the California Fish and Game Code, a permit from the CDFG is required for activities that could result in the take of a state-listed threatened or endangered species (i.e., species listed under CESA). The definition of “take” is to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (Fish and Game Code Section 86).

Unlike the federal definition of “take”, the state definition does not include “harm” or “harass”. As a result, the threshold for take under CESA is typically higher than that under FESA. Section 2080 of the Fish and Game Code prohibits the taking of plants and animals listed under the authority of CESA, except as otherwise permitted under Fish and Game Code Sections 2080.1, 2081, and 2835. Under CESA, the California Fish and Game Commission retains a list of threatened species and endangered species (Fish and Game Code Section 2070). The California Fish and Game Commission also maintains two additional lists:

1. Candidate species (CDFG has issued a formal notice that the species is under review for addition to either the list of endangered species or the list of threatened species)
2. Species of special concern (which serves as a watch list)

A lead agency reviewing a proposed project within its jurisdiction must determine whether any state-listed threatened or endangered species may be present in a project area and determine whether the proposed project may take a listed species, consistent with the requirements of CESA. If a take would occur, an incidental take permit would be required from the CDFG, including a mitigation plan that provides measures to minimize and fully mitigate the impacts of the take. The measures must be roughly proportional in extent to the impact of the taking and

must be capable of successful implementation. Issuance of an incidental take permit may not jeopardize the continued existence of a state-listed species. For species that are also listed as threatened or endangered under the FESA, CDFG may rely on a federal incidental take statement or incidental take permit to authorize an incidental take under CESA.

### ***California Fully Protected Species and Species of Special Concern***

The classification of “fully protected” was the CDFG’s initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibian and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. The California Fish and Game Code sections (fish at Section 5515, amphibian and reptiles at Section 5050, birds at Section 3511, and mammals at Section 4700) dealing with “fully protected” species states that these species “...may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species,” although take may be authorized for necessary scientific research. This language makes the “fully protected” designation the strongest and most restrictive regarding the “take” of these species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFG to authorize take resulting from recovery activities for state-listed species.

Species of special concern are broadly defined as animals not listed under the FESA or CESA, but which are nonetheless of concern to the CDFG because are declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFG, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under FESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration under the CEQA during project review.

### ***California Department of Fish and Game Code Sections 3503***

Independent of the MBTA, birds of prey are protected in California under the Fish and Game Code (Section 3504.5, 1992). Section 3504.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes (diurnal birds of prey) or Strigiformes (owls) 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.” Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The CDFG considers any disturbance that causes nest abandonment and/or loss of reproductive effort to be “taking.”

### ***Marine Life Protection Act***

The Marine Life Protection Act (MLPA) was enacted in 1999 and is part of the California Fish and Game Code (Sections 2850-2863). The MLPA requires California to reevaluate all existing

marine protected areas (MPAs) and potentially design new MPAs that together function as a statewide network. MPAs are developed on a regional basis and are evaluated over time to assess their effectiveness. There are three different types of MPAs including: state marine reserve, state marine park, state marine recreation area (Russian River Estuary mouth to Highway 1 bridge) and state marine conservation area. Each designation provides authority for different levels of restriction on human uses and includes various objectives.

The MLPA sets the following goals for the Program [California Fish and Game Code subsection 2853(b)]:

1. To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.
2. To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.
4. To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.
5. To ensure that California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.
6. To ensure that the state's MPAs are designed and managed, to the extent possible, as a network.

The Estuary Study Area westward of the Highway 1 Bridge is within the Russian River State Marine Recreation Management Area and the Russian River State Marine Conservation Area. The regulations that follow are associated with these MPAs.

#### **Russian River State Marine Recreation Management Area**

Regulations: Take of all living marine resources is prohibited except recreation hunting of waterfowl is allowed unless otherwise restricted by hunting regulations.

#### **Russian River State Marine Conservation Area**

Regulations: Take of all living marine resources is prohibited EXCEPT:

1. Only the following species may be taken recreationally: Dungeness crab by trap, and surf melt using hand-held dip net or beach net.
2. Only the following species may be taken commercially: Dungeness crab by trap.

### ***California Native Plant Protection Act***

The California Native Plant Protection Act (Fish and Game Code Sections 1900-1913) and the Natural Communities Conservation Planning Act provide guidance on the preservation of plant resources; these two acts underlie the language and intent of Section 15380(d) of the CEQA Guidelines. Vascular plants listed as rare or endangered by the CNPS (2001), but which have no designated status or protection under state or federal endangered species legislation, are defined as follows:

1. List 1A: Plants presumed extinct
2. List 1B: Plants rare, threatened, or endangered in California and elsewhere
3. List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere
4. List 3: Plants about which more information is needed – a review list
5. List 4: Plants of limited distribution – a watch list

In general, plants appearing on CNPS List 1A, 1B, or 2 are considered to meet the criteria for endangered, threatened, or rare as laid out in Section 15380 of the CEQA Guidelines. Additionally, plants listed on CNPS List 1A, 1B, or 2 also meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code.

### ***California Department of Fish and Game Code Sections 1600-1616***

Streams, lakes, and riparian vegetation as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFG under Sections 1600-1616 of the California Fish and Game Code. Any activity that would do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake generally require a 1602 Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life”. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian is defined as “on, or pertaining to, the banks of a stream;” therefore, riparian vegetation is defined as, “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself”. Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFG.

### ***State Water Resources Control Board***

The State Board was created by the legislature in 1967. The mission of the State Board is to ensure the highest reasonable quality for waters of the State while at the same time allocating those waters to achieve the optimum balance of beneficial uses. Waters of the state are defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The State Water Board protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the Clean Water Act. Waters of the State are regulated by the Water Boards under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the Water Boards have the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

### ***California State Lands Commission***

The California State Lands Commission was established by the California legislature in 1938, and was given the authority and responsibility to manage and protect the important natural and cultural resources on certain public lands within the state and the public’s rights to access these lands. The public lands under the Commission’s jurisdiction are of two distinct types—sovereign and school lands. Sovereign lands encompass approximately 4 million acres statewide. These lands include the beds of California’s naturally navigable rivers, lakes and streams, as well as the state’s tide and submerged lands along the state’s more than 1,100 miles of coastline, extending from the shoreline out to three miles offshore. The CSLC’s jurisdiction extends to more than 120 rivers and sloughs, 40 lakes and the state’s coastal waters. Public and private entities may apply to the CSLC for leases or permits on state lands for many purposes including marinas, industrial wharves, dredging, sand mining, tanker anchorages, grazing, right-of-ways, bank protection, and recreational uses. The Sonoma County Water Agency possesses a land lease permit issued by the CSLC, in accordance with Article 2 of the Leasing and Permits Regulations, to conduct artificial breaching within CSLC jurisdiction (CSLC, 2007).

### ***California Coastal Act Policies***

The California Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone under the California Coastal Act (CCA). On land the coastal zone varies in width from several hundred feet in highly urbanized areas up to five miles in certain rural areas, and offshore the coastal zone includes a three-mile-wide band of ocean. The coastal zone established by the CCA does not include the San Francisco Bay, where development is regulated by the Bay Conservation and Development Commission. Development activities, which are broadly defined by the CCA to include (among others) creation of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal



waters, generally require a coastal development permit from either the Commission or the local government. The CCA includes goals and policies that constitute the statutory standards applied to planning and regulatory decisions made by the Commission and by local governments. See the County of Sonoma Local Coastal Plan in Section 4.4 in **Appendix 4.0, Local Regulatory Framework Governing Environmental Resources**, for more detail.

## Local

Local policies established in the *Sonoma County General Plan 2020*, *Sonoma County Tree Ordinance*, *Sonoma County Local Coastal Program*, and *Sonoma Coast State Park General Plan* and associated EIR, that govern biological resources in the Estuary Study Area are summarized in Section 4.4 in **Appendix 4.0, Local Regulatory Framework Governing Environmental Resources**.

## 4.4.4 Environmental Impacts and Mitigation Measures

### Significance Criteria

The criteria used to determine the significance of an impact are based on the environmental checklist in Appendix G of the CEQA Guidelines. For this analysis, implementation of the proposed Estuary Management Project would be considered to have a significant impact associated with biological resources if it would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFG, USFWS, or NMFS;
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS;
3. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
4. Interfere substantially with the movement of any native resident or migratory fish<sup>11</sup> or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
5. Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species;
6. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

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<sup>11</sup> Fish are discussed in Section 4.5.

7. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved plan.

All of the significance criteria listed above will be included in the impact analysis, except for the following criterion, which is determined to be not relevant to the proposed project:

*Conflict with the provisions of an adopted plan.* There are no adopted habitat conservation plans, natural community conservation plans, or other approved plan for the project area and, therefore, impacts related to conflict with such a plan are not applicable and are not further discussed. Plans related to fisheries are discussed in Section 4.5.

## Approach to Analysis

As noted in **Chapter 2.0, Project Description**, the Water Agency would continue its current practice of artificial breaching outside of the lagoon management period of May 15 through October 15. Timing, implementation, access, sensitivity to pinned haulout, personnel, equipment and general procedures would be equivalent to current practices, as described in Section 2.2.1. No change to existing artificial breaching outside of the lagoon management period would occur under the Estuary Management Project.

The impact analysis below considers the following two elements of the proposed project: creation and maintenance of the outlet channel and lagoon adaptive management. The impact analysis for the creation and maintenance of the lagoon outlet channel mostly focuses on the changes (direct effects) that would occur on biological resources within the general location of the outlet channel (i.e., the lagoon outlet channel management area) and access route, defined as the area around the Goat Rock State Beach parking lot and the beach area used to access the outlet channel location (see **Figure 2-6**). The impact analysis for the lagoon adaptive management element mostly focuses on the changes that could potentially occur on biological resources from the increased duration of fresh or brackish water lagoon conditions. The duration of inundation may increase from the currently experienced duration of five to 14 days (on average) to the estimated duration of one to five months with implementation of the proposed project. Conditions that may occur under a longer duration of freshwater lagoon conditions have not been empirically recorded. Although such changes are not measurable effects at this point in time, impacts are primarily based on water quality monitoring and reports that provide a comparison between fully tidal conditions and closed-mouth conditions at the Estuary (see **Section 4.3, Water Quality**), review of literature on plant and animal species habitat requirements for and tolerance of periodic and sustained inundation or fluctuation in water quality parameters (i.e. saline to freshwater conditions), and professional judgment.

Estuaries are complex, dynamic ecosystems, normally experiencing changes between seasons, between years, and between different places in the same estuary. This condition makes estuaries difficult to study (Desmond et al., 2002). Moreover, an evaluation of the effects of changes due to Estuary management must bear in mind that, when anticipating future conditions, determination of significance is judged relative to the baseline required by CEQA (i.e. current conditions). Under the current Estuary management practices, water depth and salinity, as well as other water

quality parameters, fluctuate at varying degrees and continuously across a wide range. Therefore, for many of the impacts discussed below, particularly with regards to the lagoon adaptive management element, the effects of the proposed Estuary management practices may not be sufficiently known to reach a determination of “less than significant.”

Impacts on biological resources are evaluated based on the likelihood that special-status plant and animal species, special-status or sensitive natural communities, wildlife corridors and nursery sites, and other protected biological resources are present within the Estuary Study Area (as discussed in Section 4.4.2, Setting), and the likely effects that creation and maintenance<sup>12</sup> of the lagoon outlet channel and lagoon adaptive management may have on these resources. Sensitive biological resources that are considered unlikely or have a low potential to occur within the Estuary Study Area are not considered in the impact analysis (see Section 4.4.2).

For the purpose of this section, the definition of “substantial,” as used in the significance criteria above, has three principal components, each of which contributes to the determination of impacts on biological resources and their significance:

1. Magnitude and duration of the impact (e.g., substantial/not substantial)
2. Uniqueness of the affected resource (rarity)
3. Susceptibility of the affected resource to disturbance

## Impacts Analysis

The following impact analysis focuses on potential impacts of the proposed Estuary Management Project related to biological resources. The evaluation considers project plans, current conditions at the project area, and applicable regulations and guidelines. Impacts are summarized and categorized as either “no impact”, “less than significant impact”, “less than significant with mitigation”, or “significant and unavoidable”.

### ***Creation and Maintenance of Lagoon Outlet Channel***

#### **Impact 4.4.1: Special-Status Plant and Animal Species. The creation and maintenance of the lagoon outlet channel could adversely affect special-status plant and animal species. (Less than Significant with Mitigation)**

Although a number of special-status plant and animal species are known or have potential to occur within the Estuary Study Area (see **Tables 4.4-1** and **4.4-2**), few are known or expected to occur within the outlet channel management area or access route. These areas are comprised of developed and beach habitats with little or no vegetation. Because of the lack of potentially suitable habitat, as well as the distances from known occurrences, no impacts on the following eight special-status animal species are anticipated during creation and maintenance of the outlet

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<sup>12</sup> As noted in **Chapter 2.0, Project Description**, the frequency of equipment operation on the barrier beach during the lagoon management period may be incrementally increased compared to existing conditions, and could include up to 18 maintenance activities over the course of the lagoon management period, depending upon the performance of the outlet channel. This represents a potential increase over existing artificial breaching activities.

channel: California freshwater shrimp, foothill yellow-legged frog, California red-legged frog, western pond turtle, pallid bat, Sonoma tree vole, Townsend's big-eared bat, western red-bat, and American badger. Impacts on the remaining special-status plant and animal species with a moderate to high potential to occur in the Estuary Study Area are discussed below and, where appropriate, groups of species are discussed collectively.

### **Plants, Butterflies, and Birds**

Habitats within the outlet channel management area and access route are not expected to support special-status plant or butterfly species, or nesting birds, given their geologic and physical structure and existing level of disturbance, as well as lack of observations during ongoing monitoring efforts. However, adjacent habitats, particularly those bordering the access route in proximity to the parking lot at Goat Rock State Beach, may support such species. For example, a population of Tidestrom's lupine is known to occur north and east of the parking lot, and a historical occurrence of Myrtle's silverspot butterfly is known from along a State Park road near Goat Rock. There is high potential for such species, as well as other special-status plants (Blasdale's blade grass, coastal bluff morning glory, swamp harebell, blue coast gilia, short-leaved evax, perennial goldfields), butterflies (Behren's silverspot butterfly), and nesting birds (great blue heron, northern harrier, American peregrine falcon, Osprey, California brown pelican, double crested cormorant), to be inadvertently affected by the creation and maintenance of the outlet channel through direct loss of individuals or habitat loss or modification. Such impacts would be potentially significant. However, construction vehicles and equipment would avoid vegetated portions of the beach and dune habitats during ingress and egress, using the access point and barrier beach driving route that are currently used by lifeguarding trucks and other State Park vehicles. This includes activities conducted in cooperation with biological monitoring and compliance with all regulatory permits obtained for the proposed project. The effects of these practices in addition to implementation of **Mitigation Measures 4.4.1a** (pre-construction biological resources survey) and **4.4.1b** (worker environmental training) below would reduce potentially significant impacts on special-status plant and butterfly species, and nesting birds potentially occurring within adjacent habitats. Implementation of these measures would reduce potential impacts to less than significant.

In addition to nesting habitat, the areas adjacent to the outlet channel management area and access route support suitable roosting and foraging habitat for special-status bird species including various song birds, birds of prey, wading birds, shorebirds, seabirds, and water birds. If such species are roosting or foraging within habitat in or near the outlet channel management area or access route during the creation and maintenance of the outlet channel, increased noise and vibrations from construction vehicles, equipment, and personnel could cause minor alteration in these birds' behavior. Roosting or foraging birds may be flushed due to the human-related disturbances, or may avoid suitable habitats in or near the outlet channel management area and access route due to such disturbances. Although flushing may increase the birds' energy demands, it is not expected to result in a substantial adverse effect on any special-status birds potentially present. The CEQA baseline for the proposed project includes frequent human-related disturbances within the outlet channel management area and access route. This includes (but is not limited to) disturbances associated with artificial breaching events and recreation activities.

Additionally, human-related disturbances associated with the proposed project would be temporary and suitable roosting and foraging habitat is present throughout the Estuary and along the northern California coast. For these reasons, impacts on roosting and foraging birds would be less than significant.

### **Marine Mammals**

Harbor seals regularly haulout at the mouth of the Russian River (referred to as the Jenner haulout), and California sea lions and northern elephant seals are occasional visitors. Haulout sites are also present within the Russian River Estuary at various logs and rock piles. When seals and sea lions, especially pups, (collectively referred to as pinnipeds) haulout, they are vulnerable to human disturbance, a phenomenon noted in surveys conducted as part of the proposed project (Merritt Smith Consulting, 1997, 1998, 1999, and 2000; SCWA and Merritt Smith Consulting, 2001) and in others throughout the range of the species (e.g. Matthews and Driscoll, 2001). Creation and maintenance of the outlet channel would disturb pinnipeds occupying beach haulout sites by the presence of construction vehicles, equipment, and personnel, and associated noise. Pinniped response to such disturbance typically includes alerts (lifting heads towards source of disturbance), moving to a different location on the beach, or flushing into the water (Merritt Smith Consulting, 1997, 1998, 1999, and 2000; SCWA and Merritt Smith Consulting, 2001), although it is not unusual for pinnipeds to remain on or near the haulout during breaching events (Hanson, 1993). Additionally, pinnipeds occupying beach haulout sites, as well as river haulout sites, could be disturbed during monitoring efforts associated with Estuary management by the presence of boats and other equipment and monitoring personnel. Such human-related disturbance would disrupt pinniped behavioral patterns and, therefore, would be a potentially significant impact.

The NMFS issued an Incidental Harassment Authorization (IHA, Level B harassment)<sup>13</sup> for the proposed project on March 30, 2010 (NMFS, 2010c). The IHA is valid through March 31, 2011 and allows the Water Agency to disturb (or harass) a small number of pinnipeds incidental to the proposed project, specifically the artificial breaching of the barrier beach, creation and maintenance of the outlet channel, and physical and biological monitoring of the Estuary. The IHA includes a number of conditions to avoid and minimize impacts on pinnipeds at the Jenner haulout. The following conditions will be incorporated into the proposed project:

*Pupping Season (March 15- June 30): The following conditions apply only during the pupping season:*

1. If a pup less than one week old is on the beach where heavy machinery will be used or on the path used to access the work location, the breaching event will be delayed until the pup has left the site or the latest day possible to prevent flooding while still maintaining suitable fish rearing habitat. Pups less than one week old will be characterized by being up to 15 kg, thin for their body length, or an umbilicus or natal pelage is present. The Water Agency will coordinate with the locally

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<sup>13</sup> Level B harassment is defined under the 1994 Amendments to the MMPA as harassment that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

established seal monitoring program to determine if pups less than one week old are on the beach ; prior to a breaching event.

2. A water level management event will not occur for more than two consecutive days unless flooding threats cannot be controlled.
3. The Water Agency will maintain a one week (7 day) "no work" period between water level management events (unless flooding is a threat to the low-lying residential community) to allow for adequate disturbance recovery period. During the "no-work" period, equipment will be removed from the beach.
4. If crew or marine mammal observers sight any pup which may be abandoned, the Water Agency will contact NMFS stranding response network '[Marine Mammal Center, 415- 289-7350] immediately and report the incident to NMFS' Southwest Regional Office and NMFS Headquarters within 48 hours. Observers will not approach or move the pup.
5. Physical and biological monitoring will not be conducted if a pup less than one week old is present at the monitoring site or on a path to the site.

*Year-Round: The following conditions apply year-round:*

1. Water Agency crew will slowly and cautiously approach the haulout ahead of heavy equipment to minimize the potential for flushes to result in a stampede.
2. Water Agency staff will avoid walking or driving equipment through the seal haulout.
3. Crews on foot will take caution to approach the haulout slowly and to make an effort to be seen by the seals from a distance, if possible, rather than appearing suddenly at the top of the sandbar.
4. Equipment will be driven slowly on the beach and care will be taken to minimize the number of equipment shut-downs and start-ups.
5. The Water Agency will contact NMFS' Southwest Regional Office, Santa Rosa Office, and Headquarters to inform them of the potential flooding threat and event schedule.
6. Physical and biological monitoring will be conducted in a manner which results in the least amount of pinniped harassment practical. The Water Agency personnel will approach the haulout slowly and cautiously and only when necessary to carry out monitoring.

In addition to the conditions above, the proposed project will incorporate the following monitoring measures contained in the IHA:

1. Pinnipeds will be monitored from the overlook on the bluff along Highway 1 adjacent to the haulout with high powered spotting scopes. The method and disturbance behavior will be recorded following Mortenson (2006).
2. During the pupping season (March 15- June 30), the Water Agency will conduct a pre-lagoon outlet channel survey one to three days prior to an event to determine the number of animals on the beach and if any pups are present.

3. The day of an event, the Water Agency will begin pinniped monitoring at least one hour prior to crew and equipment accessing the beach.
4. Monitoring will continue for the duration of an event to determine how many animals have been taken and end no sooner than one hour after equipment leaves the beach.
5. In addition to event days, seal counts will also be conducted in accordance with the Water Agency's most current *Russian River Estuary Management Activities Pinniped Monitoring Plan*.

The effect of these conditions and monitoring measures would reduce impacts associated with the creation and maintenance of the outlet channel to less than significant. This conclusion is supported by the Water Agency's finding that, over five years of monitoring (1996 to 2000), once the breaching event was completed and construction vehicles, equipment and personnel left the beach, pinnipeds returned to the haulout within a day (SCWA, 2009). Additionally, the Water Agency will renew the IHA annually, unless otherwise required by the NMFS. The conditions and monitoring measures included in the renewed IHA would superseded and replace those incorporated herein.

### **Mitigation Measures**

**Mitigation Measure 4.4.1a:** The Water Agency shall conduct a pre-construction biological resources survey to identify special-status plants and butterflies (or larval host species) and nesting birds present within 150 feet of the general location of the outlet channel management area and access route. The pre-construction survey shall:

- Be conducted by a qualified biologist no more than 30 days prior to commencement of the lagoon management period (defined as from May 15 to October 15). The biologist shall have familiarity with special-status plants and butterflies (or larval host species) of the area and experience with conducting special-status species and nesting bird surveys.
- If no special-status plants or butterflies (or larval host species), or nesting birds are encountered, no further mitigation would be required for at least 30 days, unless additional measures are required by regulatory permit conditions obtained for the proposed project.
- Additional pre-construction surveys, specifically for nesting birds, shall be conducted such that no more than 30 days will have lapsed between the survey and outlet channel creation or maintenance activities.
- If a special-status plant or larval host species for special-status butterflies or nesting birds are encountered, the location shall be documented and species-specific avoidance and minimization measures shall be prepared by the qualified biologist in coordination with the Water Agency and appropriate resource agencies.
- The avoidance and minimization measures shall be implemented to prevent the loss of the species or abandonment of active nests, but shall also take the goal of the proposed project (i.e., managing the lagoon water surface elevations high enough to enhance

salmon rearing habitat while also minimizing flooding of the low-lying properties) into consideration.

**Mitigation Measure 4.4.1b:** A worker environmental awareness training shall be included to inform construction personnel of their responsibilities regarding sensitive biological resources that are present within 150 feet of the general location of the outlet channel management area and access route. The training shall comply with the following measures:

- The training shall be developed by a qualified biologist familiar with the sensitive biological resources that are known or have the potential to occur in the area.
- The training shall be completed by all construction personnel before any work occurs in the outlet channel management area, including construction equipment and vehicle mobilization. If new personnel are added to the proposed project, the Water Agency shall ensure that new personnel received training before they start working.
- The training shall provide educational information on the special-status species that are known or have potential to occur in the area, how to identify the species, as well as other sensitive biological resources (e.g., sensitive natural communities, federal and state jurisdictional waters). The training shall also review the required mitigation measures to avoid impacts on the sensitive resources, and penalties for noncompliance with biological mitigation requirements.

**Impact Significance after Mitigation:** Less than Significant.

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**Impact 4.4.2: Sensitive Natural Communities. The creation and maintenance of the lagoon outlet channel could adversely affect sensitive natural communities. (Less than Significant)**

Of the various special-status or sensitive natural communities identified within the Estuary Study Area, Northern Dune Scrub borders the outlet channel management area access route in proximity to the parking lot at Goat Rock State Beach. Consistent with current management practices, construction vehicles, equipment, and personnel would access the barrier beach from the paved parking lot at Goat Rock State Beach and would approach the outlet channel area by walking and/or driving north onto the beach. Although much of this area is developed or beach habitat, Northern Dune Scrub community is present adjacent to the access route and there is potential for this community to be inadvertently affected by encroachment by construction vehicles, equipment, or personnel during creation and maintenance of the outlet channel. Such impact would be potentially significant. However, construction vehicles and equipment would avoid vegetated portions of the beach and dune habitats during ingress and egress, using the access point and barrier beach driving route that are currently used by lifeguarding trucks and other State Park vehicles. Also, the outlet channel, with the exception of its configuration, would be constructed and maintained consistent with all regulatory permit obtained for the proposed project. The effects of these practices in addition to implementation of **Mitigation Measure 4.4.1b** (worker environmental awareness training) above would reduce potentially significant impacts on sensitive natural communities adjacent to the access route to less than significant.



### ***Mitigation Measures***

Implement **Mitigation Measure 4.4.1b**.

**Impact Significance after Mitigation:** Less than Significant.

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### **Impact 4.4.3: Waters and Wetlands. Creation and maintenance of the lagoon outlet channel could adversely affect federal and state jurisdictional waters. (Less than Significant)**

Creation and maintenance of the outlet channel would involve one or two pieces of heavy equipment to excavate a channel with a bed elevation below the lagoon water surface elevation to allow outflow from the lagoon to pass over the barrier beach, but high enough to minimize the inflow of ocean water into the lagoon. Such activities would adversely affect federal and state jurisdictional waters through direct modification by discharges of dredge material. However, the CEQA baseline for the proposed project includes artificial breaching events, although the frequency of modifications to jurisdictional waters for the proposed project may be greater than currently occurs. The proposed project would require authorization from the USACE under the Rivers and Harbors Act Section 10 and the CWA Section 404, the RWQCB under the CWA Section 401, and the CDFG under the Fish and Game Code Section 1602. Such authorizations will include a number of conditions to avoid and minimize impacts to federal and state jurisdictional waters. This may include pre-construction notification, water quality protection measures (e.g., scheduling restrictions, erosion and sediment controls, non-sediment pollution controls), and post construction monitoring and reporting. Compliance with the conditions contained in the regulatory permits, in addition to implementation of **Mitigation Measure 4.4.1b** (worker environmental awareness training) above, would reduce potentially significant impacts on federal and state jurisdictional waters to less than significant.

### ***Mitigation Measures***

Implement **Mitigation Measure 4.4.1b**.

**Impact Significance:** Less than Significant.

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### **Impact 4.4.4: Wildlife Movement and Nursery Sites. Creation and maintenance of the lagoon outlet channel could interfere with wildlife movement or impede the use of nursery sites. (Less than Significant with Mitigation)**

Habitats within the general location of the outlet channel management area and access route support wildlife movement, as well as wildlife nursery sites. For example, harbor seals regularly use the beach and channel as a travel route between the ocean and river habitats, and California sea lions and northern elephant seals are occasional users. Harbor seals also use the beach and open water habitats of the Russian River as sites to raise their pups. The presence of construction

vehicles, equipment, and personnel during the creation and maintenance of the outlet channel could disrupt seals and sea lions (collectively referred to as pinnipeds) and other wildlife species movement patterns and/or rearing activities. Such impact would be potentially significant. However, although creation and maintenance of the outlet channel may increase the frequency of vehicles and equipment operation on the beach, the CEQA baseline for the proposed project includes frequent human-related disturbances within the outlet channel management area and access route. This includes (but is not limited to) disturbances associated with artificial breaching events and recreation activities. Additionally, the outlet channel would be located within the area that the river mouth has been observed to naturally form and, with the exception of its configuration, would be constructed and maintained consistent with current management practices. This includes activities conducted in cooperation with biological monitoring and compliance with all regulatory permit conditions obtained for the proposed project. The effects of these practices in addition to implementation of **Mitigation Measure 4.4.1b** (worker environmental awareness training) above would reduce potentially significant impacts on wildlife movement and nursery sites to less than significant.

### ***Mitigation Measures***

Implement **Mitigation Measure 4.4.1b**.

**Impact Significance after Mitigation** Less than Significant.

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### **Impact 4.4.5: Local Policies and Ordinances. Creation and maintenance of the lagoon outlet channel would not conflict with any local policies or ordinances protecting biological resources. (No Impact)**

The analysis of local policies and ordinances is generally used as an indicator of the resources that may be affected by a project. Inconsistency with a policy may indicate a significant physical impact, but the inconsistency is not itself an impact. Policies related to biological resources were included in this analysis (see **Appendix 4.0, Local Regulatory Framework Governing Environmental Resources**). Agencies with jurisdiction, such as Sonoma County Permit and Resource Management Department, are charged with project review and making a consistency determination. Based on the setting of the Estuary Study Area, the proposed management practices, and compliance with conditions contained in regulatory permits obtained for the proposed project, creation and maintenance of the outlet channel is consistent with the applicable local policies related to biological resources. Therefore, no impacts related to a conflict between creation and maintenance of the outlet channel and any applicable land use plan, policy, or regulation related to biological resources are anticipated.

**Impact Significance:** No Impact; no mitigation required.

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### ***Long-term Lagoon Adaptive Management***

#### **Impact 4.4.6: Sensitive Natural Communities. Long-term adaptive management of the Estuary as a lagoon could adversely affect sensitive natural communities. (Less Than Significant)**

Implementation of the Estuary Management Project could change the extent, composition, and distribution of the vegetation communities within and adjacent to the Estuary. The Water Agency recently mapped all vegetation communities within and adjacent to the Russian River Estuary, up to 14 feet in elevation. **Figures 4.4-1 – 4.4-5** show the mapped communities with their approximate existing elevations. The extent of inundation of each community within the marked elevations can be inferred from these figures, which illustrates water surface elevations of 4.5, 7, 9, and 14 feet onto the maps. Although lagoon adaptive management would increase the duration of inundation associated with perched freshwater lagoon conditions, the exact length and extent of inundation cannot be predicted with certainty, as it would depend upon barrier beach formation and outlet channel performance. This analysis makes the assumption that a water surface elevation of up to 7 feet for periods of one to five months represents a frequency, duration and depth that would be experienced under the proposed project, and that this assumption provides a way to estimate the impacts to vegetation communities.

At least some portion of nearly all of the vegetation communities mapped, with the exception of Northern Foredune and Active Coastal Dune, lie between 4.5 and 7 feet in elevation. The percentage<sup>14</sup> of each mapped vegetation community that occurs in this elevation zone ranges from one percent (non-native grassland) to 66 percent (gravel bar/mudflat). The percentage of each community within each elevation range are summarized in **Table 4.4-4**. As previously mentioned, an increase in the duration of inundation within these areas could decrease the ability of each vegetation community to successfully inhabit that area.

Coastal and Valley Freshwater Marsh is the only CDFG sensitive natural community mapped within the Estuary Study Area that could be adversely affected by changes in surface water elevation, duration of inundation, or water quality parameters (e.g., salinity, dissolved oxygen, temperature). Northern Foredune Scrub, a CDFG Sensitive Natural Community, would not be substantially affected by the proposed project. Riparian habitats are generally considered sensitive communities, although the riparian scrub habitats present in the Estuary are not generally considered to be rare. **Table 4.4-4** summarizes the extent of existing vegetation communities within elevation ranges (as shown in **Figures 4.4-1 – 4.4-5**) and provides a basis for predicting change in the extent of vegetation communities during lagoon adaptive management. This data only provides an estimate of the extent of habitat that may be inundated during a closure of the barrier beach. As identified in **Table 4.4-4**, of the approximately 26.5 acres of Coastal and Valley Freshwater Marsh within the Estuary Study Area, approximately 9.5 acres (36 percent) occur between 4.5 and 7 feet in elevation, and approximately 13 acres (48 percent) occur between 7 and 9 feet in elevation. Under current conditions, the 9 acres that occur below 7 feet in elevation have

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<sup>14</sup> Percentages are on an area basis, and are relative to the total area of each vegetation community as mapped by the Water Agency within the 14-foot elevation contour.

**TABLE 4.4-4  
 EXTENT OF VEGETATION COMMUNITIES WITHIN EXISTING TOPOGRAPHICAL RANGES ADJACENT  
 TO RUSSIAN RIVER ESTUARY – WITHIN 14 FOOT ELEVATION**

Elevation Range	4.5-7		7-9		9-14		Total by Vegetation Type (acres)
	acres	% of total mapped	acres	% of total mapped	acres	% of total mapped	
Coastal and Valley Freshwater Marsh	9.486	36%	12.809	48%	4.131	16%	26.426
Developed	0.0824	6%	0.0552	4%	1.205	90%	1.3426
Gravel Bar/ Mudflat	17.958	66%	6.321	23%	2.984	11%	27.263
Landscaping	0.1031	22%	0.096	21%	0.261	57%	0.4601
Mixed Evergreen Forest	0.214	11%	0.438	23%	1.253	66%	1.905
North Coast Riparian Forest	1.841	7%	3.603	14%	20.538	79%	25.982
North Coastal Riparian Scrub	4.515	14%	10.509	33%	17.213	53%	32.237
Northern (Franciscan) Riparian and Coastal Scrub	1.003	9%	2.179	19%	8.442	73%	11.624
North Coastal Riparian Scrub/Northern Franciscan riparian and coastal scrub	0.539	2%	7.159	21%	26.806	78%	34.504
Non-Native Grassland	0.626	1%	1.804	3%	60.344	96%	62.774
Red Alder Riparian Forest	0.093	12%	0.160	21%	0.507	67%	0.76
Northern Foredune		0%		0%	0.0396	100%	0.0396
Active Coastal Dunes		0%	0.007	2%	0.386	98%	0.393
<b>Total Mapped Acres below 14 feet</b>	<b>36.460</b>		<b>45.140</b>		<b>144.109</b>		<b>225.7103</b>

SOURCE: SCWA, 2010; ESA 2010.

been inundated 52 of the 101 recorded breaching events occurring over the last 14 years. Inundation has been for a duration of between five to 14 days, before artificial breaching restores water surface elevations. The 13 acres occurring above the 7 foot elevation have been inundated 48 times, for a similar duration of between five to 14 days. With increased duration of inundation, mudflat, Coastal and Valley Freshwater Marsh, and northern riparian/coastal scrub assemblages may convert or shift towards higher elevations (i.e., some additional wetland and riparian vegetation may grow above the managed surface water elevation because increasing groundwater levels would induce suitable conditions for the establishment of such vegetation, such as prolonged inundation or soil saturation during the growing season).

Under the Estuary Management Project, both the 9.5 acres of Coastal and Valley Freshwater Marsh occurring below 7 feet in elevation, and the 13 acres of freshwater marsh occurring in the 7 and 9 foot elevation range, would be inundated for a period of one to five months, depending upon outlet channel performance and resulting water surface elevations. During extended inundation, a portion of the 9.5 acres of freshwater marsh within the 4.5 to 7 foot elevation range may convert to open water or mudflat habitat if vegetation is not able to tolerate prolonged inundation (i.e. a substantial increase in depth and duration), while the 13 acres of freshwater marsh in the higher elevation range between 7 and 9 feet would likely not be substantially

affected. The greatest extent of Coastal and Valley Freshwater Marsh habitat between 4.5 and 7 feet in elevation occurs in and around Penny Island, and at the confluence of Willow Creek and the Russian River. These areas could potentially see the greatest conversion from a vegetated community to an open water or mudflat habitat.

Riparian communities, such as North Coast Riparian Forest and North Coast Riparian Scrub, may also be impacted by changes in extent and duration of inundation. Of the 26 acres of North Coast Riparian Forest within the mapped area, 1.8 acres (7 percent) occur between 4.5 and 7 feet in elevation and 3.6 acres (14 percent) occur between 7 and 9 feet in elevation. The majority of North Coast Riparian Forest mapped within the Estuary Study Area (79 percent) is above the 9 foot elevation and would not be impacted by the proposed project. Additionally, of the approximately 31 acres of North Coast Riparian Scrub within the mapped 14-foot contour area, approximately 4.5 acres (14 percent) lies between 4.5 and 7 feet in elevation and approximately 10.5 acres (33 percent) occur between 7 and 9 feet in elevation. These areas would likely convert to Coastal and Valley Freshwater Marsh, which is dominated by more inundation-tolerant vegetation; thereby providing a potential net gain of approximately 5 acres of sensitive Coastal and Valley Freshwater Marsh. The gain in this sensitive natural community would be a beneficial impact.

Much of the North Coast Riparian Scrub is located upstream and downstream of the Highway 1 bridge adjacent to non-native annual grassland. It may be expected that some non-native annual grassland would transition to North Coast Riparian Scrub as this community becomes established at a higher elevation in the Estuary. Inundation of North Coast Riparian Scrub near the confluence with Willow Creek may not re-establish, or “retreat,” to a higher elevation readily because the adjacent slopes are steep, and the higher water table may be above rooting depth for the willow (*Salix*) species that dominant this vegetation type. North Coast Riparian Scrub is not a sensitive natural community in California (as designated by CDFG) nor is it a rare community in the Estuary Study Area. The potential conversion of or shift in North Coast Riparian Scrub habitat would be less than significant.

The adaptation of vegetative communities along the shoreline fringe of the Estuary is difficult to predict, as it is subject to several factors. It is anticipated that conditions resulting from the Estuary Management Project would be consistent with the range of conditions currently experienced in the Estuary, and that its implementation would result in conditions that are more natural relative to observed conditions in other estuary systems on the West Coast. Although the adaptation of vegetative communities cannot be precisely predicted, the above analysis demonstrates that changes in vegetative assemblages would likely be towards potential increases in sensitive Coastal and Valley Freshwater Marsh. Therefore, the long-term adaptive management of the Estuary as a lagoon would not result in a substantially adverse effect to sensitive natural communities and is less than significant.

**Impact Significance:** Less Than Significant; no mitigation required.

**Impact 4.4.7: Special-Status Plant and Animal Species. Long-term adaptive management of the Estuary as a lagoon could adversely affect special-status plant and animal species. (Less than Significant)**

Although a number of special-status plant and animal species are known or have the potential to occur within the Estuary Study Area (see **Tables 4.4-2** and **4.4-3**), few could be adversely affected by lagoon adaptive management. This discussion focuses on the plant and animal species considered and summarized in **Tables 4.4-21** and **4.4-3** with a moderate to high potential to occur in the Estuary Study Area and those species that are primarily associated with freshwater marsh and riparian habitats, and open water habitat and beaches, gravel bars, and mudflats. No impacts on the remaining species with a moderate to high potential to occur in the Estuary Study Area are anticipated by lagoon adaptive management because their specific habitat types are outside of the area that would potentially be impacted. Impacts on special-status plant and animal species with the potential to be adversely affected by lagoon adaptive management are discussed below and, where appropriate, groups of species are discussed collectively.

**Plants, Amphibians, Reptiles, and Birds**

Special-status plant and animal species associated with freshwater marsh and riparian habitats, such as bristly sedge, deceiving sedge, California freshwater shrimp, foothill yellow-legged frog, California red-legged frog, western pond turtle, northern harrier, and great blue heron, could be adversely affected by adaptively managing the Estuary as a summer lagoon. The increased duration of fresh or brackish water lagoon conditions from the currently experienced duration of five to 14 days to the estimated duration of one to five months could affect the freshwater marsh and riparian communities present in the Estuary Study Area through changes in the various water quality parameters (e.g., salinity, dissolved oxygen, temperature). In turn, changes in water quality could induce changes in the extent, composition, and distribution of the freshwater marsh and riparian communities (see **Impact 4.4.6** [Sensitive Natural Communities] below). Such changes could subsequently affect special-status plant and animal species that rely on these communities through habitat loss or modification.

Although the change in duration of inundation could affect freshwater marsh and riparian communities, it is anticipated that while some freshwater marsh and riparian habitat may be lost in the lower elevations of the Estuary, some may be gained in the upper elevations (i.e., some additional wetland and riparian vegetation may grow above the managed surface water elevation because increasing groundwater levels would induce suitable conditions for the establishment of such vegetation, such as prolonged inundation or soil saturation during the growing season. Therefore, effects on special-status plant and animal species potentially occurring in these habitats could be offset by the habitat gains. Additionally, estuaries are complex, dynamic ecosystems, normally experiencing changes between seasons, between years, and between different places in the same estuary. Plant and animal species within these systems are adapted to fluctuating environmental conditions. For these reasons, the loss or modifications of the freshwater marsh and riparian habitats is not expected to result in a substantial adverse effect on special-status plants and animals potentially occurring within these communities.

Special-status birds, such as various wading birds, shorebirds, seabirds, and water birds, using the open water habitat and beaches, gravel bars, and mudflats of the Russian River for roosting and/or foraging could be adversely affected by lagoon adaptive management. Beaches, gravel bars, and mudflats may become submerged, and depths of the open water habitat may become less suitable for foraging by some species, while favored by others. Although the loss or modifications of these habitats could result in concentration of birds in fewer locations, it is not expected to result in a substantial adverse effect on any special-status birds potentially using the open water habitat and beaches, gravel bars, and mudflats of the Russian River. As discussed above, estuary species are adapted to fluctuating environmental conditions. Additionally, suitable roosting and foraging habitat is present along the northern California coast.

**Impact Significance:** Less Than Significant; no mitigation required.

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**Impact 4.4.8: Protected Marine Mammals. Long-term adaptive management of the Estuary as a lagoon could adversely affect protected marine mammal species. (Significant and Unavoidable)**

Lagoon adaptive management could adversely affect harbor seals, as well as California sea lions and northern elephant seals (collectively referred to as pinnipeds), through habitat loss or modification during the one to five month lagoon management period. This potential habitat modification is addressed under two scenarios: 1) impeded access into the Estuary due to barrier beach closure and establishment of an outlet channel; and 2) inundation of interior river haulouts.

As discussed previously in **Section 4.4.2, Setting, Pinniped Haulouts**, harbor seals use the Jenner haulout at the mouth of the Russian River, which is the largest concentration of harbor seals north of Drakes Estero in Point Reyes (approximately 50 miles south of the project area). Monitoring data indicates the highest number of harbor seals occur during open barrier beach and tidal Estuary conditions. During open (breached) conditions, harbor seals haul out to rest or nurse, or use the open mouth to enter into the Estuary to forage or use interior river haulouts. Under existing conditions, closures at the barrier beach may occur for five to fourteen days, and monitoring results indicate lower numbers at the Jenner haulout, and increased activity at interior river and other regional haulouts. Harbor seal numbers generally increase again after tidal conditions are established. During the proposed lagoon management period, haulout sites at the mouth of the Russian River may become less suitable for pinnipeds due to the establishment of a shallow outlet channel, rather than the current practice of artificial breaching, which could impede easy access to haul out and ready escape to the ocean. This impeded access, coupled with increased levels of human-related disturbances which have historically contributed to the notable decline in numbers of pinnipeds hauled-out when the mouth is closed (Hanson, 1993), could be considered significant. However, although the lagoon outlet channel may be configured differently than open mouth conditions under existing artificial breaching practices, observations of harbor seal behavior during perched Estuary conditions and the July 2010 outlet channel pilot indicate that pinnipeds are able to access the lagoon and interior river haulout locations via the outlet channel (SCWA, 2010b). **Figure 4.4-13** shows pinniped (harbor seal) use of both



Photo 1. Pinniped (Harbor seal) access to Estuary during created outlet channel, July 1, 2010



Photo 2. Pinniped (Harbor seal) access to Estuary during natural breach condition via naturally occurring, shallow channel, June 2010

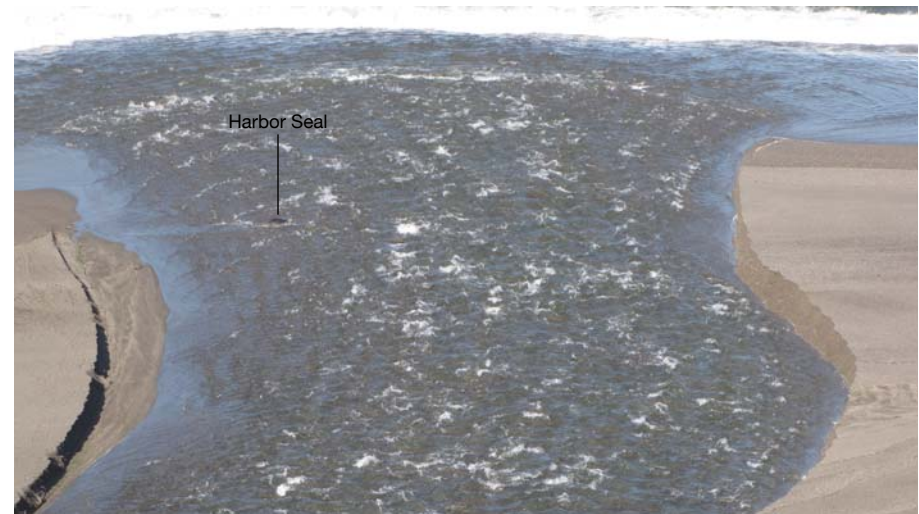


Photo 3. Pinniped (Harbor seal) in naturally occurring, shallow channel, June 2010

SOURCE: ESA

Russian River Estuary Management Project . 207734.01

**Figure 4.4-13**  
Pinniped Use of Outlet Channel  
During Open Estuary Conditions



artificially created and naturally occurring shallow outlet channels. Additionally, historic conditions would be restored during the months outside of the lagoon management period; therefore access to the Estuary and interior river haulouts via would not be permanently restricted. Continued monitoring of the Jenner haulout and peripheral haulouts would provide an indicator of haulout use or decline, provide a tracking mechanism for assessing future impacts, and provide a basis for shifting adaptive management activities to respond to changes in haulout use. The Incidental Harassment Authorization (IHA) issued by NMFS under the Marine Mammal Protection Act (NMFS, 2010c) does not provide for long-term harassment or alteration of habitat conditions that would contribute to abandonment of the Jenner haulout, nor could such an authorization be expected in the future. Therefore, the potential impact for restricted access for a longer duration during the lagoon management period is considered less than significant with implementation of **Mitigation Measure 4.4.6**.

Harbor seals use regular haulouts located within the mainstem Estuary, including the Jenner (Penny) logs, Paddy's Rock, and Chalanchawi. Under the proposed project, water levels would be increased up to 7 to 9 feet for a longer duration, which could inundate the mudflat/gravel bar areas that provide suitable haulout sites within the river, reducing their availability of haulout locations within the Estuary itself. Such modification of suitable habitat would be a potentially significant impact, as it could affect pinniped resting, foraging, and movement patterns, and rearing activities. To evaluate the potential haulout modification or loss, water levels at 7-, 9-, and 14-foot contours were projected onto aerial imagery of the Jenner (Penny) logs, Paddy's Rock, and Chalanchawi haulout sites (see **Figure 4.4-1 series**). A 7-foot elevation would submerge portions of the Jenner logs, Paddy's Rock, and Chalanchawi, thereby temporarily restricting use of these haulouts during the lagoon management period. Although availability of suitable haulout sites along the mainstem Russian River would be affected by higher water surface elevations, the duration of these would be dependent upon outlet channel performance. Tidal conditions would be restored during the months outside of the lagoon management period. Therefore, the project effect on interior river haulouts would be seasonal. Additionally, there are other haulout sites available regionally. Continued monitoring of the interior river haulouts and peripheral haulouts would provide an indicator of haulout use or decline, and provide a tracking mechanism for assessing future impacts, and provide a basis for shifting adaptive management activities should the proposed project have a significant effect on the harbor seals. Therefore, the potential inundation impact on interior river haulouts for a longer duration during the lagoon management period is considered to remain significant with implementation of **Mitigation Measure 4.4.6**.

As discussed previously in **Section 4.4.2, Setting**, Pinniped Haulouts, pinniped distribution and use of haulout locations is difficult to predict, as it is subject to several factors. Monitoring of the Jenner haulout indicates that seasonal changes are the largest factor in pinniped distribution, but that closure events do have an inverse correlation with pinniped haulout use. The Water Agency, in implementing the Estuary Management Project as required by NMFS, has in place both short-term measures to avoid impacts associated with creation and maintenance of the freshwater lagoon, as well as long-term monitoring programs that will allow for the review and determination of potential adverse effects associated with implementation of the Estuary Management Plan. It is anticipated that conditions resulting from the Estuary Management Plan

would be consistent with the range of conditions currently experienced in the Estuary, and that its implementation would result in conditions that are more natural relative to observed conditions in other estuary systems on the West Coast. Implementation of **Mitigation Measure 4.4.6** below would reduce this impact to the degree feasible.

### ***Mitigation Measures***

**Mitigation Measure 4.4.8:** In compliance with the Incidental Harassment Authorization (NMFS, 2010c), the Water Agency will conduct seal counts at the Jenner haulout and at nearby coastal and river haulouts in accordance with methods described in the *Russian River Management Activities Pinniped Monitoring Plan* (Pinniped Monitoring Plan), dated September 9, 2009, or as updated by requirements of NMFS under the MMPA. If monitoring during the lagoon management period indicates decreases in overall use at the Jenner haulout are correlated with increases in use at the three closest haulouts, the Water Agency shall consult with NMFS and CDFG to alter the Estuary Management Plan such that the haulout site is maintained as a resource. The IHA does not provide for long-term harassment or alteration of habitat conditions that would contribute to abandonment of the Jenner haulout.

**Level of Significance after Mitigation:** Impacts related to seasonal inundation of river haulout locations would remain Significant and Unavoidable.

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### **Impact 4.4.9: Waters and Wetlands. Long-term adaptive management of the Estuary as a lagoon could adversely affect federal and state jurisdictional waters. (Less than Significant)**

To comply with conditions stipulated in the Russian River Biological Opinion (NMFS, 2008), the Water Agency would pursue an alternative approach for management of water levels in the Estuary, and would adaptively manage a lagoon outlet channel to achieve an average daily water surface elevation of at least 7 feet during the lagoon management period from May 15 to October 15. This could change the jurisdictional limits of federal and state waters, including wetlands, in the Estuary. Because potential effects of the lagoon adaptive management on natural communities addressed freshwater marsh, which would be considered wetlands (see Impact 4.4.7, Natural Communities), this discussion focuses on waters (i.e., open waters of the Russian River).

The increased duration of inundation suggests that the elevation of 7 feet may become “ordinary high water,”<sup>15</sup> newly delimiting the extent of jurisdictional federal and state waters (i.e., an increase over the CEQA baseline conditions). However, if water surface elevations do not establish the elevation of 7 feet as the ordinary high water, there would not be a net change in the extent of federal and state jurisdictional waters. Therefore, no significant impact (e.g., net loss of waters) is anticipated.

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<sup>15</sup> Ordinary high water is an approach for identifying the lateral limits of non-wetland waters. It is defined in 33 CFR Part 328.3 as a line on the shore established by fluctuations of water and indicated by physically characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris.

**Level of Significance after Mitigation.** Less than Significant; no mitigation required.

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**Impact 4.4.10: Wildlife Movement and Nursery Sites. Long-term adaptive management of the Estuary as a lagoon could interfere with wildlife movement or impede the use of nursery sites. (Less than Significant with Mitigation)**

The increased duration of inundation and potentially induced changes in vegetation community composition would not alter the ability of animals to move along the river edge. There would be no significant impact on the movement of wildlife along the Russian River corridor. There could be some adverse change in the availability of riverine marsh, tributary streams, or back-channel ponding for amphibian breeding (nursery) sites. In the wetland communities where these sites occur, the discussion in Impact 4.4.6 (Natural Communities) predicts a combination of offsetting increases or losses as the water is retained for longer periods and a potential increase in wetland communities (Coastal and Valley Freshwater Marsh), and hence no net loss of amphibian nursery sites. Impacts, and mitigation, associated with effects to pinniped movement and nursery sites, are discussed in Impacts 4.4.1 and 4.4.7 above. The impact would be less than significant with implementation of **Mitigation Measure 4.4.6**.

***Mitigation Measures***

See **Mitigation Measure 4.4.8**.

**Level of Significance after Mitigation.** Less than Significant.

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**Impact 4.4.11: Local Policies and Ordinances: Adaptive management of the lagoon would not conflict with any local policies or ordinances protection biological resources. (No Impact)**

As discussed above in Impact 4.4.5 (Local Policies and Ordinances), proposed Estuary management practices are consistent with the applicable local policies related to biological resources. Therefore, no impacts related to a conflict between lagoon adaptive management and any applicable land use plan, policy, or regulation related to biological resources is anticipated.

**Level of Significance.** No impact; no mitigation required.

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