

## **5. Biological Resources**

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This chapter describes the regulatory framework and existing biological resources in Livermore. This chapter uses the term “Livermore” to cover the City of Livermore together with the immediately surrounding area within the Urban Growth Boundary (UGB) and Sphere of Influence (SOI). See the Introduction for more information on these boundaries.

### **5.1 REGULATORY FRAMEWORK**

Biological resources within Livermore are subject to different Natural Resource agency jurisdiction and regulations, as described in this section.

#### **5.1.1 FEDERAL REGULATIONS**

##### **5.1.1.1 ENDANGERED SPECIES ACT**

The federal Endangered Species Act (ESA) is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The USFWS and NMFS maintain lists of endangered and threatened plant and animal species (referred to as “listed species”). “Proposed” or “candidate” species are those that are being considered for listing and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. “Take” under the ESA is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in take of an ESA-listed species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federally listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features “essential to the conservation of the species.” Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

##### **5.1.1.2 CLEAN WATER ACT**

The federal Clean Water Act (CWA) was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the

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United States. The CWA serves as the primary federal law to protect the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands, which are important habitat for plants and animals.

The CWA empowers the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations. It also includes programs for addressing both point-source and nonpoint-source pollution. Point-source pollution 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. The CWA operates on the principle that all discharges in the nation's waters are unlawful, unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

### **5.1.1.3 MIGRATORY BIRD TREATY ACT**

The federal Migratory Bird Treaty Act (MBTA) prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. As used in the MBTA, the term "take" is defined as "to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires." Most bird species native to North America are covered by this act. In December 2017, the Department of the Interior (DOI) issued a memorandum reversing the incidental take interpretation of the MBTA. Under the latest determination of the DOI, the take of a migratory bird or its active nest (i.e., with eggs or young) that is incidental to a lawful activity does not violate the MBTA. USFWS is responsible for overseeing compliance with the MBTA, and the U.S. Department of Agriculture's (USDA's) Animal Damage Control Officer makes recommendations on related animal protection issues.

## **5.1.2 STATE REGULATIONS**

### **5.1.2.1 CALIFORNIA ENDANGERED SPECIES ACT**

The California Endangered Species Act (CESA) prohibits the take of any plant and animal species that the California Fish and Game Code (CFGF) determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to candidate species which are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

### **5.1.2.2 PORTER-COLOGNE WATER QUALITY CONTROL ACT**

Under this act (California Water Code Sections 13000–14920), the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB) are authorized to regulate the discharge of waste that could affect the quality of the state's waters. The term "waters of the State" is

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defined by the Porter-Cologne Water Quality Control Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The SWRCB and RWQCB protect waters within this broad regulatory scope through many different regulatory programs. The SWRCB and RWQCB issue permits for the discharge of fill material into surface waters through the State Water Quality Certification Program, which fulfills requirements of Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a CWA permit are also required to obtain a Water Quality Certification. If a project does not require a federal permit but does involve discharge of dredge or fill material into surface waters of the State, the SWRCB and RWQCB may issue a permit in the form of Waste Discharge Requirements.

### 5.1.2.3 CALIFORNIA FISH AND GAME CODE

The California Department of Fish and Wildlife (CDFW) is responsible for enforcing the CFGC, which contains several provisions potentially relevant to construction projects.

#### Fully Protected Species (CFGC, Sections 3511, 4700, 5050, and 5515)

The CFGC designates 37 fully protected species and prohibits the take or possession at any time of such species with certain limited exceptions.

#### Bird Protections (CFGC, Sections 3503, 3503.5, and 3513)

CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by code or any regulation made pursuant thereto. Section 3503.5 prohibits the take, possession, or needless destruction of any nests, eggs, or birds in the orders Falconiformes (New World vultures, hawks, eagles, ospreys, and falcons, among others) or Strigiformes (owls). Section 3513 prohibits the take or possession of any migratory nongame bird or part thereof, as designated in the MBTA. To avoid violation of the take provisions, it is generally required that project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle.

#### Lake and Streambed Alteration (CFGC, Section 1600 et seq.)

CFGC Section 1600 et seq. requires notifying CDFW prior to any project activity that might: (1) substantially divert or obstruct the natural flow of any river, stream or lake; (2) substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If after this notification the CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement must be obtained.

### 5.1.2.4 CALIFORNIA NATIVE PLANT PROTECTION ACT

The California Native Plant Protection Act (CNPPA) prohibits importation of rare and endangered plants into California, take of rare and endangered plants, and the sale of rare and endangered plants. The CNPPA requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. The CNPPA is administered by the CDFW. The California Fish and Game Commission

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has the authority to designate native plants as “endangered” or “rare” and to protect endangered and rare plants from take. The CESA provides further protection for rare and endangered plant species, but the CNPPA remains part of the CFGC.

### 5.1.2.5 SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by CDFW. CDFW<sup>1</sup> ranks sensitive communities as “threatened” or “very threatened” and keeps records of their occurrences in its California Natural Diversity Database (CNDDDB).<sup>2</sup> CNDDDB vegetation alliances are ranked at both the Global (full natural range within and outside of California) and state (within California) levels resulting in a single G (global) and S (state) rank ranging from 1 (very rare and threatened) to 5 (demonstrably secure). Ranks 1 through 3 are considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under the California Environmental Quality Act (CEQA) (California Code of Regulations [CCR] Title 14, Div. 6, Chap. 3, Appendix G). In addition, impacts to oak woodlands must be considered under CEQA.

### 5.1.3 REGIONAL REGULATIONS

#### 5.1.3.1 EAST ALAMEDA COUNTY CONSERVATION STRATEGY

The East Alameda County Conservation Strategy (EACCS) provides a framework to protect, enhance, and restore natural resources in eastern Alameda County, while improving and streamlining the environmental permitting process for impacts resulting from infrastructure and development projects.<sup>3</sup> The EACCS focuses on biological resources such as endangered and other special-status species, as well as sensitive habitat types (e.g., wetlands, riparian corridors, rare upland communities). The EACCS does not include incidental take permits for threatened or endangered species similar to that provided by a Habitat Conservation Plan. Participating in the EACCS is voluntary. The City of Livermore is a partner in the EACCS and uses the document for guidance and input on managing biological resources and conservation priorities during project-level planning.

#### 5.1.3.2 REGIONAL CONSERVATION INVESTMENT STRATEGIES (RCIS)

An RCIS is a voluntary, non-regulatory, and non-binding conservation assessment that includes information and analyses relating to the conservation of focal species, their associated habitats, and the conservation status of the RCIS land base. An RCIS establishes biological goals and objectives at the species level and describes conservation actions and habitat enhancement actions that, if implemented, will contribute to those goals and objectives. Those actions will benefit the conservation of focal species,

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<sup>1</sup> California Department of Fish and Wildlife. 2019. California Natural Community List. Biogeographic Data Branch. Vegetation Classification and Mapping Program, Sacramento, California. August 18.

<sup>2</sup> California Department of Fish and Wildlife. 2020. California Natural Diversity Database, Wildlife and Habitat Data Analysis Branch. Sacramento, CA. Accessed: August 2021.

<sup>3</sup> ICF. 2010. East Alameda County Conservation Strategy, Final Draft. Available online: <http://www.eastalco-conservation.org/documents.html>. Accessed: August 2021.

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habitats, and other natural resources and they may be used as a basis to provide advance mitigation or to inform other conservation investments. The development of RCISs does not create, modify, or impose regulatory requirements or standards, regulate land use, establish land use designations, or affect the land use authority of a public agency. The East Bay RCIS covers Alameda and Contra Costa Counties and was approved by CDFW in January 2021.

## 5.1.4 LOCAL REGULATIONS

### 5.1.4.1 LIVERMORE 2003-2025 GENERAL PLAN

The Open Space and Conservation Element of the 2003-2025 Livermore General Plan contains goals, objectives, policies, and actions related to biological and wetland resources. Goals from the 2003-2025 Livermore General Plan pertaining to the preservation and protection of biological resources are listed and summarized in Table 5-1. All General Plan goals and associated objectives, policies, and actions can be found on the City of Livermore's website.<sup>4</sup>

**TABLE 5-1 2003-2025 GENERAL PLAN BIOLOGICAL RESOURCES GOALS, OBJECTIVES, POLICIES, AND ACTIONS**

Goal No.	Goal
OSC-1	<b>Conserve the value and function of Livermore's open space as a biological resource.</b> Objectives, policies, and actions under Goal OSC-1 cover biodiversity, minimizing impacts to natural habitats, conserving Livermore's native trees and vegetation, and coordinating with other levels of government and interested agencies to preserve natural resources.
OSC-2	<b>Conserve Livermore's waterways, tributaries, and associated riparian habitats.</b> Objectives, policies, and actions under Goal OSC-2 continue efforts to ensure that development does not harm the quality or quantity of Livermore's surface or ground water.

Source: City of Livermore 2023-2025 General Plan.

### 5.1.4.2 LIVERMORE MUNICIPAL CODE

The City of Livermore encourages the preservation of trees through its development review and permit approval process. The City of Livermore Tree Preservation Ordinance (Section 12.20 of the Livermore Municipal Code) defines "protected trees" based on trunk circumference at breast height (CBH) i.e., 4.5 feet above grade. The definition of a protected tree varies depending on several factors including existing land use and property ownership status. The Ordinance requires that prior to the removal of a protected tree, all trees on-site must be surveyed by a certified arborist. Following the arborist survey, a "Tree Action Permit," which must include an arborist's report, must be approved by the City. Furthermore, the City may require mitigation measures as conditions of approval for the removal of protected trees.

<sup>4</sup> City of Livermore. 2021. 2003-2025 General Plan. Available online: <https://www.cityoflivermore.net/government/community-development/planning/2003-2025-general-plan>. Accessed: September 2021.

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### 5.1.4.3 LIVERMORE STREAM MAINTENANCE PROGRAM

In 2015 the City developed a programmatic Stream Maintenance Program (SMP) for routine creek and channel maintenance in coordination with the RWQCB, CDFW, USACE, and USFWS. The SMP serves as a permitting framework for routine maintenance work in and around channels. It also defines best management practices to minimize the impacts of routine maintenance to listed species and sensitive habitat and to mitigate for these impacts.

## 5.2 EXISTING CONDITIONS

This assessment of the biological existing conditions within Livermore is based on available information on biological and wetland resources in the City of Livermore vicinity. This includes the 2003-2025 Livermore General Plan; the EACCS; environmental documents for recent development applications; CNDDDB maintained by CDFW;<sup>5</sup> Information for Planning and Consultation (IPac) from the USFWS for Livermore;<sup>6</sup> the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Plants*;<sup>7</sup> and available geographic information system (GIS) data. GIS data on vegetation cover, wetlands, and streams was obtained from the EACCS baseline biological inventory.<sup>8</sup> The GIS data was used to map the existing vegetation cover and associated wildlife habitats and the known distribution of aquatic features including wetlands and streams in Livermore. Designated critical habitat for federally-listed special-status species was obtained from the USFWS. These data were used in preparing maps contained in this chapter, consisting of the following:

**Figure 5-1** shows the various vegetation communities and land cover types in Livermore.

**Figure 5-2** shows the extent of aquatic land cover in Livermore.

**Figure 5-3** shows the distribution of designated critical habitat as mapped by the USFWS in Livermore.

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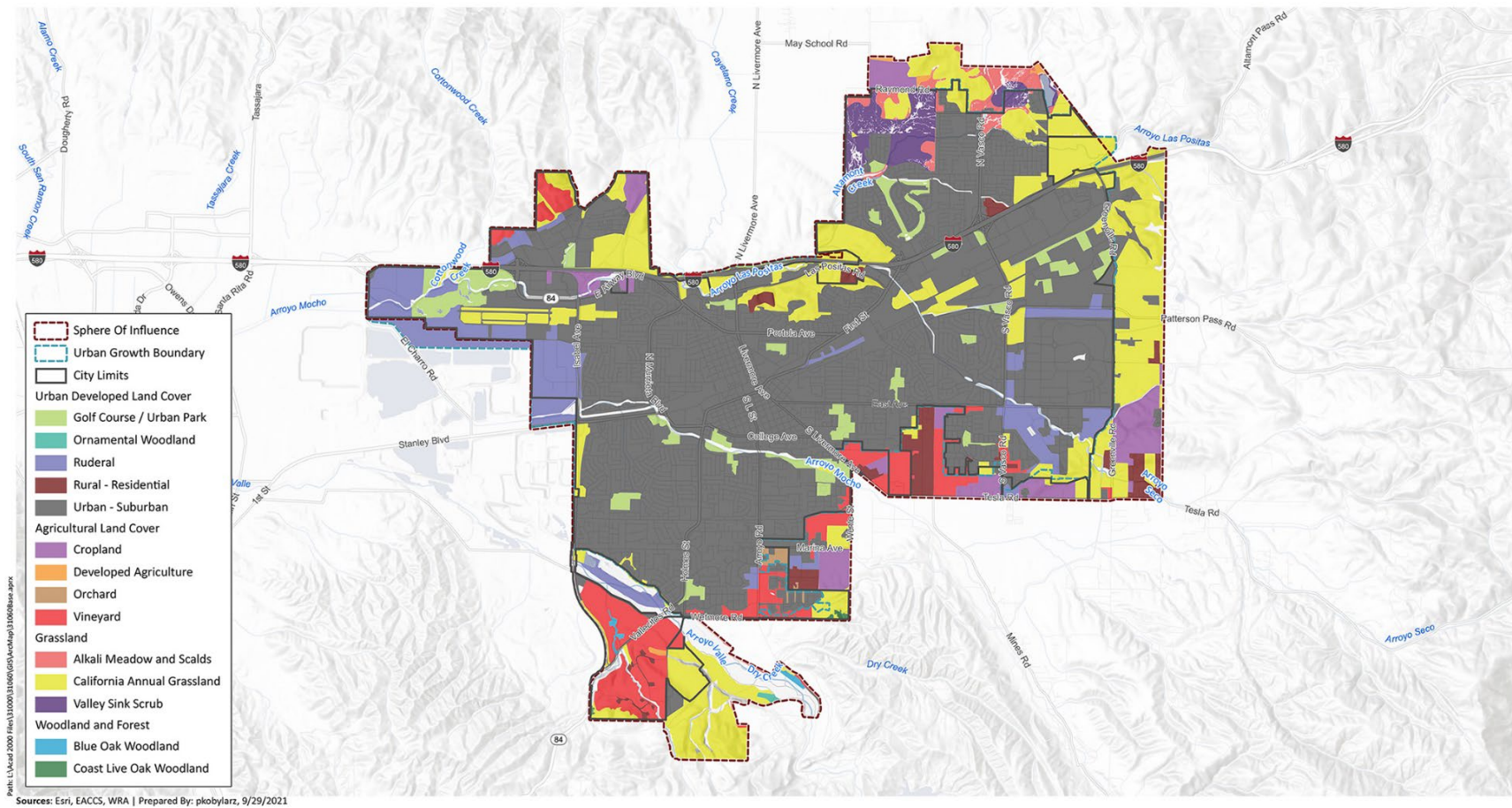
<sup>5</sup>California Department of Fish and Wildlife. 2020. California Natural Diversity Database, Wildlife and Habitat Data Analysis Branch. Sacramento, CA. Accessed: August 2021.

<sup>6</sup> U.S. Fish and Wildlife Service (USFWS). 2021. Information for Planning and Consultation (IPaC). Available online: <https://ecos.fws.gov/ipac/>. Accessed: August 2021.

<sup>7</sup> California Native Plant Society, Rare Plant Program. 2021. *Inventory of Rare and Endangered Plants of California* (online edition, v9-01 0.0). Available online: <https://www.rareplants.cnps.org>. Accessed: August 2021.

<sup>8</sup> ICF. 2010. East Alameda County Conservation Strategy, Final Draft. Available online: <http://www.eastalco-conservation.org/documents.html>. Can o Accessed: August 2021.

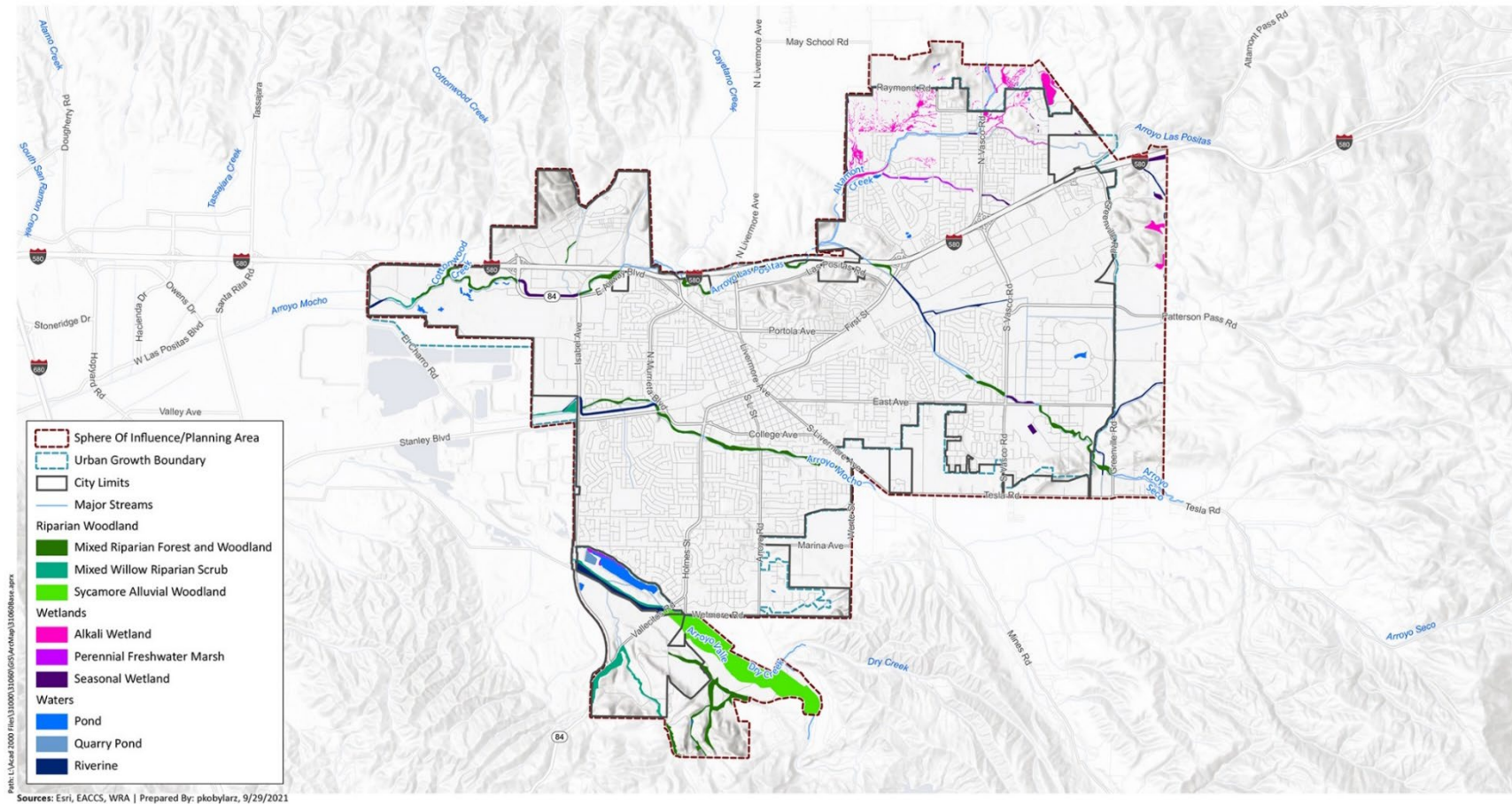
**Figure 5-1 Vegetation Communities and Land Covers within Livermore**





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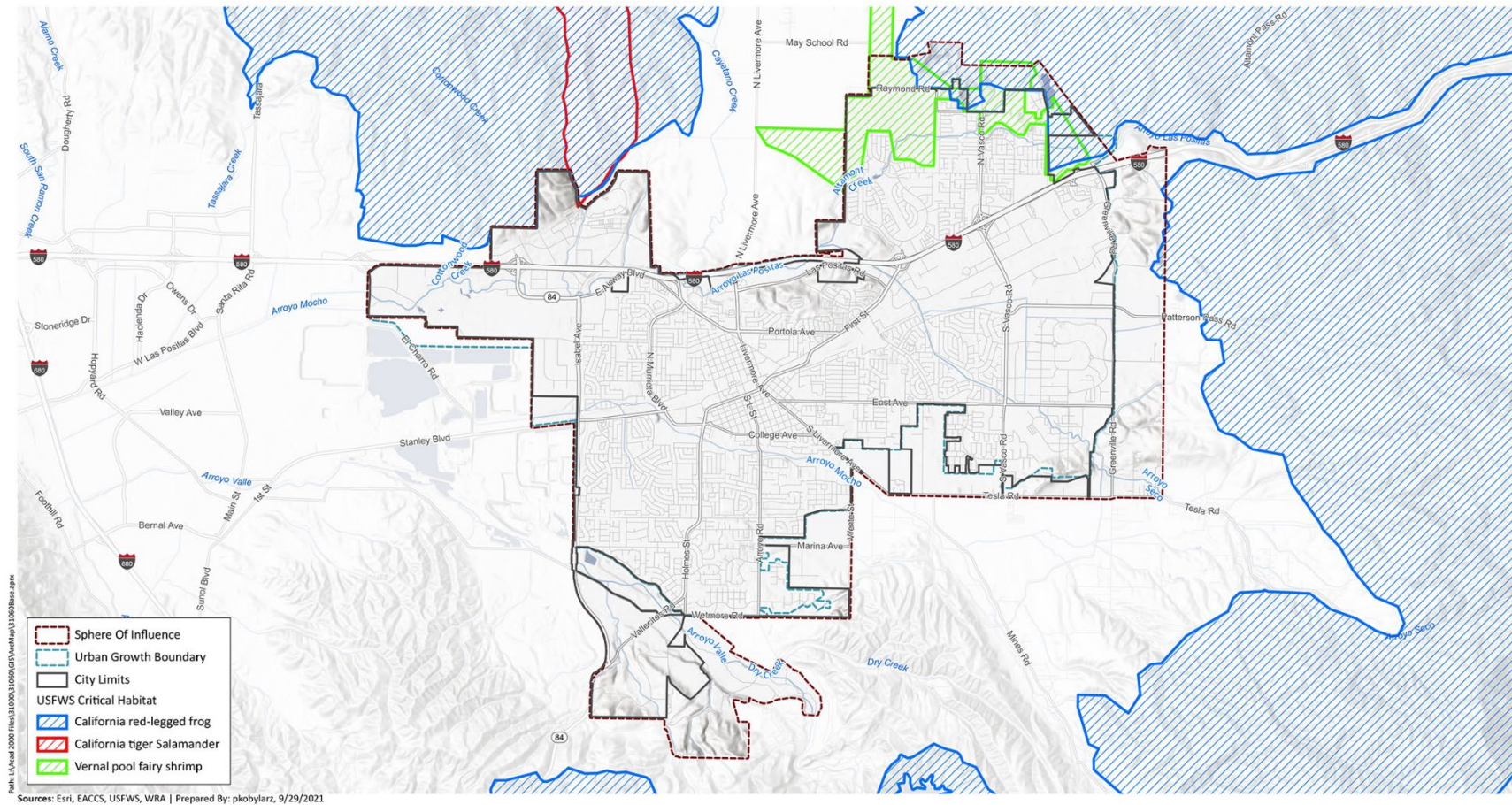
Figure 5-2 Aquatic Land Cover in Livermore





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Figure 5-3 USFWS Critical Habitat in Livermore



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### 5.2.1 REGIONAL SETTING

The City of Livermore is in the Livermore Valley in Alameda County, California (Figure 1-2). Livermore is in the easternmost portion of Alameda County and is part of the nine-county Bay Area region. The Livermore Valley lies south and west of the Diablo Range and east of the East Bay Hills. Livermore is bisected by Interstate 580 (I-580), which runs east to west through Alameda County. The Union Pacific Railroad, which now serves the Altamont Corridor Express (ACE train) commuter rail service, parallels I-580 to the south. Several streams and arroyos or small, dry creeks occur within the SOI, including Altamont Creek, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, Arroyo Valle, Cottonwood Creek, and Dry Creek. These waterways support vegetation and trees for portions of their length, imparting important topographical and visual features to the general landscape.

### 5.2.2 PHYSICAL SETTING

Livermore is within the central portion of the Coast Ranges Geomorphic Province. In the San Francisco Bay Area, the Coast Ranges Province is characterized by a series of northwest-to-southeast-trending ridges and valleys associated with faulting and folding.<sup>9</sup> The Livermore Valley is an east-west trending valley, unique to the East Bay, and is a deep alluvial depression containing sediments deposited as part of the Livermore Gravel Formation. The Greenville fault forms the eastern border of the valley, separating it from the western foothills of the Diablo Range. The valley ranges in elevation from 400 to 500 feet above mean sea level. The Livermore Valley floodplain supports very gravelly soils assigned with the Yolo-Pleasanton association, interspersed with loams and clays of the Rincon-San Ysidro association. Northeast of Livermore is the Springtown Alkali Sink, a large expanse of alkali soils that support unique wetland and grassland habitat.<sup>10</sup>

Due to the rain-shadow effect, the interior of the Coast Ranges is dry, closely resembling Mediterranean climate. Annual temperatures range from an average maximum of 72.1 degrees Fahrenheit (°F) to an average minimum of 48°F. Average annual precipitation for the Livermore area is 15.3 inches mostly between the months of November and April.<sup>11</sup> The mean freeze-free period is about 270 to 300 days.<sup>12</sup>

Livermore contains various waterways and creeks as part of the greater Alameda Creek Watershed including three major arroyos: Arroyo Valle, Arroyo Las Positas, and Arroyo Mocho. These arroyos join Arroyo de la Laguna in Pleasanton, which drains the Livermore Valley in a southerly direction approximately 18 miles to the San Francisco Bay via Niles Canyon and Alameda Creek which occur outside

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<sup>9</sup> Schoenherr, Allan A. 2017. *A Natural History of California, 2<sup>nd</sup> Edition*. University of California Press, Oakland, California.

<sup>10</sup> ICF. 2010. East Alameda County Conservation Strategy, Final Draft. Available online: <http://www.eastalco-conservation.org/documents.html>. Accessed: August 2021.

<sup>11</sup> PRISM Climate Group. 2021. Explorer: time Series Values for Individual Locations. Available online: <https://prism.oregonstate.edu/explorer/>. Accessed: August 2021.

<sup>12</sup> U.S. Department of Agriculture, Natural Resources Conservation Service. 2021. National Water and Climate Center: Climate Data and Summary Reports from AgACIS, Livermore, CA WETS Station. Available online: <https://www.nrcs.usda.gov/wps/portal/wcc/home/climateSupport/agAcisClimateData/>. Accessed: August 2021.

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Livermore. Refer to Section 5.2.5.1, Waterways/Creeks, for more details on hydrologic features within Livermore.

### **5.2.3 BIOLOGICAL RESOURCES WITHIN THE SOI**

This section provides a description of vegetation types and associated wildlife, known distribution of special-status species, sensitive natural communities, aquatic resources, and wildlife corridors. When a plant or animal species is described, the scientific name is provided in parentheses following the common name at the first mention only. Further mentions of a plant or animal only contain the common name.

#### **5.2.3.1 VEGETATION COMMUNITIES/HABITAT TYPES**

Livermore consists largely of urban developed areas surrounded by agriculture and grassland. Figure 5-1 shows the extent of urbanization, agricultural areas, and vegetative communities. Estimates of various vegetation and land cover types within Livermore are summarized in Table 5-2. In general, each cover type differs in its relative value as wildlife habitat and can be characterized by both vegetation community and associated animal species that are dependent on that habitat. Although some wildlife species may use more than one habitat type. The characteristic plant and wildlife species typically associated with each of these habitat types are summarized herein.

#### **Urban Developed Areas**

Urban developed areas occupy most of Livermore. As indicated in Table 5-2 and shown in Figure 5-1, an estimated 14,422 acres are urbanized and comprises more than 69 percent of Livermore. Urban developed areas include residential, commercial, industrial, transportation, landfill, landscaping, and recreational uses (e.g., sites with structures, paved surfaces, horticultural plantings, golf courses, and irrigated lawns). Most plant species used in landscaping are non-native ornamentals, consisting of a wide variety of tree, shrub, groundcover, and turf species. Ruderal species (non-native, invasive) tend to dominate locations where the ground surface has been disturbed. Native trees are scattered throughout the established residential and urbanized areas including buckeye (*Aesculus californica*), California sycamore (*Platanus racemosa*), and coast live oak (*Quercus agrifolia*).

Several wildlife species use urban areas for foraging, roosting, and/or nesting. These species include native animals that have adapted well to living near humans, such as Pacific treefrog (*Hyla regilla*), western fence lizard (*Sceloporus occidentalis*), barn swallow (*Hirundo rustico*), and other common but protected species of nesting birds, in addition to non-native species, such as house sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*). Urban-adapted mammal species, including raccoon (*Procyon lotor*) and opossum (*Didelphis virginiana*) are also common in this setting. In addition, a few protected species live in urban developed areas, such as burrowing owl (*Athene cunicularia*) and some species of bats. Some artificial water bodies in urban areas, such as stormwater conveyances or detention basins, may also support fish and amphibians when inundated.

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### Agricultural Areas

Approximately 1,940 acres of Livermore is occupied by cultivated agriculture and pastureland. Cultivated agriculture encompasses all areas where the native vegetation has been cleared for irrigated agriculture use or dryland farming (e.g., cropland, orchards, and vineyards). Pastureland is typically similar to grassland as it is not as intensively managed and less altered than cultivated agricultural land.

Wildlife that may use grazing land in Livermore and surrounding region include species that thrive in open environments with relatively little cover or edge habitats, such as California ground squirrel (*Spermophilus beecheyi*), black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Many bird species, including birds of prey such as red-tailed hawks (*Buteo jamaicensis*), may nest in trees adjacent to agricultural areas and often can be found foraging on small mammals or insects. Intensively farmed lands do not typically support native plant communities. However, wildlife species, particularly migrating waterfowl and raptors, use these fields for foraging and/or roosting. The edges of agricultural fields may provide opportunities for burrowing animals, such as California ground squirrels and burrowing owls. In addition, agricultural areas are often some of the few sites with readily available water, irrigation ditches, and stock ponds that are not heavily disturbed, and often support various species of reptiles and amphibians.

### Grassland

Grassland occupies most of the undeveloped areas north, east, and south of Livermore. Grassland within Livermore consists of alkali meadow and scalds, California annual grassland, and valley sink scrub grassland communities. An estimated 4,367 acres of Livermore supports grassland cover.

California annual grassland is the most common grassland community in Livermore covering 3,738 acres. California annual grassland is generally composed of introduced grasses and can be found in areas that have been grazed, or in abandoned agricultural fields and vacant lots. Dominant species typically observed in California annual grassland include foxtail brome (*Bromus madritensis*), medusa head (*Elymus caput-medusae*), ripgut brome (*Bromus diandrus*), slim oat (*Avena barbata*), and wildoats (*Avena fatua*). Non-native forbs such as filaree (*Erodium* sp.) and mustard (*Brassica* sp.), are often found in non-native annual grassland.

Alkali meadow and scalds occur in the northern portion of Livermore. Dominant species in alkali meadows include barley (*Hordeum* sp.), beardless wild rye (*Elymus triticoides*), and salt grass (*Distichlis spicata*). Associated plant species consist of halophytes, including alkali heath (*Frankenia salina*), alkali weed (*Cressa truxillensis*), alkali mallow (*Malvella leprosa*), common tarweed (*Centromadia pungens*), and saltbush (*Atriplex* sp.).

Valley sink scrub occurs in the northern portion of Livermore. Valley sink scrub develops where clay-rich alkaline soils area seasonally saturated because of a shallow water table, low surface runoff, and slow infiltration. The herbaceous layer consists of a patchwork of barren, salt-encrusted scalds and alkali grassland vegetation including alkali heath, iodine bush (*Allenrolfea occidentalis*), and salt grass.

Many wildlife species use both non-native and native grasslands, including the common western rattlesnake (*Crotalus viridis*), California horned lark (*Eremophila alpestris*), and black-tailed jackrabbit

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(*Lepus californicus*). California ground squirrels may also be found in these habitats, whose burrows may be occupied by burrowing owl where vegetation height is suitable. In addition, grassland habitats support vernal pools and seasonal wetland features, where federally listed endangered branchiopods, such as the vernal pool fairy shrimp (*Branchinecta lynchi*) can be found. These vernal pool habitats may also support special-status amphibians such as federally and/or state-listed California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*) when inundated.

**Woodland and Forest**

Woodland and forested habitats are largely restricted to the north and east-facing slopes or higher elevations to the south and west of Livermore. The moist microclimate produced by the altitude, steepness, and/or aspect of these areas has allowed the establishment of dense stands of trees. Woodland forest occupies an estimated 35 acres in Livermore. Two woodland/forest communities are present in Livermore, depending on the microclimate of the site: coast live oak woodland and blue oak woodland.

Coast live oak woodland is typically located on terraces, canyon bottoms, slopes, and flats underlain by deep, well-drained sandy or loam substrates with high organic content. These woodlands are extensive on west-facing slopes from the ridgeline to mid-elevation. The dominant tree species is coast live oak. Wildlife species found in coast live oak woodlands include a variety of bird species, including birds of prey, such as white-tailed kite (*Elanus leucurus*) and cavity nesters such as acorn woodpeckers (*Melanerpes formicivorus*), a variety of reptiles and amphibians, and common mammals such as black-tailed deer.

Blue oak woodland is usually found in low to mid-elevation hills in slightly drier microclimates. Blue oak woodland is dominated by blue oak (*Quercus douglasii*), a drought-tolerant species adapted to grow on thin soils in the dry foothills. California buckeye (*Aesculus californica*) and foothill pine (*Pinus sabiniana*) are associated tree species in blue oak woodland. The understory varies from dense to open with a composition similar to California annual grassland. Understory species typically include coffeeberry (*Rhamnus californica*), holly leaf cherry (*Prunus ilicifolia*), and poison oak (*Toxicodendron diversilobum*).

Because they generally offer opportunities for basking in canopy openings, woodland communities are home to a number of reptile species, including the federally and state-listed Alameda whipsnake (*Masticophis lateralis euryxanthus*), western rattlesnake, common kingsnake (*Lampropeltis getulus*), western fence lizard, and northern alligator lizard (*Elgaria coerulea*). Bird species common to these habitats include California thrasher (*Toxostoma redivivum*), wrentit (*Chamaea fasciata*), spotted towhee (*Pipilo maculatus*) and California quail (*Callipepla californica*). Mammals that are likely to use this habitat for cover and forage include black-tailed deer, coyote, gray fox (*Urocyon cinereoargenteus*), black-tailed jackrabbit, and various rodents.

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TABLE 5-2 ESTIMATES OF LAND COVER TYPES IN LIVERMORE

LAND COVER TYPE	SPHERE OF INFLUENCE (ACRES)	PERCENT OF TOTAL
<b>Urban Developed Areas</b>		
Golf Course / Urban Land	739	3.6
Ornamental Woodland	9	0.04
Ruderal	1,318	6.3
Rural – Residential	443	2.1
Urban – Suburban	11,913	57.4
<i>Subtotal</i>	14,422	69.5
<b>Agricultural Areas</b>		
Cropland	710	3.4
Developed Agriculture	26	0.1
Orchard	49	0.2
Vineyard	1,156	5.6
<i>Subtotal</i>	1,941	9.3
<b>Grassland</b>		
Alkali Meadow and Scalds	233	1.1
California Annual Grassland	3,738	18.0
Valley Sink Scrub	396	1.9
<i>Subtotal</i>	4,367	21.0
<b>Woodland and Forest</b>		
Blue Oak Woodland	23	0.1
Coast Live Oak Woodland	12	0.06
<i>Subtotal</i>	35	0.2
<b>Total</b>	<b>20,765</b>	<b>100%</b>

Source: ICF. 2010. *East Alameda County Conservation Strategy, Final Draft*. Available online: <http://www.eastalco-conservation.org/documents.html>. Accessed: August 2021

### 5.2.3.2 SPECIAL-STATUS SPECIES

This section outlines special-status species within Livermore. Special-status species are plants and animals that are legally protected under the federal ESA or CESA or other regulations, as well as other species that are considered rare enough by the scientific community and resource agencies to warrant special consideration, particularly regarding protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat (see Section 5.1, Regulatory Framework). Species with legal protection under the ESA/CESA often represent major constraints to development, particularly when they are wide-ranging or highly sensitive to habitat disturbance and where proposed development would result in a “take” of these species. Special-status species are defined as follows:

- Species that are listed, formally proposed, or designated as candidates for listing as threatened or endangered under the federal ESA.
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the CESA.

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- Plant species with a Rank of 1A, 1B, and 2 in the CNPS *Inventory of Rare and Endangered Plants*.
- Animal species designated as “Species of Special Concern” or “Fully Protected” by the CDFW.
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA Guidelines.
- Focal Species from the EACCS.
- Species considered to be a taxon of special concern by relevant local agencies.

The primary information source on the distribution of special-status species in California is the CNDDDB inventory, which is maintained by the Biogeographic Data Branch of CDFW. The CNDDDB inventory provides the most comprehensive statewide information on the location and distribution of special-status species and sensitive natural communities. Occurrence data is obtained from a variety of scientific, academic, and professional organizations, private consulting firms, and knowledgeable individuals, and entered into the inventory as expeditiously as possible. The occurrence of a species of concern in a particular region is an indication that an additional population may occur at another location if habitat conditions are suitable. However, the absence of an occurrence in a particular location does not necessarily mean that special-status species are absent from the area in question; only that no data has been entered into the CNDDDB inventory. Detailed field surveys are generally required to provide a conclusive determination on presence or absence of sensitive resources from a particular location, where there is evidence of potential occurrence.

**5.2.3.3 SPECIAL-STATUS PLANTS**

Review of the CNDDDB, IPac resource list, and CNPS occurrence records indicate a total of 23 special-status plant species that have been reported within or in the vicinity of Livermore. These special-status plant species are listed in Table 5-3, together with information on their status, description of typical habitat characteristics, and normal flowering season. Existing development limits the likelihood of continued occurrences of populations of special-status plant species within Livermore, with the possible exception of riparian and wetland-dependent species that may occur along arroyo and stream corridors and other major drainages, or species associated with seasonal wetlands and grassland where suitable habitat remains. Special-status plant species with the potential to occur in the grassland and aquatic resources land cover types in Livermore include big tarplant (*Blepharizonia plumosa*, California Rare Plant Rank [CRPR] 1B.1), brittlescale (*Atriplex depressa*, CRPR 1B.2), Congdon’s tarplant (*Centromadia parryi* ssp. *congdonii*, CRPR 1B.1), hispid salty bird’s-beak (*Chloropyron molle* ssp. *hispidum*, CRPR 1B.1), Livermore tarplant (*Deinandra bacigalupii*, CRPR 1B.1), palmate-bracted bird’s-beak (*Chloropyron palmatum*, FE, SE, CRPR 1B.1), and San Joaquin spearscale (*Extriplex joaquinana*, CRPR 1B.2). Focused surveys would be required to provide confirmation of presence or absence of special-status plant species from undeveloped portions of Livermore where thorough studies have not been conducted.



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TABLE 5-3 SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM LIVERMORE

Scientific Name	Common Name	Federal Status	State Status	CNPS Rare Plant Rank	Habitat
<b>Plants</b>					
<i>Androsace elongate</i> <i>ssp. acuta</i>	California androsace	—	—	4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland. Elevation ranges from 490 to 4,280 feet (150 to 1,305 meters). Blooms Mar-Jun.
<i>Astragalus tener</i> <i>var. tener</i>	Alkali milk-vetch	—	—	1B.2	Alkaline soils. Playas, valley and foothill grassland (adobe clay), and vernal pools. Elevation ranges from 3 to 197 feet (1 to 60 meters). Blooms Mar-Jun.
<i>Atriplex depressa</i>	brittlescale	—	—	1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools. Elevation ranges from 5 to 1,050 feet (1 to 320 meters). Blooms Apr-Oct.
<i>Atriplex minuscula</i>	lesser saltscale	—	—	1B.1	Chenopod scrub, playas, and valley and foothill grassland. Elevation ranges from 50 to 655 feet (15 to 200 meters). Blooms May-Oct.
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	—	—	1B.2	Chaparral, cismontane woodland, and valley and foothill grassland. Elevation ranges from 150 to 5,100 feet (45 to 1,555 meters). Blooms Mar-Jun.
<i>Blepharizonia plumosa</i>	big tarplant	—	—	1B.1	Valley and foothill grassland. Elevation ranges from 100 to 1,655 feet (30 to 505 meters). Blooms Jul-Oct.
<i>Centromadia parryi</i> <i>ssp. congdonii</i>	Congdon's tarplant	—	—	1B.1	Alkaline valley and foothill grasslands. Elevation ranges from 0 to 755 feet (0 to 230 meters). Blooms May-Nov.
<i>Chloropyron molle</i> <i>ssp. hispidum</i>	hispid salty bird's beak	—	—	1B.1	Meadows and seeps, playas, and valley and foothill grassland. Elevation ranges from 5 to 510 feet (1 to 155 meters). Blooms Jun-Sep.
<i>Chloropyron palmatum</i>	palmate-bracted bird's-beak	FE	SE	1B.1	Chenopod scrub, and valley and foothill grassland. Elevation ranges from 15 to 510 feet (5 to 155 meters). Blooms May-Oct.
<i>Deinandra bacigalupii</i>	Livermore tarplant	—	SE	1B.1	Meadows and seeps. Elevation ranges from 490 to 605 feet (150 to 185 meters). Blooms Jun-Oct.
<i>Delphinium californicum</i> ssp. <i>interius</i>	Hospital Canyon larkspur	—	—	1B.2	Chaparral, cismontane woodland, and coastal scrub. Elevation ranges from 640 to 3,595 feet (195 to 1,095 meters). Blooms Apr-Jun.
<i>Eriophyllum jepsonii</i>	Jepson's woolly sunflower	—	—	4.3	Chaparral, cismontane woodland, and coastal scrub. Elevation ranges from 655 to 3,365 feet (200 to 1,025 meters). Blooms Apr-Jun.
<i>Extriplex joaquinana</i>	San Joaquin spearscale	—	—	1B.2	Meadows and seeps, playas, and valley and foothill grasslands. Elevation ranges from 3 to 2,740 feet (1 to 835 meters). Blooms April-Oct.
<i>Fritillaria agrestis</i>	stinkbells	—	—	4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevation ranges from 35 to 5,100 feet (10 to 1,555 meters). Blooms Mar-Jun.
<i>Hesperex caulescens</i>	hogwallow starfish	—	—	4.2	Valley and foothill grassland and vernal pools. Elevation ranges from 0 to 1,655 feet (0 to 505 meters). Blooms Mar-Jun.

**BIOLOGICAL RESOURCES****TABLE 5-3 SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM LIVERMORE**

Scientific Name	Common Name	Federal Status	State Status	CNPS Rare Plant Rank	Habitat
<i>Leptosiphon acicularis</i>	bristly leptosiphon	—	—	4.2	Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Elevation ranges from 180 to 4,920 feet (55 to 1,500 meters). Blooms Apr-Jul.
<i>Leptosiphon ambiguus</i>	serpentine leptosiphon	—	—	4.2	Cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation ranges from 395 to 3,710 feet (120 to 1,130 meters). Blooms Mar-Jun.
<i>Navattetia prostrata</i>	prostrate vernal pool navaretia	—	—	1B.2	Coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation ranges from 10 to 3,970 feet (3 to 1,210 meters). Blooms Apr-Jul.
<i>Plagiobothrys glaber</i>	hairless popcornflower	—	—	1A	Marshes and swamps, and meadows and seeps. Elevation ranges from 50 to 590 feet (15 to 180 meters). Blooms Mar-May.
<i>Puccinellia simplex</i>	California alkali grass	—	—	1B.2	Chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation ranges from 5 to 3,050 feet (2 to 930 meters). Blooms Mar-May.
<i>Spergularia macrotheca</i> var. <i>longistyla</i>	long-styled sand-spurrey	—	—	1B.2	Marshes and swamps, and meadows and seeps. Elevation ranges from 0 to 835 feet (0 to 255 meters). Blooms Feb-May.
<i>Trifolium hydrophilum</i>	saline clover	—	—	1B.2	Marshes and swamps, valley and foothill grassland, and vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum	—	—	1B.1	Valley and foothill grassland. Elevation ranges from 5 to 1,495 feet (1 to 455 meters). Blooms Mar-Apr.

Source: California Department of Fish and Wildlife. 2021. CNDDDB Maps and Data: RareFind 5. Available online: <https://wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>. Accessed: September 2021.

**5.2.3.4 SPECIAL-STATUS WILDLIFE**

Based on a review of the CNDDDB, the IPac resource list, and other sources, a total of 41 special-status animal species are known or suspected to potentially occur in Livermore and surrounding region. A total of 19 of these special-status animal species have been reported by the CNDDDB within or near Livermore. These species are listed in Table 5-4, together with information on their status, and description of typical habitat characteristics. Critical habitat has been designated by the USFWS for California red-legged frog in the northeastern foothills and for vernal pool fairy shrimp in open spaces at the northern edge of Livermore (see Figure 5-3).

Many of the special-status animal species listed in Table 5-4 may occasionally pass through or forage in the Livermore vicinity, but are not known or believed to breed in Livermore. These include: San Joaquin kit fox (*Vulpes macrotis mutica*), Swainson's hawk (*Buteo swainsoni*), foothill yellow-legged frog (*Rana boylei*), and longhorn fairy shrimp (*Branchinecta longiantenna*). Most of the species listed in Table 5-4 without state and/or federal listing status are not closely monitored by the CNDDDB and therefore occurrence records are typically not included in the database. These include most of the numerous species identified as "Species of Special Concern" or "Fully Protected" by the CDFW.

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Special-status animal species known in Livermore and, are of greatest concern from a planning perspective because of their protection status or restricted distribution, which is discussed in further detail herein.

**Tricolored blackbird (*Agelaius tricolor*). State Candidate (Endangered), CDFW Species of Special Concern.** The tricolored blackbird is a locally common resident in the Central Valley and along coastal California. Most tricolored blackbirds reside in the Central Valley March through August, then move into the Sacramento-San Joaquin Delta and east to Merced County and coastal locations during winter.<sup>13</sup> This species breeds adjacent to freshwater, preferring emergent wetlands with tall, dense cattails or tules, thickets of willow or blackberry, and/or tall herbs. Flooded agricultural fields with dense vegetation are also used.<sup>14</sup> This species is highly colonial; nesting habitat must be large enough to support a minimum of 30 pairs, and colonies are commonly substantially larger (up to thousands of pairs). The tricolored blackbird often intermingles with other blackbird species during the non-breeding season. Individuals typically forage up to 5.6 miles (9 kilometers) from their colonies, although in most cases only a small part of the area within this range provides suitable foraging habitat.<sup>15</sup>

Tricolored blackbird has been documented within Livermore, chiefly in concrete-lined channels with emergent vegetation growth. Similarly, detention basins or other artificial water bodies may support sufficiently large areas of suitable vegetation for the establishment of a tricolored blackbird colony. These habitats are scattered throughout Livermore wherever semi-perennial aquatic habitats exist.

**Burrowing owl (*Athene cunicularia*). CDFW Species of Special Concern.** The burrowing owl occurs as a year-round resident and winter visitor in much of California's lowlands, inhabiting open areas with sparse or non-existent tree or shrub canopies. Typical habitat is annual or perennial grassland, although human-modified areas such as agricultural lands and undeveloped land at airports, are also used.<sup>16</sup> This species is dependent on burrowing mammals to provide the burrows that are characteristically used for shelter and nesting, and in Northern California is typically found in close association with California ground squirrels. Humanmade substrates such as pipes or debris piles may also be occupied in place of burrows. Prey consists of insects and small vertebrates. Breeding typically takes place from March to July.

Burrowing owl have the potential to occur widely within Livermore given the presence of ground squirrel activity (and thus suitable burrows). Ruderal uplands or grasslands in open spaces are the most likely to support both ground squirrels and burrowing owl, provided vegetation height is suitable (i.e., less than six inches). Burrowing owl may occur in relatively developed areas as well if the proper habitat elements are present.

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<sup>13</sup> Meese, R.J., E.C. Beedy and W.J. Hamilton, III. 2014. "Tricolored Blackbird (*Agelaius tricolor*)," The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/423>.

<sup>14</sup> Shuford, WD and T Gardali, eds. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

<sup>15</sup> Hamilton III, WJ and RJ Meese. 2006. Habitat and population characteristics of Tricolored Blackbird colonies in California. 2005 final report. U.C. Davis for California Department. of Fish and Game.

<sup>16</sup> Poulin, Ray, L. D. Todd, E. A. Haug, B. A. Millsap and M. S. Martell. 2011. Burrowing Owl (*Athene cunicularia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/061doi:10.2173/bna.61>

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**White-tailed kite (*Elanus leucurus*).** CDFW Fully Protected Species. The white-tailed kite is resident in open to semi-open habitats throughout the lower elevations of California, including grasslands, savannahs, woodlands, agricultural areas and wetlands. Vegetative structure and prey availability seem to be more important habitat elements than associations with specific plants or vegetative communities.<sup>17</sup> Nests are constructed mostly of twigs and placed in trees, often at habitat edges. Nest trees are highly variable in size, structure, and immediate surroundings, ranging from shrubs to trees greater than 150 feet tall.<sup>15</sup> This species preys on a variety of small mammals, as well as other vertebrates and invertebrates.

White-tailed kite may occur widely throughout Livermore, although most common occurrences would be in parks and open spaces given the need for foraging habitat adjacent to nest trees. Documented occurrences within Livermore are generally in semi-developed locations with suitable nest trees and ruderal uplands that likely support a suitable small mammal prey base.

**California tiger salamander (*Ambystoma californiense*),** Federal Threatened, State Threatened. The California tiger salamander is restricted to grasslands and low-elevation foothill regions in California (generally under 1,500 feet) where it uses seasonal aquatic habitats for breeding. The salamanders breed in natural ephemeral pools, or ponds that mimic ephemeral pools (stock ponds that go dry), and occupy substantial areas surrounding the breeding pool as adults. California tiger salamanders spend most of their time in the grasslands surrounding breeding pools. They survive hot, dry summers by living underground in burrows (such as those created by ground squirrels and other mammals and deep cracks or holes in the ground) where the soil atmosphere remains near the water saturation point. During wet periods, the salamanders may emerge from refugia and feed in the surrounding grasslands.

California tiger salamander has generally been documented in undeveloped portions of Livermore or at the periphery of development (chiefly at the northern and southern extremes of Livermore). Rangeland areas or other similar habitats are commonly occupied by this species due to the presence of suitable aquatic habitat (i.e., stock ponds and vernal pools) adjacent to grasslands with small mammal burrows or soil fissures where estivation can occur. This species is rarely found in waterways within developed areas.

**California red-legged frog (*Rana draytonii*).** Federal Threatened, CDFW Species of Special Concern.

California red-legged frog (CRLF) is the only native “pond frog” found throughout much of California. Suitable aquatic breeding habitat is characterized by deep and still or slow-moving water associated with emergent marsh and/or riparian vegetation, typically with at least 20 weeks of continuous inundation.<sup>18</sup> Suitable features include ponds (perennial and non-perennial), streams/creeks, seasonal wetlands, springs, seeps, humanmade features (e.g., stock ponds, roadside ditches), marshes, dune ponds, and lagoons. Dependent upon local conditions, CRLF may complete its entire life cycle in a particular habitat patch (e.g., a perennial pond suitable for all life stages), or use multiple habitat types. In aquatic features that dry down seasonally, CRLFs often undergo aestivation (a period of inactivity) during the dry months, retreating to small mammal burrows or other substrates that provide suitable refugia.<sup>19</sup> Adults and sub-

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<sup>17</sup> Dunk, JR. 1995. White-tailed Kite (*Elanus leucurus*), The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/178>.

<sup>18</sup> U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the California Red-Legged Frog; Final Rule. Federal Register 75(51): 12816-12959. March 17.

<sup>19</sup> Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. Co-published by the California Department of Fish and Wildlife and University of California Press. Oakland, California.

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adults (newly metamorphosed individuals) may disperse from breeding habitats to nearby riparian and/or aestivation areas in the summer. Conversely, during the rainy season CRLFs may migrate from aestivation sites to waters suitable for breeding. During such dispersals, frogs can travel over one mile over a variety of topographic and habitat types.<sup>20</sup> Upland dispersal habitats are variable and typically include riparian corridors, grasslands, and oak savannas.

Occurrences of CRLF are variable within Livermore, although they are most likely to be found in grassland or rangeland areas outside of developed areas due to the presence of both aquatic breeding habitat and upland estivation habitat. However, unlike California tiger salamander, CRLF is periodically documented in stormwater conveyances or natural creeks in more developed areas within Livermore, presumably due to traversing these aquatic habitats during periods of increased precipitation. CRLF critical habitat has been designated by the USFWS along the northern edge of Livermore.

**Western pond turtle (*Actinemys marmorata*), CDFW Species of Special Concern.** The western pond turtle (WPT) is the only native freshwater turtle in California. WPT is uncommon to common in aquatic habitat throughout California, west of the Sierra-Cascade crest and Transverse Ranges. WPT inhabits annual and perennial aquatic habitats, such as coastal lagoons, lakes, ponds, marshes, rivers, and streams from sea level to 5,500 feet in elevation. Pond turtles also occupy humanmade habitats such as stock ponds, wastewater storage, percolation ponds, canals, and reservoirs. This species requires low-flowing or stagnant freshwater aquatic habitat with suitable basking structures, including rocks, logs, algal mats, mud banks, and sand. Warm, shallow, nutrient-rich waters are ideal as they support prey items, which include aquatic invertebrates and occasionally fish, carrion, and vegetation. Turtles require suitable aquatic habitat for most of the year; however, WPT often occupies creeks, rivers, and coastal lagoons that become seasonally unsuitable. To escape periods of high water flow, high salinity, or prolonged dry conditions, WPT may move upstream and/or take refuge in vegetated, upland habitat for up to four months.<sup>21</sup> Although upland habitat is used for refuging and nesting, this species preferentially uses aquatic and riparian corridors for movement and dispersal.

WPT has been reported from various locations within Livermore. Typical habitats within Livermore include aquatic habitats with adjacent ruderal or grassland areas, including detention basins, concrete-lined segments of streams, and natural streams and ponds.

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<sup>20</sup> Bulger, J.B., S.J. Norman, and R.B. Seymour. 2003. Terrestrial Activity and Conservation of Adult California Red-legged Frogs (*Rana aurora draytonii*) in Coastal Forests and Grasslands. *Biological Conservation* 110 (2003) 85–95.

<sup>21</sup> Rathbun, GB, NJ Scott, Jr., and TG Murphey. 2002. "Terrestrial habitat use by Pacific pond turtles in a Mediterranean climate. *The Southwestern Naturalist* 47: 225-235.

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**Vernal pool fairy shrimp (*Branchinecta lynchi*), Federal Threatened Species.** The vernal pool fairy shrimp (VPFS) is widespread but not abundant; populations are known from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County (additional disjunct populations exist at various locations throughout state). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear sandstone rock pools to large, turbid, alkaline, grassland valley floor pools.<sup>22</sup>

VPFS are limited in where they can occur by the presence of vernal pool habitats, which are generally limited to grassland areas along the northern edge of Livermore. Some vernal pool habitats may also occur within grasslands in the southeast corner of Livermore, although it is possible these areas have not been specifically surveyed for this species. Portions of the northern edge of Livermore are designated as critical habitat for VPFS.

**Steelhead- Central California Coast DPS (*Oncorhynchus mykiss irideus*), Federal Threatened.** The Central California Coast DPS includes all naturally spawned populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin. Steelhead typically migrate to marine waters after spending 2 years in freshwater, though they may stay up to seven. They then reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn as four- or five-year-olds. Steelhead adults typically spawn between December and June. In California, females typically spawn two times before they die. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels and fast flowing water. Abundant riffle areas (shallow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.

Steelhead is not documented in the CNDDDB within Livermore or the immediate vicinity. However, some sources suggest that Arroyo Mocho, which flows through Livermore, contains a steelhead run or at least supports a population.<sup>23</sup> This population may be historical rather than current, because downstream water control structures (e.g., dams) prevent Arroyo Mocho from being inundated for long periods of the year. Thus, under certain circumstances, Arroyo Mocho could support steelhead within Livermore, but only during conditions when Arroyo Mocho is inundated and when/if fish passage is feasible.

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<sup>22</sup> U.S. Fish and Wildlife Service (USFWS). August 6, 2003. Federal Register Final Rule; designation of critical habitat for four vernal pool crustaceans and eleven vernal pool plants in California and southern Oregon.

<sup>23</sup> Leidy, R.A., G.S. Becker, B.N. Harvey. 2005. Historical distribution and current status of steelhead/rainbow trout (*Oncorhynchus mykiss*) in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.

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TABLE 5-4 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM LIVERMORE

Scientific Name	Common Name	Federal Status	State Status*	Habitat
<b>Birds</b>				
<i>Agelaius tricolor</i>	tricolored blackbird	—	ST, SSC	Nearly endemic to California, where it is most numerous in the Central Valley and vicinity. Highly colonial, nesting in dense aggregations over or near freshwater in emergent growth or riparian thickets. Also uses flooded agricultural fields. Abundant insect prey near breeding areas essential.
<i>Ammodramus savannarum</i>	grasshopper sparrow	—	SSC	Summer resident. Breeds in open grasslands in lowlands and foothills, generally with low- to moderate-height grasses and scattered shrubs. Well-hidden nests are placed on the ground.
<i>Athene cunicularia</i>	burrowing owl	—	SSC	Year-round resident and winter visitor. Occurs in open, dry grasslands and scrub habitats with low-growing vegetation, perches and abundant mammal burrows. Preys upon insects and small vertebrates. Nests and roosts in old mammal burrows, most commonly those of ground squirrels.
<i>Buteo swainsoni</i>	Swainson's hawk	—	ST	Summer resident in California's Central Valley. Nests in tree groves and isolated trees in riparian and agricultural areas, including near buildings. Forages in grasslands and scrub habitats as well as agricultural fields, especially alfalfa. Preys on arthropods year-round as well as smaller vertebrates during the breeding season.
<i>Elanus leucurus</i>	white-tailed kite	—	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.
<i>Lanius ludovicianus</i>	loggerhead shrike	—	SSC	Year-round resident in open woodland, grassland, savanna, and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.



**BIOLOGICAL RESOURCES****TABLE 5-4 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM LIVERMORE**

Scientific Name	Common Name	Federal Status	State Status*	Habitat
<b>Mammals</b>				
<i>Antrozous pallidus</i>	pallid bat	—	SSC	Found in a variety of habitats ranging from grasslands to mixed forests, favoring open and dry, rocky areas. Roost sites include crevices in rock outcrops and cliffs, caves, mines, and also hollow trees and various humanmade structures such as bridges, barns, and buildings (including occupied buildings). Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	SSC	Associated with a wide variety of habitats from deserts to higher-elevation mixed and coniferous forests. Females form maternity colonies in buildings, caves and mines, and males roost singly or in small groups. Foraging typically occurs at edge habitats near wooded areas, e.g. along streams.
<i>Lasiurus cinereus</i>	hoary bat	—	WBWG_M	Prefers open forested habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths.
<i>Taxidea taxus</i>	American badger	—	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE	ST	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.
<b>Amphibians</b>				
<i>Ambystoma californiense</i>	California tiger salamander, central population	FT	ST	Occurs in grasslands of the Central Valley and oak savanna communities in the Central Valley, the Sierra Nevada and Coast ranges, and the San Francisco Bay area. Needs seasonal or semi-permanent wetlands to reproduce, and terrestrial habitat with active ground squirrel or gopher burrows.

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TABLE 5-4 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM LIVERMORE

Scientific Name	Common Name	Federal Status	State Status*	Habitat
<i>Rana boylei</i>	foothill yellow-legged frog		SC	Found in or adjacent to rocky streams in a variety of habitats. Prefers partly-shaded, shallow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.
<i>Rana draytonii</i>	California red-legged frog	FT	SSC	Found mainly near ponds in riparian woodlands, grasslands, coastal scrub, and stream sides with emergent vegetation. Most common in lowlands or foothills. Frequently found in woodlands adjacent to streams. Breeding habitat is in permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry.
<b>Reptiles</b>				
<i>Emys marmorata</i>	Western pond turtle	—	SSC	Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking.
<i>Masticophis flagellum ruddocki</i>	San Joaquin coachwhip	—	SSC	Occurs in open, dry, treeless areas, including grassland and saltbush scrub. Takes refuge in rodent burrows, under shaded vegetation, and under surface objects.
<b>Insects and Crustaceans</b>				
<i>Branchinecta longiantenna</i>	longhorn fairy shrimp	FE	—	Endemic to the eastern margin of the central coast mountains in seasonally astatic grassland vernal pools. Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	—	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.

**BIOLOGICAL RESOURCES****TABLE 5-4 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM LIVERMORE**

Scientific Name	Common Name	Federal Status	State Status*	Habitat
<b>Fishes</b>				
<i>Oncorhynchus mykiss irideus</i>	steelhead - central CA coast DPS	FT	—	Occurs from the Russian River south to Aptos Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.

Source: California Department of Fish and Wildlife. 2021. CNDDDB Maps and Data: RareFind 5. Available online: <https://wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>. Accessed: September 2021.

\*Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
SE	State Endangered
ST	State Threatened
SC	State Candidate
SR	State Rare
CFP	California Fully Protected Species
BCC	Bird of Conservation Concern
SSC	CDFW Species of Special Concern
WBWG-H, -M	Western Bat Working Group High and Medium Priority Status

**5.2.4 SENSITIVE NATURAL COMMUNITIES**

Sensitive natural communities documented by CNDDDB within Livermore include alkali meadow and scalds and valley sink scrub. These sensitive natural communities cover approximately 623 acres (Table 5-2) of land within Livermore. Occurrences of other sensitive natural communities may be present within Livermore but have not been mapped as part of EACCS or other regional mapping efforts. Detailed surveys would be required to provide confirmation on the presence or absence of any sensitive natural communities from undeveloped portions of Livermore where thorough studies have not been conducted.

**5.2.5 AQUATIC RESOURCES**

Livermore's aquatic resources include wetlands, streams and arroyos, and riparian habitats. These resources are recognized as important features on a regional and national level because of their high inherent value to fish and wildlife, use as storage areas for storm and floodwaters, and water recharge, filtration, and purification functions. As shown in Figure 5-2, features within Livermore that could be considered wetlands or other waters of the U.S. by the U.S. Army Corps of Engineers (USACE) include alkali wetland, perennial freshwater marsh, seasonal wetland, and riverine features. Additional federal and state regulated aquatic features may be present elsewhere in Livermore but site-specific assessments and jurisdictional delineation studies would be required to confirm presence or absence from undeveloped lands.

As discussed in Section 5.1, Regulatory Framework, the USACE, RWQCB, and CDFW generally exercise authority over aquatic resources, including wetland and non-wetland waters. Based on information

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available from the EACCS baseline biological inventory, numerous features within Livermore can be assumed to fall under jurisdiction of the USACE and RWQCB pursuant to Sections 404 and 401 of the CWA and Porter-Cologne Water Quality Control Act. Streams and lakes are also regulated by the CDFW pursuant to Section 1600 of the CFGC, with jurisdiction extending to the top of bank or the outer dripline of riparian vegetation along these features, whichever is greater.

The limit of federal jurisdiction in non-tidal, non-wetland waters extends to the ordinary high water mark (OHWM) rather than the band of adjacent riparian vegetation, limiting USACE's jurisdiction where dense willow riparian scrub and forest extend a considerable distance from the stream bank. However, the limit of waters of the State regulated by CDFW and the RWQCB typically encompass both the bed and bank of a stream, as well as the limits of the associated riparian vegetation where it extends beyond the top of bank. Both agencies typically request that an adequate setback be provided to avoid both direct and indirect impacts on riparian corridors as part of environmental review for specific development plans.

### 5.2.5.1 WATERWAYS/CREEKS

Several creeks and arroyos cross the Livermore Valley. Livermore's watershed and principal waterways are shown in Figure 5-2, including Altamont Creek, Arroyo Las Positas, Arroyo Mocho, Arroyo Seco, Arroyo Valle, Cottonwood Creek, and Dry Creek and are classified as riverine aquatic features. Most of these waterways flow from east to west. The Arroyo Valle drains a relatively small area of the central and southern portion of the city. Arroyo Mocho flows through the southern portion of the city, draining much of the downtown area. Arroyo Las Positas generally flows along I-580 through Livermore. The major tributaries to Arroyo Las Positas include Altamont Creek, Arroyo Seco, and Cottonwood Creek. Arroyo Valle, Arroyo Las Positas, and Arroyo Mocho join Arroyo de la Laguna in Pleasanton, which drains the Livermore Valley in a southerly direction approximately 18 miles to the San Francisco Bay via Niles Canyon and Alameda Creek, which occur outside Livermore. These riverine aquatic features are associated with riparian vegetation communities described below.

### Mixed Riparian Forest and Woodland

Riparian vegetation refers to native woodlands occurring along streams and riverbanks. Mixed riparian forest and woodland is found along perennial and intermittent streams in Livermore. This community occupies an estimated 231 acres in Livermore, as shown in Table 5-5. Dominant cover includes alder (*Alnus* sp.), California sycamore, Fremont cottonwood (*Populus fremontii*), and willows (*Salix* sp.).

There are several arroyos in the Livermore area that support riparian vegetation. Arroyo Mocho is relatively undisturbed and supports some mature riparian woodland. Arroyo Valle, particularly within the Sycamore Grove Regional Park, also supports mature riparian woodland. Other arroyos, such as Arroyo Las Positas and Arroyo Seco, have been largely modified for flood control purposes and impacted by grazing. As a result, the riparian vegetation is sparse and has been replaced by aquatic vegetation like cattails (*Typha* sp.) and rushes (*Juncus* sp.), as well as exotic species from the surrounding non-native grasslands.

Riparian areas provide important breeding and foraging habitat for many amphibians, reptiles, birds, bats, and mammals, and comprise one of the most biologically-diverse habitats in the region. Riparian habitats

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may also provide upland areas that would be used for nesting or estivation by native special-status reptiles and amphibians such as California red-legged frog and western pond turtle.

**Mixed Willow Riparian Scrub**

Mixed willow riparian scrub occurs in and along the margins of the active channel on intermittent and perennial streams. The most extensive reach of willow riparian forest and scrub occurs along Arroyo Valle as it passes through Livermore. Mixed willow riparian scrub occupies an estimated 75 acres within Livermore, as indicated in Table 5-5. This vegetation community is dominated by shrubby willows typically arroyo willow (*Salix lasiolepis*), narrowleaf willow (*Salix exigua*), red willow (*Salix laevigata*), and yellow willow (*Salix lutea*). Understory development is controlled by canopy density. Where the canopy is more open and dominated by trees or scattered willow scrub, an understory of shrubs and herbs is present.

**Sycamore Alluvial Woodland**

Sycamore alluvial woodland is generally present on broad floodplains and terraces along low gradient streams where soils are cobbly or rocky alluvium. Within Livermore, Sycamore alluvial woodland primarily occurs along Arroyo Valle in Sycamore Grove Park south of the City of Livermore. Sycamore alluvial woodland occupies 257 acres within Livermore as indicated in Table 5-5. The canopy is mostly open and dominated by California sycamore (*Platanus racemosa*). Other associated species include bigleaf maple (*Acer macrophyllum*), California bay (*Umbellularia californica*), coast live oak, valley oak (*Quercus lobata*), white alder (*Alnus rhombifolia*), and willows.

**5.2.5.2 WETLANDS**

Wetlands are natural communities that depend on year-round or seasonally dependable sources of water. Livermore supports several different types of wetlands: alkali wetland, perennial freshwater marsh, and seasonal wetlands. Wetlands occupy an estimated 179 acres in Livermore, as shown in Table 5-5.

**Alkali Wetland**

Alkali wetlands are typically found in valley bottoms where highly alkaline Rincon Solano, Clear Lake, and Pescadero soil series are present. The soils are seasonally saturated and slow to drain, supporting vegetation that is distinct from the surrounding grasslands or woodland. Similar to vernal pools and native grasslands, the extent of this habitat has diminished greatly with only small pockets left in the vicinity of Livermore. Plant species typically observed in alkali wetlands include salt grass, wild carrot (*Daucus pusillus*), and palmate-bracted bird's-beak a federally-listed and state-listed endangered plant.

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### Perennial Freshwater Marsh

Perennial freshwater marshes occur in areas that are wet year-round and are typically associated with ponds (natural or humanmade), the shallow edges of lakes, and large pools in riparian areas. Marshes typically support bulrushes (*Scirpus* sp.), cattails, rushes, sedges (*Carex* sp.), and willows, and provide habitat for wildlife species such as California red-legged frog, California tiger salamander, and western pond turtle.

### Seasonal Wetland

Seasonal wetlands, including vernal pools, were mapped in grasslands throughout Livermore. 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. Associated species include wetland generalists such as cocklebur (*Xanthium* sp.), hyssop loosestrife (*Lythrum hyssopifolia*), and Italian rye grass (*Festuca perennis*).

To form, vernal pools require slight depressions over bedrock or hardpan soils that allow water to pool during the winter and spring rains. Since vernal pools are a unique habitat and tend to be isolated, vernal pools often support species that are endemic (i.e., restricted) to vernal pools or even to pools in that region. As a result of this endemism and the dramatic decline of vernal pools due to agriculture and development, vernal pools support many special-status plant and animal species protected by the state or federal government.

TABLE 5-5 ESTIMATES OF AQUATIC LAND COVER WITHIN LIVERMORE

Land Cover Type	SOI (acres)
<b>Waterways / Creeks</b>	
Mixed Riparian Forest and Woodland	231
Mixed Willow Riparian Scrub	75
Sycamore Alluvial Woodland	257
Riverine	90
<i>Subtotal</i>	653
<b>Wetlands</b>	
Alkali Wetland	118
Perennial Freshwater Marsh	18
Seasonal Wetland	43
<i>Subtotal</i>	179
<b>Open Water</b>	
Pond	66
Quarry Pond	8
<i>Subtotal</i>	74
<b>Total</b>	<b>906</b>

Source: ICF. 2010. *East Alameda County Conservation Strategy, Final Draft*. Available online: <http://www.eastalco-conservation.org/documents.html>. Accessed: August 2021

**BIOLOGICAL RESOURCES****5.2.5.3 OPEN WATER**

Permanently inundated open water bodies are mostly restricted to the former sand and gravel pits west of the city, such as Shadow Cliffs Lake within Shadow Cliffs Regional Recreation Area. Other open water habitats may exist as small natural or humanmade ponds and reservoirs. As shown in Table 5-5, an estimated 74 acres of Livermore supports open water as pond and quarry pond land cover. Although open water does not provide habitat for many plant species, it is important for wildlife and fish species such as CRLF (during their aquatic life history periods). These habitats may also support more common and/or invasive fish and amphibian species such as bass (*Micropterus sp.*), bluegill (*Lepomis macrochirus*), and American bullfrogs (*Lithobates catesbeianus*).

**5.2.6 WILDLIFE CORRIDORS**

Wildlife movement between suitable habitat areas can occur via open space areas lacking substantial barriers. The terms “landscape linkage” and “wildlife corridor” are often used when referring to these areas. The key to a functioning corridor or linkage is that it connects two larger habitat blocks, also referred to as core habitat areas.<sup>24,25</sup> It is useful to think of a “landscape linkage” as being valuable in a regional planning context, a broad scale mapping of natural habitat that functions to join two larger habitat blocks. The term “wildlife corridor” is useful in the context of smaller, local area planning, where wildlife movement may be facilitated by specific local biological habitats or passages and/or may be restricted by barriers to movement. Above all, wildlife corridors must link two areas of core habitat and should not direct wildlife to developed areas or areas that are otherwise void of core habitat.<sup>26</sup>

Livermore is not within a designated wildlife corridor, as based on the Essential Connectivity Areas habitat mapper.<sup>27</sup> Livermore is generally located within a dense urban and residential matrix, which is typically considered to serve as a barrier to dispersal for most wildlife species. While common and/or urban-adapted wildlife species presumably use Livermore to some degree for movement at a local scale, Livermore itself does not provide corridor functions beyond connecting other more desirable habitat patches in surrounding areas. Peripheral portions of Livermore that are characterized by larger patches of grassland or woodlands, such as along the northern and southeastern boundary, may provide more function as corridors.

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<sup>24</sup> Beier, P., and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. *Wildlife Society Bulletin* 20(4):434–440.

<sup>25</sup> Soulé, M. E., and J. Terborgh. 1999. Conserving nature at regional and continental scales - a scientific program for North America. *BioScience* 49(10):809–817.

<sup>26</sup> Hilty, J. A., W. Z. Lidicker Jr, and A. M. Merenlender. 2019. *Corridor Ecology: Linking Landscapes for Biodiversity Conservation*. Second Edition. Island Press.

<sup>27</sup> California Department of Transportation (Caltrans). 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration. Available online at: <https://www.wildlife.ca.gov/Conservation/Planning/Connectivity/CEHC>.



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### 5.3 IMPLICATIONS FOR THE GENERAL PLAN UPDATE

Based on information contained in this chapter, the General Plan Update should consider the following:

- Incorporate EACCS Landscape, Natural Community, and Focal Species Conservation Goals and Objectives; and require projects to mitigate for impacts in a manner that is consistent with EACCS.
- Prepare biological resource evaluation reports and associated technical studies for each development parcel.
- Add new policies or actions to manage and monitor non-native invasive species infestations in preserved open space areas where they compromise habitat values (e.g., Springtown Alkali Sink, Brushy Peak, Corral Hollow, Cedar Mountain and Sycamore Grove).
- Preserve vernal pools and other seasonal wetland habitats that may support protected species, including California tiger salamander and vernal pool fairy shrimp.
- Provide policy direction for potential development in areas within and adjacent to designated Critical Habitat for CRLF and vernal pool fairy shrimp to protect these biological resources.
- Employ monitoring and adaptive management strategies to mitigate potential impacts from climate change to sensitive habitats and special-status species.