Chapter 3
Affected Environment

3.1 Introduction

This chapter presents information on the current condition of the resources that may be affected by implementation of the proposed HCP/NCCP or alternatives. This section relies on existing information from the following documents, which describe the resources of East Contra Costa County and planned development activities.

- East Bay Regional Park District Master Plan 1997 (1996).
- City of Pittsburg General Plan 2020 (2001).
- City of Pittsburg General Plan 2020 EIR (2001).
- City of Brentwood General Plan (1993).
- City of Brentwood General Plan Update EIR (2001).
- City of Antioch General Plan (2003).
- City of Antioch Draft General Plan EIR (2003).
- City of Clayton 2000 General Plan: General Plan Revision and EIR (2000).
- Contra Costa County General Plan (1996).
- Contra Costa County General Plan EIR (1990).
- City of Oakley 2020 General Plan (2002).
- City of Oakley General Plan EIR (2002).

These documents are available for public review at the Contra Costa County Community Development Department (651 Pine Street, 4th Floor—North Wing, Martinez, CA).

Additional data sources to support specific resource discussion are cited in the text. The biological resources section of the EIR/EIS also relies on natural resource data that were gathered for the proposed HCP/NCCP.

3.1.1 Resources Areas Not Considered in Detail in the EIR/EIS

A preliminary review of resource issues was conducted as part of the EIR/EIS to assess the potential for specific environmental resources to be significantly affected by the proposed Plan or the alternatives. The range of resources considered was derived from guidance in the USFWS NEPA Handbook (U.S. Fish and Wildlife Service 1996), Appendix G of the State CEQA Guidelines, public comments provided during scoping, and professional judgment.

Based on the preliminary screening, it was determined that visual resources, population and housing, public services (schools and recreational facilities), public hazards and hazardous materials, utilities and services systems, and energy resources were not likely to be significantly affected by the proposed HCP/NCCP or the alternatives. These resource topics are not discussed in detail in the EIR/EIS. Consistent with NEPA (40 CFR 1508.8) and in accordance with State CEQA Guidelines Section 15128, the reason for elimination from detailed discussion for each of these resources is provided below.

Impacts on resources caused by covered activities, including urban development in Brentwood, Clayton, Oakley, and Pittsburg, are not considered in this evaluation. Although these activities may result in significant impacts on a wide range of resources, these activities are not authorized as part of the proposed HCP/NCCP. Furthermore, impacts from urban development have been assessed in the general plan EIRs for each of the local land use agencies. Specific covered activities, i.e., development projects, require additional discretionary approval by the local land use agencies and would require separate CEQA review. Potential impacts on environmental resources would be considered in project-specific CEQA documents at a less speculative stage in the land use entitlement process.

Visual Resources

The proposed project does not authorize any development or other physical changes in the landscape that would affect visual resources. Implementation of the conservation strategy would result in preservation of lands, either in open space or agricultural production, and would not affect visual resources. In accordance with Conservation Measures 1.2 and 1.5 of the conservation program, development in the preserves would be limited to habitat restoration and/or minor infrastructure improvements necessary to support recreational uses. Habitat restoration may have short-term effects on the visual landscape but may provide long-term visual benefits in eastern Contra Costa County by enhancing open space within area viewsheds. Infrastructure improvements would be small scale and would not be expected to significantly alter the visual landscape or significantly affect any visual resources.

Utilities and Service Systems

The proposed HCP/NCCP does not authorize any specific development that would place additional demands on the existing utilities in the HCP/NCCP inventory area. Preserves established under the proposed HCP/NCCP would be maintained as open space and would not place any substantial new demands on utilities. The implementing authority for the proposed HCP/NCCP would require office and support facilities but would not create any substantial demand on the utility infrastructure.

In public scoping comments, it was suggested that the EIR/EIS consider the potential for preserves established under the proposed HCP/NCCP to isolate private lands from utility service connections. The proposed HCP/NCCP prohibits development and use within the preserves that would be incompatible with the biological goals and objectives. Although installation of utilities would likely be incompatible with the preservation objectives, the proposed HCP/NCCP acknowledges that development and maintenance of utilities is likely to occur, and it is therefore considered a covered activity within the preserves.

Public and private utility infrastructure such as electric transmission lines, gas pipelines, petroleum pipelines, telecommunications lines, or cellular telephone stations may cross the preserves. Construction of new utilities in preserves is a covered activity only when no other practicable alternative exists to siting the utility within the preserve. Coverage for these projects will be decided on a case-by-case basis in consultation with the Implementing Entity. This will allow alternative sitting or redesign, if possible, to avoid or minimize impacts to covered species and natural communities. Routine and emergency maintenance and repair of existing utilities within HCP/NCCP preserves is also covered by the Plan.

Public Services (Schools)

The proposed HCP/NCCP does not authorize any specific development that would directly affect the capacity of existing schools. Specific projects would be approved by the local land use agencies and would require separate CEQA review. Potential impacts on public services would be considered in these project-specific CEQA documents, and project approval would be subject to conditions of approval, such as mitigation fees for schools.

Population and Housing

The proposed HCP/NCCP does not authorize any specific development that would directly affect population growth in the region, displace area housing, or interfere with the ability of the local land use agencies to provide a reasonable balance of housing for the population. Urban development that is a a covered activity under the proposed HCP/NCCP may result in an increase in population in eastern Contra Costa County and a concomitant increased demand for housing;

however, urban development is not authorized as part of the Plan. Further, such growth in population and housing is anticipated in the long-range planning for the region and is accommodated in and consistent with the general plans of the local land use agencies. Urban growth would be expected to occur in accordance with the relevant general plans for each of the local jurisdictions and would therefore occur in a manner that balances the local needs for population and housing. Urban growth projects and activities would also be subject to local land use agency approvals, including the appropriate level of project-specific CEQA review. Table 3.1-1 below describes the current and project populations for cities and unincorporated portions of the County within the Plan area.

Table 3.1-1. Size and Populations of Jurisdictions within the Inventory Area

Jurisdiction	Total Size Within Inventory Area (Acres)	Proportion of each Jurisdiction in Inventory Area (%)	Sphere of Influence (Acres)	Population in 2000*	Projected Population in 2020[1]	Expected Change in Population (%)
Brentwood	8,871	100	12,476	24,385	50,200	106
Clayton	2,441	100	3,673	10,863	13,200	22
Oakley	7,680	95	10,260	25,845	39,000	51
Pittsburg	8,494	81	11,158	77,479	114,000	47
Antioch[2]	16,779	95	17,701	91,293	115,600	27
Unincorporated County	129,414	75	118,310	18,200	34,000	87
Total	173,680	79	173,577	240,200	591,500	146

[1] Based on Association of Bay Area Governments projections 2002, which include spheres of influence.

[2] Antioch is within the inventory area but development within Antioch is not covered by the HCP/NCCP.

Public Hazards and Hazardous Materials

Maintenance of habitat in the preserves will require a number of management actions, including the potential use of prescribed burning to achieve vegetation management objectives. Conservation Measure 1.2 of the proposed HCP/NCCP stipulates that preserve management plans for nonagricultural lands be prepared. Preserve management plans would provide for multiple vegetation management strategies in addition to prescribed burning, grazing, herbicide use, and removal by hand. Conservation Measure 1.2 also provides that each management plan include a fire management plan that is coordinated with the California Department of Forestry and Fire Protection, local fire districts, and Bay Area Air Quality Management District (BAAQMD). The preparation of fire management plans in coordination with responsible fire control agencies should be adequate to ensure that the use of prescribed burns would be conducted in a manner that is consistent with public health and safety considerations and would not expose people or structures to an increased risk of wildfire.

Habitat restoration and maintenance of preserve lands would require the use of a number of hazardous materials, such as fuels, oils, solvents, herbicides, and pesticides. These materials would generally be contained in vessels engineered for safe storage. Spills during onsite fueling of equipment or an accidental upset (e.g., puncture of a fuel or pesticide/herbicide tank through operator error or slope instability) could result in a release of fuel, oils, or pesticides/herbicides into the environment. Storage of large quantities of these materials at the construction site is not anticipated; however, the uncontrolled release of these materials would be a potentially significant impact. A component of the Preserve Management Planprovides for the Implementing Entity to prepare a Hazardous Materials Management/Spill Prevention Plan as part of the preserve management plan to address procedures should a spill occur or hazardous materials are encountered during excavations.

Energy Resources

The proposed HCP/NCCP would have only minor impacts on energy resources. Anticipated activities conducted under the proposed HCP/NCCP, such as wildlife surveys, habitat enhancement and restoration, and construction and maintenance of minor support facilities would require use of petroleum products and electricity. These activities would be of very low scale and intensity, and the corresponding demand for energy resources would be minor. The minor demand for these services would not measurably affect existing supplies.

3.1.2 Resource Areas Considered in Detail in the EIR/EIS

The initial screening found that the following resources could potentially be significantly affected by the proposed Plan or alternatives.

- Biological Resources.
- Land Use and Planning.
- Agricultural Resources.
- Public Services (fire, police, recreational facilities).
- Hydrology and Water Quality.
- Socioeconomics and Environmental Justice.
- Geology, Soils, and Seismicity.
- Cultural Resources.
- Transportation.
- Noise.
- Air Quality.

- Mineral Resources.

These resources are discussed in greater detail in this EIR/EIS. Potential impacts to these resources from the alternatives are presented in Chapter 4, *Environmental Consequences*.

3.2 Biological Resources

3.2.1 Introduction

This chapter presents the biological setting of the proposed HCP/NCCP inventory area and describes the biological resources that could be affected by the proposed Plan or alternatives. It describes the baseline biological conditions upon which the environmental consequences presented in Chapter 4 are based. The chapter describes how data were collected to create the baseline inventory. Topographic and hydrologic conditions, which heavily influence biotic communities, are described in Sections 3.6, *Hydrology and Water Quality*, and 3.8, *Geology, Soils, and Seismicity*.

Information presented about the existing biological setting of East Contra Costa County is general and is not based on site-specific field surveys for most of the project area. Field surveys would be conducted as needed, and site-specific biological resource information would be conducted under subsequent environmental review for specific projects.

3.2.2 Regulatory Framework

This section describes the federal, state, and local plans, policies, and laws relevant to biological resources in the project area**.**

Federal Regulations

Endangered Species Act

ESA of 1973 and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems on which they depend. USFWS (with jurisdiction over plants, wildlife, and resident fish) and the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) (with jurisdiction over anadromous fish and marine fish and mammals) oversee ESA.

Section 7 of ESA mandates that all federal agencies consult with USFWS and NMFS if they determine that a proposed project *may affect* a listed species or its habitat. The purpose of consultation with USFWS and NMFS is to ensure that

the federal agencies' actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species.

Section 9 of ESA prohibits the *take* of any fish or wildlife species listed as endangered, including the destruction of habitat that prevents the species' recovery. *Take* is defined as the action of or attempt to hunt, harm, harass pursue, shoot, wound, capture, kill, trap, or collect a species. Section 9 prohibitions also apply to threatened species unless a special rule has been defined with regard to take at the time of listing.

Under Section 9 of ESA, the *take* prohibition applies only to wildlife and fish species. However, Section 9 does prohibit the unlawful removal and reduction to possession, or malicious damage or destruction of, any endangered plant from federal land. Section 9 prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under Section 9.

Section 10 of ESA requires the issuance of an incidental take permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an endangered or threatened species. The permit requires preparation and implementation of an HCP, incidental to implementation of the project, which would offset the take of individuals that may occur by providing for the overall preservation of the affected species through specific mitigation measures.

Executive Order 13186: Migratory Bird Treaty Act

Executive Order (EO) 13186 (signed January 10, 2001) directs each federal agency taking actions that would have or would likely have a negative impact on migratory bird populations to work with USFWS to develop a Memorandum of Understanding (MOU) to promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities.

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist federal agencies in their efforts to comply with the Migratory Bird Treaty Act (MBTA); it does not constitute any legal authorization to take migratory birds. Take, under the MBTA, is defined as the action of, or an attempt to, pursue, hunt, shoot, capture, collect, or kill (Title 50, Code of Federal Regulations [CFR], Section 10.12). The definition includes "intentional" take (take that is the purpose of the activity in question) and "unintentional" take (take that results from, but is not the purpose of, the activity in question).

Clean Water Act

The federal Clean Water Act (CWA) regulates discharges of pollutants to waters of the United States and serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

The CWA empowers EPA to set national water quality standards and effluent limitations and includes programs addressing both point-source and nonpoint-source pollution. *Point-source pollution* is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. *Nonpoint-source pollution* originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is CWA's primary regulatory tool.

The following paragraphs provide additional details on specific sections of CWA.

Permits for Fill Placement in Waters and Wetlands (Section 404)

Under CWA, Section 404, the U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged and fill materials into waters of the United States. *Waters of the United States* refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any or all of the following:

- Areas within the ordinary high water mark (OHWM) of a stream, including nonperennial streams with a defined bed and bank, and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Applicants must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Isolated waters and wetlands that are not used in interstate or foreign commerce are not regulated. As stated by the Counsel for EPA's January 19, 2001, determination in response to the *Solid Waste Agency of Northern Cook County* vs. *United States Army Corps of Engineers* ruling, nonnavigable, isolated waters may not be regulated by USACE. As part of the wetland delineation and verification process, USACE determines whether the wetlands in the study area are isolated and if they have link to commerce.

USACE may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. Nationwide Permits (NWPs) are a type of general permit issued to cover particular fill activities. Each NWP specifies particular conditions that must be met in order for the NWP to apply to a particular project.

Compliance with CWA Section 404 requires compliance with several other environmental laws and regulations. USACE cannot issue an individual permit or verify the use of a general permit until the requirements of NEPA, ESA, and the National Historic Preservation Act (NHPA) (see *Section 3.9 Cultural Resources)* have been met. In addition, USACE cannot issue or verify any permit until a water quality certification, or a waiver of certification, has been issued pursuant to CWA Section 401.

Permits for Stormwater Discharge (Section 402)

As described in *Section 3.6 Hydrology and Water Quality,* Section 402 of CWA regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by EPA. In California, the State Water Resources Control Board (SWRCB) is authorized by EPA to oversee the NPDES program through the Regional Water Quality Control Boards (RWQCBs) (see the related discussion under Porter-Cologne Water Quality Control Act below). The project is within the jurisdiction of the San Francisco and Central Valley RWQCBs.

NPDES permits are required for construction projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities. In addition, it describes the Best Management Practices (BMPs) that will be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

Water Quality Certification (Section 401)

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.

State Regulations

California Endangered Species Act

CESA (California Fish and Game Code Section 2050 et seq.) establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that jeopardize the continued existence of threatened or

endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that would affect a species that is federally and state-listed, compliance with ESA satisfies CESA if DFG determines that the federal incidental take authorization is consistent with CESA under California Fish and Game Code Section 2080.1. For projects that would result in take of a species that is only state-listed, the project proponent must apply for a take permit under Section 2081(b).

California Native Plant Protection Act

In 1977, the State Legislature formally recognized the plight of rare and endangered plants with the passage of the Native Plant Protection Act (NPPA). The NPPA directs DFG to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. Regulations enacting the NPPA are found in California Fish and Game Code Sections 1900–1913.

California Fish and Game Code Section 1602

Under Section 1602 of the California Fish and Game Code, agencies are required to notify DFG before any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, DFG is required to propose reasonable changes to the project to protect the resources. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

California Fish and Game Code—Various Sections

The California Fish and Game Code provides protection from take for a variety of species. Section 5050 prohibits take of fully protected amphibians and reptiles. Section 3515 prohibits take of fully protected fish species. Eggs and nests of all birds are protected under Section 3503, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, birds of prey under Section 3503.5, and fully protected birds under Section 3511. Migratory nongame birds are protected under Section 3800. Fully protected mammals are listed under Section 4700. The California Fish and Game Code defines *take* as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act authorizes the State Water Resources Control Board (SWRCB) to regulate state water quality and protect beneficial uses. The Act, passed in 1975, provides for the development and periodic review of Water Quality Control Plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters (Central Valley Regional Water Quality Control Board 1998). Basin plans are implemented through issuance of Waste Discharge Requirements and NPDES permits regulating waste discharges so that water quality objectives are met.

3.2.3 Data Sources

The primary data source for vegetation in the EIR/EIS is the detailed GIS-based map of land-cover types within the inventory area developed as a basis for the proposed HCP/NCCP. Land-cover type is defined as the dominant character of the land surface discernible from aerial photographs, as determined by vegetation, water, or human uses. Land-cover types are the most widely used units in analyzing ecosystem function, habitat diversity, covered natural communities, wetlands and streams, and covered species habitat. The proposed HCP/NCCP land cover map was developed from a variety of sources, including aerial and infrared photos, USGS and DWR data, soil survey mapping, and habitat and vegetation maps from a variety of projects in the area. Field visits were also conducted to verify data for mapping.

A classification system for land-cover types was developed for the project area based on Jones & Stokes (1996), Holland (1986), Sawyer and Keeler-Wolf (1995), Mayer and Laudenslayer (1988, 1999), and field visits by Jones & Stokes senior biologists. Each land-cover type was identified on the basis of distinct image signatures on the false-color infrared aerial photographs or in the field. Brief descriptions and specific mapping methods used to delineate each land-cover type are provided in the setting section below. A detailed description of the mapping data and the classification system is provided in the proposed HCP/NCCP.

The following sources of information were reviewed to prepare the biological resources section of this chapter.

- California Natural Diversity Database (CNDDB) (Appendix B).
- CNPS's (2001) *Inventory of Rare and Endangered Vascular Plants of California*.
- CDFG's Special Animals and Special Plants lists.
- Jones & Stokes research and environmental reports files.
- Jones & Stokes biological resource specialists.
- Informal consultation with USFWS (letter request) (Appendix B).

- Jones & Stokes in-house file information.
- Personal communication with local experts.
- Data on special status species assembled for the Proposed HCP/NCCP.

3.2.4 Vegetation and Land-Cover Types

Land-cover types in the inventory area are shown in Figure 3-1. Table 3.2-1 lists the amount of each land-cover type in the inventory area. The area extent of specific land-cover types is based on data derived from the May 2000 aerial photographs. These data were updated by intensive ground surveys conducted in spring 2003. Accordingly, land-cover data reflects current conditions in most of the inventory area in spring 2003.

In total, 26 land-cover types were identified in the project area, comprising 7 vegetation communities, 7 wetland communities, 4 irrigated agriculture types, 6 developed types, and rock outcrops (which occur in a variety of land-cover types). The land-cover type in the project area, and the associated wildlife species, are summarized below. Detailed descriptions of these vegetation communities are presented in the proposed HCP/NCCP (*Chapter 3, Physical and Biological Resources).*

Table 3.2-1. Land-Cover Types in the Inventory Area

Land-Cover Type	Number of Sites or Patches	Amount (acres)	Proportion of Inventory Area (%)
Annual grassland	144	59,287	34%
Alkali grassland	47	2,002	1%
Ruderal	210	6,476	4%
Chaparral and scrub	101	3,016	2%
Oak savanna	220	5,897	3%
Oak woodland	121	24,198	14%
Riparian woodland/scrub	84	448	< 1%
Wetland (undetermined)	255	490	< 1%
Seasonal wetland	44	121	< 1%
Alkali wetland	55	380	< 1%
Aquatic	31	3,240	1%
Stream (miles)	n/a	409[1]	< 1%
Pond	405	165	< 1%
Slough/channel	14	213	< 1%
Rock outcrops	39	119	< 1%

Land-Cover Type	Number of Sites or Patches	Amount (acres)	Proportion of Inventory Area (%)
Irrigated agriculture			
Cropland	58	21,251	13%
Pasture	29	4,658	3%
Orchard	81	4,190	2%
Vineyard	39	2,145	1%
Developed			
Urban	135	32,603	20%
Aqueduct	31	384	< 1%
Nonnative woodland	9	51	< 1%
Turf	66	1,477	1%
Wind turbines	129	217	< 1%
Landfill	1	334	< 1%
Total		175,804	

Grassland

Grassland consists of herbaceous vegetation dominated by grasses and forbs. 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 Associates 1996) to improve foraging value for livestock, and most is currently grazed by livestock. Grassland was classified into four types: annual grassland, native grassland, alkali grassland, and ruderal.

Annual Grassland

Annual grassland is by far the most common land cover in the inventory area, occupying 59,287 acres (34%). Grassland occupies a continuous band along the foothills of the Coast Ranges and is the dominant land cover in the valleys at higher elevations. The dominant grasses are generally introduced annual grasses, including wild oats (*Avena* spp.), brome grasses (*Bromus* spp.), and annual fescues (*Vulpia* spp.). The associated herbaceous cover includes native and nonnative forbs and native wildflowers. Remnant stands of native, perennial grasslands that could not be distinguished from the larger grassland matrix on aerial photographs were mapped as annual grassland.

Characteristic wildlife species in annual grassland include reptiles such as western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalis viridis*); mammals such

as 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*); and birds such as 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 turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and red-tailed hawk (*Buteo jamaicensis*).

Native Grassland

Existing stands of native grassland in the inventory area include 284 acres known from the Los Vaqueros Watershed (Jones & Stokes 1989). Native grasslands in the inventory area generally occur either as pockets within the larger annual grasslands or as subdominant populations. Native grasslands in the project area are highly variable depending on the dominant native grasses, which can be Sandberg bluegrass (*Poa secunda*), a native perennial grass; or purple needlegrass (*Nassella pulchra*), a native perennial bunchgrass. Additional native grasses commonly present include blue wildrye (*Elymus glaucus*), California fescue (*Festuca californica*), and California melic (*Melica californica*). Native grassland could not be distinguished from annual grassland on aerial photographs of the inventory area and was mapped as annual grassland.

Native grassland was once extensive in the greater Bay Area and Central Valley, but invasion by exotic annual grasses, drought, and improper livestock grazing has lead to its decline. As a result, native grasslands typically contain an abundance of nonnative annual grasses mixed with perennial grasses and forbs (Sawyer and Keeler-Wolf 1995).

Several native grassland communities listed below may be found in the inventory area (California Department of Fish and Game 2003)[1], (California Native Plant Society 2003).

- Purple needlegrass grassland.
- Wildrye grassland.
- Wildflower fields.
- Squirreltail grassland.
- One-sided bluegrass grassland.
- Serpentine grassland.

All the native grassland alliances listed above are considered rare in California.

[1] For the latest classification, see http://www.dfg.ca.gov/whdab/pdfs/natcomlist.pdf

Alkali Grassland

Alkali grassland is relatively rare in the inventory area. It is found on 2,002 acres (1%) in the southeast corner of the inventory area in scattered patches.

Alkali grasslands generally occur on alkaline soil units within the Marcuse, Pescadero, Sacramento, and Solano soil series. Dominant grasses in alkali grassland 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*). Alkali grassland vegetation alliances that occur in the inventory area include saltgrass grassland and alkali sacaton grassland (California Department of Fish and Game 2003; California Native Plant Society 2003). Alkali grassland can also include small stands of alkali sink scrub (also known as Valley sink scrub) dominated by iodine bush (*Allenrolfea occidentalis*), as well as scattered individuals of iodine bush. Many of the wildlife species that occur in annual grassland also occur in alkali grassland (e.g., western fence lizard, black-tailed jackrabbit, coyote, horned lark).

Ruderal

Ruderal land cover is relatively common in the inventory area, occupying 6,476 acres or 4% of the inventory area. Areas mapped as ruderal are disturbed areas characterized by sparse nonnative, typically weedy vegetation. Where vegetation is present, ruderal land cover is dominated by a mixture of nonnative annual grasses and weedy species that tend to colonize quickly after disturbance, such as black mustard (*Brassica nigra*), thistles (*Cirsium* spp.), and wild radish (*Raphanus sativa*).

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*).

Chaparral and Scrub

Chaparral and scrub is uncommon, occurring on 3,016 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.

Because of their small size and similarity to chaparral on aerial photographs, patches of coastal sage scrub could not be differentiated from chaparral in mapping. Chaparral and scrub consists of woody vegetation dominated by shrubs. Scattered trees and small stands of trees, such as foothill pine (*Pinus*

sabiniana) and oaks (*Quercus* spp.), are occasionally present. 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 species that use chaparral and scrub habitats include gopher snake (*Pituophis melanoleucus*), western rattlesnake, western fence lizard, brush rabbit (*Sylvilagus bachmani*), California pocket mouse (*Perognathus californicus*), Botta's pocket gopher, California ground squirrel, spotted skunk (*Spilogale gracilis*), mule deer (*Odocoileus hemionus*), coyote, and bobcat (*Lynx rufus*). Common bird species include mourning dove (*Zenaida macroura*), California quail (*Callipepla californica*), Anna's hummingbird (*Calypte anna*), western scrub jay, Bewick's wren (*Thryomanes bewickii*), California towhee (*Pipilo crissalis*), lesser goldfinch (*Carduelis psaltria*), fox sparrow (*Passerella iliaca*), white-crowned sparrow (*Zonotrichia leucophrys*), dark-eyed junco (*Junco hyemalis*), and hermit thrush (*Catharus guttatus*).

Oak Savanna

Oak savanna is uncommon, found on 5,897 acres in the inventory area (3%). This land-cover type occurs both in the transition zone between annual grasslands and oak woodlands, and in patches within annual grassland.

Oak savanna was defined as grassland with a tree canopy cover of 5–10% to represent a transition zone between grassland and woodland; such transition zones are ecologically important for a number of covered species for roosting, migration, and/or aestivation. Oak savanna consists of grassland with a low canopy cover of trees, primarily blue oak (*Quercus douglasii*), valley oak (*Q. lobata*), and scattered interior live oaks (*Q. 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 listed in the discussion of annual grassland. Wildlife associated with oak savanna include many species common to the grassland land-cover type; additionally, oak woodland associate species such as acorn woodpecker (*Melanerpes formicivorous*), wild turkey (*Meleagris gallopavo*), and mule deer are found here. Red-tailed hawks and great horned owls (*Bubo virginianus*) may nest in the oaks and forage in the grassland.

Oak Woodland

Oak woodland is very common in the inventory area, occupying 24,198 acres (14%) in the mid- to high-elevation zones in the southwestern portion.

Typical oak species common to oak woodland in the inventory area include blue oak, interior live oak, valley oak (*Quercus lobata*), and coast live oak (*Q.*

agrifolia). Other trees, such as California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), and foothill pine, may be codominant. At higher elevations these codominant trees become dominant and the oaks constitute less relative cover. Due to the difficulty in distinguishing oak woodland from mixed evergreen forest on the aerial photos, these land-cover types were not mapped separately.

Oak woodlands also occur along ephemeral and intermittent drainages, where riparian woodland may be present but not dominant. In these areas coast live oak is often associated with California buckeye, big-leaf maple (*Acer macrophyllum*), and California bay. This vegetation type includes patches of annual grassland and small chaparral stands.

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 (*Permyscus maniculatus*), western gray squirrel (*Sciurus griseus*), mule deer, and coyote. Representative birds in this cover type include red-tailed hawk, American kestrel, barn owl (*Tyto alba*), great horned owl, acorn woodpecker, Nuttall's woodpecker (*Picoides nuttallii*), northern flicker (*Colaptes auratus*), white-breasted nuthatch (*Sitta carolinensis*), California quail (*Callipepla californica)*, spotted towhee (*Pipilo maculatus*), Bewick's wren (*Thryomanes bewickii)*, and bushtit (*Psaltriparus minimus*).

Mixed Evergreen Forest

The mixed evergreen forest is dominated by evergreen trees such as California bay, madrone (*Arbutus menziesii*), tanoak (*Lithocarpus densiflora*), and foothill pine. In addition to these evergreen species, a few deciduous species such as California buckeye and big-leaf maple often occur. This land cover type was not mapped because of the difficulty distinguishing it from oak woodland; mixed evergreen forest is therefore subsumed within the oak woodland category.

Wildlife utilization is similar to that of the oak woodland land-cover type. Due to the functional similarity of these two land-cover types for wildlife habitat and the difficulty in discerning between the two types in aerial photographs, stands of mixed evergreen forest are contained in the oak woodland land-cover type.

Riparian Woodland/Scrub

Riparian woodland/scrub is rare in the inventory area, occurring on only 448 acres (<1%). The largest and longest stands of riparian vegetation are found in and near Pittsburg along Kirker Creek, and along Marsh Creek above and below Marsh Creek Reservoir.

The riparian woodland/scrub land-cover type is dominated by woody vegetation associated with streams and permanent water sources. Riparian woodland is dominated by trees and contains an understory of shrubs and forbs. Generally,

riparian areas 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 two categories were combined as the riparian woodland/scrub land-cover type.

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 mule fat (*Baccharis salicifolia*). These understory shrubs are also found along streams where riparian woodland is extremely limited or nonexistent, and they are the dominant species in riparian scrub.

Riparian land cover provides habitat for a wide diversity of wildlife. Common mammals found in this cover type include mule deer, raccoon, gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), deer mouse, harvest mouse, broad-handed mole (*Scapanus latimanus*), and dusky-footed woodrat (*Neotoma fuscipes*). Because of their proximity to rangelands, many riparian areas in the inventory area are grazed by livestock. Many birds are also typical of this cover type; these include yellow warbler (*Dendroica petechia*), northern flicker, Bewick's wren, white-tailed kite, Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), song sparrow (*Melospiza melodia*), and black-headed grosbeak (*Pheucticus melanocephalus*). Riparian habitat is especially important for neotropical migrants such as Pacific-slope flycatcher (*Empidonax difficilis*) and Wilson's warbler (*Wilsonia pusilla*).

Wetland

There are 490 acres of wetlands in the inventory area at 255 sites (i.e., distinct map units). 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.

Wetlands are dominated by herbaceous species that grow in perennially or seasonally flooded, ponded, or saturated soil conditions. Wetlands were further separated, when possible, into seasonal wetland and alkali wetland subtypes by their apparent duration of inundation and abundance of alkali soils (i.e., wetlands mapped within alkali grasslands were classified as alkali wetlands).

Permanent Wetland

Permanent wetlands (also referred to as perennial 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.).

The permanent wetland land-cover type is important for a wide variety of wildlife species. Representative waterbirds that forage and rest in permanent wetlands and associated open-water areas include great blue heron (*Ardea herodias*) and great egret (*Ardea alba*); various ducks, including wood duck (*Aix sponsa*), green-winged teal (*Anas crecca*), and mallard (*Anas platyrhynchos*); American coot (*Fulica americana*); killdeer (*Charadrius vociferus*); and greater yellowlegs (*Tringa melanoleuca*). Typical amphibians and reptiles in this cover type include red-legged frog, western pond turtle (*Clemmys marmorata*), and garter snakes. Many of the larger mammals, such as mule deer, may frequent permanent wetlands and use them as a source of drinking water.

Seasonal Wetland

A total of 121 acres of seasonal wetlands were mapped at 44 sites. This wetland type is likely underrepresented because of the small size, isolated locations, and difficulty in interpreting the photographic signature of individual features.

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 Pacific treefrog (*Hyla regula*), western spadefoot (*Scaphiopus hammondii*), Pacific chorus frog (*Pseudacris regilla*), western toad (*Bufo boreas*), and California tiger salamander (*Ambystoma californiense*); shorebirds such as killdeer, black-necked stilt (*Himantopus mexicanus*), and American avocet (*Recurvirostra americana*); and passerines such as Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), brown-headed cowbird (*Molothrus ater*), and American pipit (*Anthus rubescens*). During the dry season, a variety of small mammals use the areas, including deer mouse, California vole, and long-tailed weasel (*Mustela frenata*). Raptors such white-tailed kite, northern harrier, and red-tailed hawk may forage in this land-cover type.

Vernal pool is a subtype of seasonal wetland that could not be mapped with available photography but is included in this land-cover type. Vernal pools are areas that pond water on the surface for extended durations during winter and spring, and dry completely during late spring and summer. Because of their unique hydrology, vernal pools support specialized plants adapted to growing in these stressful conditions, such as 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. A number of special-status invertebrates, including vernal pool fairy shrimp (*Brachinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), and longhorn fairy shrimp (*Brachinecta longiantenna*), may occur in vernal pools.

Vernal pools are expected to be very rare in the inventory area based on field surveys in large portions of the inventory area.

Alkali Wetland

Alkali wetlands are rare in the inventory area, occurring at 55 sites on 380 acres (<1%) in the southeastern portion of the inventory area south of Byron.

Alkali wetlands support ponded or saturated soil conditions and occur as perennial or seasonally wet features on alkali soils.

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

Alkali wetlands provide function and value for wildlife similar to those provided by seasonal wetlands. The array of wildlife species found in seasonal wetlands is also found in alkali wetlands.

Aquatic

A total of 3,240 acres (1%) of the aquatic land-cover type occurs at 31 sites.

Aquatic land-cover types are open water or aquatic habitats such as lakes, reservoirs, water treatment ponds, sloughs, channels, streams, and ponds (including stock ponds) that do not support emergent vegetation.

Stream

Approximately 409 miles of streams exist in the inventory area based on existing data. Assuming that streams are, on average, 5 feet wide, this is equivalent to 254 acres of streams.

The stream land-cover type includes ephemeral, intermittent, and perennial watercourses characterized by a defined bed and bank and/or ordinary high water mark. Marsh Creek, Kirker Creek, and lower Sand and Deer Creeks are the only perennial streams within the inventory area. Streams that are channelized and contained by levees were mapped as slough/channel.

Like the riparian and wetland land-cover types, the stream land-cover type is important because it provides essential habitat for terrestrial and aquatic species. Many upland species rely on seasonal and perennial streams as water sources. In summer and early fall, perennial streams provide the only available water in an otherwise dry landscape. In addition, ephemeral, intermittent, and perennial

streams provide habitat for aquatic macroinvertebrates, which are an important food source for local and downstream populations of fish, birds, and other animals.

Reservoir

Los Vaqueros, Contra Loma, Antioch, and Marsh Creek Reservoirs, designated on USGS topographic maps as named reservoirs, were mapped as the aquatic land-cover type.

Reservoirs can be important to various ducks, including mallard, green-winged teal, cinnamon teal (*Anas cyanoptera*), gadwall (*A. strepera*), American widgeon (*A. americana*), and American coot. Shore and wading birds including killdeer, black-necked stilt, greater yellowlegs, and several gull species can also be found in reservoirs. The vegetated fringes of reservoirs can provide habitat for amphibians such as California red-legged frog and reptiles such as western pond turtle. Large mammals can use reservoir habitat for drinking water. Reservoirs also can provide refuge for nonnative fish and amphibians.

Pond

This land-cover type is very common in the landscape of the inventory area, but it occupies a small overall area, comprising a total of 165 acres (<1%) at 405 sites. Ponds are evenly distributed in the inventory area, probably because ranchers have established them to support cattle-grazing operations.

Ponds are small perennial or seasonal water bodies dominated by little or no vegetation. If vegetation is present, it is typically submerged or floating. Like the reservoir land-cover type, ponds may support a variety of ducks and shore and wading birds. Ponds that contain either submerged or emergent vegetation are of particular importance to native amphibians as breeding habitat and may also provide refuge for nonnative fish and amphibians.

Slough/Channel

Sloughs and channels are relatively uncommon, occupying only 213 acres on the east and southeast sides of the inventory area near Discovery Bay and the Clifton Court Forebay.

Sloughs and channels are features with perennial water and artificial banks (e.g., levees) constructed of natural soil materials; they have little or no in-channel vegetation. Although the banks of sloughs are generally composed of soil, portions of sloughs may be lined with riprap, concrete, or rock gabions for bank stabilization. Sloughs are tidally influenced and may contain brackish waters. Channels include channelized urban streams such as the lower portion of Marsh Creek in Brentwood and Oakley.

Like 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 snakes, a variety of ducks, wading and shore birds, and large mammals that use these features for drinking water. In addition, the portion of Marsh Creek mapped as slough/channel provides habitat for western pond turtle, juvenile and spawning adult Chinook salmon (*Oncorhynchus tshawytscha*), and a variety of other aquatic species.

Rock Outcrop

Rock outcrops are a rare cover type, totaling 119 acres (<1%) in only 39 patches. Concentrations of rock outcrops are found around Mount Diablo, which is outside the inventory area, 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, were difficult to recognize in the field from a distance, or were smaller than the minimum mapping unit.

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 host common wildlife species such as western fence lizard and western rattlesnake. These species may use outcrops for basking and foraging areas. Common birds include rock wren (*Salpinctes obsoletus*) and several species of raptors that use rock outcrops for nesting or roosting.

Irrigated Agriculture

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

Pasture

Pasture occupies 4,658 acres (3%), primarily in the eastern portion of the inventory area between Knightsen and Byron.

The pasture land-cover type comprises fast-growing annual and perennial grasses mixed with irrigated forage crops in the legume family and typically function as onsite sources of forage for livestock. Common vegetation includes fast-growing forage grasses, such as slender oats (*Avena fatua*) and Italian ryegrass, and irrigated legumes such as alfalfa (*Medicago* spp.), sweet clover (*Melilotus* spp.), and true clover (*Trifolium* spp.). In some areas, nonnative weedy vegetation, such as thistles, mustards, and a variety of other weedy 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 timing and intensity of livestock grazing affects the quality and character of wildlife habitat in this land-cover type.

Cropland

Cropland is the most common of the agriculture land-cover types in the low-lying areas of the inventory area, occupying 21,251 acres (13%). Croplands are abundant in the eastern portion of the inventory area, particularly between Brentwood and the Clifton Court Forebay.

Croplands are those areas tilled and cultivated for agricultural crops such as corn, summer squash, pumpkin, wheat, and dryland and irrigated hay. Common wildlife species found in croplands are similar to those found in pasture, but the species composition depends heavily on the planting cycle. For example, cropland has a higher value for terrestrial mammals (e.g., black-tailed jackrabbit) and herbivorous birds (e.g., red-winged blackbird) near harvest time, when the standing crop is mature and produces a quantity of food (e.g., fruit, seeds), than it does after the harvest when the cropland is fallow. Agricultural production methods can also have an impact on wildlife use.

Orchard

Orchards are scattered but relatively common throughout the low-lying agricultural lands in the northeastern portion of the inventory area, occupying 4,190 acres (2%). Orchards are most common in Oakley and immediately south of Brentwood in the area designated in the Contra Costa County General Plan as Agricultural Core.

Orchards are those areas planted in fruit-bearing trees (e.g., apples, apricots, kiwis, and cherries). Orchards may provide habitat for common wildlife species such as raccoon, opossum, California vole, Brewer's blackbird, American crow (*Corvus brachyrhynchos*), and yellow-billed magpie (*Pica nuttalli*).

Vineyard

Vineyards occupy 2,145 acres (1%) in scattered areas in and around Oakley and Brentwood, generally surrounded by cropland or orchard.

Data provided by Sonoma County indicates that vineyards generally support far higher abundance of nonnative predators such as red fox and feral cats than do adjacent natural habitats (Hilty in press). Other common wildlife species found in most vineyards include California ground squirrel, European starling, Brewer's blackbird and house finch. Some vineyard practices may encourage habitat use by birds of prey such as American kestrel and great-horned owl (Locke 2002).

Developed

Developed areas comprise all types of development for residential, commercial, industrial, transportation, landfill, landscaping, and recreational uses (e.g., sites with structures, paved surfaces, horticultural plantings, golf courses, and irrigated lawns). This category is separated into six subtypes: urban, aqueduct, nonnative woodland, turf, wind turbine, and landfill.

Urban

The urban land-cover type is the second most abundant type in the inventory area, occupying 32,603 acres (20%), mostly in the Cities of Pittsburg, Oakley, Clayton, and Brentwood. Small developed areas occur in unincorporated portions of the county east of Mount Diablo, in Byron, and around the Byron Airport.

Urban sites are those 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 smaller lawns.

Aqueduct

Surface aqueducts occupy 384 acres within the inventory area. Major aqueducts in the inventory area are the California Aqueduct (California Dept. of Water Resources), Delta-Mendota Canal (U.S. Bureau of Reclamation) and the Contra Costa Canal (owned by the U.S. Bureau of Reclamation, operated and maintained by CCWD). Aqueducts were identified by the presence of a concrete-lined channel and open, perennially flowing water.

Nonnative Woodland

Nonnative woodlands occur in 9 stands totaling 51 acres (<1%).

Nonnative woodlands are those areas where ornamental and other introduced species of trees have been planted or naturalized and dominate to form a dense canopy. The majority of nonnative woodland in the inventory area consists of planted stands of eucalyptus.

Turf

Turf occupies 1,477 acres (<1%) near large residential areas south of Antioch and Pittsburg. The majority of the turf land-cover type is in Contra Loma Regional Park, the Brentwood Golf Club (three courses), and the Roddy Ranch Golf Course south of Antioch.

The turf land-cover type comprises developed parks and golf courses that support irrigated lawns and horticultural plantings with little or no natural land cover. Turf may be planted with native or ornamental trees.

Wind Turbine

Wind turbine occupies 217 acres (<1 %) in the southern portion of the inventory area between Los Vaqueros Reservoir and Byron Airport.

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

Landfill

The Keller Canyon Landfill, located south of Pittsburg, is the only active landfill in East Contra Costa County, occupying 334 acres (<1%). Landfills are those areas where vegetation has been cleared and large amounts of soil have been moved for solid waste disposal.

3.2.5 Special-Status Species

Special-status species are plants and animals that are legally protected under state and federal ESA or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species in the following categories.

- Species listed or proposed for listing as threatened or endangered under the federal ESA.[2]
- Species that are candidates for possible future listing as threatened or endangered under the federal ESA.[3]
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA.[4]
- Species that meet the definitions of rare or endangered under CEQA.[5]
- Plants listed as rare under the California Native Plant Protection Act.[6]
- Plants considered by CNPS to be "rare, threatened, or endangered in California." [7]
- Plants listed by CNPS as plants about which more information is needed to determine their status, and plants of limited distribution,[8] which may be included as special-status species on the basis of local significance or recent biological information.
- Animal species of special concern to CDFG.[9]
- Animals fully protected under the California Fish and Game Code..[10]
- Other laws that protect wildlife species include:
  - Federal MBTA, which protects nesting migratory birds.
  - Bald and Golden Eagle Protection Act, which protects bald eagles and golden eagles, except under certain specified conditions, from the taking, possession, transportation, export or import, barter, or offers to sell a bald or golden eagle, alive or dead, or any part, nest, or eagle egg.
  - Sections 3503 and 3503.5 of the California Fish and Game Code, which protect nesting raptors, their nests, and eggs.

[2] Federal Register, 50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species].

[3] Federal Register, 66 FR 54808, October 30, 2001.

[4] Federal Register, 9(14 CCR 670.5), October 30, 2001.

[5] State CEQA Guidelines, Section 15380

[6] California Fish and Game Code, Section 1900 et seq.

[7] California Native Plant Society, 2001. *Inventory of Rare and Endangered Plants of California (sixth edition).* Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. Sacramento, CA: California Native Plant Society. (Data available at: http://www.northcoast.com/~cnps/cgi-bin/cnps/sensinv.cgi); Lists 1B and 2.

[8] Ibid. Lists 3 and 4.

[9] Remsen, J. V., 1978. *Bird Species of Special Concern in California: An Annotated List of Declining or Vulnerable Bird Species*. (Wildlife Management Branch Administrative Report No. 78-1.) Sacramento, CA: California Department of Fish and Game, Nongame Wildlife Investigations; Williams, D. F., 1986. *Mammalian Species of Special Concern in California*. (Pages 1–112 in Administrative Report 86-1). Sacramento, CA: California Department of Fish and Game, Wildlife Management Division; and Jennings, M. R., and M. P. Hayes, 1994. *Amphibian and Reptile Species of Special Concern in California*. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA.

[10] California Fish and Game Code, Section 3511 (birds), 4700 (mammals), and 5050 (amphibians and reptiles).

Special-Status Wildlife

A total of 69 special-status wildlife and 11 special-status fish species are known to occur or have the potential to occur within the inventory area. Refer to Appendix C for a summary of legal status, distribution, habitat, and likelihood for occurrence in the proposed Plan area for each of these special-status species. Of the 80 special-status wildlife species, 17 would be covered under the proposed HCP/NCCP. The covered species are listed below.

- Longhorn fairy shrimp (*Branchinecta longiantenna*).
- Vernal pool fairy shrimp (*Branchinecta lynchi*).
- Midvalley fairy shrimp (*Branchinecta mesovallensis*).
- Vernal pool tadpole shrimp (*Lepidurus packardi*).
- California tiger salamander (*Ambystoma californiense*).
- California red-legged frog (*Rana aurora draytoni*).
- Foothill yellow-legged frog (*Rana boylii*).
- Silvery legless lizard (*Anniella pulchra pulchra*).
- Giant garter snake (*Thamnophis couchi gigas*).
- Alameda whipsnake (*Masticophis lateralis euryxanthus*).
- Golden eagle (*Aquila chrysaetos*).
- Swainson's hawk (*Buteo swainsoni*).
- Western burrowing owl (*Athene cunicularia hypugaea*).
- Tricolored blackbird (*Agelaius tricolor*).
- Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*).
- San Joaquin kit fox (*Vulpes macrotis mutica*).
- Western pond turtle (*Clemmys marmorata*).

The 12 other non-covered special-status species with high potential to occur within the proposed HCP/NCCP area are listed below and are not covered under the HCP/NCCP.

- California horned lizard (*Phrynosoma coronatum frontale*).
- Great blue heron (*Ardea herodias*).
- Double-crested cormorant (*Phalacrocorax auritus*).
- Northern harrier (*Circus cyaneus*).
- White-tailed kite (*Elanus leucurus*).
- American peregrine falcon (*Falco peregrinus anatum*).
- California black rail (*Laterallus jamaicensis coturniculus*).

- California least tern (*Sterna antillarum* (=*albifrons*) *browni*).
- California horned lark (*Eremophila alpestris actia*).
- Loggerhead shrike (*Lanius ludovicianus*).
- Suisun song sparrow (*Melospiza melodia maxillaries*).
- Bell's sage sparrow (*Amphispiza belli belli*).

The remaining species were identified as having moderate or low potential to occur in the inventory area. These species are not discussed below, but are described in Appendix C.

Special-Status Plants

A total of 44 special-status plant species were identified as having the potential to occur in the inventory area. Profiles for each species are provided in Appendix C, including listing status, geographic distribution, habitat requirements, specific occurrence data within the inventory area, and blooming period. Of the 44 special-status plants identified, 11 would be covered under the proposed Plan, including:

- Mount Diablo manzanita (*Arctostaphylos auriculata*).
- Brittlescale (*Atriplex depressa*).
- San Joaquin spearscale (*Atriplex joanquiniana*).
- Big tarplant (*Blepharizonia plumose*).
- Mount Diablo fairy lantern (*Calochortus pulchellus*).
- Recurved larkspur (*Delphinium recurvatum*).
- Round-leaved filaree (*Erodium macrophyllum).*
- Diablo helianthella (*Helianthella castanea*).
- Brewer's dwarf flax (*Hesperolinon breweri*).
- Showy madia (*Madia radiata*).
- Adobe navarretia (*Navarretia nigelliformis* ssp. *nigelliformis*).

Fifteen special-status plant species have some potential to occur in the inventory area and could be affected by the proposed Plan or plan alternatives.

- Contra Costa manzanita (*Arctostaphylos manzanita* ssp. *Laevigata*).
- Congdon's tarplant (spikeweed) (*Centromadia* (*Hemizonia*) *parryi* ssp. *Congdonii*).
- Mt. Diablo bird's-beak (*Cordylanthus nidularius*).
- Hospital Canyon larkspur (*Delphinium californicum* ssp. *Interius*).
- Fragrant fritillary (*Fritillaria liliacea*).

- Hall's bush mallow (*Malacothamnus hallii*).
- Robust monardella (*Monardella villosa* ssp. *Globosa*).
- Rayless ragwort (*Senecio aphanactis*).
- Mount Diablo phacelia (*Phacelia phacelioides*).
- Eel-grass pondweed (*Potamogeton zosteriformis*).
- Rock sanicle (*Sanicula saxatilis*).
- Most beautiful jewel-flower (*Streptanthus albidus* ssp. *Peramoenus*).
- Mt. Diablo jewel-flower (*Streptanthus hispidus*).
- Oval-leaved viburnum (*Viburnum ellipticum*).

An additional six plants are designated as no-take species. The remaining 13 species occur in habitats such as Delta wetlands and coastal dunes that were identified as having moderate or low potential to be impacted by the Proposed Plan. These species are not discussed below, but are described in Appendix C.

3.3 Land Use

3.3.1 Existing Land Uses

For purposes of describing land uses in the inventory area, the EIR/EIS relies on the consolidated map of land use designations that was developed by the County for the proposed HCP/NCCP. This map combines the land use designations identified in the general plans of Brentwood, Clayton, Oakley, Pittsburg, and the County into a single classification system. The map illustrates city land use designations in incorporated areas and County designations in unincorporated areas. The map also depicts all dedicated open space in the county and a current inventory of public facilities.

The 28 categories from the land use designation map were combined into nine groups that represent a combination of current and future land use in the inventory area. Table 3.3-1 shows the grouped land use categories. Figure 3-2 illustrates the extent within the inventory area of the land use designation types listed in the table.

Future land uses were assumed to be consistent with the general plans of Contra Costa County (1996); Antioch (1988, 2003); Brentwood (2001); Clayton (2000); Oakley (2002); and Pittsburg (2001); and with amendments and recent updates from County planning staff (Kopchik pers. comm.). Planning staff from the County and the participating cities provided geographic information system (GIS) data of the political boundaries, including the County boundary, city limit lines (2002), the County Urban Limit Line (ULL) as amended by the County Board of Supervisors in September 2000, city spheres of influence, and land use designations in the inventory area.

Table 3.3-1. Grouping of Land Use Designations

Land Use Designation Type	County Abbreviation	General Plan Land Use Designation
Development	SV	Very Low-Density Single-Family Residential
	SL	Low-Density Single-Family Residential
	SM	Medium-Density Single-Family Residential
	SH	High-Density Single-Family Residential
	ML	Low-Density Multiple-Family Residential
	MM	Medium-Density Multiple-Family Residential
	MH	High-Density Multiple-Family Residential
	MV	Very High-Density Multiple-Family Residential
	MS	Very High-Density Multiple-Family Residential (Special)
	CC	Congregate Care Senior Housing
	MO	Mobile Home
	CO	Commercial[1]
	ACC	Airport Commercial
	OF	Office
	BP	Business Park
	LI	Light Industry
	HI	Heavy Industry
	CR	Commercial Recreation
	MU	Mixed Use[2]
	PR	Parks and Recreation (in part)[3]
Agriculture	AL	Agricultural Land
	DR	Delta Recreation
Agricultural Core	AC	Agricultural Core
Public Facilities	PS	Public/Semi-Public
	LF	Landfill
Public Facilities with Undeveloped Land	PS	Public/Semi-Public
	LF	Landfill
Water	WA	Water
Urban Parks and Open Space	PR	Parks and Recreation (in part)[3]
	OS	Open Space (in part)[3]
Open Space (Planned)[4]	OS	Open Space (in part)[3]
Parks and Open Space[5]	PR	Parks and Recreation (in part)[3]
	OS	Open Space (in part)[3]
	WS	Watershed

Notes:

[1] Includes Commercial (CO), Regional Commercial (RC), Local Commercial (LC), and Marina Commercial (MC)

[2] Includes all other mixed-use designations (e.g., M1, M3, M5, M10)

[3] Small, isolated parks and open space in urban areas (within city limits) are categorized as "Urban Parks"; Parks and open spaces adjacent to or within rural areas (outside city limits) are categorized as "Parks and Open Space".

[4] Open space areas that are designated in city or County General Plans as open space but are on private land and are not further encumbered by conservation easements or dedicated development rights are categorized as "Open Space (planned)".

[5] Regional and other undeveloped parks, public watershed lands, and private lands with conservation easements

Source: Contra Costa County Consolidated Land Use Designations

Under this classification, all industrial, residential, and commercial land use designations are merged into the development category. The County defines Agriculture as all grazing land, croplands, orchards, and vineyards. Because the County does not distinguish grazing lands from other agricultural lands (such as croplands) in its General Plan, these existing and planned land uses could not be distinguished in the land use maps created for the proposed HCP/NCCP. Agriculture also includes the Delta Recreation (DR) category, which in turn includes islands and adjacent lowlands of the Sacramento–San Joaquin Delta that are used mostly for agriculture.

The Agricultural Core designation is applied to the agricultural lands with the most fertile soils in the County, and is generally devoted to intensive row-crop cultivation. The Agricultural Core designation is more restrictive of subdivision and development activities than the Agriculture designation.

The Public Facilities category includes most lands designated as Public/Semi-Public (PS), including highways, government offices, hospitals, railroad lines, and other developed public facilities.

Public Facilities with Undeveloped Land includes PS facilities such as the Byron Airport and the County Detention Facility along Marsh Creek Road. This category also includes the Landfill designation (LF), because the only active landfill in the inventory area, the Keller Canyon landfill south of Pittsburg, encompasses large areas of undisturbed land not currently used for landfill operations.

The Urban Parks and Open Space category includes lands designated for Parks and Recreation and for Open Space that are surrounded by urban development or that are themselves developed or landscaped.

The Open Space (Planned) category includes areas that are designated in city or County general plans as Open Space but are on private land and are not further encumbered by conservation easements or dedicated development rights.

The Protected Lands category includes federal land; local, state, and regional parks; private lands with conservation easements or dedicated development rights; and public watershed lands. Watershed (WS) indicates land owned by CCWD, the major water supplier in ECCC. Watershed lands are managed for water-quality protection and support passive recreational activities.

The Water category includes areas designated as Water in the General Plan. Only larger water bodies and reservoirs receive this designation. Ponds are not generally designated as Water.

Descriptions of the designated land uses within the inventory area by jurisdiction are provided below.

Unincorporated Areas of East Contra Costa County

Three-quarters of the land in the inventory area—129,414 acres—are in unincorporated areas of Contra Costa County. Development within these unincorporated areas is concentrated in small communities such as Bay Point, Knightsen, and Byron. Bay Point is the most developed area of unincorporated East Contra Costa County. Located immediately west of Pittsburg, the Bay Point community accounts for the bulk of the 9,331 acres of developed unincorporated land. The agricultural communities of Knightsen and Byron also include residential areas and public facilities. Knightsen is east of Oakley and Brentwood; Byron is south of Brentwood.

Although the amount of agricultural land in Contra Costa County has declined over the last 50 years, agriculture remains the primary land use on the unincorporated lands of the inventory area. Most of the county's agricultural land is located in unincorporated East Contra Costa County and, within the inventory area, more than 80,000 acres are designated for agricultural use; 99% of this land is located in unincorporated areas of the county.

Existing agricultural land uses include croplands, vineyards, orchards, and range lands. A variety of crops are grown in the area, with nursery crops, vegetables, fruits, and nuts being the most profitable (Contra Costa County 1990). Agricultural lands east and southeast of Oakley and Brentwood consist of row crops. Immediately east of Brentwood and extending east and south of Oakley, the agricultural land is extremely productive. This area is defined as Agricultural Core by the General Plan. The designation is intended to preserve and protect the most productive farmlands in the county. Much of the Agricultural Core is under active cultivation with intensive row crops (e.g., tomatoes and berries). The southwestern portion of the inventory area is primarily rangeland, characterized by steep slopes and rugged terrain (Contra Costa County2005). The southeastern portion of the inventory area is also primarily rangeland but on moderate to gentle slopes with numerous wind turbines.

City of Antioch

The City of Antioch is not a participating member of the HCPA, nor will it be a signatory to the final HCP/NCCP agreement. It is therefore excluded from the permit area. It is, however, within the larger inventory area. Land use changes and population growth within Antioch will influence the surrounding area and are therefore included in this review.

Antioch is the most populous city within the inventory area. According to the 2000 census, 91,293 people live in Antioch. The city is characterized by large amounts of vacant and open land providing a considerable area for urban expansion (City of Antioch 1988, 2003). Land uses in Antioch include industrial and commercial development, but the principal land use is residential development. The northern portion of the city contains areas of industrial and commercial use, whereas the southern portion is almost entirely residential. The

southern portion of Antioch has been designated for residential development. The southeastern corner of Antioch's planning area, known as Future Urban Area 2, is designated for industrial and business park development. Future Urban Area 1, also known as the Sand Creek Specific Plan, lies along the southern border of Antioch.

Approximately 10% of the inventory area is within the Antioch city limits. Antioch's jurisdiction encompasses 17,732 acres, of which 13,684 are designated for development (City of Antioch 2003). The remaining 4,048 acres are designated as open space, watershed lands, agriculture, and parklands. The majority of this land is owned or managed by East Bay Regional Park District (EBRPD). A number of other urban parks and open space areas are located near EBRPD land or are scattered throughout the city.

City of Pittsburg

Pittsburg is the second most populous city in the inventory area. The most prevalent land uses in Pittsburg are residential and industrial. Like Antioch, most of Pittsburg's industrial areas (e.g., power plants, chemical, and other heavy industry) are located in the northern section of the city along the Sacramento/San Joaquin River. Areas designated for commercial use in Pittsburg are concentrated around SR 4 and Pittsburg's downtown area in the eastern part of the city. New natural gas power plants have been constructed in the last few years in and near Pittsburg. Commercial development within already established areas is expected to increase (Association of Bay Area Governments 1999; City of Pittsburg 2001). New residential development is planned for the southern portion of Pittsburg, specifically in the Southwest Hills and Buchanan planning subareas (City of Pittsburg 2001).

Pittsburg comprises 5% of the inventory area, and 80% of the city is designated for development. Parks and open space—mainly serving residential areas in the southern portion of the city—are designated for the remaining 1,600 acres within the city.

City of Oakley

The City of Oakley is a rural agricultural community incorporated in 1999 (City of Oakley 2002). Oakley is currently undergoing a transition from a rural landscape to a suburban one. More than 90% of the land within Oakley in the inventory area is designated for development, with the majority of that development being residential. Five percent (451 acres) of city land is designated for agricultural use, mainly in eastern Oakley. Of all the cities in the inventory area, Oakley has dedicated the largest number of acres to agriculture. Parks are mainly designated in residential areas. The California Coastal Conservancy, with assistance from the California Department of Water Resources, the Natural Heritage Institute, and the City of Oakley, is leading a

large (1,224 acres) habitat restoration project on Dutch Slough in the northeast corner of Oakley.

City of Clayton

The City of Clayton incorporated in 1964. Clayton has been experiencing rapid population growth, and its 1990 population grew by almost 50% to reach 10,762 residents in 2000. The city is bounded on the west and north by Concord, on the south by Mount Diablo State Park, and on the northeast by Black Diamond Regional Preserve. Accordingly, future growth of Clayton will occur to the east. Residential development is the principal land use in Clayton, dominated by single-family, low-density homes. Commercial land use is concentrated in the Town Center and the Kirker Corridor, which is intended to become a commercial center serving the regional market. The city currently contains 400 acres of open space (City of Clayton 2000).

City of Brentwood

The City of Brentwood has historically been an agricultural community. Recently, however, Brentwood has undergone a rapid change from an agricultural to a suburban community. Between 1990 and 2000, the population of Brentwood grew by 152%. By 2020, Brentwood's population is projected to increase by another 106% (Association of Bay Area Governments 2002).

The rapid population growth across East Contra Costa County has been projected to exceed the supporting number of jobs. In an attempt to correct this imbalance, Brentwood's general plan calls for the rate of employment growth to be greater than residential development growth. To meet this goal, 87% of Brentwood is designated as development, and the city plans a major expansion of business parks and commercial areas throughout its city limits (City of Brentwood 2001). Industrial areas are limited to the northeastern corner of the City's planning area.

Areas of open space and parks are designated in the southern portion of the city and account for 10% of the total area of Brentwood. Two percent of Brentwood is dedicated to agricultural use. As is the case with Oakley, agriculture is allocated to the eastern portion of the city, where it serves as a buffer between the city and the Agricultural Core located in unincorporated portions of the county. Furthermore, Brentwood has designated several areas in the city planning area as urban reserve; these will not be developed during the life of the current general plan[11]. To attempt to conserve agricultural lands in and around Brentwood, the City launched the independent Brentwood Agricultural Land Trust (BALT). The City also imposes an agricultural impact fee to be spent by BALT on conservation of agricultural lands through acquisition of permanent conservation easements.

[11] For the purposes of this document, urban reserves have been considered a Development land use designation.

Other Developed Areas

Turf land-cover type is defined as that which supports irrigated lawns, such as parks and golf courses. This land-cover type occupies 1,468 acres, or less than 1% of the inventory area, primarily south of Antioch and Pittsburg. More specifically, this land-cover type is found in Contra Loma Regional Park, the Brentwood Golf Club, and the Roddy Ranch Golf Course.

Wind turbine land cover, comprising 217 acres of the inventory area, exists in the southern inventory area near Los Vaqueros Reservoir.

The Keller Canyon landfill is the only active landfill in the inventory area. It occupies 333 acres south of Pittsburg and. Once a landfill reaches capacity, it can only be closed, capped, and planted with grass.

Public Lands and Open Space

In addition to agriculture, the inventory area contains many large parks and protected lands (Table 2-4 and Figure 3-2); a contiguous string of parks and open space lies along most of the inventory area's southern boundary. California State Parks, EBRPD, and CCWD each own large portions of this land. Mount Diablo State Park, in the southwestern section of the inventory area, is the largest park in the county, comprising 4% of the inventory area (the majority of the park is outside the inventory area). CCWD manages the largest open space property in the inventory area, the Los Vaqueros Watershed and Reservoir, comprising approximately 10% of the inventory area. EBRPD manages several parks, including Black Diamond Mines Regional Preserve, Contra Loma Regional Park, Morgan Territory Regional Preserve, Round Valley Regional Preserve, and Vasco Caves Regional Preserve (which is owned and managed jointly with CCWD). EBRPD also owns land outside the inventory area in all cardinal directions. A portion of the federal Seal Beach Naval Weapons Station (NWS), Detachment Concord, lies west of the inventory area.

California's Delta Protection Act

The Johnston-Baker-Andal-Boatwright Delta Protection Act of 1992 (Delta Protection Act) identified the Sacramento–San Joaquin Delta as a natural resource of statewide, national, and international significance and formalized the state's commitment to preserve and protect its diverse values. The purpose of the Delta Protection Act is to ensure protection, maintenance, and enhancement of the Delta environment; assure orderly and balanced use of delta land resources; and improve flood protection to increase public health and safety.

The Delta Protection Act mandated a state-level planning effort to address the needs of the Delta communities. The Delta Protection Commission was made a permanent state agency in 2000 as a need for continued planning and management was identified. It has planning jurisdiction over portions of five

counties—Solano, Yolo, Sacramento, San Joaquin, and Contra Costa. The Delta Protection Commission was charged with developing a comprehensive regional plan to guide land use and resource management in the heart of the Delta. The resulting *Land Use and Resource Management Plan for the Primary Zone of the Delta* was adopted by the Commission on February 23, 1995. Its policies became part of the California Code of Regulations in 2000, and it has undergone one round of subsequent revision (May 2002). The policies of the Plan have been forwarded to the five Counties under the Commission's jurisdiction for incorporation into their general plans and zoning codes, enabling implementation of the Plan at the County level, through the existing local government framework. The Delta Protection Commission does not have land use authority but it can suspend local projects under an appeal process while the Commission reviews them for consistency with the Act and the Plan.

The HCP/NCCP inventory area includes two small areas considered Primary Delta Zones by the Commission. The first is the land between the Clifton Court Forebay and the Contra Costa County line to the south. The second and larger area roughly corresponds to the agricultural zone northeast of the Brentwood city limit and south of the Oakley city limits. The inventory area includes extensive areas of the Secondary Delta Zone in the cities of Pittsburg, Antioch, Oakley, Brentwood, and Contra Costa County in low-elevation agricultural areas of the eastern County where land uses are monitoring but not regulated by the Commission.

Commission regulations (Title 14, CCR, Chapter 3, Sect. 20030) state that "Lands managed primarily for wildlife habitat shall be managed to provide several inter-related habitats. Delta-wide habitat needs should be addressed in development of any wildlife habitat plan. Appropriate programs, such as "Coordinated Resource Management and Planning" (Public Resources Code Section 9408(c)) and "Natural Community Conservation Planning" (Fish and Game Code Section 2800 et seq.) should ensure full participation by local government and property owner representatives." The HCP/NCCP has been developed to be consistent with this and other relevant regulations of the Delta Protection Commission and with the land use policies in the *Land Use and Resource Management Plan for the Primary Zone of the Delta.*

Land Use Designations and Relevant Planning Documents

Land use designations in the inventory area are provided by the general plans for each of the local land use agencies. It is assumed that future urban development within the incorporated areas, which is a covered activity under the proposed HCP/NCCP, would be approved in accordance with the applicable policies of each jurisdiction's general plan. These activities or projects would be approved by the local land use authority.

Contra Costa County General Plan

In 1990, as part of Measure C, the County passed and adopted the 65/35 Land Preservation Standard, which "limits urban development in the County to no more than 35% of the land in the County and requires that at least 65% of all land in the County shall be preserved for agriculture, open space, wetlands, parks, and other non-urban uses." The 65/35 Land Preservation Standard is maintained through the implementation of the ULL, a line beyond which the County may not designate areas for urban uses. Measure C and the ULL apply only to Contra Costa County's approval authority; however, it has served to limit annexation and development beyond the ULL. The ULL is incorporated into the 2005 Contra Costa County General Plan and ensures that no more than 35% of the land within the County, whether inside or outside the ULL, can be developed, at least through the lifetime of the current General Plan (Contra Costa County 2005).

The following goals and policies from the Contra Costa County General Plan Land Use Element are pertinent to the proposed HCP/NCCP because overall implementation of the plan, as well as specific acquisition of preserve lands and habitat restoration activities, would be subject to these policies.

Goals

3-A. To coordinate land use with circulation, development of other infrastructure facilities, and protection of agriculture and open space, and to allow growth and the maintenance of the County's quality of life. In such an environment, all residential, commercial, industrial, recreational, and agricultural activities may take place in safety and harmony, and to mutual advantage.

3-M. Protect and promote the economic viability of agricultural land.

Countywide Policies

3-10. The extension of urban services into agricultural areas outside the ULL, especially growth-inducing infrastructure, shall be generally discouraged.

3-11. Urban uses shall be expanded only within the ULL, where conflicts with the agricultural economy will be minimal.

3-12. Preservation and buffering of agricultural land should be encouraged, as it is critical to maintaining a healthy and competitive agricultural economy and assuring a balance of land uses. Preservation and conservation of open space, wetlands, parks, hillsides, and ridgelines should be encouraged, as it is crucial to preserve the continued availability of unique habitats for wildlife and plants, to protect unique scenery, and to provide a wide range of recreational opportunities for County residents.

3-13. Promote cooperation between the County and cities to preserve agricultural and open space land.

Southeast County Area Policies

3-86. Many of the specific policy statements of this plan support the concept of allowing for multiple uses compatible with the predominantly agricultural watershed and public purposes of the area. The policies stress the need to preserve designated agricultural lands for agricultural use, and also to allow certain other uses in the area such as wind energy farms, mineral extraction, and reservoirs.

3-87. The Southeast County area is almost exclusively planned for agricultural, watershed, or public purposes. New land uses within this plan should be limited to those which are compatible to the primary agricultural and watershed purposes of the planning area (farming, ranching, poultry raising, animal breeding, aviaries, apiaries, horticulture, floriculture, and similar agricultural uses and structures) and consistent with the multiple use philosophy enumerated by this plan.

3-88. Southeastern Contra Costa County contains a range of natural and cultural resources that warrant special recognition in the General Plan. Mineral and meteorological resources exist which have the potential to be developed as additional uses within this essentially agricultural area. Multiple uses of the land, which assist in its long-term protection as an agricultural area, are to be encouraged.

The southeastern portion of the County is blessed with archaeological and wildlife resources that are unique and worthy of long-term protection and preservation. While in certain portions of the planning area multiple uses may conflict with the need for environmental protection and enhancement, there are other areas where multiple use may reinforce preservation.

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

The *San Joaquin Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP) is a regional conservation plan that encompasses all of San Joaquin County except for federally owned lands (approximately 900,000 acres). The planning area of the SJMSCP is immediately east and adjacent to the ECCC HCP/NCCP inventory area.

CALFED

The CALFED Program is a cooperative effort of more than 20 state and federal agencies working with local communities to develop and implement a long-term comprehensive plan to restore ecological health and improve water management for beneficial uses of the Bay-Delta System. The objective of the collaborative planning process is to identify comprehensive solutions to the problems of water quality, ecosystem quality, water supply, and vulnerability of Delta functions. The CALFED Program extends over a broad geographic area: the Delta Region,

the Bay Region, the Sacramento Valley Region, the San Joaquin River Region, and the Southern California Region. The CALFED planning area includes lands within 1,000 feet from the margins of the Bay and overlaps with the proposed HCP/NCCP inventory area along the Delta.

3.4 Agriculture

3.4.1 Regulatory Setting

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) of 1984 requires federal agencies to consider how their activities or responsibilities that involve financing or assisting construction of improvement projects, or acquiring, managing, or disposing of federal land and facilities may affect farmland. The FPPA does not apply to federal permitting (7 CFR §658.2[a][1][i]).

California Environmental Quality Act

CEQA includes a finding that the conversion of agricultural lands to nonagricultural uses threatens the long-term health of the state's agricultural economy. Impacts on agricultural resources are evaluated on the basis of a project's potential to affect land designated as Important Farmland. In California, the farmland classification system developed by the Department of Conservation's (DOC's) Farmland Mapping and Monitoring Program (FMMP) is the primary system used to evaluate the quality and distribution of farmland in California. The FMMP prepares Important Farmland maps approximately every 2 years for most of the state's agricultural regions on the basis of soil survey information and land inventory and monitoring criteria developed by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The farmland classification system used by the FMMP consists of eight mapping categories: five categories of agricultural lands and three categories of nonagricultural lands. The characteristics of these categories are described below.

Agricultural Land

- **Prime Farmland.** Prime Farmland is defined by the state as "irrigated land with the best combination of physical and chemical features able to sustain long-term production of agricultural crops." Prime Farmland has the soil quality, growing season, and moisture supply needed to produce sustained high yields. To be designated as Prime Farmland, the land must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date. The majority of the lands in Zone 6 of the inventory area are designated as Prime Farmland.

- **Farmland of Statewide Importance.** The state defines Farmland of Statewide Importance as "irrigated land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops." However, this land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. In order for land to be designated as Farmland of Statewide Importance, it must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date. Most of the Farmland of Statewide Importance in the county is located outside the inventory area. However, several parcels are located within Zone 6 of the inventory area.
- **Unique Farmland.** Unique Farmland is considered to consist of lower-quality soils and is used for production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. To qualify for this designation, land must have been used for crops at some time during the 4 years prior to the mapping date. Several small parcels of Unique Farmland are located throughout Zone 6 of the inventory area.
- **Farmland of Local Importance.** Farmland of Local Importance is important to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. These lands are described in more detail in *Existing County Agricultural Land Use Designations* below. Farmland of Local Importance is found throughout the inventory area.
- **Grazing Land.** Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. This category is used only in California and was developed in cooperation with the California Cattlemen's Association, the University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres. Grazing land is found throughout the inventory area.

Nonagricultural Lands

- **Urban and Built-up Lands.** Urban and Built-up Lands consist of land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This type of land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land.** Other Land is land not included in any other mapping category. Examples include low-density rural developments and brush, timber, wetland, and riparian areas not suitable for livestock grazing. This category also includes vacant and nonagricultural land surrounded on all sides by urban development; confined livestock, poultry, or aquaculture facilities; strip mines; borrow pits; and water bodies smaller than 40 acres.

- **Water.** Water includes perennial water bodies with an extent of at least 40 acres.

California Land Conservation Act (Williamson Act)

The California Land Conservation Act, or Williamson Act, is one of the state's primary mechanisms for conserving farmland. The Williamson Act enables counties and cities to designate agricultural preserves (Williamson Act lands) and offer preferential taxation to private agricultural landowners based on the income-producing value of their property in agricultural use, rather than on the property's assessed market value. In return for the preferential tax rate, the landowner is required to sign a contract with the county or city agreeing not to develop the land for a minimum 10-year period. Contracts are automatically renewed annually unless a party to the contract files for non-renewal or petitions for cancellation. If the landowner chooses not to renew the contract, it expires at the end of its duration. Under certain circumstances, a county or city may approve cancellation of a Williamson Act contract. Cancellation requires private landowners to pay back taxes and cancellation fees.

Permissible land uses under Williamson Act contracts are governed by Government Code Section 51238.1. Each city and county has the discretion to determine land uses that are or are not compatible with Williamson Act contracts, provided these uses are not prohibited under the Act. The following are categories into which land can be placed under the Williamson Act.

Prime Agricultural Land

Prime Agricultural Land enrolled under Williamson Act contract meets any of the following criteria.

1. Land that is Class I or Class II in the NRCS land use capability classification system.
2. Land that rates 80–100 in the Storie Index Rating system.
3. Land that supports livestock used for the production of food and fiber and has an annual carrying capacity equivalent to at least one animal unit per acre as defined by USDA.
4. Land planted with fruit- or nut-bearing trees, vines, bushes, or crops that have a non-bearing period of less than 5 years and will normally return during the commercial-bearing period on an annual basis from the production of unprocessed agricultural plant production not less than $200 per acre.
5. Land that has returned from the production of unprocessed agricultural plant production with an annual gross value of not less than $200 per acre for 3 of the previous 5 years.

Non-Prime Agricultural Land

Non-prime Agricultural Land enrolled under Williamson Act contract is other agricultural land that does not meet any of the criteria for classification listed above for Prime Agricultural Land. Non-Prime Agricultural Land is defined as Open Space Land of Statewide Significance under the California Open Space Subvention Act and may be identified as such in other documents. Most Non-prime Agricultural Land is used for grazing or nonirrigated crops. However, Non-prime Agricultural Land may also include other open space uses compatible with agriculture and consistent with local general plans.

Land in Non-Renewal

The non-renewal period begins with a Notice of Non-Renewal from the County, and the contract is terminated at the end of the non-renewal period. During the non-renewal process, the annual tax assessment gradually increases.

Contra Costa County General Plan

The General Plan Conservation Element maintains specific goals and policies related to preservation of agricultural lands. The following goals and policies from the Conservation Element are pertinent to this EIR/EIS.

Goals

8-G. To encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy.

8-H. To conserve prime productive agricultural land outside the ULL exclusively for agriculture.

8-J. To encourage cooperation between the County and cities in the preservation of agricultural lands.

Policies

8-29. Large contiguous areas of the County shall be encouraged to remain in agricultural production as long as economically viable.

8-31. Urban development in the future shall take place within the ULL and areas designated by this plan for urban growth.

8-32. Agriculture shall be protected to assure a balance in land use. The policies of Measure C–1990 shall be enforced.

8-34. Urban developments shall be required to establish effective buffers between them and land planned for agricultural uses.

A 40-acre minimum parcel size for prime productive agricultural land (Class I and Class II soils per Soil Conservation Service [SCS] Land Use Capability Classification) shall be established by the County for land outside the designated ULL. To the extent feasible, the County shall enter into preservation agreements with cities in the County designated to preserve land for agriculture.

3.4.2 Agricultural Land Use Designations in East Contra Costa County

The Contra Costa County General Plan establishes two agricultural land use designations: Agricultural Lands (AL) and Agricultural Core (AC). These land use designations are described below.

Agricultural Lands

The purpose of the AL designation is to "preserve and protect lands capable of and generally used for the production of food, fiber, and plant materials." This land use designation includes most of the privately owned rural lands in the County, excluding private lands that are composed of prime soils or lands that are located in or near the Delta. Generally, these lands are characterized by steep hills and are used only for livestock grazing or dry grain farming. The AL designation also includes non-prime agricultural lands in flat areas of East Contra Costa County.

Land-dependent and non-land-dependent agricultural production and related activities are allowed in AL-designated areas (Contra Costa County2005). Other uses may be allowed within AL areas after obtaining a permit. The AL designation permits a density of 0.2 units per acre.

Agricultural Core

The Agricultural Core (AC) designation applies to agricultural lands that consist primarily of prime soils according to SCS Land Use Capability Classifications. These soils, which are considered the best soils for farming many types of crops, are categorized as Class I or Class II. Soils of this designation, most of which are under intense cultivation, are located outside the current ULL in East Contra Costa County, specifically to the east, south, and west of the city of Brentwood.

The purpose of the AC designation is to "preserve and protect the farmlands of the County, which are most capable of, and generally used for, the production of food, fiber, and plant materials." In order to maintain economically viable commercial agricultural lands, the lands in this designation must have a

minimum parcel size larger than that of the AL designation, in accordance with Measure C. The subdivision of these lands and ranchette housing development are strongly discouraged (Contra Costa County2005).

Uses allowed in the AC designation are the same as those allowed without a permit in the AL designation. Public roads and new utility corridors are strongly discouraged in the AC if another economically viable alternative is available. The AC designation permits a density of 0.025 units per acre.

3.4.3 Existing Agricultural Uses

Most of the County's agricultural land is located in unincorporated East Contra Costa County. Within the inventory area, more than 80,000 acres are designated for agricultural use; 99% of this land is located in the unincorporated areas (Contra Costa County 2003). Although the amount of agricultural land in Contra Costa County has declined over the last 50 years, agriculture remains the primary land use in the unincorporated lands of the inventory area.

The Contra Costa County General Plan Conservation Element indicates that since 1940, Contra Costa County has seen a tremendous decrease in the acreage of production of agriculture, due primarily to the increasing urbanization of the County. Between 1940 and 1987, agricultural land in the County declined by almost half, from more than 400,000 acres to 216,000 acres.

Approximately 3,500 acres of land was converted to other nonagricultural uses between 2000 and 2002, including approximately 1,700 acres of Important Farmland and approximately 600 acres of grazing land. The rate of loss of agricultural land declined somewhat from the previous period (1998–2000), when 2,500 acres of Important Farmland and 1,000 acres of grazing land were converted to nonagricultural uses (Department of Conservation 2002).

Existing agricultural uses in East Contra Costa County include croplands, vineyards, orchards, pasture, and rangelands. A variety of crops are grown in the area, with nursery crops, vegetables, fruits, and nuts being the most profitable (Contra Costa County2005). Agricultural lands east and southeast of the Cities of Oakley and Brentwood consist of row crops. Immediately east of Brentwood and extending east and south of Oakley, the agricultural land is extremely productive. According to the County's General Plan, the area is designated as AC, lands that are preserved and protected due to their high productivity. Much of the AC is under active cultivation with intensive row crops (e.g., tomatoes and berries). The southwestern portion of the inventory area is predominantly rangeland, characterized by steep slopes and rugged terrain (Contra Costa County2005).

The following provides a detailed description of irrigated agriculture types in the inventory area.

Pasture

The pastureland cover type comprises fast-growing annual and perennial grasses mixed with irrigated forage crops in the legume family. Pasturelands generally occur in the lowland areas adjacent to croplands and are common in the eastern portion of the inventory area, primarily between Knightsen and Byron. This type of agriculture covers 4,658 acres, or approximately 3% of the inventory area.

Cropland

Croplands are those areas tilled and cultivated for agricultural crops such as corn, summer squash, pumpkin, and wheat, as well as lands used for hay production. Cropland is the most common of the agricultural land-cover types in the low-lying areas of the inventory area, occupying 21,251 acres, or 13% of the inventory area. Most croplands in the inventory area are found between Brentwood and the Clifton Court Forebay.

Orchard

Orchards are areas planted with fruit-bearing trees and are scattered throughout the inventory area, occupying a total of 4,190 acres, or 2% of the inventory area. They are most common in Oakley and in the area just south of Brentwood that is designated by the Contra Costa County General Plan as AC.

Vineyard

Vineyards occupy 2,145 acres, or just 1% of the inventory area, and are scattered in and around Oakley and Brentwood, often surrounded by croplands and orchards.

3.4.4 Important Farmland

In 2000, 38,069 acres and 11,657 acres were designated as Prime Farmland and Farmland of Statewide Importance, respectively, in Contra Costa County (Department of Conservation 2002). Prime Farmland is found almost exclusively in the lowland areas of the eastern county. The majority of Zone 6 is Prime Farmland, although smaller areas of Farmland of Statewide Importance and Unique Farmland are also within this zone.

The western portion of the inventory area (Acquisition Zones 1–4) is largely grazing land, although Farmland of Local Importance is found along many of the valleys and drainages west of Brentwood and south of Antioch. Figure 3-3 shows the areas mapped by the FMMP as Important Farmland in eastern Contra Costa County.

3.4.5 Williamson Act Lands

In 2000, 51,468 acres in Contra Costa County were under Williamson Act contract. In 2001, the number of acres preserved under the Act decreased to 49,018 acres. In 2001, 9,053 acres of prime land were enrolled in Williamson Act contract, while 39,965 acres of non-prime land were under Williamson Act contract. Figure 3-4 shows Williamson Act enrolled lands and Williamson Act lands in eastern Contra Costa County.

The majority of prime enrolled lands are in the far eastern portion of Contra Costa County, east and southeast of Brentwood (approximately 1,650 acres of enrolled lands are within Acquisition Zone 6). Additional prime enrolled lands are located north of Discovery Bay and west of Clifton Court Forebay (outside the proposed HCP/NCCP priority acquisition zones). Non-prime enrolled lands are found throughout eastern Contra Costa County, although large tracts are located between Los Vaqueros Reservoir and Clayton (approximately 17,770 acres of enrolled lands are within Zones 1–5). Limited areas throughout the east County are designated as Prime Land or Non-Prime Land in Non-Renewal.

3.5 Public Services

This section describes public services (fire, police, and parks and recreation) in the proposed HCP/NCCP inventory area.

3.5.1 Fire Services

The East Contra Costa Fire Protection District (ECCFPD) serves the Cities of Brentwood and Oakley as well as the unincorporated areas of Byron, Bethel Island, Discovery Bay, Knightsen, and Marsh Creek–Morgan Territory. The ECCFPD was created in 2002 by the unification of the Bethel Island, East Diablo, and Oakley Fire Protection Districts. The ECCFPD currently has nine fire stations with 100 firefighters. Three stations are located in the unincorporated areas of the county: one on Marsh Creek Road, one in Byron, and one in Discovery Bay. There are plans to build one more station with nine firefighters by 2006 in Brentwood (Wahl pers. comm.).

Contra Costa County Fire Protection District (CCCFPD) responds to incidents in the cities of Clayton, Antioch, and Pittsburg, and maintains a response time of less than 5 minutes within these areas. There are 306 firefighters for the 30 fire stations in the district (Contra Costa County Fire Protection District 2002). EBRPD has a mutual aid agreement with the County and local fire districts for incidents in open space areas in or near parks.

3.5.2 Police Services

The Contra Costa County Office of the Sheriff provides law enforcement services to unincorporated areas of the county, contract cities, and special districts. The Office of the Sheriff employs 758 sworn personnel and provides law enforcement to approximately 517,454 residents. The department has a network of stations throughout the county, each commanded by a lieutenant. The Delta Station, which is staffed by one lieutenant, five sergeants, and 15 deputies, is the first to respond to calls in the unincorporated areas. When backup is needed, other sheriff's substations, adjacent city police, the Coast Guard, or California Highway Patrol respond. Deputies assigned to the Unincorporated Patrol Services Division respond to more than 400,000 citizen-generated emergency and nonemergency calls and deputy-initiated events each year. Response times to these calls vary depending on the priority and range—from 4 minutes 13 seconds to 15 minutes 9 seconds. There are no plans for new sheriff's substations within the county (Hasbrouck pers. comm. 2004).

Each incorporated city in East Contra Costa County has its own police department. The City of Brentwood has one station with 55 sworn officers who patrol four beats (King pers. comm. 2004). The City of Oakley Police Department has 20 sworn officers with one station and four beats. Response rates range from less than 1 minute to 2 minutes (Aguilar pers. comm. 2004). The City of Clayton Police Department has one station with no beats and 11 sworn officers. The current response rate is less than 5 minutes for emergencies (Enea pers. comm. 2004). The City of Pittsburg Police Department maintains one station with 72 sworn officers who patrol eight beats. The department does not track response rates (Calia pers. comm. 2004). EBRPD has a mutual aid agreement with the County and local police departments for incidents in open space areas in or near parks.

3.5.3 Parks and Recreation

Incorporated Areas

The cities of Brentwood, Clayton, Oakley, Antioch, and Pittsburg maintain various types of parkland, including neighborhood parks, community parks, multi-use recreation areas, and open space areas.

The City of Brentwood currently maintains a variety of park and recreation areas, including neighborhood, community, and regional parks; sports facilities; and paths/trails. Parks within Brentwood occupy approximately 72 acres, although an additional 80 acres of park space have been identified and planned for service (City of Brentwood 2001).

School parks within the city of Clayton also serve as neighborhood parks. Other recreation and city parklands are located in the greenbelt system, outside the

ULL, and provide 400 acres of open space with 17 miles of walking and hiking trails that connect to regional open space (City of Clayton 2000).

Eleven parks and recreational areas, encompassing approximately 30 acres, are located within Oakley. All are joint-use parks, shared primarily with schools. A 1,224-acre habitat restoration project on Dutch Slough, in the northeast corner of the city, is currently in progress and will provide a large new community park (City of Oakley 2002).

Neighborhood and community parks in Pittsburg comprise approximately 312 acres. Several trails connect to regional open space (City of Pittsburg 2001).

3.5.4 Unincorporated Areas

Mount Diablo and Cowell Ranch State Parks

Nearly one-third of Mount Diablo State Park is within the inventory area. This portion of the park contains the North and South Peaks of Mount Diablo and the eastern slopes of the mountain. Recreational activities within the park include camping, hiking, mountain biking, horseback riding, hang gliding, and photography. Visitor impacts are monitored and evaluated by park employees. Vegetation management policies focus on restoration of native communities by removal of nonnative species, revegetation, and the use of prescribed burning. Some common herbicides are used to control roadside vegetation and to remove nonnative species. Rodenticides are generally not used and are only considered for use in and around park residences. Exotic animal control programs include trapping and removal of feral animals in the park. Little or no grazing is conducted in the park.

In late 2002 Cowell Ranch became a new addition to the California State Park system. Plans to develop the ranch generated controversy, which was resolved when the Trust for Public Land secured the bulk of the property for public open space and park purposes. The nearly 4,000-acre ranch includes annual grasslands, oak woodlands, wetlands, and seasonal streams and provides habitat for special-status species such as red-legged frog, fairy shrimp, tiger salamander, and San Joaquin kit fox. The California Department of Parks and Recreation will be developing a management plan for the park. Currently, the ranch is not open to the public.

Los Vaqueros Watershed and Reservoir

Los Vaqueros Reservoir holds up to 100,000 acre-feet of water for distribution to local residents and is managed by CCWD (Contra Costa Water District 2004). Comprising 10% of the inventory area, it is the largest open space property in the inventory area.

Twenty thousand acres of protected watershed surround the reservoir and provide many recreational uses, including hiking, picnicking, biking, horseback riding, education, and interpretation. Fifty-five miles of hiking trails are located on the western portion of the Los Vaqueros watershed. Recreational activities in the reservoir include fishing and boating (Contra Costa Water District 2004).

Regional Parks

EBRPD manages five regional parks in the inventory area.

- Black Diamond Mines Regional Preserve.
- Contra Loma Regional Park.
- Morgan Territory Regional Preserve.
- Round Valley Regional Preserve.
- Vasco Caves Regional Preserve.

Recreational activities in the regional parks include hiking, camping, horseback riding, and interpretation. In all the parks, visitors are encouraged to stay on the trails and are not permitted to disturb plants or wildlife. EBRPD employees monitor and evaluate visitor impacts. Policies and practices are adjusted to improve resource management on the basis of employee assessments.

Black Diamond Mines Regional Preserve encompasses 5,717 acres. A historic cemetery and a visitor center are located in the park, and guided tours of the mines are available (East Bay Regional Park District 2004).

Contra Loma Regional Park encompasses 776 acres and contains an 80-acre reservoir for fishing and a lagoon for summertime swimming. Morgan Territory encompasses 4,147 acres; Round Valley encompasses 2,024 acres and allows some mountain biking (East Bay Regional Park District 2004). Vasco Caves is 1,339 acres and is currently closed to the public, except for docent-led tours approximately once per month.

3.6 Hydrology and Water Quality

3.6.1 Regulatory Setting

Clean Water Act

The federal Clean Water Act (CWA) prohibits the discharge of pollutants to navigable waters from point and nonpoint sources unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. The EPA has granted the State of California primacy in administering and enforcing the provisions of the CWA and NPDES. NPDES is the primary federal program that

regulates point-source and nonpoint-source discharges to waters of the United States.

The State of California adopts water quality standards to protect beneficial uses of state waters as required by Section 303 of the CWA and the Porter–Cologne Water Quality Control Act of 1969 (described below).

Placement of clean fill materials into waters of the United States is regulated by Section 404 of the CWA, which is administered by USACE. Under the CWA, the state Regional Water Quality Control Board (RWQCB) must issue Section 401 Water Quality Certification for a project to be permitted under Section 404. Water quality certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States.

The Porter–Cologne Water Quality Control Act of 1969

The Porter–Cologne Water Quality Control Act established the State Water Resources Control Board (SWRCB) and divided the state into nine regional basins, each with an RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies and enforcing the CWA. Administration is delegated to the nine RWQCBs.

Both the Central Valley and San Francisco Bay RWQCBs regulate water quality in the proposed HCP/NCCP inventory area. The San Francisco Bay RWQCB regulates water quality of the San Francisco Bay, from Suisun Bay to the Pacific Ocean. The Central Valley RWQCB has jurisdiction over drainages of the Sacramento and San Joaquin Rivers. The West Antioch Creek, Marsh Creek, Kellogg Creek, Brushy Creek, and East County Delta drainages are under the jurisdiction of the Central Valley RWQCB.

The Porter–Cologne Water Quality Control Act authorizes SWRCB to draft state policies regarding water quality. It requires that SWRCB or the appropriate RWQCB adopt water quality control plans (Basin Plans) for the protection of water quality. A Basin Plan must do the following.

- Identify beneficial uses of water to be protected.
- Establish water quality objectives for the reasonable protection of the beneficial uses.
- Establish a program of implementation for achieving the water quality objectives.

Basin Plans also provide the technical basis for determining Waste Discharge Requirements (WDRs), taking enforcement actions, and evaluating clean water grant proposals. Each RWQCB has designated beneficial uses of water resources in a Basin Plan document. (Beneficial uses of water bodies in the inventory area

are described below in the discussion of *Surface Water Quality*.) The RWQCBs protect designated beneficial uses from potential adverse impacts by issuing WDRs under NPDES permits and the CEQA process.

The inventory area is covered under a joint municipal NPDES permit granted to 19 cities and water districts that form the Contra Costa County Clean Water Program. The permit was granted by the Central Valley and San Francisco Bay RWQCBs.

Coverage under the general construction NPDES permit for stormwater discharge is required for construction of projects 1 acre or larger. The general construction permit is administered by the RWQCBs and requires the applicant to develop a Storm Water Pollution Prevention Plan (SWPPP) to address grading, erosion, and nonpoint-source pollution impacts of the project, including postconstruction impacts.

3.6.2 Surface Hydrology

The Draft Aquatic Resources Inventory, Classification, and Function of East Contra Costa County HCP/NCCP Inventory Area (See *Aquatic Resources Inventory* in Appendix K of the HCP/NCCP) provides an aquatic resource inventory, classification, and functional description of the confines of the planning boundaries of the East Contra Costa County HCP/NCCP. Although the City of Antioch is not participating in the HCP/NCCP, the inventory area includes Antioch.

This wetlands inventory and assessment was conducted in support of a regional planning, conservation, and permitting effort coordinated by the HCPA and the U.S. Army Corps of Engineers (USACE). The primary goal of this inventory is to provide a baseline record of waters of the United States (WoUS), including wetlands, on a regional scale throughout the inventory area. This report was specifically designed to support the HCPA's application to the USACE for a series of Regional General Permits (RGPs) in the inventory area that are expected to replace the existing Nationwide Permit Program. These RGPs will be bundled into a Regional Permit Program (RPP) that will provide a customized and streamlined wetlands permitting system for many projects in the inventory area, particularly those that receive coverage under the HCP/NCCP for impacts on listed species.

The inventory area has a moderate Mediterranean climate. The heaviest rainfall occurs during winter months, averaging from 12 inches per year near Brentwood to 28 inches per year at Mount Diablo (Contra Costa County 2003).

There are eight major watershed areas within the inventory area. Lower Marsh Creek and Kirker Creek are perennial streams. Willow Creek, West Antioch Creek, Kellogg and Brushy Creeks, Upper Marsh Creek, and the East County drainages are intermittent and ephemeral streams (Contra Costa County 2003). The headwaters of Mt. Diablo Creek also lie in the project area. Mt. Diablo

Creek, along with Willow and Kirker Creeks, drain northwest toward Suisun Bay. All other streams in the inventory area flow northeast to the San Joaquin River. For more detailed information about the streams and watersheds in the project area, refer to the *Contra Costa County Watershed Atlas* (Contra Costa County 2003).

Many of the major streams have been altered for flood control or to convey irrigation water. CCWD operates canals to convey water to consumers; one of these, the Contra Costa Canal, conveys water from the San Joaquin River at Rock Slough to multiple reservoirs in the county (Contra Costa Water District 2003).

Most of the low-lying lands within the western Sacramento–San Joaquin Delta have been reclaimed by protective dikes and converted to agricultural uses. As a result, portions of the northeastern corner of the inventory area have substantially subsided and are currently at or below sea level.

3.6.3 Groundwater Hydrology

The project area overlies silt and clay sediments formed from alluvial deposits that originated through the erosion of sedimentary rocks in the Diablo Range and fluvial deposits laid down in the Delta. Groundwater flows generally north towards the Delta.

Groundwater basins underlying the project area are the Pittsburgh Plain, Clayton Valley, and San Joaquin Valley–East Contra Costa groundwater basins (California Department of Water Resources 2004). Data from wells located within the inventory area indicate that groundwater is typically shallow, with depths of approximately 10–20 feet below ground surface (California Department of Water Resources 2004). The Pittsburg Plain contains a deep aquifer, lying 40–80 feet below the surface (City of Pittsburg 2001).

Groundwater is the principal source of drinking water for the City of Brentwood. Residents of Brentwood receive groundwater during the fall and winter months. To supplement groundwater supplies during the spring and summer, water is purchased from the Contra Costa and Diablo Water Districts (City of Brentwood 2002). The Cities of Antioch, Bay Point, Clayton, Oakley, and Pittsburg receive water diverted from the Sacramento–San Joaquin Delta. Numerous groundwater wells operated by private irrigation districts and local landowners in the project area produce both potable and non-potable water.

3.6.4 Flooding

The Contra Costa County Flood Control and Water Conservation District is empowered to control flood and storm waters throughout the county. The district has no direct influence over the County or the cities regarding land use and planning matters; however, the district does develop drainage plans for entire watersheds that cross jurisdictional boundaries. These drainage plans specify the

flood control improvements needed to serve planned development in the area and are used to set drainage fees assessed against new development. Portions of the inventory area, mainly along creeks and the Delta shoreline, lie within the 100-year floodplain as designated by the Federal Emergency Management Agency (FEMA). These areas are illustrated and discussed in the Contra Costa General Plan EIR (Contra Costa County2005).

3.6.5 Surface Water Quality

Both the Central Valley and San Francisco Bay RWQCBs regulate water quality in the project area. The Central Valley RWQCB has jurisdiction over drainages that discharge to the Sacramento and San Joaquin Rivers. The San Francisco Bay RWQCB regulates water quality of the San Francisco Bay from Suisun Bay to the ocean. The West Antioch Creek, Marsh Creek, Kellogg Creek, Brushy Creek, and East County Delta drainages are under the jurisdiction of the Central Valley RWQCB. The San Francisco Bay RWQCB manages Kirker, Willow, and Mt. Diablo Creeks. Both RWQCBs have established water quality standards and objectives in their respective Basin Plans. The Central Valley RWQCB Basin Plan designates the following beneficial uses for the Sacramento–San Joaquin Delta: municipal and domestic supply, irrigation, industrial uses, recreation, freshwater habitat, migration corridors, warm-water spawning, wildlife habitat, and navigation. Marsh Creek and Marsh Creek Reservoir are designated to support recreation, and freshwater and wildlife habitat (Central Valley Regional Water Quality Control Board 1998). The San Francisco Bay RWQCB designates the following beneficial uses for Mt. Diablo Creek: wildlife habitat, freshwater habitat, spawning, migration corridors, and recreation (San Francisco Regional Water Quality Control Board 1995).

SWRCB designates water bodies that do not meet water quality standards in accordance with CWA Section 303(d). Marsh Creek, Marsh Creek Reservoir, and Dunn Creek are listed as impaired by mercury and metals from past mining practices. The San Joaquin River is listed for agricultural sources of boron, chlorphyrifos, DDT, diazinon, electrical conductivity, Group A pesticides, mercury, selenium, and other unknown toxicity. Mt. Diablo Creek is listed for diazinon from urban runoff. The Suisun Bay is listed as impaired by chlordane, DDT, diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, nickel, PCBs, and selenium mainly from atmospheric deposition and nonpoint sources (U.S. Environmental Protection Agency 2003).

3.6.6 Groundwater Quality

The quality of shallow groundwater is largely dependent on the quantity and quality of surface water that percolates into the ground and the subsequent chemical interactions that take place with the soil's bedrock within the saturated aquifer layers. Factors that affect the susceptibility of shallow groundwater to contamination include the type of soil and water-bearing materials, permeability of the soil to surface water infiltration, location of pollutant sources, and depth to

the aquifer. Potential sources of shallow groundwater contamination include agricultural application of fertilizers and pesticides, hazardous material spills from industrial and commercial processes, septic tank leachate, infiltration of contaminated urban stormwater runoff, and disposal of municipal wastewater.

Groundwater quality data from wells sampled within the project area indicate high total dissolved solids (TDS) and nitrates in some areas (California Department of Water Resources 2003). These levels fall within state drinking water standards and are typical of groundwater.

3.7 Socioeconomics and Environmental Justice

3.7.1 Regulatory Setting

General Plans

The County and the cities in the inventory area have general plans that contain policies intended to guide growth within their respective jurisdictions. The proposed HCP/NCCP assumes full build-out of the developable land within the ULLs of the cities. Accordingly, only the County's General Plan policies are applicable to the proposed Plan as they relate to the acquisition of land and easements. General Plan land use policies are described in detail in Section 3.3, *Land Use.*

California Land Conservation Act (Williamson Act)

The California Land Conservation Act of 1965—more popularly known as the Williamson Act—allows local governments to enter into 10-year contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. The intended purpose of the Act is to prevent premature and unnecessary conversion of farmland to urban uses. In return, landowners receive property tax assessments that are lower than normal because they are based on farming and open space uses rather than on full market value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. Williamson Act contracts are automatically renewed unless the landowner files a notice of nonrenewal.

3.7.2 Demographics

The project area is located in Contra Costa County, the ninth most populous county in California. Table 3.7-1 shows the Association of Bay Area Governments (ABAG) population projects for the project area from 1990 through 2025 (Association of Bay Area Governments 2002). The annual growth rate for

the County as a whole during this period is expected to be 1.76%. The unincorporated county areas are expected to experience a growth rate somewhat lower than the county as a whole (1.18%), and the Cities of Brentwood and Oakley are expected to experience higher growth rates (5.70% and 2.27%, respectively).

Table 3.7-1. Association of Bay Area Governments Population Projections

	Total Population						
Jurisdiction	1990	2000	2005	2010	2015	2020	2025
Antioch	62,195	90,532	94,000	101,700	107,900	114,600	117,500
Brentwood	7,563	23,302	29,700	36,400	43,000	48,500	52,700
Clayton	7,317	10,762	11,100	11,700	12,200	12,800	13,500
Oakley	18,374	25,619	30,400	33,400	36,300	38,800	40,300
Pittsburg	47,607	56,769	61,600	69,200	76,300	82,700	85,100
Unincorporated County	134,602	151,690	165,800	179,000	188,400	198,100	202,900
Contra Costa County	277,658	358,674	392,600	431,400	464,100	495,500	512,000

Source: Association of Bay Area Governments Projections 2002.

Table 3.7-2 shows comparative racial characteristics for the state, county, and cities in the project area as reported in the 1990 and 2000 Censuses. The data show a trend toward increased diversity of the county's population, with relatively large increases in the Hispanic and Asian/Pacific Islander share of the population over the 10-year period between censuses.

Table 3.7-2. Contra Costa County Population Racial Characteristics—1990 and 2000 Censuses

			Percent of Total	
Racial Group	1990	2000	1990	2000
County Total:	803,732	948,816		
White	561,040	557,339	69.80%	58.74%
Hispanic	91,284	167,526	11.36%	17.66%
Asian & Pacific Islander	73,946	120,596	9.20%	12.71%
Black or African American	73,012	92,689	9.08%	9.77%
American Indian & Alaska Native	4,450	10,666	0.55%	1.12%

Table 3.7-3 and Table 3.7-4 present additional demographic and economic characteristics of the inventory area. These data show that the county's

population is older on average than the state's population. However, with the exception of Clayton, the cities in the inventory area have a younger population than the state as a whole. Clayton's population has a notably higher average age than both the state and county. Household size in the project area is generally higher than in both the state and county.

Table 3.7-4 shows that income characteristics vary considerably among the cities in the project area, with Pittsburg and Antioch below, Brentwood and Oakley slightly above, and Clayton well above the county's median income.

Vacancy rates, which are a good indicator of the demand for housing, are relatively low in the inventory area. The vacancy rates reported in the 2000 Census range from 1.0% in Clayton to 3.7% in Oakley; vacancy rates are generally consistent with the county rates and below the state rates.

Table 3.7-3. Demographic Characteristics of the Project Area

	California	Contra Costa County	Antioch	Brentwood	Clayton	Oakley	Pittsburg
Median age (years)	33.3	36.4	32.3	32.7	40.2	31.5	30.9
Average household size (persons)	2.87	2.72	3.07	3.1	2.76	3.26	3.17

Source: U.S. Bureau of the Census 2000.

Table 3.7-4. Economic Data for the Project Area

	California	Contra Costa County	Antioch	Brentwood	Clayton	Oakley	Pittsburg
Median income (1999)	47,493	63,675	60,359	69,198	101,651	65,589	50,557
Income below poverty level	14.2%	7.6%	8.5%	5.8%	2.6%	5.0%	11.5%
Total housing units	12,214,549	354,577	30,116	7,788	3,924	7,946	18,300
Percent vacant	5.8%	2.9%	2.6%	3.7%	1.0%	1.4%	3.1%

Source: U.S. Bureau of the Census 2000

3.7.3 Agricultural Activities

Contra Costa County ranked thirty-seventh out of California's 58 counties in total agricultural production in 2001 (California Agricultural Statistics Service 2001). In 2001, Contra Costa County had a total employment of 477,391 workers; of these, 2,618 (0.55%) were employed in farm-related jobs. In 2002, the county contained approximately 273,000 acres of agricultural land, of which

172,000 acres were grazing land. The 1997 Census of Agriculture reported that between 1992 and 1997, the number of full-time farms in the county decreased 14%, from 336 to 289. (U.S. Department of Agriculture 2004.)

The total value of agricultural production for Contra Costa County in 2001 was $97,515,000. Approximately one-fourth of the agricultural production was livestock related, and the remainder was crops. The County's net income from farm operations in 2001 was $503,000 (Bureau of Economic Analysis 2004). Table 3.7-5 shows the county's top 10 agricultural commodity groups based on their share of the gross value of agricultural production in 2001.

Table 3.7-5. Top Agricultural Commodities for 2001

Commodity Group	Gross Value ($000)	Percent of Total
Nursery, Bedding Plants	26,921	27.6%
Livestock Products	8,670	8.9%
Corn, Sweet	8,652	8.9%
Grapes	7,201	7.4%
Cattle and Calves	6,953	7.1%
Pasture and Range	4,533	4.6%
Nursery, Herbaceous Perennials	3,842	3.9%
Tomatoes	3,518	3.6%
Apples	3,270	3.4%
Vegetable Crops	2,670	2.7%

Source: California Agricultural Statistics Service, 2001.

3.8 Geology, Soils, and Seismicity

3.8.1 Regulatory Setting

Clean Water Act

The federal CWA is discussed in detail in Section 3.6, *Hydrology and Water Quality*. Because CWA Section 402 is directly relevant to earthwork, additional information is provided here. Amendments to the CWA in 1987 added Section 402[p], which establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES program. As described in Section 3.6, the EPA has delegated to SWRCB the authority for the NPDES program in California, where it is implemented by the state's nine RWQCBs. Under the NPDES Phase II Rule, any construction activity disturbing 1 acre or more must

obtain coverage under the state's General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). General Permit applicants are required to prepare an NOI stating that stormwater will be discharged from a construction site, as well as a SWPPP that describes the best management practices (BMPs) that will be implemented to avoid adverse effects on receiving water quality as a result of construction activities, including earthwork.

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (PRC Sec. 2621 *et seq*.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (earthquake fault zones). It also defines criteria for identifying active faults, giving legal weight to terms such as *active*, and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones.

Under the Alquist-Priolo Act, faults are zoned and construction along or across them is strictly regulated if they are *sufficiently active* and *well-defined*. A fault is considered *sufficiently active* if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the Act as referring to approximately the last 11,000 years). A fault is considered *well-defined* if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface using standard professional techniques, criteria, and judgment (Hart and Bryant 1997).

Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (PRC Sec. 2690–2699.6) is intended to reduce damage resulting from earthquakes. The Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction, and seismically induced landslides. Through provisions of the Act, the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards; and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been carried out and measures to reduce potential damage have been incorporated into the development plans.

Contra Costa County Ordinances

County grading permits are required prior to performing any ground-disturbing activity within the county. Grading permits are granted only after a qualified professional has conducted a thorough assessment of the land and made recommendations for building.

3.8.2 Topography

Topography in the inventory area comprises three general physiographic regions that have been formed through a complex geologic history. These regions are the highlands of the Coast Ranges, the intermountain valleys, and the Sacramento–San Joaquin Delta. Elevations in the inventory area vary due to the complex history of the region, ranging from Delta islands that are at or below sea level near Brentwood and Oakley, to the 3,849-foot peak of Mount Diablo. Most of the mountain valleys are geologically young, and the foothills generally have slopes from gentle to steep.

Geologic features in the inventory area include a part of the Coast Ranges, which trend northwest-southeast and have formed over millions of years as a result of uplift along the San Andreas Fault and several of its subsidiary faults, including the San Pablo and Hayward Faults (Alt and Hyndman 2000). Movement continues to occur along the faults, subjecting the area to frequent moderate to large earthquakes.

The dominant geologic features in the inventory area are the Franciscan Complex and the Great Valley Sequence. The Franciscan Complex is a poorly understood assortment of sedimentary and other rocks that were deposited along with basalt flows on the ocean floor. The Great Valley Sequence is characterized by oceanic sediments of the same age as the rocks of 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 has resulted in extremely diverse soils, hydrology, and topography.

3.8.3 Soils

Soil types in the inventory area are highly variable due to the complex geology and topography of the region. The Contra Costa County general soils map (Soil Conservation Service 1977) identifies 14 soil associations (distinctive patterns of soils in defined proportions) in the county. The inventory area contains all of these listed soil associations, except the Joice-Reyes association, which consists of saline mucks and silty clays in saltwater marshes and tidal flats. Alluvial, sedimentary, and meta-sedimentary sources have formed most of the soils in the inventory area throughout history.

Expansive soils (soils that are prone to shrinking or swelling) are found throughout the inventory area (Soil Conservation Service 1977). The degree to which a soil will undergo changes in volume depends on the moisture and clay content of the soil.

The liquefaction potential in most of the inventory area is considered low, and in some areas moderate to low (Contra Costa County2005).

3.8.4 Geologic Hazards

East Contra Costa County is an area of high seismicity. The San Francisco Bay Region, in which the county is located, has experienced 10 severe (6.5 magnitude or greater) earthquakes during historic time. Although there are many faults in the county, the Greenville Fault is the only zoned fault that runs through the inventory area. The Greenville fault has historically experienced a surface rupture and, according to the Contra Costa County General Plan, was the cause of a "damaging earthquake" in 1980 (Contra Costa County 2005).

Land slopes greater than 15% are generally not considered suitable for types of buildings that require substantial grading or other land disturbances. Much of the inventory area is on slopes of 26% or more, and landslide deposits are scattered throughout the area. Slopes of 26% or more are not zoned for buildings in order to prevent hazards from occurring on these slopes (Contra Costa County 2005).

3.9 Cultural Resources

Cultural resources are districts, sites, buildings, structures, objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and culture. For the purposes of this EIR/EIS, cultural resources include existing and/or potential historic and prehistoric archaeological sites, historic buildings and structures, Native American traditional cultural properties (TCPs), and paleontological sites. Cultural resources are divided into three groups: archaeological resources, ethnographic resources, and the historic built environment (architectural resources).

3.9.1 Regulatory Setting

Federal Regulations

NEPA requires that federal agencies assess whether federal actions would result in significant effects on the human environment. The Council on Environmental Quality's (CEQ's) NEPA regulations further stipulate that identification of significant effects should incorporate "the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or

eligible for listing in the National Register for Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources" (40 CFR 1508.27[b][8]).

The National Historic Preservation Act of 1966 and its implementing regulations (36 CFR Part 800, as amended in 1999) also require federal agencies and entities they fund or permit to consider the effects of their actions on properties that may be eligible for listing or are listed in the National Register of Historic Places (NRHP). To determine whether an undertaking could affect NRHP-eligible properties, cultural resources—including archaeological, historical, and architectural properties—must be inventoried and evaluated.

The Section 106 review process involves a four-step procedure.

- Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties.
- Identify historic properties by determining the scope of efforts, identifying cultural resources, and evaluating their eligibility for inclusion in the NRHP.
- Assess adverse effects by applying the criteria of adverse effect to historic properties (resources that are eligible for inclusion in the NRHP).
- Resolve adverse effects by consulting with the State Historic Preservation Officer (SHPO) and other consulting agencies, including the Advisory Council if necessary, to develop an agreement that addresses the treatment of historic properties.

According to Section 106 of the NHPA, an undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register (36 CFR, Part 800.9[a]). An effect is considered adverse when the effect on an NRHP-eligible property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include the physical destruction of all or part of the property (36 CFR, Part 800.9[b]).

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (NAGPRA) (Title 25, USC, § 3001 *et seq.*), in addition to requiring federal agencies and federally funded projects to document Native American human remains and cultural items within their collections and providing an opportunity for repatriation of these materials, requires federal agencies to develop plans for dealing with potential future collections of Native American human remains and associated funerary objects, sacred objects, and objects of cultural patrimony that are discovered as a result of projects funded or overseen by the federal government

State Regulations

CEQA requires that public or private projects financed or approved by state or local public agencies be assessed to determine their potential to affect historical resources. CEQA uses the term *historical resources* to include buildings, sites, structures, objects, or districts, each of which may have historical, pre-historical, architectural, archaeological, cultural, or scientific importance. CEQA states that if implementation of a project would result in significant effects on historical resources, then alternative plans or mitigation measures must be considered; however, only significant historical resources need to be addressed (14 CCR 15064.5, 15126.4). Therefore, before impacts and mitigation measures can be identified, the significance of historical resources must be determined.

The state's CEQA guidelines define three ways that a property may qualify as a historical resource for the purposes of CEQA review.

- The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
- The resource is included in a local register of historical resources, as defined in Section 5020.1[k] of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of section 5024.1[g] of the Public Resources Code, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (California Code of Regulations, Title 14, Division 6, Chapter 3, section 15064.5[a]).

Each of these ways of qualifying as an historical resource for the purpose of CEQA is related to the eligibility criteria for inclusion in the CRHR (PRC 5020.1[k], 5024.1, 5024.1[g]). A historical resource may be eligible for inclusion in the CRHR if it meets any of the following conditions.

- The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- The resource is associated with the lives of persons important in our past.
- The resource embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- The resource has yielded, or may be likely to yield, information important in prehistory or history.

Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC 5024.1[d][1]).

According to CEQA, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant impact on the environment (14 CCR 15064.5[b]). Under CEQA, a *substantial adverse change* in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. Actions that would *materially impair* the significance of a historic resource are any actions that would demolish or adversely alter the physical characteristics that convey the property's historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC 5020.1[k] and 5024.1[g].

California Health and Safety Code—Treatment of Human Remains

Under Section 8100 of the California Health and Safety Code, six or more human burials at one location constitute a cemetery. Disturbance of Native American cemeteries is a felony (Health and Safety Code Sec. 7052).

Section 7050.5 of the Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the County Coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the Coroner must then contact the Native American Heritage Commission (NAHC), which has jurisdiction pursuant to Section 5097 of the California Public Resources Code.

When human remains are discovered or recognized in any location other than a dedicated cemetery, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains may take place until the County Coroner has been informed and has determined that no investigation of the cause of death is required; and, if the remains are of Native American origin, either

- the descendants of the deceased Native American(s) have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or
- the NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

3.9.2 Archaeological Resources

Prehistoric Context

Prehistoric resources are physical properties that result from human activities that predate European contact with native peoples in America. Prehistoric archaeological sites may include villages, campsites, lithic or artifact scatters, fishing sites, roasting pits/hearths, milling features, rock art (petroglyphs/ pictographs, intaglios), rock features, and burials.

A systematic survey of Contra Costa County has not been conducted; most of the documented sites have been found during investigations for development proposals. Based on the archaeological and ethnographic documentation, the area may contain several kinds of archaeological resources.

- Shell middens or refuse heaps associated with permanent settlement or camping sites.
- Fire pits or hearths associated with resource processing stations.
- Human remains and grave goods from burial grounds.
- Lithic material from tool-manufacturing loci.
- Bone and stone tools.
- Rock piles.

An archaeological sensitivity map was prepared for the Contra Costa County General Plan to conceptually illustrate areas of varying archaeological sensitivity within the county (Contra Costa County 2005). This map is intended to be used by the County as a planning tool for determining future survey requirements imposed upon development applications. The map divides the County into five sensitivity categories.

- Extremely Sensitive Areas—known sites.
- Highly Sensitive Areas—areas with a high probability for sites, such as areas near water or along streamcourses.
- Medium-Sensitivity Areas—areas where sites may be found due to proximity to highly sensitive areas, such as the plains area between two stream corridors that may have been used for hunting, butchering camps, hunting blinds, or food processing sites.
- Moderately Sensitive Areas—areas with a higher probability of subsurface resources due to deposition. This category generally encompasses the plains and Delta area, and is divided into two subcategories: areas showing surface manifestation of use and areas where indications of prehistoric use would most likely be buried. Because of the deposition that has occurred in this part of the County, subsurface monitoring should be conducted as a condition of [General] Plan approval.

- Low-Sensitivity Areas—areas designated as low sensitivity are mainly ridgetops, which may contain special-use sites. Low-sensitivity areas would not require as intense an archaeological reconnaissance as required for the above categories but, as a condition of [General] Plan approval, a reconnaissance for outcrops, caves, quarries, or other features that may yield information should be conducted.

While no sites from the prehistoric period have been found in the Bay Area, it is reasonable to assume that Paleo-Indian and Lower Archaic Indians inhabited. It is likely they lived near the shore or along watercourses that have since been submerged and silted over. It is also reasonable to assume that inland areas were exploited on a short-term basis for hunting and gathering purposes, leaving little evidence of archaeological resources. Temporary seasonal use camps may have been established near water sources, which have also been altered by sea level changes.

Evidence for relatively intensive use of the Los Vaqueros region during the past 2,000 to 1,500 years is more substantial (Bramlette 1987, 1988, 1989), including obsidian flakes and tools indicating expansion in land use from a valley focus to include the uplands. Detailed overviews of the San Francisco Bay and Central Valley archaeological regions can be found in Eidsness (1986), Frederickson (1982), and Moratto (1984).

The beginning of the development of the cultures that were in place at contact with the Spanish was approximately 1500 B.P. The three different language groups inhabiting Contra Costa County at that time were the Coastanoan (Ohlone), Bay Miwok, and Northern Valley Yokuts.

The Coastanoans inhabited the western hills, plains and the Bay shore from Carquinez south to Salinas. All of the village sites were associated with a permanent source of fresh water, many located at the mouth of streams along the Bay shore. A number of villages were also established inland along permanent streams and at the base of the hills at the 50 to 150 meter elevation. Special use and seasonal use sites were established throughout their territories, often in association with rock outcrops or abundant food sources.

The Bay Miwok inhabited the western slopes of the Diablo range, the inland valleys, and the northern coastal plains. Their largest villages were located in the San Ramon Valley.

The Northern Valley Yokuts controlled the eastern slopes of the Diablo range to the San Joaquin River. Evidence indicates that the Yokuts were the last to arrive in the Bay Area. Their primary villages were located along the San Joaquin River, with only scattered use of the eastern plains and smaller secondary villages in the inland valleys.

Ethnographic resources include sites, areas, and materials important to American Indians for religious, spiritual, or traditional uses. These resources can encompass the sacred character of physical locations (mountain peaks, springs, and burial sites) or particular native plants, animals, or minerals that are gathered

for use in traditional ritual activities. Also included are villages; burials; rock art; rock features; and traditional hunting, gathering, and fishing sites. Ethnographic resources can be eligible for listing in NRHP if certain criteria are met (refer to National Register Bulletin 38 – Guidelines for Evaluating and Documenting Traditional Cultural Properties – Parker and King 1990).

Ethnographic resources that meet the definition set forth in Executive Order (EO) 13007 can be considered sacred sites. Activities that might affect accessibility to or availability of materials used in traditional practices are subject to EO 13007. In some cases, ethnographic resources may overlap prehistoric or historic archaeological resources, or they may be embedded within each other.

3.9.2 Historic Context

Historical archaeological sites consist of the physical remains (unoccupied ruins) of structures or built objects that result form the work of European Americans. These physical remains must be more than 50 years old and postdate contact between Europeans and Native Americans. Historic archaeological sites may include townsites, homesteads, agricultural or ranching features, mining-related features, and refuse concentration. These resources are generally standing structures that are currently occupied or are being preserved from deterioration and rehabilitated to accommodate occupation and use.

Historic properties in the proposed HCP/NCCP inventory area are primarily related to the history of settlement during the Spanish and Mexican periods of California history, and early agricultural and mining features. Review of the literature suggests the proposed HCP/NCCP inventory area may contain as-yet-unidentified historic resource materials, including materials related to the early agricultural industry, establishment of homesteads and farms, road building, railroad construction, and development of maritime industries.

The proposed HCP/NCCP inventory area includes land studied in earlier cultural resource studies (Frederickson 1982; Miliken 1986; Bramlette et al. 1988; Frederickson et al. 1988); each of these studies contains a comprehensive overview. Sections of the following overview were excerpted from Bramlette et al. (1988).

Spanish Period: 1769–1822

In 1772, the first Spanish party explored lands in present-day Contra Costa County with subsequent expeditions between 1776 and 1807 also traveling through eastern Contra Costa County. In 1776, Mission Dolores was established in San Francisco, leading to the missionization of the Indian cultures, plagues, and the subdivision of the area into ranches.

Mexican Period: 1822 –1848

Between 1834 and 1846, more than 800 patents of land constituting more than 12 million acres were issued to individuals by the Mexican government (Lavender 1976:30). Sixteen of the final 813 grants were in the current boundaries of Contra Costa County (Beck and Haase 1988:30). Of the 16 land grants in Contra Costa County, 2 occur within the study area—Rancho Los Meganos and Canada de los Vaqueros.

In 1837, John Marsh purchased Rancho Los Meganos and planted a vineyard and an orchard, and sowed the first wheat fields in Contra Costa County (Munro-Fraser 1882:55; Hoover et al. 1966:59). Marsh constructed a stone mansion on the site, approximately 6 miles west of Byron on the current Marsh Creek Road. The John Marsh House is listed on the NRHP.

Early American Period: 1848–1878

On 7 July 1846, following the declaration of war between the United States and Mexico, California was claimed for the United States, catalyzing the first major exodus to California. As part of the "Delta triangle" and Central Valley prairie, the proposed HCP/NCCP inventory area was a region of extensive natural grasslands and savannahs suitable for raising livestock (Davis 1962:57; MacDiarmid 1976). Additional immigrants arrived throughout the County during and after the California gold rush of 1848 (Smith and Elliot 1879:4).

The public land in the study area was surveyed in the 1860s and 1870s, opening the area to permanent settlement. Many of the odd-numbered sections within the inventory area were granted to Western Pacific Railroad. Land in the low-lying eastern portion of the study area was purchased under provisions of the State of California-sponsored Swamp Acts, which reclaimed Delta and put them into production.

Commercial coal mining began in eastern Contra Costa County during the mid-1860s. The principal mines lay in the hills to the south of Pittsburgh and Antioch; however, another seam was discovered in the western portion of the Los Meganos Land Grant (Munro-Fraser 1882:69). The Mount Diablo Coal Field within the EBRPD Black Diamond Mines Regional Park south of Pittsburg is listed on the CRHP and NRHP.

Later American Period: 1878–1940

California irrigation districts started incorporating in 1887 with the passage of the Wright Act. The development of irrigation technology facilitated a substantial change in the types of crops produced in California. Much of the acreage previously devoted to wheat was changed to orchard products (Beck and Williams 1972:283).

Concomitant with the growth of irrigation technology, 1870 was the decade during which many rail lines had been laid down throughout Central California. This allowed widespread transportation of agricultural products (Russo and McBride 1979). The towns of Brentwood and Byron, both within one-half mile of the study area, were established as railway stations for the new Southern Pacific and Tulare Line.

In the late 1910s, the Balfour-Guthrie Company constructed modern irrigation systems taking water from the San Joaquin River and distributing it through a system of canals and pumping stations throughout Contra Costa County. This began an expansion of orchard and produce production in the region.

3.10 Transportation and Circulation

This section provides an overview of the existing transportation networks and applicable transportation regulations within the inventory area.

3.10.1 Regulatory Setting

Individual cities in Contra Costa County have jurisdiction over their respective city streets and city-operated traffic signals. The State of California Department of Transportation (Caltrans) has authority over the state highway system, including mainline facilities, interchanges, and aerial state routes. Caltrans approves the planning and design of improvements for all state-controlled facilities. Transit service providers in Contra Costa County have jurisdiction over their services. These include Bay Area Rapid Transit (BART), Tri-Delta Transit, and County Connection. Several regional agencies, including the Contra Costa Transportation Authority (CCTA), TRANSPLAN Regional Transportation Planning Committee, and the Metropolitan Transportation Commission (MTC) coordinate and establish funding priorities for intra-regional transportation improvement programs.

In response to the rapid growth and a growing environmental awareness in Contra Costa County, Measure C was adopted by voters in 1990. The Measure established a 65/35 Land Preservation Standard, which limited urban development to 35% of the county while preserving 65% for open space, agriculture, parks, wetlands, and other non-urban uses. Measure C also created a ULL, which prohibits the County from approving urban land uses beyond the ULL (Contra Costa County 2005). In 2000, the County Board of Supervisors amended the ULL, excluding more than 14,000 acres previously available for development; more than half of the affected lands were in the East County (and within what is now the HCP/NCCP inventory area). Several cities in the inventory area disagreed with and filed litigation against the decision of the Board of Supervisors to retract the ULL and have proposed amending the ULL again to include areas where the cities may consider growth. The ULL and a variety of other growth-related topics are a focus of the “Shaping Our Future”

process, a cooperative planning effort involving the County and all cities in the County.

The Contra Costa Transportation Authority sales tax extension Measure J, approved by the voters in 2004, will fund a variety of transportation projects in East County, including the completion of capacity and safety enhancements to Vasco Road, the State Route (SR) 4 Bypass, Byron Highway, and the existing Route 4 through Brentwood, Oakley, and unincorporated areas. According to Measure J-2004, "corridors lying outside of the 2004 boundary of the Contra Costa County ULL, in effect as of May 26, 2004 (the ULL), local sales tax funds may be allocated by the Authority only to fund environmental reviews, route adoption studies, right of way protection and safety improvements. Funds may be used to fund safety and operational improvements, and potentially consider realignment where warranted" (State Route 4 Bypass Authority 2004).

The CCTA oversees transportation improvements included in the Measure C Growth Management Program. Measure C requires CCTA to adopt a Contra Costa Countywide Comprehensive Transportation Plan (CTP) and update it every other year. The 2004 Update includes a list of programmed/under construction and future transportation projects in the Central/East Contra Costa County Travel Corridor, including MTC Regional Transportation Plan (RTP) projects (see below). Table 3.10-1 summarizes these projects. Some of the Measure C transportation improvement projects overseen by CCTA are also developed directly by CCTA, while others are administered by cities, the County, or transit districts, and funded by CCTA. Numerous Measure C projects are located in the inventory area, the majority along SR 4.

In addition, CCTA is the congestion management agency (CMA) that sets state and federal funding priorities for improvements that affect the Contra Costa County Congestion Management Program (CMP) roadway system. Multiple roadways in the County, including SR 4, comprise this system. The CCTA updates the County CMP every other year. The CMP includes a 7-year Capital Improvement Program (CIP) that includes a list of those roadway, transit, and trail projects that have committed funding; those proposed for funding through MTC's RTP process; Traffic System Management (TSM) projects; Transportation Fund for Clean Air (TFCA) projects; and those developer-funded projects where funding through fee programs is imminent.

TRANSPLAN is the regional transportation planning committee for eastern Contra Costa County and comprises the Cities of Antioch, Brentwood, Oakley, Pittsburg, and unincorporated Contra Costa County. Each jurisdiction provides one elected official to serve on the TRANSPLAN committee. Pursuant to Measure C requirements, the committee develops Action Plans, which include measures and programs for mitigation of regional traffic impacts. TRANSPLAN Action Plans are incorporated with Action Plans from other regional transportation planning committees to form the CCTA CTP.

MTC is the regional transportation planning agency for the Bay Area. MTC is the clearinghouse for state and federal funds for transportation improvements; each county's CMA is responsible for providing MTC with a capital

improvement list. MTC reviews the lists provided by the nine Bay Area counties and submits a regional priority list to the California Transportation Commission (CTC) and/or the Federal Highway Administration (FHWA). CTC and/or FHWA then selects projects to receive funding. The 2001 MTC RTP for the San Francisco Bay Area identifies transit projects in the Delta travel corridor, which includes East Contra Costa County. Projects with committed funding in this corridor include multiple SR 4 improvements, SR 160 improvements, and other local road improvements.

Table 3.10-1. Programmed and Planned Transportation Projects in the State Route 4 Central/East Corridor

Project	Summary
Programmed/Under Construction	
Pittsburg/Bay Point BART	400 new parking spaces and lighting improvements
Wilbur Avenue Widening	Two to four lanes from Burlington Northern Santa Fe Railroad to Route 160
Lone Tree Way Widening	Four to six lanes from SR 4 Bypass to Fairview Avenue in Brentwood
Laurel Road Extension	From Route 4 Bypass to Laurel Road East
Regional Express Bus Program	Brentwood to Pittsburg/Bay Point BART station
SR 4/Railroad Avenue and Loveridge Road	Interchange improvements and highway widening from Railroad Avenue to Hillcrest Avenue (six mixed-flow lanes and two high-occupancy vehicle [HOV] lanes between Railroad Avenue and Loveridge Road)
Panoramic Drive Extension	From North Concord BART station to Willow Pass Road
SR 4 Bypass, Segment 1	Complete interchanges at Laurel Road and Lone Tree Way
SR 4 Bypass, Segment 2	Widen to four lanes from Lone Tree Way to Balfour Road
Track 1 of the Regional Transportation Plan	
eBART	Right-of-way acquisition for rail service east from Pittsburg/Bay Point BART station to Byron
Eastbound Hillcrest Avenue offramp widening	From one to two lanes and add an SR 4 eastbound auxiliary lane in Antioch
SR 4 non-capacity increasing improvements to interchanges and parallel arterials	
SR 4 upgrade	To full freeway from I-80 to Cummings Skyway (Phase 2)
SR 4 widening	From four to eight lanes from Loveridge Road to west of Somersville Road with HOV lanes; from four to six lanes from Somersville Road to Route 160 with reversible HOV lane in median (interim project)
SR 4 bypass, segment 1	Route 160 freeway-to-freeway connectors to and from the north
Vasco Road safety improvements	Realign roadway to improve sight distance and add shoulders (includes Alameda County portion)

Project	Summary
Other Future Projects	
Route 4 widening from Somersville Road to SR 160	From four to eight lanes with HOV lanes from Somersville Road to Hillcrest Avenue, and four to six lanes (mixed-flow) from Hillcrest Avenue to SR 160. Includes improvements to interchanges at Somersville Road, Contra Loma, A Street, and Hillcrest Avenue (interim version of this project is in Track 1)
SR 239 (Brentwood–Tracy Expressway)	Construction of a new state route connecting SR 4 to Interstate 205 and 580 near Tracy
Vasco Road Widening	From 2 to 4 lanes from the SR 4 Bypass south to the Contra Costa County/Alameda County line
Byron Highway Widening	From Delta Road, northeast of the City of Brentwood, to the Contra Costa/Alameda County line; also includes intersection widenings, railroad crossing upgrades, and roadway shoulders
Brentwood Boulevard Corridor Improvements	Widening of non-freeway portion of SR 4
SR 4 Direct Connectors	Construction of direct connectors at the SR 4 Bypass/SR 160 interchange; mainline widening from four to six lanes and interchange modifications at Laurel Road and Lone Tree Way
SR 4 Bypass	Widening to four lanes from Lone Tree Way to Vasco Road at Walnut Creek; freeway interchanges at Sand Creek Road; Balfour Road; Marsh Creek Road; Vasco Road at Walnut Creek
SR 4/Willow Pass Ramps	(if Naval Weapons station becomes available for development)

Source: 2004 Update of the Contra Costa Transportation Authority Contra Costa Countywide Comprehensive Transportation Plan.

3.10.2 Local Transportation System

Contra Costa County

Contra Costa County's transportation system consists of an interconnected network of federal, state, and county roads; regional transit systems; bikeways; elderly and handicapped transportation services; and air, water, and rail service. The county's roadway network includes I-80, I-580, I-680, SR 24, SR 242, and portions of SR 4. Numerous locally maintained arterials, streets, and roads comprise the remainder of the network. BART is the primary form of public mass transit in Contra Costa County. BART provides connections to Alameda, San Francisco, and San Mateo Counties via multiple lines and stations. Bus service comprises the remainder of the county's mass transit system.

Other modes of transportation in Contra Costa County include intercity rail service and bikeways. AMTRAK provides intercity rail service to and from Contra Costa County. These trains travel along the Southern Pacific main line between Oakland and Martinez and across the Carquinez Strait to the Central

Valley. County bikeways include both on- and off-road facilities operated by the County, cities, or EBRPD.

City of Clayton

Clayton is situated in the larger regional circulation system of East Contra Costa County, east of I-680 and south of SR 4. In the Clayton area, the main arterials are Ygnacio Valley–Kirker Pass Road and Clayton Road, both of which carry traffic from east Concord and the Clayton area to I-680 and SR 24 for destinations in downtown Concord, Walnut Creek, Martinez, Pittsburg, Antioch, Alameda County, and San Francisco. Other important roadways in the Clayton area include Concord Boulevard, Marsh Creek Road, Pine Hollow Road, and Mitchell Canyon Road.

Alternative modes of transportation in the City of Clayton include bus service provided by CCCTA and van- and carpools.

City of Brentwood

SR 4 is the most predominant feature of the roadway system in the City of Brentwood. SR 4, referred to as Brentwood Boulevard within the City limits, passes directly through downtown. SR 4 a main route through eastern Contra Costa County. Other key routes within Brentwood include Marsh Creek Road, Balfour Road, Sellers Avenue, Walnut Boulevard, Deer Valley Road, and Lone Tree Way.

Alternative modes of transportation in the City of Brentwood include bus service provided by Tri Delta Transit and BART Express.

City of Oakley

Automobiles are the primary source of transportation in Oakley. No freeways lie within the Oakley city limits, although SR 160 borders the city limits to the west. The main arterial in Oakley is Main Street (SR 4), which connects with SR 160 to the west and Brentwood to the south. The remainder of roadways in Oakley consists of local streets and two-lane rural roads. Major intersections on Main Street are controlled with traffic signals; however, the majority of intersections in Oakley are controlled with stop signs. Tri-Delta Transit and school transportation services are the two primary types of public transportation that serve Oakley. Tri-Delta Transit maintains fixed route service between and within Oakley, Antioch, Pittsburg, and Brentwood. Additionally, bicycle facilities, including bicycle lanes on major roadways and multi-use paved trails, exist within Oakley.

City of Pittsburg

The transportation system in Pittsburg consists of the roadway system; public transportation; and alternative modes such as carpooling, bicycling, and walking. Multiple regionally significant roadways provide access to and from Pittsburg. These include SR 4, Pittsburg–Antioch Highway, Kirker Pass Road, Bailey Road, Leland Road, and Willow Pass Road. SR 4 bisects the city and connects Pittsburg to Highway 160 in East Antioch, Highway 242 and I-680 in Concord, and I-80 in Hercules. BART service through Contra Costa County terminates in Pittsburg at the Pittsburg/Bay Point station, located at the southwest quadrant of the SR 4/Bailey Road interchange. As discussed above, BART provides connections to Alameda, San Francisco, and San Mateo Counties via multiple lines and stations.

Additionally, local fixed-route bus service in Pittsburg is provided by Tri-Delta Transit and County Connection. Existing bicycle lanes that provide access throughout Pittsburg include those along East Leland Road, Loveridge Road, Harbor Street, Buchanan Road, and Crestview Avenue. The multi-use Delta De Anza Trail connects Pittsburg to neighboring communities.

3.11 Noise

This section describes the environmental and regulatory setting for noise, as well as background information on environmental acoustics and additional information on the terms used in noise analysis.

3.11.1 Terminology

Brief definitions of noise terminology used in this analysis are listed below.

Sound is a vibratory disturbance created by a vibrating object that, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism such as the human ear or a microphone.

Noise is sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Ambient noise is the composite of noise from all sources near and far in a given environment exclusive of particular noise sources to be measured.

A *decibel (dB)* is a unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-Pascals.

A-weighted decibel (dBA) is the overall frequency-weighted sound level in dB that approximates the frequency response of the human ear.

The *day-night level (Ldn)* is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m.

The *community noise equivalent level (CNEL)* is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7 p.m. to 10 p.m., and 10 dB added for the period from 10 p.m. to 7 a.m.

Maximum sound level (L_{max}) is the maximum sound level measured during the measurement period.

Minimum sound level (L_{min}) is the minimum sound level measured during the measurement period.

Equivalent sound level (L_{eq}) is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy.

Percentile-exceeded sound level(L_{xx}) is the sound level exceeded "xx" percent of a specific time period. For example, L_{10} is the sound level exceeded 10% of the time.

Sensitive receptors are land uses where people reside or locations where the presence of unwanted noise could adversely affect the use of the land. Noise-sensitive land uses typically include residences, hospitals, schools, libraries, and certain types of recreational facilities. Noise-sensitive land uses occur throughout the inventory area.

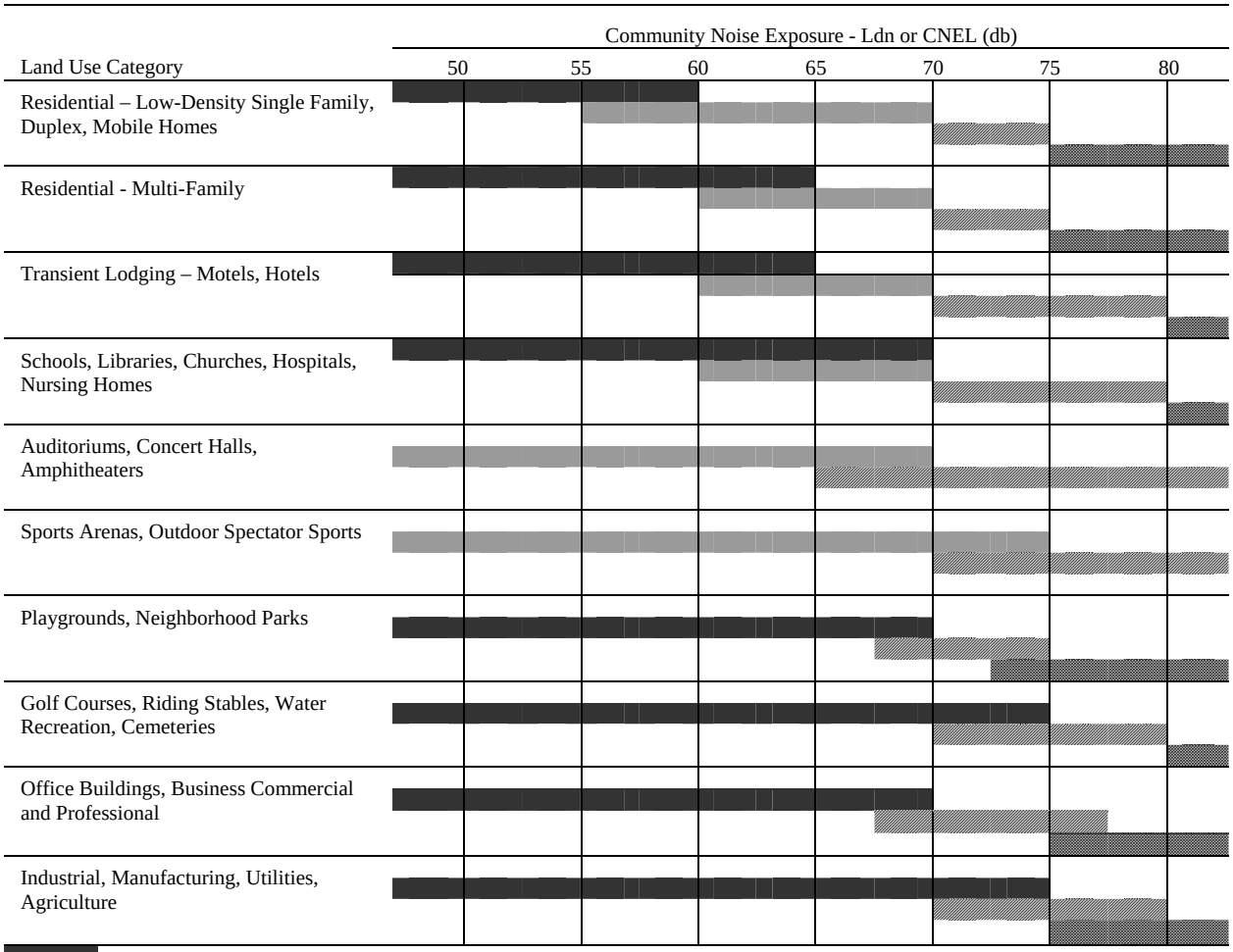
In general, most people cannot detect differences in sound levels of 1 to 2 dB, and a 3-dB change in sound level is generally perceived as being just noticeable. For most people, a 5-dB change is clearly noticeable. A 10-dB increase or decrease in sound level is perceived as a doubling or halving of sound level.

3.11.2 Regulatory Setting

California

California requires each local government to implement a noise element as part of its general plan. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. Table 3.11-1 lists the state land use compatibility guidelines.

Table 3.11-1. State Land Use Compatibility Standards for Community Noise Environment



Source: California Governor's Office of Planning and Research, November 1998.

Contra Costa County

Noise Element

The goals of the Contra Costa County Noise Element, as stated in the 1995–2010 General Plan, are to improve the overall environment, maintain appropriate noise conditions, and properly distribute the costs of noise control. The current standard for noise levels in residential areas of the county is 60 dB, except in

areas of train passbys, where it is 70 dB. Interior noise of new residential housing projects may not exceed 45 dB.

City of Clayton

Noise Element

As stated in the Clayton 2000 General Plan (City of Clayton 2000), the City's goal with regard to noise is to "maintain or improve the overall environment and general well-being of the community by reducing annoying levels of noise for all land uses in the City." The General Plan Noise Element maintains 60 dB as the acceptable noise level for single-family residential neighborhoods and all new developments, with an indoor noise level of 45 dB in similar neighborhoods and developments. The General Plan states that noise levels for all land uses in the city should not exceed 70 dB. The City also limits construction activities to between the hours of 7 a.m. and 5:30 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on weekends. Additionally, noise from homes should not exceed 55 dB at the property line, and home power equipment should be used only between the hours of 7:00 a.m. and 10:00 p.m.

Noise Ordinance

Chapter 15.01 of the City of Clayton's Municipal Code states that all "grading and excavation, construction, demolition, renovation, and other works of improvement, as well as onsite maintenance and servicing of equipment within the City may occur only during the hours of 7:00 a.m. and 5:00 p.m. Monday through Friday." Any work outside these hours must be authorized in writing by the city engineer, designee, or by project conditions of approval.

City of Oakley

Noise Element

According to the Oakley 2020 General Plan (City of Oakley 2002), the primary noise goal is to "protect residents from the harmful and annoying effects of exposure to excessive noise." The City has adopted a noise ordinance that disallows outdoor noise levels over 65 dB from transportation sources. However, some sections of SR 4 exceed these levels. Indoor noise levels from point sources in residential neighborhoods must not exceed 55 dB between the hours of 7:00 a.m. and 10:00 p.m., or 45 dB between the hours of 10:00 p.m. and 7:00 a.m.

Noise Ordinance

The City of Oakley's Noise Ordinance does not establish specific standards for noise. However, Section 12 of the City's municipal code states that "the making, creation, or maintenance of loud, unnecessary, unnatural, or habitual noises that are prolonged, unusual, and unnatural in their time, place, and use affect and are a detriment to the public health, comfort, safety, welfare, and prosperity of the residents of the City."

City of Pittsburg

Noise Element

The Pittsburg 2020 General Plan (City of Pittsburg sets forth three goals regarding noise. The first goal aims to "protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by preventing increased noise levels in the future." The next two goals encourage specific criteria to mitigate traffic noise along all routes except SR 4 and incorporate noise considerations into the City's land use plans. The City currently has regulations stating that indoor noise for noise-sensitive uses cannot exceed 45 dB. The City has also implemented restrictions on loud noises from construction sites adjacent to existing development, allowing such noises to occur only from 8:00 a.m. to 5:00 p.m.

Noise Ordinance

The City's noise ordinance does not establish explicit noise standards, but Chapter 9.44 of the City's municipal code states that pile drivers, steam shovels, pneumatic hammers, derricks, steam or electric hoists, or other similar equipment that makes a loud or unusual noise may operate only between the hours of 7:00 a.m. and 10:00 p.m. Additionally, the code requires that the exhaust of any steam engine, motorboat, stationary internal combustion engine, or motor vehicle be released through a muffler or other device that can effectively prevent loud or explosive noises from these devices (Ord. 668 C.S. § 12, 1974; prior code § 554).

City of Brentwood

Noise Element

The goals of the City of Brentwood General Plan Noise Element are "to protect noise-sensitive uses from the harmful and annoying effects of exposure to excessive noise and to preserve the rural noise environment of the City and surrounding areas."

Implementation Policy 1.2.5 in the City of Brentwood General Plan Noise Element states that construction activities near sensitive land uses should be limited to the hours of 9 a.m.–7 p.m. on weekdays, and 8 a.m.–7 p.m. on Saturday. Construction is prohibited on Sundays.

Noise Ordinance

The City's noise ordinance does not establish explicit noise standards, but Chapter 9.32 of the City's municipal code states that power construction equipment or outside construction work (including grading, trenching, or any other construction device that would create noise that exceeds the City's noise limits) shall be limited to the hours of 8:00 a.m.–5:00 p.m. Monday through Thursday, 9:00 a.m.–5:00 p.m. on Friday, and 9:00 a.m.–4:00 p.m. on Saturday.

Outside carpentry construction (including the operation of any mechanically powered saw, sander, drill, grinder, or similar tools that would exceed the City's established noise limits) shall be conducted only during the hours of 7:00 a.m.–7:00 p.m. Monday through Friday, and 9:00 a.m.–5:00 p.m. on Saturday (Ord. 696 § 2 (part), 2002).

California State Parks

The California State Parks system does not have regulations regarding noise impacts on campgrounds or other recreation areas. For purposes of CEQA, a significant adverse noise impact in the park system is defined as an increase above current levels that would be clearly noticeable and objectionable to park users.

East Bay Regional Park District

EBRPD has no defined guidelines for noise within its parks, but for CEQA purposes may follow guidelines similar to those of Caltrans (Olsen pers. comm.).

3.11.3 Existing Noise Sources

Primary mobile noise sources in the area include cars and trucks on roads and freeways, and the nearby railroads. Noise from industrial sources is not considered a significant source of noise in any of the cities.

Freeways and Arterial Roadways

Ambient noise from freeways and roads exists in each city. The main highway in East Contra Costa County is SR 4, which is the main source of ambient and

mobile noise. Arterial roadways for SR 4, many of which exceed local noise standards, also contribute to ambient noise.

The city of Clayton has additional ambient noise sources from roads. Gravel trucks on Mitchell Canyon Road going to and from the Lone Star Quarry are the primary source of this noise (City of Clayton 2000).

Railroads

Two railroads travel through the project area. The Burlington Northern & Santa Fe and the Union Pacific Railroad tracks pass through the Oakley, Pittsburg, and Brentwood, and are adjacent to residential neighborhoods. Noise levels from these railroads can reach unacceptable levels, affecting adjacent noise-sensitive uses. Noise from trains can reach levels up to 76.5 dB in some areas when the warning horn is used. Approximately 20 trains travel through the cities each day during both daytime and nighttime hours (City of Oakley 2002).

Because the railroad is not routed through Clayton, railroad noise is considered insignificant there.

The BART line that terminates at the Pittsburg-Baypoint station runs inside the median of SR 4, contributing to the general noise environment of SR 4. Seventy-five trains travel this line on a typical weekday, and noise levels from BART trains vary along the route. An extension of the Pittsburg-Baypoint line to Railroad Avenue is proposed; this extension would extend noise from BART 3 additional miles into the center of Pittsburg (City of Pittsburg).

Point Sources

A wide range of facilities that are point sources are located throughout eastern Contra Costa County. Point sources include the following.

- Commercial facilities (e.g., shopping centers, repair shops).
- Industrial facilities (e.g., refineries, metal fabrication shops).
- Transportation facilities (e.g., rail yards).
- Public works facilities (e.g., pump stations, corporate yards).
- Mining operations.
- Athletic fields.
- Event centers (i.e., Concord Pavilion).

3.12 Air Quality

This section describes existing baseline air quality information, including descriptions of topography and climate in the inventory area, federal and state air quality standards, existing air quality conditions in the inventory area, and the overall regulatory framework for air quality management in California and the region.

3.12.1 Regulatory Setting

Federal

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments (CAAA). The CAAA delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies.

EPA has established national Ambient Air Quality Standards (AAQS) for criteria pollutants (Table 3.12-1). Criteria pollutants include carbon monoxide (CO), nitrogen oxides (NO_X), sulfur dioxide (SO_2), ozone (O_3), particulate matter smaller than or equal to 10 microns in diameter (PM10), and lead (Pb).

If an area does not meet the federal AAQS shown in Table 3.12-1, federal clean air planning requirements specify that states develop and adopt State Implementation Plans (SIPs), which are air quality plans showing how air quality standards will be attained. In California, EPA has delegated authority to prepare SIPs to the California Air Resources Board (CARB), which in turn has delegated that authority to individual air districts.

State

CARB, which is part of the California Environmental Protection Agency (Cal-EPA), develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining state AAQS as set forth in the California CAAA of 1988 (Table 3.12-1). CARB is also responsible for developing emission standards for California vehicles. CARB maintains smoke management guidelines for prescribed burning[12].

[12] See http://www.arb.ca.gov/smp/regs/RevFinRegwTOC.pdf for these guidelines.

Local

At the local level, the Bay Area Air Quality Management District (BAAQMD) is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. BAAQMD has jurisdiction over the nine-county region of the San Francisco Bay Area Air Basin (SFBAAB). Air quality is also managed through land use and development planning practices.

BAAQMD maintains regulations for open burning within its jurisdiction. Regulation 5 forbids open burning with certain exceptions, including fires for cooking, recreation, fire training, and prescribed burning for vegetation management. Prescribed burning is defined in Section 5-213 as "the planned, controlled application of fire to vegetation to achieve a specific natural resource management objective(s) on land areas selected in advance of that application. The fire is conducted within the limits of a plan and prescription that describes both the acceptable range of weather, moisture, fuel, and fire behavior parameters to achieve the desired affects." Specific requirements for wildland vegetation management fires are provided.

3.12.2 Air Quality Pollutants

The federal and state governments have established AAQS for six criteria pollutants: O_3, CO, NO_x, SO_2, PM10, and Pb. O_3 and PM10 are generally considered to be regional pollutants, as these pollutants or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and Pb are considered to be local pollutants that tend to accumulate in the air locally. PM10 is also considered to be a localized pollutant (as well as a regional pollutant). A complete summary of state and national AAQS is provided in Table 3.12-1.

Ozone

O_3 is an irritant to the respiratory tract and sensitive tissues in the eyes. As an oxidant, it increases susceptibility to respiratory infections. O_3 also attacks synthetic rubber, textiles, plants, and other materials, and can cause substantial damage. Effects on plants, through leaf discoloration and cell damage, can be extensive.

State and federal standards for ozone have been set for a 1-hour averaging time. The state requires that a 1-hour O_3 standard of 0.09 part per million (ppm) not be exceeded. The federal 1-hour O_3 standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. The EPA replaced the 1-hour O_3 standard with an 8-hour standard of 0.08 ppm, with the exception of areas classified as nonattainment for O_3, which must also attain the 1-hour O_3 standard.

O_3 is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O_3 precursors, which include reactive organic gases (ROG) and NO_x, react in the atmosphere in the presence of sunlight to form O_3. Because photochemical reaction rates increase when the intensity of ultraviolet light and air temperature increase, O_3 is primarily a summer air pollution problem. ROG and NO_x are emitted by internal combustion engines.

Carbon Monoxide

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

Motor vehicles are the dominant source of CO emissions in most areas, with electric utilities, fires, and other mobile and miscellaneous sources contributing. High CO levels develop primarily during winter, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Inhalable Particulates

Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

The federal and state AAQS for particulate matter apply to two classes of particulates: particulate matter 2.5 microns or less in diameter (PM2.5) and PM10.

The state PM10 standards are 50 micrograms per cubic meter (μ/m^3) as a 24-hour average and 20 μ/m^3 as an annual geometric mean. The federal PM10 standards are 150 μ/m^3 as a 24-hour average and 50 μ/m^3 as an annual arithmetic mean. The federal PM2.5 standards are 15 μ/m^3 for the annual average and 65 μ/m^3 for the 24-hour average. On May 14, 1999, a three-judge panel of the U.S. Court of Appeals for the District of Columbia put a hold on implementing the PM2.5 standard and asked for further comments. On February 27, 2001, the U.S. Supreme Court unanimously upheld the constitutionality of the CAA as the EPA had interpreted it in setting health-protective air quality standards for PM2.5. On June 20, 2002, CARB adopted a new annual PM2.5 standard of 12 μ/m^3.

Particulate emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

Toxic Air Contaminants

Although AAQS exist for criteria pollutants, no ambient standards exist for toxic air contaminants (TACs). Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor—called a Hazard Index—is used to evaluate risk. In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

3.12.3 Climate and Topography

The concentration of a given pollutant in the atmosphere is determined by the amount of the pollutant and the atmosphere's ability to transport and dilute it. Air pollution transport and dilution are mostly determined by wind, atmospheric stability, terrain, and insolation.

East Contra Costa County's topography varies geographically. Generally, a portion of the Coast Ranges dominates the western edge of East Contra Costa County. To the east, intermountain valleys give way to the Sacramento–San Joaquin Delta. Elevations in the inventory area range from Delta Islands that are at or below sea level near Brentwood and Oakley to the 3,849-foot peak of Mount Diablo, the highest point in the inventory area.

The San Francisco Bay Area, including Contra Costa County, has a Mediterranean-type climate characterized by warm, dry summers and mild, wet winters. The climate is largely determined by a semi-permanent high-pressure system that is often present over the eastern Pacific Ocean. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. During the winter, this high-pressure system migrates southward and has less influence on the region.

3.12.4 Existing Air Quality Conditions and Ambient Air Quality Standards

Air quality conditions in the SFBAAB are regulated by BAAQMD. The pollutants of greatest concern in the project area, and in the SFBAAB as a whole, are O_3, PM10, and CO (Table 3.12-1). The air quality in the SFBAAB is influenced by a wide range of emissions sources, such as dense population centers, heavy vehicular traffic, and industry.

The State of California has designated the SFBAAB as a serious nonattainment area for O_3 and a nonattainment area for PM10. The State of California has designated the SFBAAB as being an attainment area for CO. EPA has designated the SFBAAB as being a not classified/moderate/other attainment area for O_3 (2006 attainment deadline) and an unclassified area for PM10. EPA has designated the SFBAAB as an unclassified/attainment area for CO.

The existing air quality conditions in East Contra Costa County can be characterized by monitoring data collected in the region. PM10, CO, and O_3 are the pollutants of greatest concentration within the SFBAAB, and therefore are the pollutants of most concern for the proposed HCP/NCCP. Air quality monitoring data for the last 3 years were collected from the Pittsburg 10th Street monitoring station; these are presented in Table 3.12-2.

As shown in Table 3.12-2, the Pittsburg 10th Street monitoring station has shown six violations of the state 1-hour ozone standard during the 3 most recent years for which data are available. PM10 concentrations have exceeded state standards five times. Concentrations of CO did not approach the state or federal standards; however, CO concentrations in the vicinity of congested intersections and freeways would be expected to be higher than those recorded at the monitoring station, and local, unrecorded exceedances may have occurred.

Table 3.12-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria	
			California	National	California	National	California	National
Ozone	O_3	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
		8 hours	NA	0.08	NA	157	NA	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Nitrogen dioxide	NO_2	Annual average	NA	0.053	NA	100	NA	If exceeded
		1 hour	0.25	NA	470	NA	If exceeded	
Sulfur dioxide	SO_2	Annual average	NA	0.03	NA	80	NA	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	NA	655	NA	NA	NA
Hydrogen sulfide	H_2S	1 hour	0.03	NA	42	NA	If equaled or exceeded	NA
Vinyl chloride	C_2H_3Cl	24 hours	0.010	NA	26	NA	If equaled or exceeded	NA
Sulfate particles	SO_4	24 hours	NA	NA	25	NA	If equaled or exceeded	NA
Inhalable particulate matter	PM10	Annual geometric mean	NA	NA	20	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	50	NA	If exceeded
		24 hours	NA	NA	50	150	If exceeded	If average 1% over 3 years is exceeded
	PM2.5	Annual geometric mean	NA	NA	12	NA	If exceeded	NA
		Annual arithmetic mean	NA	NA	NA	15	NA	If exceeded
		24 hours	NA	NA	NA	65	NA	If average 2% over 3 years is exceeded
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded no more than 1 day per year
		30 days	NA	NA	1.5	NA	If equaled or exceeded	NA

Notes:
All standards are based on measurements at 25ºC and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
NA = not applicable.

Table 3.12-2. Ambient Air Quality Monitoring Data at Pittsburg 10th Street Monitoring Station

Pollutant Standards	2001	2002	2003
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.118	0.111	0.094
Number of Days Standard Exceeded[a]			
CAAQS 1-hour (>0.09 ppm)	2	4	0
NAAQS 1-hour (>0.12 ppm)	0	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	2.4	2.5	1.7
Maximum 1-hour concentration (ppm)	5.2	6.2	3.4
Number of Days Standard Exceeded[a]			
CAAQS 8-hour ($\geq$9.0 ppm)	0	0	0
NAAQS 8-hour ($\geq$9.0 ppm)	0	0	0
CAAQS 1-hour ($\geq$20 ppm)	0	0	0
NAAQS 1-hour ($\geq$35 ppm)	0	0	0
Particulate Matter (PM10)			
Maximum 24-hour concentration ($\mu g/m^3$)	82.9	76.7	59.1
Second highest 24-hour concentration ($\mu g/m^3$)	39.4	59.5	48.0
Number of Days Standard Exceeded[a]			
CAAQS 24-hour (>50 $\mu g/m^3$)[b]	1	3	1
NAAQS 24-hour (>150 $\mu g/m^3$)[b]	0	0	0

Notes: CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards.

[a] The number of days above the standard is not necessarily the number of violations of the standard for the year.

[b] Calculated exceedances based on measurements taken every 6 days.

Sources: California Air Resources Board 2004, Environmental Protection Agency 2004.

3.12.5 Sensitive Receptors

BAAQMD defines sensitive receptors as facilities where sensitive receptor population groups (children, the elderly, the acutely ill, and the chronically ill) are likely to be located. These land uses include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics.

Land uses adjacent to the proposed preserve system acquisition zones are largely open space, agricultural uses, and parks. Portions of proposed acquisition zones border the city limits of cities, and may be adjacent to sensitive receptors.

3.13 Mineral Resources

3.13.1 Regulatory Setting

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.) mandates that the Mineral Resources Project classify lands throughout the state that contain regionally significant mineral resources. Through the SMARA Mineral Land Classification Project, the State Geologist classifies (identifies and maps) non-fuel mineral resources of the state to show where economically significant mineral deposits occur and where they are likely to occur based upon the best available scientific data. (California Department of Conservation 2004.)

Non-fuel mineral resources classified under the Mineral Land Classification Project include metals; industrial minerals; and construction aggregate, which includes sand and gravel and crushed stone. Special emphasis has been given to construction aggregate because it is the state's most important mineral commodity in terms of tonnage, value, and societal infrastructure. Local agencies are required to use the classification information when developing land-use plans and when making land-use decisions. (California Department of Conservation 2004.)

Contra Costa County

The following goals and policies from the Contra Costa County General Plan Conservation Element apply to the protection of mineral resources within the proposed HCP/NCCP inventory area.

Goals

8-M. To ensure the continued viability of mineral extraction operations which are important to the County's economy.

8-N. To protect areas of identified value mineral resources from incompatible nearby land uses through zoning and other land use regulations.

8-O. To minimize and buffer the impact of surface mining activities on the surrounding land uses and the natural environment.

Policies

8-54. Mining and quarrying shall be a permitted use in certain privately owned areas which are in an open space designation in the General Plan (e.g., Open Space, Agricultural Lands) and which contain known mineral deposits with potential commercial value. These deposits include rocks, gravel, sand, salt, and clay.

8-56. Incompatible land uses shall not be permitted within the mineral resource impact areas identified as containing significant sand and gravel deposits.

Incompatible uses are defined as land uses inherently incompatible with mining and/or uses that require a high public or private investment in structures, land improvements, and landscaping that prevent mining because of the higher economic value of the land and its improvements.

8-57. Future development in the vicinity of valuable mineral resource zones shall be planned and designed to minimize disturbance to residential areas or other sensitive land uses, and to permit the safe passage of quarry trucks.

8-58. Development of compatible land uses shall be encouraged within 1,000 feet of the quarrying sites. Compatible uses include secondary industrial operations related to the quarry operation, recreation facilities, parks, agricultural uses, and permanent open space.

3.13.2 Contra Costa County Mineral Resources

The Mineral Land Classification Project identifies several significant mineral resource areas in Contra Costa County for protection. Mineral Resource areas identified in SMARA and the Contra Costa County General Plan are depicted in Figure 3-5.

A deposit of domegine sandstone is located south of Brentwood and east of Vasco Road, identified as Sector GG in SMARA §3550.10. The Contra Costa County General Plan states that the Sector GG sandstone deposit is the only deposit of this material in California, and it is considered to be a nationally important resource (Contra Costa County2005). The General Plan calls for the protection of the entire sandstone area, beyond the boundaries designated by the SMARA Mineral Land Classification Project. This mineral deposit is within the proposed HCP/NCCP Zone 5 (Contra Costa County 2003).

A deposit of diabase, an igneous rock used for road base and streambank erosion control, is located in the Mt. Zion area near Concord and Clayton, identified as Sector T in SMARA §3550.10. The Sector T deposit is considered to be regionally significant (Contra Costa County2005). The resource area is in proximity to Mt. Diablo State Park and residential development in the city of Concord (Contra Costa County2005); its location may limit future development of this deposit. The easternmost portion of the Sector T deposit is located within the proposed HCP/NCCP acquisition Zone 3.

A third deposit of clay minerals is located near Port Costa, west of the city of Pittsburg. This resource area is outside the inventory area.