Chapter 3

Physical and Biological Resources

Note to Reviewers: This is an administrative working draft of Chapter 3 of the East Contra Costa County HCP/NCCP. As a working draft, some sections of this chapter are incomplete. See the HCP/NCCP outline for the contents of other chapters. An earlier version of this chapter was reviewed by the Staff Committee. We have incorporated text comments but not all previous comments on the figures—they are still being revised. This version of the chapter will be reviewed by the Science Advisory Panel and distributed to the HCPA Coordination Group (Stakeholder Group). Based on comments received, we will revise the chapter and include it in the administrative draft of the HCP/NCCP to be completed in Phase 2 of the project. There will be another opportunity to review this chapter before it is distributed in the Draft HCP/NCCP released to the public for formal comments.

3.1 Introduction

This chapter presents the physical and biological setting of the East Contra Costa County HCP/NCCP. It describes the baseline physical and biological conditions upon which impact analyses (chapter 5) and conservation strategies (chapter 6) are based. The first part of the chapter describes the inventory area of the HCP/NCCP and how it was delineated. After that there is a summary of how existing and new data were collected to create the baseline inventory. The setting of the inventory area is then described according to the following subject areas.

- Physical resources
- Existing land-cover types
- Historic conditions
- Ecosystem functions
- Environmental gradients and habitat diversity
- Biological diversity
- Covered natural communities
- Wetlands, streams, and other jurisdictional waters
- Covered species

Biological resources are described at several scales to address the regulatory requirements of the federal Endangered Species Act (ESA), California ESA, Natural Community Conservation Planning (NCCP) Act, Section 404 of the Clean Water Act, and Section 1601 of the California Fish and Game Code. These categories are listed approximately from the largest scale (ecosystems) to the smallest scale (covered species) evaluated in this plan. These categories overlap, so they are not mutually exclusive. For example, many wetlands and streams are also habitat for covered species, and many ecosystem functions support biological diversity and habitat for covered species.

3.2 Inventory Area

The ECCC HCP/NCCP inventory area includes approximately 170,000 acres in East Contra Costa County (County) (Figure 3-1). The southern and western boundaries of the inventory area are generally defined by the Alameda–Contra Costa County line, which corresponds to the western edges of the watersheds for Kellogg, Marsh, Kirker, and other east-flowing creeks. From the peak of Mount Diablo to the north, the western boundary follows the Mount Diablo Meridian, which corresponds in part to the eastern boundary of the City of Clayton. The northwestern boundary follows the watershed line in the hills between Pittsburg and Concord but excludes the City of Concord and the Concord Naval Weapons Station.

The northern boundary of the inventory area was defined by the limit of urban development along the San Joaquin River shoreline. It excludes current and historic tidal areas (as determined by Soil Conservation Service soil surveys [1977]) to avoid the need to cover Delta-exclusive species and natural communities. The eastern boundary of the inventory area was defined based on the course of the most western Delta sloughs between Oakley and the Alameda–Contra Costa County line near Clifton Court Forebay. Former tidal areas were also excluded from the eastern boundary of the inventory area. In addition, the community of Discovery Bay was excluded because it is already built-out and will not require additional coverage under the state or federal ESA. The Clifton Court Forebay in the southeastern corner of the County was excluded because no activities are contemplated in that area there that will require ESA coverage.

3.3 Data Collection

3.3.1 Physical Features

Sources used to map and describe the physical setting of the inventory area included United States Geological Survey (USGS) data on topography and hydrology (USGS), geologic maps of the area (California Department of Conservation 1990), soil survey information (Soil Conservation Service 1977),

and other published information (Alt and Hyndman 2000; Hickman 1993). Topography, hydrology, and soil data were downloaded from agency web sites and imported into ArcInfo where files were clipped and converted into the projection for the inventory area.

Note: physical data may be added later to address ecosystem functions

3.3.2 Land-Cover Mapping

One of the primary data sources of this plan is a detailed GIS-based map of land cover within the inventory area. Land-cover types are defined as the dominant feature of the land surface discernible from aerial photographs, defined by vegetation, water, or human uses. Land-cover types are the basic unit used to analyze ecosystem function, habitat diversity, covered natural communities, wetlands and streams, and covered species. Data sources, mapping standards, and the classification and interpretation of land-cover types are discussed below.

Data Sources

The primary sources of information for the land-cover mapping in the inventory area included the following.

- Orthorectified black-and-white aerial photographs (flown in May 2000) for the entire inventory area (scale in rural areas is 1":400', scale in urban areas is 1":200') (provided by Contra Costa County)
- Color infrared photographs, scale 1:6,000, taken in June 1987 and 1988; covered inventory area except southeastern corner (provided by Contra Costa Water District)
- United States Geological Survey streams and roads data (USGS digital line graph data–various dates)
- California Department of Water Resources Land Use Data (1995)

The following ancillary data sources were used to provide information not available in the primary sources and to check the mapped information for accuracy.

- East Alameda–Contra Costa Biodiversity Study (Jones & Stokes 1996)
- Habitat mapping within the Los Vaqueros Reservoir watershed (Jones & Stokes 1994)
- Color aerial photographs, scale 1:6000, taken in February 1987; covered southeastern corner of inventory area (Jones & Stokes files)
- Soil survey mapping (Soil Conservation Service 1977)

- Conservation opportunity mapping in eastern Contra Costa County (Jones & Stokes 1996)
- Vegetation maps of Contra Costa Water District interim service area (Contra Costa Water District 2000)
- Geologic maps of the San Francisco–San Jose Quadrangle (California Department of Conservation 1990)
- Current residential development maps (provided by Contra Costa County)
- Personal communications with knowledgeable specialists (see pers. comm. list in references)

In addition, field visits were conducted by Jones & Stokes botanists. The initial field visit by Jones & Stokes botanists on December 7, 2001, was conducted to develop the land-cover classification and to verify aerial photograph signatures. The second field visit on January 10, 2002, was conducted to verify land-cover types and consistency of mapping, and to collect additional data for land-cover type descriptions. Mapping was verified by visual inspection from locations accessible by public roads. Field-verified areas were targeted based on the land-cover types present and the accessibility of the area. Once field visits were conducted, land-cover mapping was revised based on field findings.

Mapping Procedures

Land-cover types were mapped onto 1":400'-scale hard copies of the black-and-white photographs by using the available signatures and supplementing them with the other primary sources of information discussed above, where appropriate. A 10-acre minimum-mapping unit was used for all land-cover types, except for riparian, wetland, wind turbine, and rock outcrop land-cover types, for which a 1-acre unit was used. Maps were digitized using AutoCad Release 14. Following the completion of all digitizing, the AutoCad file was converted to a GIS coverage using ArcInfo. ArcInfo was used to edit the coverage and calculate acreage for each land-cover type. The final hard copy of the land-cover maps were then produced using ArcMap.

Ancillary information was used to supplement land-cover information acquired by aerial photograph interpretation from the primary information discussed above. Color aerial photographs (February 1987) were used to spot check signatures in areas not covered by the infrared photographs. Natural Resource Conservation Service (NRCS) soils maps were used to identify areas with alkaline soils (Soil Conservation Service 1977). USGS data (U.S. Geologic Survey 2001) was used to complete the stream coverage for most of the area. In the northeastern portion of the project area, however, USGS streams data were not available, and streams were mapped based on signatures from the aerial photographs. Land use maps and development maps were used to further refine agriculture and development mapping.

Mapped signatures for specific land-cover types were also compared with ground-truthed maps prepared by Jones & Stokes for the Los Vaqueros reservoir project (Jones & Stokes 1996) to verify the accuracy of the current mapping effort. If the land-cover type was not easily identifiable to the lowest classification level from the photographs or other available information, it was mapped at the higher classification level. Wetlands that could not be classified by type (seasonal or otherwise), for example, were mapped at the highest classification level (i.e., emergent wetlands).

Land-Cover Type Classification

A classification system for land-cover types (Table 3-1) was developed for the inventory area based on Jones & Stokes (1996), Holland (1986), Sawyer and Keeler-Wolf (1995), Mayer and Laudenslayer (1988), and field visits by Jones & Stokes senior botanists. The classification system was also developed to support the impact analysis on covered species and the inclusion of wetland permitting in the HCP/NCCP. Each land-cover type was identified based on distinct image signatures on the false-color infrared aerial photographs. Brief descriptions and specific mapping methods used to delineate each land-cover type are provided in the setting section below. A comparison between land-cover types and common vegetation classification systems is presented in Table 3-2.

3.4 Setting

3.4.1 Physical Resources

This section describes the physical setting of the ECCC HCP/NCCP inventory area, including a general discussion of topography, soils, hydrology, and floodplains.

The inventory area is located in the San Francisco Bay Area and San Joaquin Valley subregions in eastern Contra Costa County (Hickman 1993). These physiographic subregions are characterized by maritime and Mediterranean climates respectively. Precipitation in the inventory area falls mostly as rain during the late fall, winter, and early spring months, although the higher elevations can receive infrequent snowfalls during the winter months, with snow sometimes lasting for 2 to 3 days on Mount Diablo (Soil Conservation Service 1977).

The climate in the inventory area is strongly influenced by its location and topography. In the summer, a steady marine wind blows through the Golden Gate and up the Carquinez Strait. The eastern part of the inventory area is not influenced by this marine air to same the extent as the western part, and

temperatures are therefore generally warmer in the eastern portion of the inventory area than in the western portion.

Topography

Topography in the inventory area consists of 3 general physiographic regions: the highlands of the Coast Ranges, the intermountain valleys, and the Sacramento–San Joaquin Delta. These regions have been shaped by a complex geologic history. Because of this complexity, the elevation in the inventory area is characterized by a relatively large range that extends from islands at or below sea level, near the Cities of Brentwood and Oakley, to the 3,849-foot peak of Mount Diablo, the tallest feature in the inventory area (Figure 3-2). Most of the mountain valleys are geologically young, and the foothills are generally smooth, with gentle to steeply rolling topography.

Geologic features in the inventory area consist of long slices of the Coast Ranges, which trend northwest–southeast. These ranges slid into their present positions by millions of years of slow movement along the San Andreas fault and several of its branches, including the San Pablo and Hayward faults (Alt and Hyndman 2000). Movement along the faults continues today, subjecting the area to frequent moderate to large earthquakes.

The dominant geologic features present in the inventory area are known as the Franciscan Complex and the Great Valley Sequence. The Franciscan Complex is a poorly understood assortment of sedimentary rocks that were deposited in seawater along with slices of the basalt ocean floor. The Great Valley Sequence is better understood and is characterized by a cover of oceanic sediments, which are the same age as the rocks in the Franciscan Complex. Both features are characterized by tilting and uplifting, but the Franciscan Complex has also been deformed under pressure from faulting. This complex geologic history resulted in extremely diverse soils and hydrology and a diverse topographic landscape.

Soils

Soils in the inventory area are highly variable due to the complex geology, topography, and land use in the area. The Contra Costa County general soil map (Soil Conservation Service 1977) identifies 14 soil associations (distinctive patterns of soils in defined proportions) found in the County (Figure 3-3). The inventory area contains 13 of these soil associations, excluding only the Joice-Reyes Association, which forms in saline mucks and silty clays on saltwater marshes and tidal flats. Most of the soils in the inventory area are derived from alluvium, sedimentary, and meta-sedimentary sources and have been formed in concert with the complex geologic history of the area. Many areas on the lower terraces have been urbanized and/or altered to produce crops.

Hydrology

The inventory area consists of 39 watersheds and sub-watersheds (Figure 3-4). Because of the Mediterranean climate and its characteristic lack of rainfall during the summer months, ephemeral streams are the dominant hydrologic features in the inventory area. Total precipitation falls mostly as winter rain and is variable from an average of 13 inches per year at Antioch to almost 23 inches at Mount Diablo (Soil Conservation Service 1977). The differences in total rainfall reflects elevation and proximity to the coast.

Many ephemeral streams are supplied by winter rains and occasionally by springs that dry up in the late spring and early summer months. Major perennial streams present in the inventory area include Marsh Creek and Kirker Creek. Marsh Creek drains the largest area of any stream originating within the inventory area. Figure 3-4 shows major perennial and ephemeral streams present in the inventory area. Except for a few small streams that drain west into San Francisco and San Pablo Bays, most streams drain into the San Joaquin River and Suisun Bay to the north and east.

The natural hydrology of many of the major streams in the urban areas have been altered for flood control or to convey irrigation water. Most streams have been diverted from their historic floodplains by channelization. Many of these streams are also highly altered and maintained as part of the flood control process and support little or no riparian vegetation. Most of the low-lying river delta has been reclaimed by protective dikes and drainageways. As a result, the northeastern portion of the inventory area has subsided substantially and is currently at or below sea level. Outside the urbanized areas, most drainages remain relatively natural and occupy at least a portion of their historic floodplains. Most of these features are ephemeral in nature, however, and support mostly narrow floodplains with little or no riparian habitat.

3.4.2 Existing Land-Cover Types

Land-cover types in the inventory area are shown in Figure 3-5. Table 3-3 lists the amount of each land-cover type in the inventory area. This section describes the characteristics of each land-cover type in the inventory area.

Grassland

Grassland is an herb- and forb-dominated land cover. Grassland land cover includes annual grassland, alkali grassland, and ruderal land-cover types. Most of the grassland in the inventory area was historically or is currently disked (Jones & Stokes 1996) to improve foraging value for livestock, and most is currently grazed.

Annual Grassland

Annual grassland was mapped where grasses and forbs dominate the land cover and where trees and shrubs amounted to less than 5% canopy cover. Annual grassland consists of herbaceous vegetation dominated by grasses and forbs. The dominant grasses generally consist of introduced annual grasses, including wild oats (*Avena* spp.), brome grasses (*Bromus* spp.), and annual fescues (*Vulpia* spp.). The associated herb cover includes native and non-native forbs and native wildflowers. Characteristic wildlife that occur in annual grassland include a variety of reptiles, such as the western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalis viridis*). Mammals typically found in this land-cover type include the black-tailed jackrabbit (*Lepus californicus),* California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), American badger (*Taxidea taxus*), and coyote (*Canis latrans*). Common birds that breed in annual grassland habitats include the burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*). Annual grassland also provides important foraging habitat for the turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and red-tailed hawk (*Buteo jamaicensis*).

Grassland is by far the most common land cover in the inventory area, occupying over 57,000 acres (34%). Grassland occupies a continuous band along the foothills of the Coast Range and is the dominant land cover in the valleys at higher elevations.

Alkali Grassland

Grasslands occurring where soils surveys indicated alkaline soils were mapped as alkali grassland. Alkali grasslands occur on soil units within the Marcuse, Pescadero, Sacramento, and Solano soil series. In alkali grassland, dominant grasses include saltgrass (*Distichlis spicata*) and wild barley (*Hordeum* spp.). The associated herb cover consists of halophytes, including saltbush (*Atriplex* spp.), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), alkali mallow (*Malvella leprosa*), and common spikeweed (*Centromadia pungens*). This subtype also includes small stands of alkali sink scrub (< 10 acres) dominated by the shrub iodine bush (*Allenrolfea occidentalis*) or scattered individuals of iodine bush within alkaline grassland. Wildlife species common to this habitat include many of those described above for annual grassland, including western fence lizard, black-tailed jackrabbit, coyote, and horned lark.

Alkali grassland is relatively rare in the inventory area. It is found on 1,977 acres (1%) in the southeast corner of the inventory area in scattered patches between Byron and the Contra Costa-Alameda County line, and south of Discovery Bay.

Ruderal

Areas mapped as ruderal are disturbed areas that have sparse non-native, typically weedy vegetation. Most ruderal areas are vacant parcels surrounded by developed areas. Additional areas mapped as ruderal include an aggregate mining site located near Byron; abandoned gravel mines; closed landfills; and several areas outside of Antioch and Brentwood that have been cleared of most vegetation but for unknown purposes (i.e., areas that did not have evidence of agriculture, subdivision, or street layouts). The minimum mapping unit for ruderal was 10 acres.

Where vegetation is present, ruderal land cover is dominated by a mixture of non-native annual grasses and weedy species, such as black mustard (*Brassica nigra*), thistles (*Cirsium* spp.), and wild radish (*Raphanus sativa*), which tend to colonize quickly after disturbance. -

Wildlife common to ruderal habitats can include species closely associated with urban development, such as house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), western scrub jay (*Aphelocoma californica*), black-tailed jackrabbit, raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mehpitis*), and house mouse (*Mus musculus*).

This land-cover type is relatively common in the inventory area (8,564 acres; 5%) and generally occurs on the edge of or within the developed areas. A large area of ruderal land cover is found away from urban development west of Byron. This area is the active aggregate mine of Sand Hill Ranch.

Chaparral and Scrub

Chaparral and scrub land cover was identified on the aerial photographs based on its dark, homogeneous signature and location on steep hillsides and mountaintops. The minimum mapping unit for this land-cover type was 10 acres. This land-cover type includes small stands of scattered trees, less than 10 acres in size. In addition, there are patches of coastal sage scrub less than 10 acres in size within the inventory area, primarily near Mount Diablo. Because of their small size and appearance similar to chaparral on aerial photographs, patches of coastal sage scrub could not be mapped with the available data and were therefore not differentiated from chaparral.

Chaparral and scrub consists of woody vegetation dominated by shrubs. Scattered trees and small stands of trees, such as Foothill pine (*Pinus sabiniana*) and oak (*Quercus* spp.), are present, but they are not the dominant vegetative cover. The dominant species include chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos* spp.), and buckbrush (*Ceanothus* spp.). California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), and California buckwheat (*Eriogonum fasciculatum*) occur as associates in chaparral and in small, nearly pure patches of scrub.

Common wildlife that use chaparral and scrub land cover include gopher snake (*Pituophis melanoleucus*), western rattlesnake (*Crotalus viridis*), western fence lizard (*Sceloporus occidentalis*), Anna's hummingbird (*Calypte anna*), California quail (*Callipepla californica*), brush rabbit (*Sylvilagus bachmani*), California pocket mouse (*Perognathus californicus*), Botta pocket gopher, California ground squirrel (*Spermophilus beecheyi*), spotted skunk (*Spilogale gracilis*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Common bird species within this land-cover type include California quail; mourning dove; Anna's hummingbird; and foliage-gleaning birds such as western scrub-jay, Bewick's wren, and California towhee. Lesser goldfinch is an important seed-eating bird in this cover type and is joined by wintering species that include fox sparrow, white-crowned sparrow, dark-eyed junco, and hermit thrush.

Chaparral and scrub is uncommon, occurring on 2,863 acres of the inventory area (2%). It is found in scattered large and small patches in the higher elevations of the western and southwestern portions of the inventory area, near Mount Diablo.

Oak Savannah

Oak savannah was defined as grassland with a tree canopy cover of 5 to 10%. Oak woodland was defined as grassland with a tree canopy cover of over 10%. Oak savannah was distinguished from oak woodland because most oak woodlands in the inventory area had a canopy cover of nearly 100%. Oak savannah was easily identifiable on aerial photographs and was mapped by following the outer canopy edge of continuous stands. Grassland with a sparse oak canopy is an important and unique habitat for some covered species.

Oak trees were easily identifiable on aerial photographs. To distinguish between grassland (<5% oak canopy cover), oak savannah, and oak woodland, we used an acetate reference grid with simulated tree canopies at 5% and 10% cover. Oak savannah and oak woodland was mapped by following the outer canopy edge of continuous stands. Oak savannah and woodlands include annual grassland and chaparral stands less than 10 acres in size.

Oak savannah consists of grassland with a low canopy cover of trees, primarily blue oak (*Quercus douglasii*), valley oak (*Quercus lobata*), and scattered live oaks (*Quercus wislizenii*). Shrubs are generally scarce and may include scattered individuals or occasional aggregations of chaparral species. Herbaceous species commonly found include many of the species mentioned above in annual grassland land cover. Wildlife associated with oak savannah include many species that also are common to the grassland land-cover type described above, in addition to various oak woodland associate species such as acorn woodpeckers (*Melanerpes formicivorous*), wild turkey (*Meleagris gallopavo*), and mule deer. Red-tailed hawks and great-horned owls (*Bubo virginianus*) may also nest in the oaks and forage in the grassland.

This land-cover type occurs in the transition zone between annual grasslands and oak woodlands. Oak savannah is uncommon, found on 5,835 acres in the inventory area (3%).

Oak Woodland

As defined above under oak savannah, oak woodland was defined as grassland with a tree canopy cover of over 10%. The minimum mapping unit for this land-cover type was 10 acres. Typical oak species common to oak woodland in the inventory area include blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizenii*), valley oak (*Quercus lobata*), and coast live oak (*Quercus agrifolia*). Other trees may be codominant, such as California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), and foothill pine. The understory varies from an open community dominated primarily by grasses and forbs to a dense shrub layer.

Oak woodlands provide food and cover for many species of wildlife. Common reptiles include gopher snake and western fence lizard. Common mammals include deer mouse, western gray squirrel (*Sciurus griseus*), mule deer, and coyote. Representative raptors in this cover type include red-tailed hawk, American kestrel, barn owl, and great horned owl. Trunk-dwelling birds include acorn woodpecker, Nuttall's woodpecker, northern flicker, and white-breasted nuthatch. Other common birds include California quail, spotted towhee (Pipilo maculatus), Bewick's wren (*Thryomanes bewickii*), and bushtit (*Psaltriparus minimus*).

This vegetation type includes patches of annual grassland and small chaparral stands. Oak woodland is very common in the inventory area, occupying 24,188 acres (14%) in the southwestern portion in the mid- to high-elevation zones.

Riparian Woodland/Scrub

The riparian woodland/scrub land-cover type is dominated by phreatophytic woody vegetation associated with streams and permanent water sources. Riparian woodland is dominated by trees and contains an understory of shrubs and herbs. Riparian scrub is dominated by young trees and shrubs, typically representing an early successional stage to riparian woodland. This land-cover type was identified based on its specific signature on the photographs and proximity to streams, drainages, and lakes or reservoirs. On infrared photographs, riparian areas were discernable based on their light signatures. These light-colored signatures indicate areas of rapid vegetation growth. Riparian areas were mapped based on this signature type, topographic location, and canopy density. Generally, the riparian land-cover types occupy narrow corridors in the inventory area, with a canopy only several trees or shrubs wide.. Because riparian scrub is an early successional stage of riparian woodland, and

because it was difficult to distinguish on aerial photos, the 2 categories were combined as riparian woodland/scrub. The minimum mapping unit for riparian woodland/scrub was 1 acre.

Some intermittent streams in the inventory area are dominated by a narrow corridor of oaks and California bay laurel (*Umbellularia californica*), with only scattered riparian tree species present (i.e., trees such as willows and cottonwoods). Stands in streams dominated by oaks were therefore mapped as oak woodland.

Riparian land cover is woody vegetation associated with streams and permanent water sources. Riparian woodland/scrub is dominated by a mixture of hydrophytic trees and shrubs adapted to saturated and/or flooded soil conditions. When present, trees include Fremont cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), and red willow (*Salix laevigata*). The understory may also include woody shrubs, such as arroyo willow (*Salix lasiolepis*) and coyote brush (*Baccharis pilularis*), which are also typically found when mature trees are lacking.

Riparian land cover provides habitat for a wide diversity of wildlife. The presence of flowing water associated with this land-cover type attracts numerous mammals, amphibians, and reptiles. Riparian corridors are also an important deer migratory habitat. Common mammals, in addition to deer, found in this cover type include raccoon, gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), deer mouse (*Peromyscus maniculatus*), harvest mouse, broad-handed mole (*Scapanus latimanus*), and dusky-footed woodrat (*Neotoma fuscipes*). Numerous birds are also typical of this cover type and include Wilson's warbler (*Wilsonia pusilla*), yellow warbler (*Dendroica petechia*), northern flicker (*Calaptes auratus*), Bewick's wren (*Thryomanes bewickii*), white-tailed kites, Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), song sparrows (*Melospiza melodia*), and black-headed grosbeak (*Pheucticus melanocephalus*).

Riparian woodland/scrub is rare in the inventory area, occurring on 219 acres. The largest and longest stands of riparian vegetation are found in and near Pittsburg along Kirker Creek, and near Marsh Creek Reservoir south of Brentwood.

Wetland

Wetlands are dominated by herbaceous species that grow in perennially or seasonally flooded, ponded, or saturated soil conditions. Wetlands were identified based on their aerial photograph signatures and landscape positions that would support wetland hydrology (e.g., wetlands generally have a dark red signature on the infrared photographs because these areas are greener and are actively growing). The minimum mapping unit for all freshwater wetland land-cover types was 1 acre.

Wetlands were further separated, when possible, into seasonal wetland and alkali wetland land covers by their apparent duration of inundation and abundance of alkali soils (i.e., wetlands mapped within alkali grasslands were classified as alkali wetlands). Wetland subtypes were distinguished based on the darkness of the signature and the density of vegetation. If the type of wetland could not be determined (i.e., the duration of inundation could not be determined from aerial photography), the wetland was classified as the general category of wetland. There are 210 acres of wetland in the inventory area. Wetlands include both permanent and seasonal wetland types. Vernal pools could not be distinguished on the aerial photographs; they are included as seasonal wetlands or wetlands.

Permanent Wetland

Permanent wetlands are characterized by a year-round water source. They are typically dominated by erect, rooted, herbaceous hydrophytic plant species adapted to growing in conditions of prolonged inundation. Common plant species present in this land-cover type include perennial wetland species such as cattails (*Typha* spp.) and tules (*Scirpus* spp.). This land-cover type is present in the inventory area but could not be differentiated from other types of freshwater wetland through available aerial photography. This land-cover type was included in the general category of wetland, which also includes seasonal wetland.

The permanent wetland land-cover type is important for a wide variety of wildlife species. Representative water birds that forage and rest in permanent wetlands and associated open-water areas include great blue heron and great egret, as well as various ducks, including wood duck, green-winged teal, mallard, American coot, killdeer, and greater yellowlegs. Typical amphibians and reptiles in this cover type include red-legged frog, northwestern pond turtle, and garter snakes. Many of the larger mammals, such as black-tailed deer, may frequent permanent wetlands and use them as a source of drinking water.

Seasonal Wetland

Seasonal wetlands are freshwater wetlands that support ponded or saturated soil conditions during winter and spring and are dry through the summer and fall until the first substantial rainfall. The vegetation is composed of wetland generalists, such as hyssop loosestrife (*Lythrum hyssopifolia*), cocklebur (*Xanthium* spp.), and Italian ryegrass (*Lolium multiflorum*), that typically occur in frequently disturbed sites, such as along streams.

During the wet season, these wetlands are commonly used by a variety of wildlife, including various amphibians such as western spadefoot toad (*Scaphiopus hammondii*), Pacific chorus frog (*Psuedacris regilla*), western toad (*Bufo boreas*), and California tiger salamander (*Ambystoma californiense*); shorebirds including killdeer (*Charadrius vociferus*), black-necked stilt (*Himantopus mexicanus*), and American avocets (*Recurvirostra americana*); and a variety of passerines such as Brewer's blackbirds (*Euphagus cyanocephalus*),

red-winged blackbirds (*Agelaius phoeniceus*),brown-headed cowbirds (*Molothrus ater*), and American pipits (*Anthus rubescens*). During the dry season, a variety of small mammals use the areas, including deer mouse (*Peromyscus maniculatus*), California vole, (*Microtus californicus*), and long-tailed weasel (*Mustela frenata*). Raptors, including white-tailed kites, northern harrier, and red-tailed hawk may also forage in this land-cover type.

A subtype of seasonal wetland that could not be mapped with available photography but is included in this land-cover type is vernal pools. Vernal pools include areas that pond water on the surface for extended durations during the winter and spring, and dry completely during the late spring and summer. Because of their unique hydrology, vernal pools support specialized plants adapted to growing in these stressful conditions, including coyote thistle (*Eryngium* spp.), goldfields (*Lasthenia* spp.), downingia (*Downingia* spp.), and navarretia (*Navarretia* spp.). These species are generally restricted or nearly restricted to vernal pools. Within the vernal pools, a number of special-status invertebrates may be found, including vernal pool fairy shrimp (*Brachinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), and longhorn fairy shrimp (*Brachinecta longiantenna*).

Seasonal wetlands were mapped at 12 sites totaling 19 acres. This wetland type is likely underrepresented because of its small size, isolated locations, and difficulty in interpreting its photographic signature. Many seasonal wetlands, were not mapped because they were below the minimum mapping unit of 1 acre or were not visible on the aerial photographs. In addition, many of the mapped seasonal wetlands were included in the general wetland land-cover category because they could not be differentiated from permanent wetlands.

Alkali Wetland

Alkali wetlands support ponded or saturated soil conditions and occur as perennial or seasonally wet features on alkali soils. Wetlands greater than 1 acre on alkali soils were mapped as alkali wetlands. Alkali wetlands were mapped where wetlands occurred within the alkali grassland cover type.

The vegetation of alkali wetlands is composed of halophytic plant species adapted to both wetland conditions and a high salinity level. Typical species include a mixture of species common to both emergent and alkali wetlands, such as salt grass (*Distichlis spicata*), and alkali heath (*Frankenia salina*), common spikeweed (*Centromadia pungens*).

For wildlife, alkali wetlands are similar to seasonal wetlands in function and value. The wildlife found in alkali wetlands is similar to that found in seasonal wetlands described above. Alkali wetlands are rare in the inventory area, occurring at 16 sites on 44 acres in the southeastern portion of the inventory area south of Byron.

Aquatic

Aquatic land-cover types are open water or aquatic habitats that support no vegetation, or submerged or floating vegetation, such as lakes, reservoirs, sewage ponds, sloughs, channels, streams, and ponds (including stock ponds). Open-water land covers that were not mapped as reservoirs and occupied greater than 5 acres were mapped as aquatic. Because ponds (including stock ponds) provide habitat for covered species, ponds that were discernable on aerial photographs were mapped, regardless of size.

Stream

Streams include ephemeral, seasonal, and perennial drainages characterized by a defined bed and bank and/or ordinary high-water mark. Perennial streams support flowing water year round or nearly year round in normal rainfall years. Seasonal (or intermittent) streams carry water though all or most of the wet season (November–April) and are dry through most or all of the dry season (May–October) in a normal rainfall year. Ephemeral streams carry water only during or immediately following a rainfall event. Perennial streams are relatively rare, while seasonal streams are very common throughout the inventory area. Streams were mapped as linear features in areas where the USGS stream coverage was not available. Stream signatures were represented by long, often thin, dark lines on the black and white aerial photos. Approximately 436 miles of streams were mapped in the inventory area.

Similar to the riparian and wetland land-cover types, the stream land-cover type can be important because it provides a water source for a variety of water-dependent wildlife species.

Reservoir

Note to Reviewers: The reservoir category has not yet been added to the land-cover map. Currently, reservoirs are included in the general "aquatic" category.

Four water bodies, designated on USGS topographic maps as named reservoirs, were mapped under the reservoir land-cover type. These included Los Vaqueros, Contra Loma, Antioch, and Marsh Creek Reservoirs. The reservoir land-cover type was easily discernable on aerial photographs based on the smooth, uniform, dark signatures of open water. Where discernable, this land-cover type was mapped to the high-water line. The high-water line was observed on the aerial photographs as either obvious rings of sparse vegetation or an open-water signature (most of the reservoirs appeared to be full or nearly full when the aerial photographs were taken).

Reservoir can be an important land-cover type to various ducks, including mallard, green-winged teal, cinnamon teal, gadwall, American widgeon, and American coot. Shore and wading birds including, killdeer, black-necked stilt, greater yellowlegs, and several gull species can also be found in this cover type. Large mammals can also use reservoir habitat for drinking water.

This land-cover type is uncommon in the inventory area, occurring only at the 4 sites described above on a total of __ acres.

Pond

Ponds were mapped as open water occupying less than 5 acres (generally including all stock ponds used by livestock). Ponds are small perennial water bodies dominated by little or no vegetation. Ponds were easily discernable based on the smooth, uniform, dark signatures on the aerial photographs. Where discernable, this land-cover type was mapped to the high-water line. If vegetation is present, it is typically submerged or floating. Some wetland land-cover types are likely included as ponds. Ponds may occur naturally or be created or expanded for livestock use (stock ponds).

Similar to the reservoir land-cover type, pond supports a variety of ducks and shore and wading birds.

This land-cover type is very common in the inventory area, occurring at 246 sites on a total of 136 acres.

Slough/Channel

Sloughs and channels are features with perennial water and artificial banks, or levees, constructed of natural soil materials. Sloughs are tidally influenced and may include brackish waters. Channels include channelized urban streams, such as the lower portion of Marsh Creek Brentwood and Oakley. Levees were clearly visible on the aerial photographs, so sloughs and channels could be mapped to the visible waterline.

Similar to other aquatic land-cover types, sloughs and channels can be important to a variety of wildlife because they provide drinking water, foraging habitat, and resting habitat. Common wildlife found associated with this land-cover type include garter snake, a variety of ducks, both wading and shore birds, and large mammals that use these areas for drinking water.

This cover type is relatively uncommon, only occurring on 373 acres on the east and southeast sides of the inventory area, near Discovery Bay and the Clifton Court Forebay.

Rock Outcrops

Rock outcrops are exposures of bedrock that typically lack soil and have sparse vegetation. Within the inventory area, several types of rock outcrops are present and are derived from sedimentary, volcanic, and metamorphic sources. This land-cover type includes areas of serpentine outcrops that could not be mapped with the available data but are known to occur in the Mount Diablo area (Kruckeberg 1984; California Department of Conservation 1990). Rock outcrops identifiable on aerial photographs were mapped as polygons based on their unique aerial photograph signatures. Rock outcrop signatures appear as textured areas with mottled coloring on black and white aerial photos.

Rock outcrops host common wildlife species such as the western fence lizard and western rattlesnakes. These species may use outcrops for basking and foraging areas. Common birds include rock wrens and several species of raptors that use rock outcrops for nesting or roosting.

Rock outcrops are a rare cover type, only occurring in 13 patches totaling 80 acres. Rock outcrops are restricted to 2 areas, around Mount Diablo and near Los Vaqueros Reservoir (e.g., Vasco Caves). This land-cover type is likely underrepresented in the inventory area because these features are difficult to see on aerial photographs or were below the minimum mapping unit.

Irrigated Agriculture

Irrigated agriculture encompasses all areas where the native vegetation has been cleared for agricultural use. This land-cover type was broken down into 4 subtypes: pasture, cropland, orchard, and vineyard. In some cases, it was not possible to distinguish between these 4 categories. For example, newly planted orchards resemble both row crops and newly planted orchard on aerial photos. In these instances, the agriculture was mapped as cropland.

Pasture

Note to Reviewers: This category has not yet been added to the land-cover maps. We will be re-designating most (or all) of the general "agriculture" category as either pasture or 1 of the other 3 subtypes.

The pasture land-cover type includes irrigated areas used for grazing and/or hay production. This land cover is only common in the flat northeastern portion of the inventory area, north of Knightsen. Pasture was mapped where large parcels of pasture were known to occur (based on personal observations by Jones & Stokes staff). Using known locations for pasture lands, other pasture was mapped on aerial photographs based on their location and smooth texture on the photographs, indicating land that is covered by vegetation and not currently tilled for cropland. The minimum mapping unit for this land-cover type was 10 acres.

Common vegetation in the pasture land-cover type includes mostly non-native perennial grass species introduced because of their high forage value for livestock. In some areas, non-native weedy vegetation, such as thistles (*Cirsium* spp.), mustards (*Brassica* ssp.), and a variety of other forbs, are also common.

Pasture supports a variety of wildlife, particularly ground-nesting birds such as western meadowlarks. Several birds that forage in open grasslands, such as white-tailed kites and great blue herons, may also use this land-cover type. The wildlife value of pasture can be diminished if the pasture lands are overgrazed.

This land-cover type occupies _ acres, occurring most often in the northeastern portion of the inventory area, north of Knightsen.

Cropland

Tilled land not appearing to support orchard or vineyard in aerial photographs was mapped as cropland. Croplands are those areas tilled and cultivated for agricultural crops. Fallow fields that will likely continue in agriculture were mapped as cropland. Agricultural crops include various vegetables and annual crops that are planted early in the season and removed and rotated with other crops every year. Common wildlife found in croplands is similar to that of pasture but depends heavily on the cycle of planting. For example, cropland close to harvest has a higher value for wildlife than fallow fields that will continue in agriculture.

This is the most common of the agriculture land-cover types present in the low-lying areas of the inventory area and occupies 22,713 acres (13%). Croplands are abundant in the eastern portion of the inventory area, particularly between Brentwood and the Clifton Court Forebay.

Orchard

Orchard was distinguished based on its tree cover arranged in rows. Orchards include those areas planted in fruit-bearing trees, including apples, apricots, kiwis, and cherries. Orchards are scattered but relatively common throughout the low-lying agricultural lands in the northeastern portion of the inventory area and occupy 4,925 acres (3%). Orchards are most common within Oakley and immediately south of Brentwood in the area designated in the Contra Costa County General Plan as Agricultural Core.

Orchards may provide habitat for common wildlife species such as raccoon, opossum, California vole, and western fence lizard. Generally, because of routine farming practices and maintenance, orchards are not considered to have a high value for wildlife.

Vineyard

Vineyards, areas planted in grapes, were identified based also on its row pattern. Vineyards appeared similar to orchards on the aerial photos but were characterized by more closely spaced and smaller vegetation. Vineyards are relatively uncommon in the inventory area. They occur on 1,077 acres (1%) in scattered areas in and around Oakley and Brentwood, surrounded with cropland or orchard.

Developed

Developed areas include all types of development for residential, commercial, industrial, transportation, landfill, landscaping, and recreational uses. Developed areas also include sites that have structures, paved surfaces, horticultural plantings, golf courses, and irrigated lawns. Developed sites were mapped based on their distinct signatures. Developed areas often consist of geometric shapes, and are clearly discernable from naturally occurring signatures in any terrain. This category was separated into 6 subtypes: urban, aqueducts, non-native woodland, turf, wind turbines, and landfill.

Urban

Urban sites encompass all areas where the native vegetation has been cleared for residential, commercial, industrial, transportation, or recreational structures. Developed areas include areas that have structures, paved surfaces, horticultural plantings, and lawns smaller than 10 acres (irrigated lawns larger than 10 acres were mapped as turf). Many small, rural residential areas were observed occurring in the inventory area. When there were a sufficient number and size of buildings, turf, and pavement associated with these areas to equal at least 10 acres, these areas were mapped as urban. Areas where rural residential areas were adjacent to or surrounded by agriculture and/or grassland cover types, but were less than 10 acres in size, were mapped as the adjacent cover type.

This land-cover type is the second most abundant type in the inventory area, occupying 29,044 acres (17%), mostly in the Cities of Pittsburg, Antioch, Oakley, and Brentwood. Small developed areas occur in the portion of Clayton within the inventory area, in unincorporated portions of Contra Costa County east of Mount Diablo, within the agricultural areas of east County, in Byron, and around the Byron Airport.

Aqueduct

Aqueducts were identified based on the presence of a concrete-lined channel and open, perennially flowing water. These features were easily visible on aerial photographs as having lined channel banks with no vegetation. Aqueducts were

distinguished because of their function as major barriers to wildlife movement. Buried aqueducts were not mapped. Within the inventory area, surface aqueducts occupy 277 acres.

Non-Native Woodland

Non-native woodlands are those areas where ornamental and other introduced species of trees have been planted or naturalized and dominate and form a dense canopy. Non-native woodland was mapped primarily in areas surrounded by development, where the signatures and locations did not meet the requirements for oak or riparian woodlands. Non-native woodlands were included as a separate land cover because some stands could provide suitable habitat for raptors.

Within the inventory area, non-native woodlands occur in 4 stands totaling 48 acres. Three of these stands are in Pittsburg; 1 is in the northeast corner of the inventory area.

Turf

The turf land-cover type includes developed parks and golf courses that support irrigated lawns and horticultural plantings with little or no natural land cover.

Within the inventory area, this land-cover type encompasses 918 acres near large residential areas south of Antioch and Pittsburg. The majority of turf land cover is within Contra Loma Regional Park, the Brentwood Golf Club (3 courses), and the Roddy Ranch Golf Course.

Wind Turbines

Wind-turbine land cover was mapped in the southern portion of the inventory area where the turbines have been installed in rows for power generation. Wind-turbine land cover was mapped to the extent of disturbed land (mainly roads and turn-arounds) around the turbines.

Wind-turbine land cover encompasses 218 acres in the southern portion of the inventory area near Los Vaqueros Reservoir, where the turbines have been installed in rows for power generation.

Landfill

Landfills are those areas where vegetation has been cleared and large amounts of soil have been moved for solid waste disposal. Typically, these areas are excavated pits into which refuse is thrown and compacted. After a landfill is

closed and capped, it may return to grassland habitat through planting and management. Only active landfills were mapped in this category. The Keller Canyon Landfill located south of Pittsburg, is the only active landfill in the east County. It was mapped as occupying 333 acres.

3.4.3 Historic Conditions

Land-cover types within the inventory area have changed substantially since European settlement of the area. Although the historic distribution and composition of vegetation communities in the inventory area is unknown, some communities were likely substantially different from current conditions. The land-cover types that have probably undergone the most dramatic changes are grassland, streams and wetlands, riparian forests, and oak woodlands.

Most native wildlife was likely more abundant in the inventory area historically. For example, black bears (*Euarctos americanus*) were known to occur in the San Francisco Bay Area, as were tule elk (*Cervus elophus nannodes*). Other wildlife, such as the mountain lion (*Felis concolor*) and bobcat (*Lynx rufus*), still occur in the inventory area but were likely more common prior to European settlement.

Grasslands

Native grasslands dominated by perennial bunchgrasses, such as purple needlegrass (*Nassella pulchra*), likely occurred through most of the inventory area in areas occupied currently by grassland, urban development, ruderal, and agricultural land-cover types (Heady 1977; Wester 1981). These native grasslands supported a high diversity of native annual and perennial herbs and grasses. Common wildlife included high densities of pronghorn (*Antilocapra americana*), black-tailed deer (*Odocoileus hemionus*), Botta pocket gopher (*Thomomys bottae*), and tule elk (Heady 1977).

Starting in 1769, many non-native plants were introduced and spread throughout California, including Mediterranean annual grasses and herbs such as wild oats (*Avena* sp.), bromes (*Bromus* sp.), barleys (*Hordeum* sp.), ryes (*Lolium* sp.), and thistles (*Centaurea* sp.; *Cirsium* sp.) (Bartolome and Gemmill 1981). European settlers grazing livestock grazing in the inventory area likely became more widespread after the gold rush of the 1850s. The combination of livestock grazing, drought, and spread of exotic grasses and herbs dramatically altered the native grasslands that occurred in the inventory area prior to the 1850s (Heady 1977). No surveys of native grassland have been conducted in the inventory area, but it is expected that only small patches of native grassland (< 1 acre) remain in scattered locations. Although probably less intensively than in the past, grazing continues today in almost all of the grasslands of the inventory area.

Streams and Wetlands

Aquatic habitats, such as vernal pools, seasonal wetlands, and alkali wetlands, were almost certainly more abundant in the inventory area than they are today. For example, vernal pools have been reduced to less than 10% of their former extent within the Great Valley of California (Holland 1978), of which the eastern portion of inventory area is a part. Historically, vernal pools and other seasonal wetlands and ponds were likely scattered throughout the lowland portions of the inventory area. Streams in the northern and eastern portions of the inventory area historically flowed unimpeded by the channels, water diversions, and barriers that occur today.

Since European settlement, non-native aquatic species, such as bullfrogs (*Rana catesbeiana*), have been introduced into aquatic habitats, especially those whose hydrology has been altered by damming (e.g., stock ponds) or channelization.

Riparian Forests

Riparian forest, woodland, and scrub communities dominated by willows and cottonwood were likely more common in the inventory area historically than they are today. These communities likely dominated major streams, such as Marsh Creek, Kellogg Creek, and Kirker Creek, from the foothills to near the San Joaquin River. Dense riparian vegetation would likely have been present within the 100-year floodplain of the lowland stream courses (Katibah 1984), usually between natural levees. These forests and woodlands would have supported diverse passerine and raptor communities similar to those found today in these remnant habitats. Urban development, water diversion and flood control projects, woodcutting, agricultural expansion, and extensive livestock grazing have greatly reduced the extent of these riparian forests in the Central Valley of California (Katibah 1984).

Oak Woodland

Historically, oak woodlands and savannahs may have been more extensive in the inventory area than today. The remnant valley oaks at the margins of agricultural fields in the inventory area suggest that these species were once more widespread. Valley oaks may have occurred throughout the grasslands of the lowland areas of the inventory area. Myriad factors have contributed to the decline in density and extent in the inventory area of these and other oaks, including urban and agricultural development, woodcutting, livestock grazing, deer and rodent overpopulation (due to a lack of native predators), and an altered fire regime (Pavlik et al. 1991). Many of these factors continue today in the inventory area, which some researchers hypothesize is reducing the ability of oaks to regenerate.

3.4.4 Ecosystem Functions

Note to Reviewers: This section will address a requirement of the 2001 NCCP Act that NCCPs "conserve, restore, and manage representative natural and seminatural landscapes to maintain the ecological integrity of large habitat blocks, ecosystem function, and biological diversity" (Fish and Game Code Section 2820(a)(4)(A)). This analysis was not included in Jones & Stokes's original scope of work or budget. It is expected to be added to our scope at the September meeting of the Executive Governing Committee (EGC). We will develop the methodology for this section, conduct the analysis, and add the results to this chapter after our scope and budget change is approved by the EGC.

3.4.5 Environmental Gradients and Habitat Diversity

Note to Reviewers: Similar to the section above, this section will address the requirement in the new NCCP Act for NCCPs to "incorporate a range of environmental gradients (such as slope, elevation, aspect, and coastal or inland characteristics) and high habitat diversity to provide for shifting species distributions due to changing circumstances" (Fish and Game Code Section 2820(a)(4)(D)). This section will be added once a scope and budget change has been approved by the EGC.

3.4.6 Biological Diversity

Note to Reviewers: See note above under "Ecosystem Functions."

3.4.7 Covered Natural Communities (Vegetation Communities)

The NCCPA requires that natural communities proposed for coverage be identified in an NCCP. These are the communities for which impacts could occur during plan implementation and mitigation is required. This HCP/NCCP uses the term "vegetation communities" to describe the natural communities that will be covered in the plan. This term is used because the communities are described based on vegetation characteristics, such as dominant species and vegetation structure, rather than by other features, such as wildlife composition. Vegetation communities were also chosen as the unit with which to define natural communities because of the accepted classification schemes in use for vegetation communities (Table 3-2).

This plan includes the following 5 covered vegetation communities that correspond to the major terrestrial land-cover types, excluding development.

- Grassland community
- Chaparral/scrub community
- Oak woodland community (including oak savannah)
- Riparian woodland/scrub community
- Irrigated agriculture

Irrigated agriculture is included as a covered vegetation community despite its disturbed or artificial nature (i.e., agriculture is not a "natural community") because this land-cover type provides habitat for some covered species.

Special land-cover types are defined as land-cover types that provide important habitat features for covered species and occur as small inclusions within larger vegetation communities. These special land-cover types are considered part of the covered vegetation community in which they are found (Table 3-4). For example, streams and ponds are aquatic special land-cover types found throughout grassland and oak woodland-covered vegetation communities. The position of special land-cover types in the landscape (e.g., whether they are within grasslands or riparian woodland) may be more important to wildlife than their similar characteristics across vegetation communities.

Functions of Covered Vegetation Communities

The location and functions of the covered natural communities are described briefly below to provide the setting for the impact analysis and the conservation strategies. Functions of aquatic special land-cover types within these communities (e.g., wetlands, ponds) are described in Section 3.4.8.

Grassland Community

The grassland vegetation community is the most abundant vegetation community in the inventory area, occurring over 59,315 acres. It contains all special land-cover types except slough/channel (Table 3-4). Grasslands within the inventory area are the core vegetation community, linking small and large patches of all other natural vegetation communities in the landscape. Grasslands are also critical upland habitat for a variety of amphibians dependent on aquatic habitats such as ponds and seasonal wetlands. These amphibians move through grassland during the rainy season to disperse to other aquatic sites, and may aestivate within grassland during the dry season. Grasslands are also important for fossorial rodents such as ground squirrels and gophers. These rodents burrows, in turn, provide habitat for a variety of other species, including burrowing owls. The diverse and abundant rodent community supports a diverse assemblage of raptors that feed on them, including golden eagle, northern harrier, and white-tailed kite.

Periodic fire is an important part of the grassland vegetation community. Historically, fires kept woody vegetation from converting grassland into chaparral or oak woodland in higher elevation sites within the inventory area. At lower elevations, grassland was likely always the dominant vegetation community, kept open by native grazers like tule elk and pronghorn.

Chaparral/Scrub Community

The chaparral vegetation community occurs over 2,863 acres in the southwestern portion of the inventory area. This community contains small, intermittent streams but no other special land-cover types. Because it occurs on dry, south- and west-facing slopes, no wetlands or ponds occur within this vegetation community. The unique life-history of many of the plants in the chaparral community is dependent on periodic fire for regeneration. Many of the dominant shrubs, such as manzanita and ceanothus, regrow only by sprouting from basal burls. Regrowth is triggered by removal of the overstory, typically by fire. Chemicals in smoke and charred wood also stimulate germination in a wide variety of native herbs that lay dormant as seeds in the soil for decades before a fire. These fire-following herbs are abundant for 1 or several years after a fire and provide high-quality habitats for a diversity of insects and other wildlife. The unique flora of post-fire chaparral contributes to this vegetation community having the highest concentration of special-status plants of any community in California (Tibor 2001). Many species that inhabit chaparral also inhabit adjacent grassland and oak woodlands. However, some birds and mammals are found largely in the dense cover and shade of mature chaparral stands.

Oak Woodland Community

The oak woodland vegetation community is a combination of oak savannah, oak woodland, and the ponds, streams, and rock outcrops that occur within them. There are 30,094 acres of this community within the inventory area. Oak woodlands share many of the same functions as the adjacent grasslands and chaparral communities. However, the dominance of oaks within this community makes them unique because of the structure and food that oaks provide. Oaks provide shelter to a variety of wildlife in an otherwise open, dry landscape through shading and within trunk cavities. Evergreen oaks, such as coast live oak, provide this shelter year round, unlike the largely deciduous vegetation of riparian forest and scrub. Oaks also support a diverse wildlife community dependent on their acorns. For example, scrub jays, acorn woodpeckers, and black-tailed deer consume this high-quality food in abundance. The diverse insect fauna found on oaks also provides food for mammals and birds.

As in grasslands, the oak woodland community provides important upland habitat for aquatic species such as frogs and salamanders that are dependent on ephemeral ponds and wetlands within oak woodland. The often deep leaf litter under oaks provides a deep cover of organic matter and protection from desiccation for soil invertebrates and amphibians.

Riparian Woodland/Scrub Community

Riparian woodland and riparian scrub vegetation community occurs in 219 acres within the inventory area, as described in Section 3.4.2. This vegetation community is disproportionately important in the landscape because of its function as habitat for migratory passerine birds. Riparian woodland and scrub typically has a high density of invertebrates on which these birds feed. This vegetation community is also important locally as a wildlife corridor with abundant protective cover. Riparian woodland extends into urban areas in Pittsburg and Antioch, providing a partial link along streams between grasslands in the foothills and the habitats of the San Joaquin River. Where it occurs, riparian woodland and scrub serves to greatly reduce and moderate (i.e., reduce their variability) stream temperatures, increasing the value of these aquatic habitats for native fish and amphibians.

Irrigated Agriculture Community

The irrigated agriculture vegetation community occurs in ____acres within the inventory area, almost exclusively within the northeastern, lowland portion. As described in Section 3.4.2, this community has relatively low value for native plants and wildlife. However, some native wildlife, such as small mammals, raptors, and migratory waterfowl, utilize this community seasonally or year round. Year-round activity tends to be concentrated along the margins of active farmland where vegetation is less disturbed or where trees and shrubs tend to occur (some are planted deliberately as windbreaks). Open fields are also used if they are irrigated for forage crops. Fields are left fallow temporarily, just before crops are harvested, and water ponds temporarily. Because this vegetation community provides scattered habitat for some widely distributed species, it is important as a regional connection (i.e., as a stepping stone) between areas of high-quality habitat. The agriculture vegetation community is bisected by streams, sloughs, and channels. Some amphibians and reptiles (e.g., giant garter snake) utilize these linear aquatic features and the adjacent upland habitat within this community.

3.4.8 Wetlands, Streams, and Other Jurisdictional Waters

Wetlands, streams, reservoirs, sloughs and ponds typically meet the criteria for federal jurisdiction under Section 404 of the Clean Water Act. Streams and ponds typically meet the criteria for state jurisdiction under Section 1601 of the California Fish and Game Code. Regional data collected on these resources for the HCP/NCCP do not represent a jurisdictional delineation for either federal or state regulations. The resources mapped, however, provide an excellent planning tool for identifying regional conservation measures for aquatic and wetland resources. Conservation of aquatic and wetland resources is a focus of the HCP/NCCP, and conservation measures developed for the plan are intended to

provide the framework for compliance with Sections 404 and 401 of the Clean Water Act and Section 1601 of the California Fish and Game Code.

Section 404 Regulated Waters

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) regulates activities that result in the discharge of dredged or fill material into waters of the United States. Waters of the United States is a broad category of water bodies and includes wetlands along with other waters that are non-wetland habitats, such as streams, rivers, lakes, reservoirs, ponds, bays, and oceans. USACE jurisdiction in non-tidal waters is measured to the ordinary high-water mark, defined in the federal regulations as follows: "The term *ordinary high-water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR 328.3[e]).

As waters of the United States, wetlands are regulated under the Clean Water Act. Wetlands are defined under USACE regulations as follows: "The term *wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3[b]).

Section 1601 Regulated Waters

Under Section 1601 of the California Fish and Game Code, the California Department of Fish and Game (DFG) regulates public agency activities that would alter the flow, bed, channel or bank of streams and lakes. The limits of DFG jurisdiction are defined in the Code as the "…bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit…" (CFGC Section 1601). Streams are defined in the California Code of Regulations as: "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition to streams, DFG regulates water courses such as sloughs, canals, aqueducts, irrigation ditches. DFG also regulates the stream or channel bed and levees, including riparian vegetation. Land-cover types mapped in this HCP/NCCP that are assumed to fall under DFG jurisdiction include reservoir, slough/channel, aqueduct, stream, and riparian woodland/scrub (Table 3-5).

Federal and State Jurisdictional Waters in the Inventory Area

This section presents an overview of the land-cover types within the ECCC HCP/NCCP inventory area that may qualify as waters regulated by USACE and DFG (Table 3-5). This section is the biological setting that supports the impact analysis on these potentially regulated waters (chapter 5), conservation measures for these waters (chapter 6), and subsequent applications to these agencies for regional or programmatic permits.

USACE Jurisdiction

All aquatic and wetland land-cover types within the inventory area are assumed to be waters of the United States under Section 404 of the Clean Water Act (Table 3-5). Almost all of these waters are non-tidal. The only tidally influenced waters in the inventory area are sloughs and some channels connected to the Delta and San Joaquin River.

There are an estimated 2,792 acres of wetlands and other waters in the inventory area (Table 3-6). The majority of these areas are reservoirs (1,744 acres, including Los Vaqueros Reservoir). Up to 273 acres of these waters of the United States may qualify as jurisdictional wetlands. The estimated extent of wetlands is most likely underestimated by the land-cover mapping because of the low resolution of the aerial photographs, lack of on-ground surveys, and use of a minimum mapping unit of 1 acre. The aerial photographs used in the mapping were taken in May 2000. The rainy season of 1999–2000 (September to May) was average (National Weather Service data), so some seasonal wetlands may have dried before May 2000 and may not have been mapped.

All ponds (mostly stock ponds) visible on the aerial photographs were mapped, even if they were less than 1 acre. Nevertheless, smaller ponds may have been missed in the mapping effort and the extent of ponds underestimated.

There are approximately 436 miles of streams mapped in the inventory area, all of which are likely under USACE jurisdiction. The estimated extent of streams is likely an underestimate because many of the smaller jurisdictional streams were not mapped in the data collection.

In some cases, isolated wetlands and ponds may not qualify as jurisdictional wetlands under a recent Supreme Court decision. In such instances, the resource mapping may have overestimated jurisdictional extent.

DFG Jurisdiction

There are approximately 2,879 acres of waters potentially subject to DFG regulation within the inventory area (Table 3-7). These areas mostly comprise

the reservoirs (1,744 acres). There are approximately 436 miles of streams mapped in the inventory area, all of which are likely under DFG jurisdiction. Up to 219 acres of riparian woodland/scrub would also be under DFG jurisdiction.

The estimated extent of DFG jurisdiction is likely an underestimate because many of the smaller jurisdictional streams and channels were not mapped in the data collection. In addition, small stands (i.e., below the minimum mapping unit) of DFG-jurisdictional riparian woodland/scrub were not mapped and are likely present in the inventory area.

3.4.9 Covered Species

Species Evaluation

To determine which species would be covered by the ECCC HCP/NCCP, a comprehensive list of 154 special-status that occur or may occur in the inventory area was compiled based on information available from the following sources.

- California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB) Rarefind 2 biological inventory database
- California Native Plant Society's (CNPS's) (Tibor 2001) 6th edition Inventory of Rare and Endangered Vascular Plants of California
- CDFG (2001) Special Animals and Special Plants lists
- Jones & Stokes research and environmental reports files
- Jones & Stokes biological resource specialists
- Informal consultation with the U.S. Fish and Wildlife Service (USFWS) (letter request)
- Jones & Stokes in-house file information
- Personal communication with local experts

Definition of Special-Status Species

Special-status species are defined as plants and animals that are legally protected under the federal ESA, the California ESA (CESA), or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants include plants that are

- listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants] and various notices in the Federal Register [FR] [proposed species]);

- candidates for possible future listing as threatened or endangered under the federal ESA (66 FR 54808, October 30, 2001);
- listed or candidates for listing by the State of California as threatened or endangered under the CESA (14 CCR 670.5);
- listed as rare under the California Native Plant Protection Act (Cal. Fish and Game Code, Section 1900 et seq.);
- determined to meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (State CEQA Guidelines, Section 15380);
- considered by CNPS to be "rare, threatened or endangered in California" (Lists 1B and 2 in Tibor 2001); or
- listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in Tibor 2001), which may be included as special-status species on the basis of local significance or recent biological information.

Special-status animals include animals that are

- listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.11 [listed animals] and various notices in the FR [proposed species]);
- candidates for possible future listing as threatened or endangered under the federal ESA (66 FR 54808, October 30, 2001);
- determined to meet the definitions of rare or endangered under CEQA (State CEQA Guidelines, Section 15380);
- listed or candidates for listing by the State of California as threatened or endangered under the CESA (14 CCR 670.5);
- species of special concern to the CDFG and Point Reyes Bird Observatory (PRBO) 2001 (birds) and Special Animals list (CDFG 2001) (mammals); or
- fully protected under California Fish and Game Code Section 3511(birds), Section 4700 (mammals), Section 5515 (fish), and Section 5050 (reptiles and amphibians).

Covered Species Criteria

For each special-status species with potential to occur in the inventory area, information was gathered on its status, population trends, distribution, threats, and conservation and management efforts. The following criteria were then applied to each species to determine whether it would be covered (i.e., included in the final permits). To be covered, a species had to meet all 4 of the following criteria.

1. **Range:** The species is known to occur or likely occurs within the inventory area, based on credible evidence.
2. **Status:** The species is currently listed under the federal ESA or the CESA, or it is likely to become listed within the permit term (assumed to be up to 30 years). Species that are considered likely to become listed within the permit term include species that are
   - proposed for listing under the ESA,
   - candidates under the CESA,
   - candidates under the ESA, or
   - California fully protected species or specified birds;

   and some species, based on species specific information, that are
   - California species of special concern (CSC);
   - CNPS List 1A, List 1B, List 2, or List 3;
   - unlisted and are known by experts to be very rare (e.g., newly discovered species) or declining rapidly; or
   - unlisted and not rare, but the covered activities may affect a substantial portion of the species' range or important habitat.
3. **Impact:** The species will be or will likely be adversely affected by covered activities.
4. **Data:** Sufficient data exists on the species' life history, habitat requirements, and occurrence in the inventory area to adequately evaluate impacts to the species and to develop conservation measures to mitigate these impacts to regulatory standards.

Species Evaluation

Table 3-8 summarizes which criteria were met by each species. Species that met all 4 criteria were divided into 2 priority groups based on their current status and likelihood of future listing:

- **Priority 1:** Species that met the criteria and should be covered because of current listing status, the potential for substantial impacts, or a high likelihood of future listing
- **Priority 2:** Unlisted species that met the criteria but have a lower likelihood of future listing, or listed species that would be affected by a limited set of covered activities

Species that met the "range" and "impact" criteria but did not meet the "status" or "data" criteria were categorized as Priority 3. These species would not likely be in the final federal or state ESA permit but could be included in the plan under

a lower standard of coverage (e.g., to provide programmatic mitigation under the National Environmental Policy Act [NEPA] or CEQA).

For the purposes of this draft chapter, only Priority 1 species were assessed as potential covered species. Table 3-9 presents the list of 27 species proposed for coverage in the ECCC HCP/NCCP.

Note to Reviewers: Species may be added or deleted later based on further analysis, new information, agency consultation, comments from the scientific advisory panel, or stakeholder feedback. The discussion of priority lists will be deleted from the HCP/NCCP once the list of covered species is finalized. The priority lists are intended only to assist the reviewers in prioritizing species to include in the covered species list.

Covered Species Locations

The locations of all CNDDB records in the inventory area are shown in Figure 3-6. These records represent the best available data from the CNDDB but are limited in their use for conservation planning. CNDDB records rely on field biologists to voluntarily submit information on the results of surveys and monitoring. As a result, the database is biased geographically towards areas where surveys have occurred or survey effort is greater (many areas have not been surveyed at all). The database may also be biased taxonomically towards species that receive more survey effort. For example, there have been more surveys for California red-legged frog than other special-status wildlife because it is a listed species. Conspicuous diurnal species such as raptors likely receive greater survey effort than nocturnal species such as bats. Plants typically receive less survey effort than wildlife.

Covered Species Descriptions

Detailed species profiles are provided in Appendix __ for each of the 27 covered species (Table 3-9—*temporary designation*). These profiles summarize basic ecological information, distribution, status, threats, population trends, and conservation and management activities in and near the inventory area. Each profile is designed for easy reference, so all literature cited within the profile is provided at the end of the profile. The basic biological data in these profiles form the basis for the impact analysis (chapter 5) and conservation strategy (chapter 6) in this HCP/NCCP.

Note to Reviewers: The covered species list is preliminary and may change based on new information or recommendations from agency staff, the HCPA Coordination Group, or the scientific advisory panel.

3.5 Citations

3.5.1 Literature Cited

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3.5.2 Personal Communications

Tables

Table 3-1. Hierarchical Classification of Land-Cover Types

1.0 Grassland
- 1.1 Annual grassland
- 1.2 Alkali grassland
- 1.3 Ruderal

2.0 Shrubland
- 2.1 Chaparral and scrub

3.0 Oak savannah

4.0 Oak woodland

5.0 Riparian
- 5.1 Riparian woodland/scrub

6.0 Wetland
- 6.1 Permanent wetland
- 6.2 Seasonal wetland
- 6.3 Alkali wetland

7.0 Aquatic
- 7.1 Stream
- 7.2 Reservoir
- 7.3 Pond
- 7.4 Slough/channel

8.0 Rock outcrops

9.0 Irrigated Agriculture
- 9.1 Pasture
- 9.2 Cropland
- 9.3 Orchard
- 9.4 Vineyard

10.0 Developed
- 10.1 Urban
- 10.2 Aqueduct
- 10.3 Non-native woodland
- 10.4 Turf
- 10.5 Wind turbines
- 10.6 Landfill

Table 3-2. Land-Cover Types Cross Referenced to Other Classification Systems

East Contra Costa County HCP/NCCP	Holland System (Element Code) [a]	CNPS Classification [b]	California Wildlife Habitat Relationship [c]
Native Grassland *Note to Reviewers: native grassland could not be mapped but it will be described in the text as a unique (and rare) land cover type*	Valley and Foothill Grassland (42000) Valley Needlegrass Grassland (42110) Valley Wildrye Grassland (42140) Pine Bluegrass Grassland (42150)	Creeping Ryegrass Series Foothill Needlegrass Series Nodding Needlegrass Series Purple Needlegrass Series One-sided Bluegrass Series	Perennial Grassland
Annual Grassland	Non-Native Grassland (42200)	California Annual Grassland Series	Annual Grassland
Alkali Grassland	Alkali Meadow (45310) Alkali Playa (46000) Valley Sink Scrub (36210)	Saltgrass Series Iodine Bush Series	N/A
Ruderal	N/A	N/A	Barren
Chaparral and Scrub	Scrub and Chaparral (30000) Chamise Chaparral (37200) Northern (Franciscan) Coastal Scrub (32100) Diablan Sage Scrub (32600) Mixed Montane Chaparral (37510) Buck Brush Chaparral (37810) Mesic North Slope Chaparral (37E00)	California Sagebrush Series California Sagebrush-Black Sage Series Coyote Bush Series California Buckwheat Series Chamise Series Chamise-Wedgeleaf Ceanothus Series	Mixed Chaparral Chamise-Redshank Chaparral Coastal Scrub
Oak Savannah/Woodland	Woodland (70000) Valley Oak Woodland (71130) Blue Oak Woodland (71140) Interior Live Oak Woodland (71150) Coast Live Oak Woodland (71160) Digger Pine Oak Woodland (71410) Mixed Evergreen Forest (81100)	Valley Oak Series Blue Oak Series Interior Live Oak Series Coast Live Oak Series Mixed Oak Series California Bay Series California Buckeye Series	Blue Oak, Valley Oak, Coastal Oak Woodland
Riparian Woodland/Scrub	Riparian and Bottomland Habitat (60000) Riparian Scrub (63000) Great Valley Willow Scrub (63410) Riparian Forest (61000) and Riparian Woodland (62000) Great Valley Cottonwood Riparian Forest (61410) Great Valley Mixed Riparian Forest (61420)	Black Willow Series Arroyo Willow Series Mixed Willow Series Narrowleaf Willow Series Red Willow Series Fremont Cottonwood Series Valley Oak Series California Sycamore Series	Valley Foothill Riparian

East Contra Costa County HCP/NCCP	Holland System (Element Code) [a]	CNPS Classification [b]	California Wildlife Habitat Relationship [c]
	Great Valley Valley Oak Riparian Forest (61430) Sycamore Alluvial Woodland (62100)		
Permanent Wetland	Marsh and Swamp (52000) Coastal and Valley Freshwater Marsh (52410)	Common Reed Series Bulrush Series Bulrush-Cattail Series Bur-reed Series Cattail Series Spikerush Series	Freshwater Emergent Wetland
Seasonal Wetland	Freshwater Seep (45400) Northern Hardpan Vernal Pool (44110) Northern Claypan Vernal Pool (44110)	Spikerush Series Northern Hardpan Vernal Pool Northern Claypan Vernal Pool	Freshwater Emergent Wetland
Alkali Wetland	Northern Claypan Vernal Pool (44110)	Northern Claypan Vernal Pool	Freshwater Emergent Wetland
Aquatic	N/A	Duckweed Series Pondweed with Floating Leaves Series Pondweed with Submerged Leaves Series	N/A
Pasture	N/A	N/A	Pasture Irrigated Hayfield
Cropland	N/A	N/A	Irrigated Row and Field Crops Irrigated Grain Crops Dryland Grain Crops
Orchard	N/A	N/A	Evergreen Orchard Deciduous Orchard
Vineyard	N/A	N/A	Vineyard
Urban	N/A	N/A	Urban
Non-Native Woodland	N/A	N/A	Eucalyptus

[a] Source: Holland 1986.
[b] Source: Sawyer and Keeler-Wolf 1995.
[c] Source: Mayer and Laudenslayer 1988, with additional agricultural and developed habitats from http://www.dfg.ca.gov/whdab/html/wildlife_habitats.html

Table 3-3. Land-Cover Types in the Inventory Area

Land-Cover Type	Number of Sites or Patches	Amount (Acres)	Proportion of Inventory Area (%)
Grassland			
Annual grassland	170	57,101	34%
Alkali grassland	19	1,977	1%
Ruderal	157	8,564	5%
Chaparral and scrub	75	2,863	2%
Oak savannah	234	5,835	3%
Oak woodland	148	24,188	14%
Riparian woodland/scrub	59	219	< 1%
Wetland	114	210	< 1%
Seasonal wetland	12	19	< 1%
Alkali wetland	16	44	< 1%
Aquatic	27	1,744	1%
Stream	n/a	n/a[1]	n/a
Pond	246	136	< 1%
Slough/channel	12	373	< 1%
Rock outcrops	13	80	< 1%
Irrigated agriculture	46	6,905	4%
Cropland	60	22,713	13%
Orchard	92	4,925	3%
Vineyard	28	1,077	1%
Developed			
Urban	170	29,044	17%
Aqueduct	32	277	< 1%
Non-native woodland	4	48	< 1%
Turf	25	918	1%
Wind turbines	129	218	< 1%
Landfill	1	333	< 1%
Total		169,812	

[1] Streams were mapped as lines within the inventory area, not as polygons. Stream area within the inventory area can be estimated by multiplying an estimated mean stream width of 5 feet by 436 miles of streams = 264 acres.

Table 3-4. Special Land-Cover Types Found within Covered Vegetation Communities

Special Land-Cover Type	Covered Vegetation Community				
	Grassland	Chaparral	Oak Woodland	Riparian Woodland/ Scrub	Agriculture
alkali grassland	X				1
wetland	X				
alkali wetland	X				X
seasonal wetland	X				
aquatic	X				
ponds	X		X		X
streams	X	X	X		X
slough/channel					X
rock outcrop	X		X		

Notes:

1 There is one site near Byron in which alkali grassland occurs within a matrix of agriculture; because of its large size and proximity to other stands of alkali grassland within a grassland matrix, this stand of alkali grassland is included within the grassland vegetation community.

Table 3-5. Land-Cover Types that May Be Federal or State Jurisdictional Waters

Land-Cover Type	U.S. Army Corps of Engineers Jurisdictional Water	Department of Fish and Game Stream or Lake
Permanent wetland	X	
Seasonal wetland	X	
Alkali wetland	X	
Reservoir	X	X
Pond	X	
Slough and channel	X	X
Stream	X	X
Aqueduct		X
Riparian woodland/scrub		X

Table 3-6. Potential Waters of the United States in the Inventory Area

Land-Cover Type	Number of Sites	Amount (acres)	Qualifies as a Jurisdictional Wetland
Reservoirs	27	1,744	No[a]
Wetland	114	210	Yes
Seasonal wetland	12	19	Yes
Alkali wetland	16	44	Probably
Pond	246	136	Vegetated portions
Slough/channel	12	374	Vegetated portions
Stream	n/a	265[b]	No
Total		2,792	

[a] Except for reservoir margins that are vegetated

[b] Estimated based on an average stream width of 5 feet (not measured) x 436 miles of streams (from land-cover mapping) in the inventory area

Table 3-7. Land-Cover Types that Are Potential Department of Fish and Game Jurisdictional Waters

Land-Cover Type	Number of Sites	Amount (acres)
Reservoir	27	1,744
Aqueduct	32	277
Slough/channel	12	374
Riparian woodland/scrub	59	219
Stream	n/a	265[a]
Total		2,879

[a] Estimated based on an average stream width of 5 feet (not measured) x 436 miles of streams (from land cover mapping) in the inventory area

Table 3-8. Evaluation of Special-Status Species in East Contra Costa County for Coverage in the ECCC HCP/NCCP

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Mammals								
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	CSC	FSC	Y	Y	Y	Y	1	Western Bat Working Group High Priority species; high potential for listing
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	–	FSC	Y	Y	Y	Y	2	CNDDB occurrences recorded as extant; IUCN VU/B1+2c
Greater western mastiff bat *Eumops perotis*	CSC	FSC	Y	Y	Y	Y	2	Western Bat Working Group High Priority species
Small-footed myotis *Myotis ciliolabrum*	–	FSC	Y	N	Y	Y	3	Widely distributed; unlikely to be listed; buildings, bridges
Long-eared myotis *Myotis evotis*	–	FSC	Y	N	N	Y	N	Primarily coniferous forest species
Fringed myotis *Myotis thysanodes*	–	FSC	Y	Y	Y	Y	2	Western Bat Working Group High Priority species
Long-legged myotis *Myotis volans*	–	FSC	Y	Y	Y	Y	2	Western Bat Working Group High Priority species
Yuma myotis *Myotis yumanensis*	–	FSC	Y	N	N	Y	N	Widely distributed; unlikely to be listed; not CSC
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	CSC	FSC	Y	Y	Y	Y	2	
Riparian woodrat *Neotoma fuscipes riparia*	–	FE	N	Y	N	U	N	No records for ECCC HCP/NCCP inventory area
San Joaquin pocket mouse *Perognathus inornatus inornatus*	–	FSC	Y	N	Y	Y	3	
Saltmarsh harvest mouse *Reithrodontomys raviventris*	SE/FP	FE	N	Y	N	Y	N	Delta marsh
Suisun ornate shrew *Sorex ornatus sinuosus*	CSC	FSC	N	Y	N	Y	N	Tidal marsh
Riparian brush rabbit *Sylvilagus bachmani riparius*	SE	FE	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
San Joaquin kit fox *Vulpes macrotus mutica*	ST	FE	Y	Y	Y	Y	1	
Birds								
Tricolored blackbird (nesting colony) *Agelaius tricolor*	CSC-1	FSC	Y	Y	Y	Y	1	
Grasshopper sparrow (nesting) *Ammodramus savannarum*	CSC-2	FSC	Y	Y	Y	Y	2	

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Bell's sage sparrow (nesting) *Amphispiza belli belli*	CSC	FSC	Y	N	N	Y	3	Confirmed breeding within ECCC HCP/NCCP inventory area
Greater white-fronted goose (tule) *Anser albifrons elgasi*	CSC-2	–	Y	Y	Y	Y	2	
Golden eagle (nesting and wintering) *Aquila chrysaetos*	FP	BGPA	Y	Y	Y	Y	1	
Great blue heron (rookery) *Ardea herodias*	–	–	Y	N	Y	Y	3	Observed breeding within ECCC HCP/NCCP inventory area
Short-eared owl (nesting) *Asio flammeus*	CSC-2	FSC	Y	Y	Y	Y	2	
Western burrowing owl *Athene cunicularia*	CSC-1	FSC	Y	Y	Y	Y	1	
Redhead *Aythya americana*	CSC-2	–	Y	Y	N	Y	N	Covered activities not likely to impact
American bittern *Botaurus lentiginosus*	CSC-3	–	Y	N	Y	Y	3	Possible breeding rookeries in northeast section of ECCC HCP/NCCP inventory area
Bufflehead *Bucephala albeola*	CSC-3	–	Y	Y	N	Y	N	Covered activities not likely to impact
Ferruginous hawk (wintering) *Buteo regalis*	CSC	FSC	Y	N	Y	Y	3	
Swainson's hawk (nesting) *Buteo swainsoni*	ST	–	Y	Y	Y	Y	1	
Costa's hummingbird *Calypte costae*	CSC	FSC	Y	N	Y	Y	3	
Lawrence's goldfinch (nesting) *Carduelis lawrencei*	–	FSC	Y	N	Y	Y	3	Confirmed breeding within ECCC HCP/NCCP inventory area
Swainson's thrush *Catharus ustulatus*	CSC-2	–	Y	Y	N	Y	3	Confirmed breeding within ECCC HCP/NCCP inventory area
Belted kingfisher *Ceryle alcyon*	CSC-3	–	Y	N	Y	Y	3	
Vaux's swift *Chaetura vauxi*	CSC-2	–	Y	N	Y	Y	3	
Mountain plover (wintering) *Charadrius montanus*	CSC	FPT	Y	Y	Y	Y	1	
Northern harrier (nesting) *Circus cyaneus*	CSC-2	–	Y	Y	Y	Y	2	
Black swift *Cypseloides niger*	–	FSC	N	N	N	Y	N	Covered activities not likely to impact

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
White-tailed kite (nesting) *Elanus leucurus*	–	FSC	Y	Y	Y	Y	2	Likely to be de-listed from fully protected status when category revised; low potential for listing under state or federal ESA
Little willow flycatcher (nesting) *Empidonax trailii brewsteri*	SE	–	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
California horned lark *Eremophila alpestris*	CSC-3	FSC	Y	N	Y	Y	3	Confirmed breeding within ECCC HCP/NCCP inventory area
American peregrine falcon (nesting) *Falco peregrinus*	SE/FP	D	Y	Y	Y	Y	2	Few records; covered activities not likely to directly impact
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CSC-2	FSC	N	Y	N	Y	N	Tidal marsh
Greater sandhill crane (nesting and wintering) *Grus canadensis tabida*	ST/FP	–	N	Y	Y	Y	N	No records for ECCC HCP/NCCP inventory area
Bald eagle (nesting and wintering) *Haliaeetus leucocephalus*	SE	FPD	Y	Y	Y	Y	2	Few records; covered activities not likely to directly impact
Loggerhead shrike *Laniue ludovicianus*	–	FSC	Y	N	Y	Y	3	
California black rail *Laterallus jamaicensis coturniculus*	ST/FP	SC	N	Y	N	Y	N	Delta tidelands
Lewis' woodpecker *Melanerpes lewis*	–	FSC	Y	N	Y	Y	3	
Suisun song sparrow *Melospiza melodia*	CSC-3	FSC	N	N	N	Y	N	Tidal marsh
Alameda song sparrow *Melospiza melodia pusillula*	CSC-1	–	N	N	N	Y	N	Tidal marsh
San Pablo song sparrow *Melospoza melodia samuelis*	CSC-2	–	N	Y	N	Y	N	Tidal marsh
Long-billed curlew (nesting) *Numenius americanus*	CSC	FSC	Y	N	Y	Y	3	
California brown pelican (nesting colony) *Pelecanus occidentalis californicus*	SE	–	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
Double-crested cormorant (rookery) *Phalacrocorax auritus*	CSC	–	N	N	N	Y	3	Observed breeding within ECCC HCP/NCCP inventory area
White-faced ibis (rookery site) *Plegadis chihi*	CSC	FSC	Y	N	N	Y	3	
Sora *Porzana carolina*	CSC-3	–	Y	N	N	Y	N	Tidal marsh
California clapper rail *Rallus longirostris obsoletus*	SE/FP	FE	N	Y	N	Y	N	Delta tidelands

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Bank swallow (nesting) *Riparia riparia*	ST	–	Y	Y	N	Y	N	Only rare migrants or post-breeding wanderers; no real suitable habitat
Rufous hummingbird *Selaphorus rufus*	–	FSC	Y	N	Y	Y	3	
Allen's hummingbird *Selasphorus sasin*	–	FSC	Y	N	Y	Y	3	
California least tern (nesting colony) *Sterna antillarum browni*	SE/FP	FE	N	Y	N	Y	N	Delta tidelands
Reptiles								
Silvery legless lizard *Anniella pulchra pulchra*	CSC	FSC	Y	Y	Y	Y	2	One record near north border; suitable habitat within inventory area
Western pond turtle *Clemmys marmorata*	CSC	FSC	Y	Y	Y	Y	2	
Alameda whipsnake *Masticophis lateralis euryxanthus*	ST	FT	Y	Y	Y	Y	1	
California horned lizard *Phrynosoma coronatum frontale*	CSC	FSC	Y	Y	Y	Y	2	
Giant garter snake *Thamnophis gigas*	ST	FT	Y	Y	Y	Y	1	Records in delta, suitable habitat within ECCC HCP/NCCP inventory area
San Joaquin whipsnake	CSC	FSC	Y	Y	Y	Y	2	
Amphibians								
California tiger salamander *Ambystoma californiense*	–	–	Y	Y	Y	Y	1	
California red-legged frog *Rana aurora draytonii*	–	FT	Y	Y	Y	Y	1	
Foothill yellow-legged frog *Rana boylii*	CSC	FSC	Y	Y	Y	Y	1	
Western spadefoot toad *Scaphiophus hammondii*	CSC	FSC	Y	Y	Y	Y	2	
Fish								
Green sturgeon *Acipenser medirostris*	–	FSC	N	N	N	Y	N	Delta riverine
Sacramento perch (within native range) *Archoplites interruptus*	–	FSC	N	N	N	Y	N	Delta riverine
Delta smelt *Hypomesus transpacificus*	ST	FT	N	Y	N	Y	N	Delta riverine and tidal areas

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
River lamprey *Lampetra ayresi*	–	FSC	N	N	N	Y	N	Delta riverine
Pacific lamprey *Lampetra tridentata*	–	FSC	N	N	N	Y	N	Delta riverine
Central valley steelhead *Oncorhynchus mykiss*	–	FT	See note	Y	N	Y	See note	Still gathering data to complete evaluation; steelhead may occur in Marsh Creek
Central valley spring-run chinook salmon *Oncorhynchus tshawytscha*	ST	FT	See note	Y	?	Y	See note	Record of chinook salmon confirmed by DFG in Marsh Creek (run unknown). Still gathering data to complete evaluation
Winter-run chinook salmon *Onchorhynchus tshawytscha*	SE	FE	See note	Y	?	Y	See note	Still gathering data to complete evaluation
Central valley fall/late fall-run chinook salmon *Onchorhynchus tshawytscha*	–	–	See note	N	?	Y	See note	Still gathering data to complete evaluation
Sacramento splittail *Pogonichthys macrolepidotus*	–	FT	N	Y	N	Y	N	Delta riverine and tidal areas
Longfin smelt *Spirinichus thaleichthys*	–	FSC	N	N	N	Y	N	Delta riverine and tidal
Invertebrates								
Ciervo aegialian scarab beetle *Aegialia concinna*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Antioch dunes anthicid beetle *Anthicus antiochensis*	–	FSC	N	N	N	Y	N	Antioch dunes
Sacramento anthicid beetle *Anthicus sacramento*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Lange's metalmark butterfly *Apodemia mormo langei*	–	FE	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
Longhorn fairy shrimp *Branchinecta longiantenna*	–	FE	Y	Y	Y	Y	1	
Vernal pool fairy shrimp *Branchinecta lynchi*	–	FT	Y	Y	Y	Y	1	
Midvalley fairy shrimp *Branchinecta mesovalliensis*	–	FSC	Y	Y	Y	Y	1	Likely to be listed when officially described
San Joaquin dune beetle *Coelus gracilis*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	–	FT	Y	Y	Y	Y	1	
Antioch cophuran robberfly *Efferia antioch*	–	FSC	N	N	N	Y	N	Antioch dunes

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Antioch efferian robberfly *Efferia antiochi*	–	FSC	N	N	N	Y	N	Antioch dunes
Delta green ground beetle *Elaphrus viridis*	–	FT	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
Bridges' Coast Range shoulderband snail *Helminthoglypta nickliniana bridgesi*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	–	FSC	N	Y	Y	Y	N	No records for ECCC HCP/NCCP inventory area
Middlekauf's shieldback katydid *Idiostatus middlekaufi*	–	FSC	N	N	N	Y	N	Antioch dunes
Vernal pool tadpole shrimp *Lepidurus packardi*	–	FE	Y	Y	Y	Y	1	
California linderiella fairy shrimp *Linderiella occidentalis*	–	FSC	N	N	Y	Y	N	No records for ECCC HCP/NCCP inventory area
Molestan blister beetle *Lytta molesta*	–	FSC	Y	Y	Y	Y	2	2 CNDDB records
Hurd's metapogon robberfly *Metapogon hurdi*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Antioch multillid wasp *Myrmosula pacifica*	–	FSC	N	N	N	Y	N	Antioch dunes
Yellow-banded andrenid bee *Perdita scituta antiochensis*	–	FSC	N	N	N	Y	N	No records for ECCC HCP/NCCP inventory area
Antioch andrenid bee *Perdita scituta antiochensis*	–	FSC	N	N	N	Y	N	Antioch dunes
Antioch sphecid wasp *Proceratium californicum*	–	FSC	N	N	N	Y	N	Antioch dunes
Callippe silverspot butterfly *Speyeria callippe callippe*	–	FE	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
California freshwater shrimp *Syncaris pacifica*	SE	FE	N	Y	N	Y	N	No records for ECCC HCP/NCCP inventory area
Plants								
Large-flowered fiddleneck *Amsinckia grandiflora*	SE	FE	Y	Y	N	Y	N	All natural populations in CC Co. have been extirpated
Mount Diablo manzanita *Arctostaphylos auriculata*	1B	–	Y	Y	Y	Y	1	

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Contra Costa County manzanita *Arctostaphylos manzanita* ssp. *laevigata*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mt. Diablo SP or EBRPD
Suisun Marsh aster *Aster lentus*	1B	–	N	Y	N	Y	N	Tidal marsh
Ferris' milkvetch *Astragalus tener* ssp. *ferrisiae*	1B	–	N	Y	N	Y	N	No records from CC Co.
Alkali milkvetch *Astragalus tener* ssp. *tener*	1B	–	Y	Y	N	N	N	Historic occurrence; insufficient data to determine whether plant still exists in HCP/NCCP inventory area
Heartscale *Atriplex coronata*	1B	–	N	Y	N	Y	N	Reported occurrences are misidentified; are actually crownscale
Brittlescale *Atriplex depressa*	1B	–	Y	Y	Y	Y	1	
San Joaquin spearscale *Atriplex joaquiniana*	1B	–	Y	Y	Y	Y	1	
Big tarplant *Blepharizonia plumosa*	1B	–	Y	Y	Y	Y	1	
Mount Diablo fairy lantern *Calochortus pulchellus*	1B	–	Y	Y	Y	Y	1	
Butte County morning-glory *Calystegia atriplicifolia* ssp. *buttensis*	1B	–	N	Y	N	N	N	Reported occurrence in CC Co. is probably misidentification
Bristly sedge *Carex comosa*	1B	–	N	Y	N	Y	N	Tidal marsh
Congdon's spikeweed *Centromadia parryi* ssp. *congdonii*	1B	–	N	Y	N	Y	N	No records from HCP/NCCP inventory area
Soft bird's-beak *Cordylanthus mollis mollis*	SR	FE	N	Y	N	Y	N	Tidal marsh
Mount Diablo bird's-beak *Cordylanthus nidularius*	SR	–	Y	Y	N	Y	N	Only known occurrence in Mt. Diablo SP
Hospital Canyon larkspur *Delphinium californicum* ssp. *interius*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mt. Diablo SP
Recurved larkspur *Delphinium recurvatum*	1B	–	Y	Y	Y	Y	1	

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Dwarf downingia *Downingia pusilla*	1B	–	N	Y	N	Y	N	No records from CC Co.
Mount Diablo buckwheat *Eriogonum truncatum*	1A	–	Y	Y	N	N	N	Presumed to be extinct. No information on historic occurrences in HCP/NCCP inventory area.
Delta button-celery *Eryngium racemosum*	SE	–	N	Y	Y	Y	N	Delta wetlands
Contra Costa wallflower *Erysimum capitatum angustatum*	SE	FE	Y	Y	N	N	N	Occurrences are in Antioch Dunes NWR
Diamond-petaled poppy *Eschscholzia rhombipetala*	1B	–	Y	Y	Y	Y	1	
Fragrant fritillary *Fritillaria liliacea*	1B	–	N	Y	N	Y	N	No records from HCP/NCCP inventory area
Diablo helianthella *Helianthella castanea*	1B	–	Y	Y	Y	Y	1	
Brewer's dwarf flax *Hesperolinin breweri*	1B	–	Y	Y	Y	Y	1	All known CC Co. occurrences in Mount Diablo SP, EBRPD, or CCWD lands, but may occur outside these areas
California hibiscus *Hibiscus lasiocarpus*	1B	–	N	Y	N	Y	N	Delta wetlands
Carquinez goldenbush *Isocoma arguta*	1B	–	N	Y	N	Y	N	No records from HCP/NCCP inventory area
Contra Costa goldfields *Lasthenia conjugens*	–	FE	Y	Y	N	N	N	All HCP/NCCP inventory area populations are extirpated
Delta tule pea *Lathyrus jepsonii* ssp. *jepsonii*	1B	–	N	Y	N	Y	N	Delta wetlands
Mason's lilaeopsis *Lilaeopsis masonii*	1B	–	N	Y	N	Y	N	Delta wetlands
Delta mudwort *Limosella subulata*	1B	–	N	Y	N	Y	N	Delta wetlands
Showy madia *Madia radiata*	1B	–	Y	Y	N	N	1	Historic occurrence; insufficient data to determine whether plant still exists in HCP/NCCP inventory area
Hall's bush mallow *Malacothamnus hallii*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mount Diablo SP

	Status[1]		Criteria[2]				Recommended Covered Status[3]	Notes
	State	Federal	Range	Status	Impact	Data		
Robust monardella *Monardella villosa* ssp. *globosa*	1B	–	N	Y	N	Y	N	No records from HCP/NCCP inventory area
Little mousetail *Myosurus minimus* ssp. *apus*	1B	–	Y	Y	N	N	N	Reported to occur in HCP/NCCP inventory area, but insufficient info.
Adobe navarretia *Navarretia nigelliformis* ssp. *nigelliformis*	–	–	Y	Y	Y	Y	1	
Colusa grass *Neostapfia colusana*	SE	FT	N	Y	N	Y	N	No records from CC Co.
Antioch dunes evening primrose *Oenothera deltoides howellii*	SE	FE	Y	Y	Y	Y	N	Populations planted or in Antioch Dunes NWR
Mount Diablo phacelia *Phacelia phacelioides*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mount Diablo SP
Bearded popcorn-flower *Plagiobothrys hystriculus*	1A	–	N	Y	N	Y	N	No record of sp. in CC Co.
Rock sanicle *Sanicula saxitilis*	SR	–	Y	Y	N	Y	N	All CC Co. occurrences in Mount Diablo SP
Marsh skullcap *Scutellaria galariculata*	2	–	N	Y	N	Y	N	Occurrences are in Delta
Blue skullcap *Scutellaria lateriflora*	2	–	N	Y	N	Y	N	Occurrences are in Delta
Rayless ragwort *Senecio aphanactis*	1B	–	Y	Y	N	N	N	Historic occurrences; insufficient data to determine whether plant still exists in HCP/NCCP inventory area
Livermore tarplant *Deinandra bacigalupi*	1B	–	N	Y	N	Y	N	No records from CC Co.
Most-beautiful jewelflower *Streptanthus albidus* ssp. *peramoenus*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mount Diablo SP
Mount Diablo jewelflower *Streptanthus hispidus*	1B	–	Y	Y	N	Y	N	All CC Co. occurrences in Mount Diablo SP
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	1A	–	Y	Y	N	N	N	Historic occurrences; insufficient data to determine whether plant still exists in HCP/NCCP inventory area

[1] State

FP	Fully Protected
SE	State listed as endangered
ST	State listed as threatened
CSC	California special concern species

CSC-1	Bird species of special concern (BSSC); First priority
CSC-2	Bird species of special concern; Second priority
CSC-3	Bird species of special concern; Third priority
CSC (no number)	Former CDFG California special concern species; replaced by BSSC list
SR	State rare (plants)
Federal	
FE	Federally endangered
FT	Federally threatened
FPT	Federally proposed for threatened listing
FPD	Federally proposed for delisting
FD	Federally delisted
FSC	Federal special concern species

[2]Criteria

Range:	The species is known to occur or likely occurs within the inventory area, based on credible evidence.
Status:	The species is currently listed under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA) or is expected to be listed within the permit term (assumed to be up to 30 years). Species that are expected to be listed within the permit term include species that are proposed for listing under the ESA, candidates under the CESA, candidates under the ESA, California fully protected species or specified birds; and some species are: California species of special concern (CSC), California native Plant Society (CNPS) List 1A, 1B, List 2, or List 3, or are unlisted and are known by experts to be very rare (e.g. newly discovered species) or declining rapidly; or are unlisted and not rare but the covered activities may affect a substantial portion of the species' range or important habitat for this species.
Impact:	The species will be or will likely be adversely affected by covered activities or projects.
Data:	Sufficient data exists on the species' life history, habitat requirements, and occurrence in the inventory area to adequately evaluate impacts to the species and to develop conservation measures to mitigate these impacts to regulatory standards.

[3]Covered Species Priority

Priority 1 species	species that met the criteria and should be covered because of current listing status, the potential for substantial impacts, or a high likelihood of future listing.
Priority 2 species	unlisted species that met the criteria but have a lower likelihood of future listing, or listed species that would be affected by a limited set of covered activities.
Priority 3 species	species that do not meet the "status" or "data" criteria but could be included in the plan under a lower standard of coverage (e.g. NEPA or CEQA).
N	no coverage recommended.

[4]California Native Plant Society Ranking

1A	Presumed extinct in California
1B	Rare or endangered in California and elsewhere
2	Rare or endangered in California, more common elsewhere

Table 3-9. Special-Status Species Proposed for Coverage by the ECCC HCP/NCCP *[Note: List is preliminary]*

Common Name	Scientific name	Status[1] State	Status[1] Federal
Mammals			
Townsend's western big-eared bat	*Corynorhinus townsendii townsendii*	CSC	SC
San Joaquin kit fox	*Vulpes macrotus mutica*	ST	FE
Birds			
Tricolored blackbird	*Agelaius tricolor*	CSC-1	SC
Golden eagle	*Aquila chrysaetos*	FP	BGPA
Western burrowing owl	*Athene cunicularia hypugea*	CSC-1	SC
Swainson's hawk	*Buteo swainsoni*	ST	–
Reptiles			
Silvery legless lizard	*Anniella pulchra pulchra*	CSC	SC
Alameda whipsnake	*Masticophis lateralis euryxanthus*	ST	FT
Giant garter snake	*Thamnophis gigas*	ST	FT
Amphibians			
California tiger salamander	*Ambystoma californiense*	CSC	SC
California red-legged frog	*Rana aurora draytonii*	–	FT
Foothill yellow-legged frog	*Rana boylii*	CSC	SC
Invertebrates			
Longhorn fairy shrimp	*Brachinecta longiantenna*	–	FE
Vernal pool fairy shrimp	*Brachinecta lynchi*	–	FT
Midvalley fairy shrimp	*Brachinecta mesovallensis*	–	SC
Vernal pool tadpole shrimp	*Lepidurus packardi*	–	FE
Plants		**CNPS**	
Mount Diablo manzanita	*Arctostaphylos auriculata*	1B	–
Brittlescale	*Atriplex depressa*	1B	–
San Joaquin spearscale	*Atriplex joanquiniana*	1B	–
Big tarplant	*Blepharizonia plumosa*	1B	–
Mount Diablo fairy lantern	*Calochortus pulchellus*	1B	–
Recurved larkspur	*Delphinium recurvatum*	1B	–
Diamond-petaled poppy	*Eschscholzia rhombipetala*	1B	–
Diablo helianthella	*Helianthella castanea*	1B	–
Brewer's dwarf flax	*Hesperolinon breweri*	1B	–
Showy madia	*Madia radiata*	1B	–
Adobe navarretia	*Navarretia nigelliformis* ssp. *nigelliformis*	1B	–

[1] **Status:**

Federal

FE Federally Endangered
FT Federally Threatened
FPT Federally Proposed for Threatened Listing
FPD Federally Proposed for Delisting
FD Federally Delisted
FSC Federal Special Concern Species
BGPA Bald Eagle and Golden Eagle Protection Act

State

SE State Listed as Endangered
ST State Listed as Threatened
CSC California Special Concern Species
CSC 1 Bird Species of Special Concern; First Priority
CSC 2 Bird Species of Special Concern; Second Priority
CSC 3 Bird Species of Special Concern; Third Priority
SR State Rare (plants)
FP Fully Protected
1B California Native Plant Society, Rare or Endangered in California and Elsewhere

Figures

Note to Reviewers: These figures are preliminary and will be revised based on previous comments already received from Staff (their comments could not be incorporated in time for this submittal). Major changes will include improving the color scheme in the topography map (figure 3-2), improving and finishing the stream and watershed coverage for the inventory area (figure 3-4), adding the categories "pasture" and "reservoir" to the land-cover map (figure 3-5), and improving the special-status species locational data by eliminating records of species not covered and by labeling the records (if possible; figure 3-6). Other comments are welcome.