4.4 BIOLOGICAL RESOURCES

This section discusses biological resources in Vacaville and evaluates the potential biological resource impacts resulting from the spatial location of development that would be allowed by the proposed General Plan and Energy and Conservation Action Strategy (ECAS). The following evaluation assesses special-status species, sensitive biological communities, wetlands, migratory species, and policies and plans intended to protect biological resources. As noted in Chapter 3, Project Description, impacts are determined by comparing the proposed General Plan and ECAS to existing conditions, rather than to the existing General Plan. The following evaluation is based on a spatial analysis and examines the effects of the location of potential development on biological resources and identifies conflicts with plans, policies, regulations, and ordinances relating to biological resources.

A. Regulatory Framework

1. Federal Laws and Regulations

This section summarizes federal laws and regulations that apply to biological resources within the EIR Study Area.

a. Section 404 of the Clean Water Act

The US Army Corps Engineers (Corps), the federal agency charged with investigating, developing, and maintaining the country's water and related resources, is responsible under Section 404 of the Clean Water Act for regulating the discharge of fill material into waters of the United States. Waters of the United States and their lateral limits are defined in Part 328.3(a) of Title 33 of the Code of Federal Regulations (CFR) and include streams that are tributaries to navigable waters and adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of the Ordinary High Water Mark[1] or the limit of adjacent wetlands.[2] Any permanent extension of the limits of an existing water of the United States, whether natural or human-made, results in a similar extension of Corps jurisdiction.[3]

Waters of the United States fall into two broad categories: wetlands and other waters. Other waters include water bodies and water courses such as rivers, streams, lakes, springs, ponds, coastal waters, and estuaries. Wetlands include marshes, wet meadows, seep areas, floodplains, basins, and other areas experiencing extended seasonal soil saturation. Seasonally- or intermit-

[1] 33 CFR Part 328.3(e).
[2] 33 CFR Part 328.3(b).
[3] 33 CFR Part 328.5.

tently-inundated features, such as seasonal pools, ephemeral streams, and tidal marshes, are categorized as wetlands if they have hydric soils and are dominated by wetland plants. Seasonally inundated water bodies or watercourses that do not exhibit wetland characteristics are classified as "other waters of the United States."

Waters and wetlands that cannot trace a continuous hydrological connection to navigable Waters of the United States are not considered tributaries to waters of the United States. These are termed "isolated wetlands." Isolated wetlands are jurisdictional when their destruction or degradation can affect interstate or foreign commerce.[4] The Corps may or may not take jurisdiction over isolated wetlands depending on the circumstances.

In addition, there are certain exemptions for normal agricultural activities under the 404 regulations. These exemptions include:

- The construction of farm roads (Sec. 1344(f)(1)(E)).
- The construction of farm or stock ponds, irrigation ditches, and minor agricultural drainages (Sec. 1344(f)(1)(A)).
- The maintenance of drainage ditches (Section 1344(f)(1)(C)).

In general, a Corps permit must be obtained before an individual project in Vacaville can place fill or grade in wetlands or other waters of the United States, and mitigation for such actions will be required based on the conditions of the Corps permit. The Corps will be required to consult with the US Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (described in Section A.1.c) if the action being permitted under the Clean Water Act could affect federally listed species.

b. Section 401 Water Quality Certification

Pursuant to Section 401 of the Clean Water Act, projects that require a Corps permit for discharge of dredge or fill material must obtain a water quality certification or waiver that confirms the project complies with State water quality standards, or a no-action determination, before the Corps permit is valid. State water quality is regulated and administered by the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCB). Vacaville is mainly within jurisdiction of the Sacramento RWQCB. In order for the applicable RWQCB to issue a 401 certification, a project must demonstrate compliance with CEQA (e.g. negative declaration, EIR, or notice of exemption).

[4] 33 CFR Part 328.3(a).

c. Endangered Species Act

The US Fish and Wildlife Service (USFWS), the federal agency whose mission is to, "conserve, protect, and enhance fish, wildlife, and plants," has jurisdiction over terrestrial and non-anadromous aquatic plant and animals species listed as threatened or endangered under the federal Endangered Species Act.[5] In addition, the National Marine Fisheries Service (NMFS), the federal agency responsible for managing, conserving, and protecting living marine resources, has jurisdiction over marine and anadromous fish species listed under the Endangered Species Act. The Endangered Species Act protects listed animal species from "take," which is broadly defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct." The term "harm" is further defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. The term "harass" is further defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.[6] An activity can be defined as a "take" even if it is unintentional or accidental. Plants are legally protected under the Endangered Species Act if take occurs on federal land or from federal actions, such as issuing a wetland fill permit. Any activity in Vacaville that could result in the take of a federally listed species would require an incidental take authorization. Projects with a federal nexus such as federal funding or those that require a permit from a federal agency such as the Corps may obtain take authorization through the Endangered Species Act Section 7 consultation process. Projects lacking a federal nexus must obtain permits through an Endangered Species Act Section 10(a)(1)(B) permit.

An endangered species is one that is considered in danger of becoming extinct throughout all, or a significant portion, of its range. A threatened species is one that is likely to become endangered in the foreseeable future. The USFWS also maintains a list of species proposed for listing as threatened or endangered. Proposed species are those for which a proposed rule to list as endangered or threatened has been published in the *Federal Register*.

The protection of listed species under the federal Endangered Species Act from take extends to development projects in Vacaville as well as an individual's actions in Vacaville.

d. Migratory Bird Treaty Act

The USFWS is responsible for enforcing the Migratory Bird Treaty Act of 1918 (MBTA),[7] which prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. In addition, it contains a clause that prohibits baiting or poi-

[5] USFWS, Who We Are, http://www.fws.gov/who/, accessed on August 23, 2012.

[6] 50 CFR Section 17.3.

[7] United States Code, Title 16, Chapter 7, Subchapter II.

soning these birds. As used in this Act, 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."

The Migratory Bird Treaty Act has traditionally been seen as imposing strict liability on activities resulting in the "take" of migratory birds, regardless of whether there was any intent to take the birds. However, recent case law in several areas has determined that the MBTA was not intended to impose criminal liability on the acts or omissions of persons involved in lawful commercial activities such as agriculture or land clearing for development, which may indirectly cause the death of birds protected under the Migratory Bird Treaty Act.

Most of the native bird species that occur in and around Vacaville are covered by this Act. As with the federal Endangered Species Act, the Migratory Bird Treaty Act is broad regulation aimed at protecting migratory bird species; however, unlike the Endangered Species Act, the Migratory Bird Treaty Act implementing regulations do not have a permit system that allows for taking of most migratory birds.

2. State Laws and Regulations

This section summarizes State laws and regulations that apply to biological resources within the EIR Study Area.

a. Porter-Cologne Water Quality Act

The State and Regional Water Quality Control Boards (RWQCB) maintain independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Water Quality Act of 1969. This Act is similar to and largely based off the federal Clean Water Act and is intended to preserve and enhance all beneficial uses of the waters of the State. The RWQCB currently employs the Corps procedures and definitions for defining the physical boundaries of wetlands and waters. However, there are differences in the State and federal ability to regulate these features. In order to be subject to federal regulation as waters of the United States, wetlands and waters must demonstrate that water is, or is adjacent to, a navigable waterway or a tributary to a navigable waterway, or have an interstate or foreign commerce connection. Under the Porter-Cologne Act, the State has regulatory authority over what are termed "isolated" waters and wetlands, in addition to waters of the United States. There are other important differences between the State and federal regulations. First, State regulations do not have a similar agricultural exemption to the 404 regulations. In addition, the State may choose to impose or require different mitigation requirements than may be required by the Corps.

Should the RWQCB decide not to issue a 401 certification or waiver for a project or there are isolated wetlands, the RWQCB would regulate the fill of waters of the State under this Act. As with the 401 certification discussed in Section A.1.b, the applicable RWQCB must demonstrate compliance with CEQA (e.g. negative declaration, EIR, or notice of exemption) before issuing a permit.

b. California Endangered Species Act

The California State Fish and Game Commission is a five-member, Governor-appointed body which manages the State's fish, wildlife, and plant resources, including adopting hunting and sport fishing regulations. Section 2080 of the Fish and Game Code prohibits the "take" of any species that the California State Fish and Game Commission determines to be an endangered species or a threatened species. "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill; or attempt to hunt, pursue, catch, capture, or kill."

The State and federal lists of threatened and endangered species are generally similar; however, a species present on one list may be absent from the other. California Endangered Species Act of 1984 regulations are also somewhat different from the federal Endangered Species Act in that the State regulations include threatened and endangered plants on non-federal lands within the definition of "take."

The California Endangered Species Act allows for take incidental to otherwise lawful development projects. The California Endangered Species Act emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to fully offset project-caused losses of listed species populations and their essential habitats.

The California Department of Fish and Game (CDFG) is a State department which oversees the management of fish, wildlife, and plant resources, and their habitats. Through permits or memorandums of understanding, CDFG may authorize individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess any endangered species, threatened species, or candidate species of plants and animals for scientific, educational, or management purposes.

CDFG also maintains lists of Species of Special Concern, which include plants and animals that may have shown population declines or restricted distribution within the state, and/or are associated with habitats that are declining in California. These species, along with other special interest species, are inventoried in the California Natural Diversity Database (CNDDB). Impacts on special-status plants and animals may be considered significant under Section 15380 of CEQA, depending on the particular circumstances.

As with the federal Endangered Species Act, the California Endangered Species Act provides broad protection for listed species from take. This protection extends to development projects in Vacaville as well as an individual's actions.

c. California Fish and Game Code Sections 1600 to 1616

CDFG also administers the issuance of Streambed Alteration Agreements under Fish and Game Code Sections 1600 to 1616. Streambed Alteration Agreements are required for any project activities in Vacaville that would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated as such by CDFG. Similar to the water quality regulations administered by the RWQCB, a project must demonstrate compliance with CEQA before a permit may be issued.

d. California Fish and Game Code 3503 and 3503.5

Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (e.g. hawks, eagles, vultures, and owls), or destroy their nests or eggs. These regulations provide the primary regulatory basis requiring nest avoidance measures for species such as the burrowing owl and Swainson's hawk in Vacaville.

e. Oak Woodlands Conservation Act

The California Oak Woodlands Conservation Act[8] of 2001 acknowledges the importance of private land stewardship to the conservation of the state's valued oak woodlands. The Act establishes the California Oak Woodlands Conservation Program, which aims to conserve oak woodlands existing in the state's working landscapes by providing education and incentives to private landowners. The program provides technical and financial incentives to private landowners to protect and promote biologically-functional oak woodlands.

f. California Native Plant Society

The California Native Plant Society (CNPS) is a nonprofit organization dedicated to conserving native plants in California. The CNPS, in conjunction with CDFG, other agency staff, consultants, academic botanists, and other nongovernmental conservation organizations, has developed an Inventory of Rare and Endangered Vascular Plants of California. The ranking categories recently changed from the "CNPS List" to the "California Rare Plant Rank" (RPR); the rankings are as follows:

- **RPR 1A:** Extinct.
- **RPR 1B:** Rare, threatened, or endangered in California and elsewhere.

[8] California Fish and Game Code Section 1360 et seq.

- **RPR 2:** Rare, threatened, or endangered in California, but more common elsewhere.
- **RPR 3:** Lack of necessary information to determine whether the plant should be assigned to a list.
- **RPR 4:** Limited distribution in California.

All of the plant species on RPR 1 and RPR 2 are generally considered to meet the requirements of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) California Endangered Species Act from the California Fish and Game Code for State listing. Therefore, plants appearing on RPR 1 or RPR 2 are typically considered to meet the criteria of CEQA Section 15380 and impacts on these species are considered "significant" under CEQA.

3. Local Regulations and Policies

This section summarizes local regulations and policies that apply to biological resources in the EIR Study Area.

a. Solano Multi-Species Habitat Conservation Plan

The US Bureau of Reclamation is responsible for water management and constructed many of the dams, powerplants, and canals in the western United States. The Solano County Water Agency (SCWA) is a whole water agency providing untreated water throughout Solano County. The US Bureau of Reclamation, together with the SCWA and its eight member agency contracts with the Cities of Vacaville, Fairfield, Suisun City, and Vallejo, the Solano Irrigation District, the Maine Prairie Water District, the University of California, Davis, and the California Medical Facility/California State Prison, Vacaville, have agreed to implement conservation measures to ensure the protection of threatened and endangered species and their habitat within the SCWA contract service area.[9] Full implementation of the conservation measures outlined in the Solano Project Water Service Contract Renewal Biological Opinion is key to the survival and recovery of listed species. As such, SCWA and the member agencies are developing the Solano Multi-Species Habitat Conservation Plan (HCP) for the Solano Project contract service area. The HCP is intended to support the issuance of a Section 10(a)1(B) "incidental take permit" under the Endangered Species Act for activities associated with future water use in the Solano Project contract service area. The HCP participants also intend to secure incidental take authorization from CDFG for State-listed species.[10]

Once the applicable State and federal incidental take permits are issued, the HCP participants will assume primary responsibility for extending incidental take coverage for their own activities,

[9] The Solano Irrigation District is an independent special district and a local government agency that provides agricultural and domestic water to farms, families, and businesses within its jurisdiction. The Maine Prairie Water District is the water district to the south of Dixon and east of Vacaville.

[10] Fish and Game Code Section 2080.1.

extending coverage to third parties over which the HCP participants have direct regulatory control (e.g. through issuance of grading permits, occupancy permits, and use permits), and ensuring compliance with required avoidance, minimization, and mitigation measures. The HCP effectively shifts endangered species regulations compliance from a federal and State level to the local level under the authority of a well-regulated, regional plan.

The Solano HCP proposes to secure incidental take authorization for 37 species present within the county. The scope of the HCP includes take coverage for federally listed fish species under the jurisdiction of NMFS and species listed as threatened or endangered under the California Endangered Species Act. The HCP further addresses other species of concern, that is, species recognized by groups such as CDFG and the California Native Plant Society (CNPS) as having declining or vulnerable populations, but not officially listed as threatened or endangered species.

An additional 35 species are addressed in the HCP's Conservation Strategy as "Special Management Species." Special Management Species include species that were initially considered for inclusion in the HCP as Covered Species and are considered under CEQA Section 15380 to be threatened or endangered. However, the life history and/or habitat associations for such species may not be fully known. While these species will benefit from the broader community conservation provided for other Covered Species, sufficient information on their biology and management is not available to allow the federal agencies to make the necessary findings under the "No Surprises" assurances[11] that the proposed Conservation Program and Covered Activities will not appreciably reduce the likelihood of survival and recovery of the species in the wild.

The Solano HCP is at the final administrative draft stage and a Public Draft is scheduled to be released in late summer or early fall of 2013. Once adopted, permitting authority for the take of covered species would be largely transferred from the federal and State levels to the HCP participants, such as the City of Vacaville.

b. Vacaville Land Use and Development Code

Section 14.09.131 of the Vacaville Land Use and Development Code sets forth criteria for the preservation of native species, healthy trees, large specimens, and visually prominent trees. Impacts to any tree greater than 31 inches in circumference at 4.5 feet above the ground surface requires a City permit.

[11] The purpose of the No Surprises Rule (50 CFR 17.21(b)(5)-(6) and 17.22(b)(5)-(6); 63 F.R. 8859) is to provide assurances to nonfederal landowners participating in habitat conservation planning under the Endangered Species Act that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the Permittee(s).

Section 14.12.174.050 of the Vacaville Land Use and Development Code sets forth criteria for the designation of development setbacks for creeks, with a minimum setback standard of 40 feet from the top of the stable bank, as determined by the City Engineer.

Section 14.09.098 of the Vacaville Land Use and Development Code establishes the permitted and conditional uses allowed in the Agricultural Hillside (AH) district, and establishes development standards for uses in this district. The AH district provides for low intensity agricultural uses on privately held hillside lands. Lands within this designation are generally areas of steep slope, lacking the necessary public infrastructure to support urban development. Development is limited to one dwelling unit per 20 acres and other accessory uses associated with agriculture.

Section 14.09.101 of the Vacaville Land Use and Development Code establishes development standards for the Open Space (OS) district. The purpose of the OS district is to provide for the preservation of public open space lands such as hillsides, ridgelines, and scenic areas. The OS district also includes areas with limited development potential due to physical characteristics of the land or lack of access. The purposes of the OS chapter are to: promote the preservation of public open space lands in order to protect natural resources, wildlife habitat, ridgelines, and areas of scenic beauty and cultural significance; provide for continued agricultural uses; provide for low intensity outdoor recreational uses in natural environments; protect the public health and safety by limiting the use of lands which are subject to fire, landslide, or seismic hazards; and implement the goals, objectives, and policies of the Land Use and Development Code and the General Plan.

B. Existing Conditions

Vacaville is located at the transition zone between the Sacramento Valley to the east and the Coast Ranges to the west. The EIR Study Area includes two small valleys, Vaca and Lagoon, and is drained by several creeks, including Alamo, Ulatis, Horse, and Gibson Canyon creeks. Its location within a transition zone between two major geographical regions results in a diversity of biological resources.

As discussed in Section A.3.a, a regional HCP is being developed for Solano County. The City of Vacaville is a participant in the HCP, and this section is based on the data developed for the Solano HCP.

1. Natural Communities

For simplicity, the conservation strategy for the Solano HCP was divided into four broad natural community types defined through a combination of dominant plant community characteristics,

landform, land use, and ecological function. These natural communities correspond to the broad geographic regions within the county and include:

- Valley floor grassland and vernal pool natural community
- Inner Coast Range natural community
- Riparian, stream, and freshwater marsh natural community
- Coastal marsh natural community

The northeastern portion of Solano County consists primarily of irrigated agriculture. The Solano HCP does not define agriculture as a natural community; however, it provides important habitat for several wildlife species.

As shown in Figure 4.4-1, of the four natural community types defined in the Solano HCP, the EIR Study Area encompasses three: the valley floor grassland and vernal pool natural community; the Inner Coast Range natural community; and the riparian, stream and freshwater marsh natural community. In addition, the EIR Study Area encompasses a significant amount of agricultural habitat.

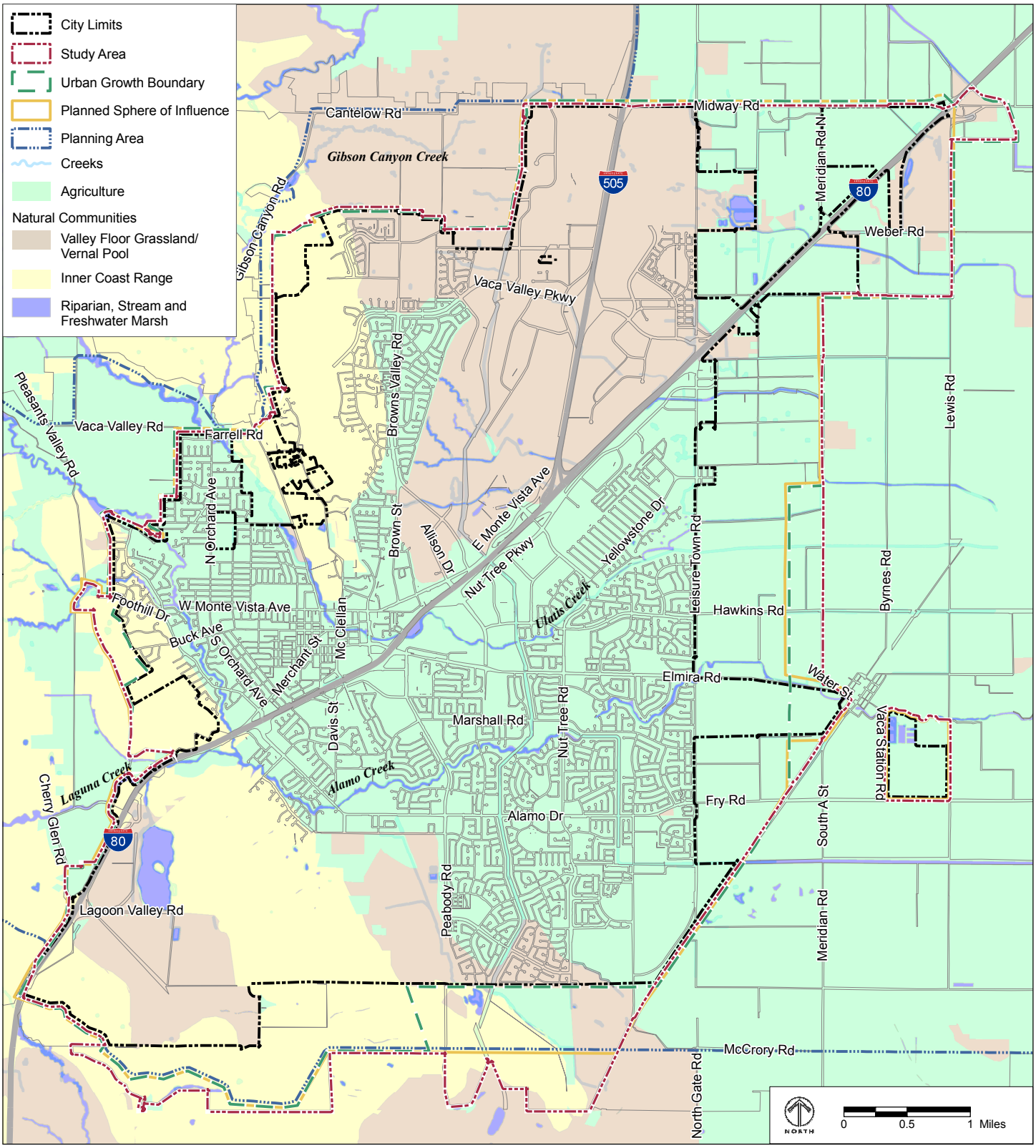
a. Valley Floor Grassland and Vernal Pool Natural Community

The valley floor grassland and vernal pool natural community can be found in several places within the EIR Study Area: Lagoon Valley in the southwest area; large portions of the northeast area, east of Browns Valley Road; and areas around Peabody Road in southern Vacaville. The valley floor grassland and vernal pool natural community includes areas that currently support vernal pool habitats or likely historically supported them and are reasonably capable of being restored to vernal pool habitats.

This community type also includes the surrounding grasslands within the immediate watershed of these areas. This community type is primarily tied to soil types with an underlying claypan or other shallow impermeable layer that significantly restricts the downward percolation of water.

b. Inner Coast Range Natural Community

The Inner Coast Range natural community encompasses the entire western margin of the county, and includes the Vaca Mountains and Blue Ridge area, which extend into western portions of the EIR Study Area. This community association is distinguished from the lowland, valley floor, or vernal pool grassland association by geographic location, elevation, and soils. Consisting of ridges and valleys that trend in a northwestern direction, this natural community is better characterized as a geographical region because it combines a number of plant communities, including grassland, oak woodland, oak savanna, and mixed chaparral/scrub, that form a mosaic over the



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-1

NATURAL COMMUNITY BOUNDARIES

entire Inner Coast Range. This mosaic of different plant communities provides a diverse array of habitat types for plants and wildlife. Portions of the Inner Coast Range that fall within the EIR Study Area include the English Hills to the north, and the hills surrounding Lagoon Valley in the southwest.

c. Riparian, Stream, and Freshwater Marsh Natural Community

Embedded throughout all of the other natural communities is the riparian, stream, and freshwater marsh natural community, which encompasses all freshwater, aquatic, marsh, and riparian habitats. The major riparian and stream habitats that run through the EIR Study Area are Alamo Creek, Ulatis Creek, Laguna Creek, and Gibson Canyon Creek. Alamo Creek and Ulatis Creek have well-developed riparian plant communities, but the majority of these areas within the EIR Study Area are dominated by non-native species. Even though the "riparian" habitats within the city are very narrow (i.e. only 1 or 2 tree canopies wide) and characterized by non-native trees and shrubs, they provide important habitat linking the Vaca Mountains to the valley floor.

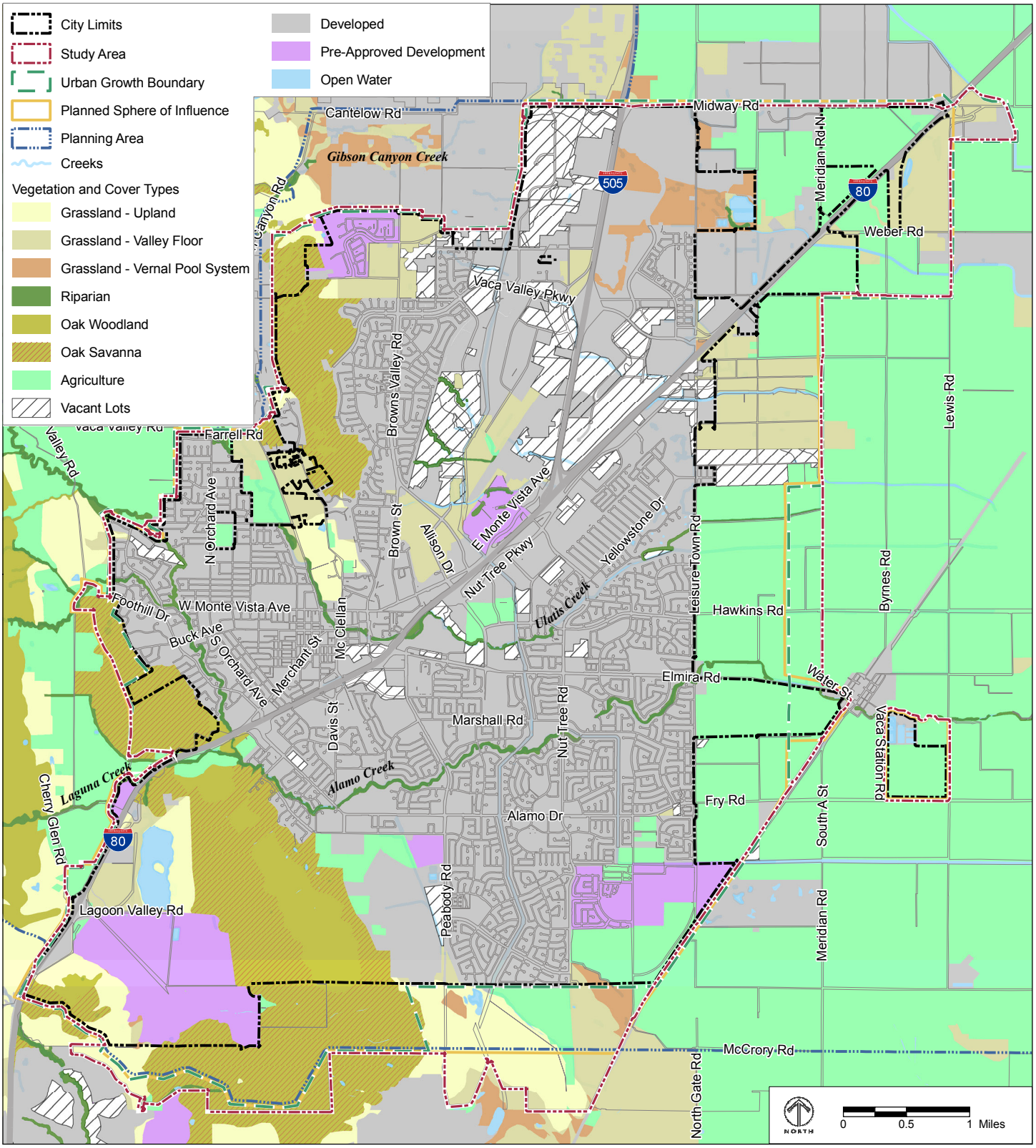
Additional smaller drainages that run through the EIR Study Area include: Horse Creek, Encinosa Creek, and Pine Tree Creek. The Horse Creek watershed is just south of Gibson Canyon Creek. The creek has been highly modified and channelized and lacks riparian vegetation. Pine Tree Creek drains into Horse Creek and is also fairly devoid of riparian vegetation. Encinosa Creek is a tributary of Alamo Creek just upstream of West Monte Vista Avenue. It is a relatively pristine drainage, with a large stand of riparian vegetation. Large portions of Gibson Canyon Creek between Interstates 505 and 80 in the North Village area are protected under a conservation easement.

d. Agriculture

Major portions of the EIR Study Area are classified as agricultural lands, although the majority of the agricultural areas west of Leisure Town Road have been developed. Irrigated agriculture in the eastern portion of the EIR Study Area that has not been developed provides important habitat for several species, including Swainson's hawk and burrowing owls. Agricultural areas were not defined as a natural community type for the Solano HCP. Nevertheless, agriculture is an important resource for some sensitive, threatened, and endangered species.

2. Plant Community Descriptions

This section provides a brief description of the plant communities found and mapped within the EIR Study Area, as shown in Figure 4.4-2. In addition, Table 4.4-1 provides the total area of each community/habitat type.



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-2

VEGETATION AND COVER TYPES

TABLE 4.4-1 **VEGETATION/COMMUNITY COVER TYPES IN THE EIR STUDY AREA**

Vegetation/Community Type	Acreage
Grassland – Inner Coast Range	941
Grassland – Valley Floor	1,777
Grassland – Vernal Pool System	337
Riparian	235
Oak Woodland	501
Oak Savanna	2,539
Agriculture	3,773
Vacant Lots	1,587
Existing and Pre-Approved Development[a]	12,600
Open Water	236
Total	**24,526**

[a] Pre-approved development includes projects approved by the City but that have not been constructed.
Source: Solano Habitat Conservation Plan.

a. Grasslands

Large portions of North America's grasslands were formerly dominated by native perennial grasses interspersed with numerous native annual and perennial forbs (i.e. broad-leaved plants). The introduction of non-native species farming and unrestricted continuous livestock grazing following European settlement in the mid-19th century has contributed to the substantial reduction or elimination of native grasses in most of California. As a result, non-native grassland is currently the dominant grassland community in the EIR Study Area, and these usually include a large number of native and non-native forb species.

Within the EIR Study Area, the broad, general category of "grassland" communities contains a number of recognized community types. However, for the purposes of the Solano HCP, grasslands were mapped and divided into two primary categories grouping areas of similar ecological relationships or function, largely based on landform and geographical regions. These categories were identified as Inner Coast Range (upland) grassland and valley floor grassland associations. The valley floor association contains a further subdivision to identify vernal pool associations based on soil types. Also included in this broader grassland vegetation type are vacant lots within the city.

i. Grasslands within the Inner Coast Range

This category, which is classified as "grassland-uplands" on Figure 4.4-2, refers to the grasslands associated with dry conditions typically on hillsides, slopes, ridges, and flat areas with well-drained soils within the Inner Coast Range and foothill terraces. Annual non-native grasses and forbs are the dominant component of the majority of these grasslands and form the characteristic component of the upland grassland community**.** Many of the non-native grass and forb species are well-adapted to colonizing and persisting in landscapes disturbed by grazing and agriculture. As a result, they have largely been replaced with non-native grasses. As shown in Figure 4.4-2, this type of plant community occurs in the western portions of the EIR Study Area in the English Hills and the hills around Lagoon Valley. It is primarily found intermixed within other communities, including oak woodland/oak savanna, agriculture, and developed areas.

Common non-native grassland species in this vegetation type include: wild oats (*Avena fatua, A. barbata*), bromes (*Bromus diandrus, B. hordeaceus*), hare barley (*Hordeum murinum* ssp. *leporinum*), rye grass (*Festuca perennis*; formerly *Lolium multiflorum*), filarees (*Erodium* spp.), mustards (*Brassica rapa, B. niger, Hirschfeldia incana*), wild radish (*Raphanus sativus*), mallows (*Malva* spp.), vetches (*Vicia* spp.), starthistles (*Centaurea* spp.), and others. These non-native grasslands are found in areas with significant ground disturbance; they tend to be dominated by tall, broad-leaved species such as mustards, wild radish, mallow, and star thistles, and are often referred to as ruderal or disturbed communities.

While non-native plants typically dominate the grasslands, a few native species commonly occur with non-native plants in disturbed situations. Common natives remaining in this community include: small-flowered lupine (*Lupinus bicolor*), fiddleneck (*Amsinckia* spp.), California goldfields (*Lasthenia californica*), California poppy (*Eschscholzia californica*), and owl's-clovers (*Castilleja* spp., *Triphysaria* spp.).

In spite of the large-scale introduction and spread of non-native grasses and forbs, some native, perennial grasses are also still present in small patches or intermixed stands with the non-native grasses. The most common native grassland that occurs within the EIR Study Area is the Valley Needlegrass Grassland.

Common native grass species that dominate native grassland areas are: purple needle grass *(Stipa pulchra*), one-sided blue-grass (*Poa secunda*), California fescue (*Festuca californica*), and beardless wild rye (*Elymus triticoides*). Other grasses that occur in lesser densities include blue wild rye (*Elymus glaucus*) in shady areas, such as in the understory of oak woodland/oak savanna; melic grasses (*Melica* spp.); and nodding needlegrass (*Stipa cernua*), which commonly grows in dry, often rocky grasslands. Wildflowers (forbs) that are often found in grasslands with a native component include: yarrow (*Achillea borealis*), sanicles/snakeroots (*Sanicula* spp.), California dandelion (*Agoseris*

grandiflora), California goldfields, brodiaeas (*Brodiaea* spp., *Triteleia* spp., *Dichelostemma* spp.), and mariposa lilies (*Calochortus* spp.).

ii. Valley Floor Grasslands

The second major grassland community association found within the EIR Study Area is referred to as the valley floor grassland. The valley floor grasslands in the county are dominated by two, typically intermixed associations: vernal pool system grasslands and grasslands associated with low hills, such as the Montezuma Hills, Potrero Hills, and upper terraces along the valley floor. As shown in Figure 4.4-2, the valley floor grassland association is the main type of grassland found within the EIR Study Area. Although vernal pools or other similarly functioning seasonal wetland may occur throughout the valley floor grassland, the main blocks of vernal pool grasslands are limited primarily to the northeastern portions of the EIR Study Area.

Within the vernal pool grassland association, the true wetland vernal pool and swale plant communities typically only comprise a minor component (i.e. 5 to 50 percent) of a broader grassland matrix. Vernal pool habitats have become very rare since they are often found in landscapes that favor agriculture or development. In the last 150 years, the total area of vernal pools in the Central Valley has been reduced by 75 percent.[12] In the EIR Study Area, there is a 540-acre area called the Michael Remy North Preserve that serves as a vernal pool preservation area.

Vernal pools are generally small, ephemeral (i.e. seasonal) wetlands that form in shallow depressions underlain by a hardpan (i.e. a layer near the ground surface that restricts the percolation of water). These depressions fill with rainwater and runoff from adjacent areas during the winter and may remain inundated during the spring to early summer. Vernal pools are found in areas of level or gently undulating topography in the lowlands of California, especially in the grasslands of the Central Valley. Rising spring temperatures cause the water to evaporate, promoting the growth of concentric bands of many plant species, especially native wildflowers, along the shrinking edge of the pool. The vernal pool vegetation in California is characterized by a high percentage of native species, several of which are endemic (i.e. restricted) to vernal pools. Many of these plant species, as well as a number of animal species, are listed as or are otherwise considered to be rare, threatened, or endangered.

Two types of vernal pools are present within the EIR Study Area: Northern Claypan Vernal pools[13] and Northern Hardpan Vernal pools.[14] Northern Claypan Vernal pools are the most

[12] Solano County Farmlands & Open Space Foundation, 2001, *Conservation Strategy for the Vernal Pools of the Greater Jepson Prairie Ecosyste*m.

[13] Element Code 44120, Holland, R.F., 1986, *Preliminary descriptions of the terrestrial natural communities of California*, Sacramento: California Department of Fish and Game.

[14] Element Code 44110, Holland, R.F., 1986, *Preliminary descriptions of the terrestrial natural communities of California*, Sacramento: California Department of Fish and Game.

common pool type found within Solano County while the Northern Hardpan pools are more restricted to the northeastern portions of the county. While classified differently based on soil types, both pool types support similar resources and values.

Other types of seasonal wetlands are also present in the EIR Study Area. Seasonal wetlands are typically distinguished from vernal pools by a longer or altered hydrology, the presence of more persistent emergent vegetation dominated by species such as rush (*Juncus* spp.) and spike rush (*Eleocharis* spp.), the presence of non-native plant species such as ryegrass and Mediterranean barley, and/or a reduced number of native forbs that typically grow in vernal pools. In many cases, the seasonal wetlands represent or occur in historic vernal pool habitats, but have lost many or all of their natural characteristics because of land use changes and disturbance. While often lacking significant native components of true vernal pools, seasonal wetlands can support species of concern and can provide important areas for vernal pool restoration.

b. Riparian Habitats

"Riparian" means, "relating to or located on the banks of a natural watercourse." Riparian vegetation, which is shown in Figure 4.4-2, occurs along water bodies, such as intermittent and perennial streams, lakes, ponds, and floodplains that are the interface between terrestrial and aquatic ecosystems. Riparian areas, known for their high diversity of species and productivity, are distinctly different from surrounding lands because of soil and vegetation characteristics that are strongly influenced by the presence of water. Riparian vegetation also occurs in areas such as seeps and springs where the water table is sufficiently high to provide water to the roots of plants year round.

Riparian habitats are very important biologically because they support a great diversity of plant and animal species. They provide wildlife with important food, cover, and breeding sites in close proximity to water. Many animal species are restricted to riparian habitats, especially migratory and resident birds, and many amphibians.

Agricultural, residential, and industrial water use, as well as land development, has substantially reduced the extent of riparian habitats in California. The biological importance of riparian habitat and the dependence of many declining animal species on riparian habitat have made it a focus of many conservation efforts. Two types of natural riparian habitat occur in the EIR Study Area: riparian woodland and riparian scrub.

i. Riparian Woodland

The dominant trees in riparian woodland are most commonly winter-deciduous, broadleaved trees, up to 60 feet in height, with a canopy cover ranging from relatively open to very dense. "True" riparian species (i.e. species that are dependent on available water year round) are found

along major rivers and streams and other freshwater features. Cottonwoods (*Populus* spp.) and willows (*Salix* spp.), mixed with bigleaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), box elder (*Acer negundo*), and California sycamore (*Platanus racemosa*) are the most commonly occurring "true" riparian trees in central California. Valley oak (*Quercus lobata*) is common in riparian areas in the Central Valley, as are various species of walnut (*Juglans californica* ssp. *hindsii*, *J. nigra, J. regia*). Other trees, including coast live oak (*Quercus agrifolia*) and California bay (*Umbellularia californica*), are components of riparian vegetation in woodland/forest areas, but also grow in less moist environments. Riparian woodland commonly has a shrubby understory.

Riparian areas in and around Vacaville have been severely degraded as a result of development and agriculture. Although the structure (i.e. the vertical stratification of the riparian vegetation) has been maintained along some of the major streams in the EIR Study Area, the width of the "corridors" has been greatly reduced due to human activities. Riparian corridors are now commonly only as wide as the diameter of one tree's canopy. In addition, sections of most major streams have been channelized and the natural riparian vegetation has been removed.

Well-developed riparian plant communities now primarily occur along the banks of small portions of the major creeks, including Alamo Creek and Ulatis Creek. In those remaining well-developed riparian areas, the tree canopy is dominated by Fremont's cottonwood (*Populus fremontii*) and willows, including red willow (*Salix laevigata*), Pacific willow (*S. lucida* ssp. *lasiandra*), arroyo willow (*S. lasiolepis*), and sandbar willow (*S. exigua*). Scattered stands of willows and riparian shrubs are present along minor streams and drainages. Throughout much of Vacaville, a number of invasive, non-native trees are common within or dominate the riparian corridor. Common invasive species in the riparian zones in Vacaville include almond (*Amygdalus communis*), elm (*Umus* sp.), English walnut (*Juglans regia*), eucalyptus (*Eucalyptus* sp.), locust (*Robinia pseudoacacia*), palm tree, pepper tree (*Schinus molle*), and tree of heaven (*Ailanthus altissima*).

ii. Riparian Scrub

Impenetrable scrub is usually a component of riparian vegetation. Shrub species vary depending on the geographical location. Broad-leaved, deciduous riparian thickets are usually dominated by any of several species of willow (*Salix* spp.), especially arroyo willow, forming dense thickets within the riparian corridor. Other shrubby species that may occur are blue elderberry (*Sambucus mexicana*), California blackberry (*Rubus ursinus*), Himalayan blackberry (*R. discolor*), California rose (*Rosa californica*), poison oak (*Toxicodendron diversilobum*), and California grape (*Vitis californica*). The herbaceous layer, if present, is a mix of grasses and forbs, commonly including Italian ryegrass, and mugwort (*Artemisia douglasiana*). This habitat type may be found in smaller tributaries within the Inner Coast Range.

c. Oak Woodland/Oak Savanna

Oak woodland and oak savanna are dominated by oaks (*Quercus* spp.); however, the density of trees and structure of these plant communities vary within their distributional range depending on the dominant species of oak and several environmental parameters, such as soils, availability of water, aspect, and elevation. Oak woodland and oak savanna commonly intergrade, going from more dense woodlands to more open savanna. These plant communities include broad-leaved upland forest and cismontane woodland, as designated by CNPS.[15]

Oak woodlands support an unusual diversity of animal species. This is a result of the many resources that oaks in particular provide, including nesting sites and abundant food such as large acorn crops. Many oak woodlands have been lost due to intensive agriculture and urban development. In addition, even in areas where oak woodlands persist, they have been significantly altered. This is evident in the predominant ground cover that primarily consists of non-native annual grasslands that dominate grazed landscapes. Regeneration of oak woodlands has been reduced due to disturbance from grazing by livestock and wildlife and increased seedling mortality from competition with non-native grasses.

i. Oak Woodland

The absolute tree canopy-cover in oak woodland communities ranges from 30 to 100 percent, depending on the aspect of the woodland. On moist, north- to east-facing slopes, the cover is greater than on dryer, south- to west-facing slopes. Species composition also varies according to aspect and water availability.

Coast live oak, a broad-crowned, evergreen tree up to 75 feet tall, and blue oak (*Q. douglasii*), a deciduous oak up to 60 feet tall, are commonly dominant trees in oak woodlands within the EIR Study Area. Other broad-leaved, evergreen or deciduous trees, including interior live oak (*Q. wislezenii*), black oak (*Q. kelloggii*), California buckeye *(Aesculus californica*), California bay, and walnut, are common associates in or at the edges of the woodlands.

Where the canopy cover is less dense and sunlight reaches the forest floor, a diverse flora of mostly native shrubs and herbaceous species may be present. Shrubs in the understory may include currant/gooseberry (*Ribes* spp.), woodland rose (*Rosa gymnocarpa*), poison oak, and California hazelnut (*Cornus cornuta* var. *californica*). Grasses, forbs, and ferns may include a variety of native species, including California fescue, blue wild rye, hound's-tongue (*Cynoglossum grande*), Dutchman's pipe (*Aristolochia californica*), Pacific pea (*Lathyrus vestitus*), California polypody (*Polypodium californicum*), goldback fern (*Pentagramma triangularis*), and woodfern (*Dryopteris arguta*).

[15] California Native Plant Society, January 9, 2005, *Electronic Inventory of Rare and Endangered Plants*. On-line version 6-05a, available at http://www.cal.net/~levine/cgi-bin/cnps/sensinv.cgi.

As shown in Figure 4.4-2, oak woodlands within the EIR Study Area occur on the higher elevation areas along the English Hills and the hills around Lagoon Valley, where they generally grade into oak savanna at lower elevations.

ii. Oak Savanna

The canopy cover in oak savanna typically ranges from 10 to 30 percent. Dominant oak species in this plant community in Solano County are valley oak (*Quercus lobata*), which grows on deep, alluvial soils on the Central Valley floor, and blue oak (*Q. douglasii*) and Oregon oak *(Q. garryana*), which occur in shallower soils and in other drier areas at higher elevations. Blue oak savanna commonly grades into blue oak woodland as elevation increases. In areas grazed by livestock, the shrubby understory in oak savanna is poorly developed, if present at all. In such areas, the herbaceous understory consists of mostly non-native grasses and forbs; however, native wildflowers and grasses may be abundant in less disturbed areas.

As shown in Figure 4.4-2, oak savanna within the EIR Study Area occurs along the English Hills and the hills around Lagoon Valley, where it generally grades into oak woodland at higher elevations.

d. Agricultural Lands

Agricultural areas were not defined as a natural community type in the Solano HCP. Nevertheless, agriculture is an important resource for sensitive, threatened, and endangered species. The value of agricultural lands to wildlife depends on the vegetation characteristics, cultivation practices, and flooding regimes of particular areas.

Cropland (i.e. intensive agriculture) is the main type of agriculture found within the EIR Study Area. Common crop types within the EIR Study Area include alfalfa, ryegrass, Sudan grass, corn, wheat, and tomato. Croplands are typically established in flat terrain on fertile soils and are greatly manipulated in terms of soil tillage, irrigation, crop rotation, and fertilization. Cropland vegetation is usually grown in a monoculture, using tillage or herbicides to eliminate unwanted vegetation. Cultivated species in such fields exhibit a variety of sizes and growing patterns that provide various heights and canopy covers. As shown in Figure 4.4-2, agricultural fields are more or less continuous in the eastern portion of the EIR Study Area and extend into the majority of the eastern portion of Solano County. Within the EIR Study Area, agricultural lands provide important habitat for numerous raptors, including the burrowing owl and Swainson's hawk.

e. Developed Areas

As indicated in Table 4.4-1 and Figure 4.4-2, developed areas represent the dominant cover type within the EIR Study Area. Vacant lots and disturbed lands supporting weedy (ruderal) vegetation are also included within this category. However, depending on the intensity of develop-

ment, vacant lots in urban areas may be occupied or used by special-status species such as Swainson's hawks and burrowing owls for nesting and foraging. Urban vegetation consists, for the most part, of non-native, landscape plants; few native species, except some trees and shrubs, typically remain in an urban setting. Most of the vegetation in urban settings is maintained as a monoculture, such as in tree groves, street landscaping strips, and lawns. Urban vegetation consisting of large stands and/or dense stands of trees and shrubs can provide habitat for "urban adapted" wildlife and, in some cases, habitat for migrating species.

3. Fish and Wildlife

As indicated above, Vacaville is located at the intersection of two major geographical provinces: the Coast Range and the alluvial fans, terraces, and basins on the valley floor. As a result, there is a high diversity of wildlife that occurs within the EIR Study Area. This section describes common wildlife species that occupy the various vegetation types found within the EIR Study Area.

The valley floor grassland region harbors a diversity of wildlife species. Songbird species primarily occurring in grasslands include western kingbird *(Tyrannus verticalis)*, western meadowlark (*Sturnella neglecta*), barn swallow *(Hirundo rustica),* horned lark (*Eremophila alpestris*), red-winged blackbird *(Agelaius phoeniceus)*, and savannah sparrow (*Passerculus sandwichensis*).

Other common wildlife species associated with the valley floor grassland community include Sierran treefrog (*Pseudacris sierra*), gopher snake (*Pituophis melanoleucus*), California kingsnake *(Lampropeltis californiae*), western fence lizard (*Sceloporus occidentalis*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), California ground squirrel (*Spermophilus beecheyi*), deer mouse *(Peromyscus maniculatus)*, California vole (*Microtus californicus*), raccoon *(Procyon lotor)*, striped skunk (*Mephitis mephitis*), and coyote *(Canis latrans*).

The Inner Coast Range natural community consists of a mosaic of plant communities that provide important habitat for several wildlife species. Oak woodlands, in particular, provide important resources to wildlife. Approximately 331 species depend on oak woodlands to varying degrees throughout their life cycle.[16] Native amphibians and reptiles potentially occurring in this region include arboreal salamander (*Aneides lugubris*), California slender salamander *(Batrachoseps*

[16] Verner, J, 1980, "Birds of California oak habitats - management implications," in *Proceedings of the Symposium on the Ecology, Management, and Utilization of California Oaks, June 26-28, 1979*, General Technical Report PSW-44, US Department of Agriculture, Forest Service, pages 246 to 264.

Barrett, R. H, 1980, "Mammals of California oak habitats: management implications," in *Ecology, Management, and Utilization of California Oaks*, Gen. Tech. Rep. PSW-44, tech. coord. T. R. Plumb, Berkeley, California: US Department of Agriculture, Forest Service, pages 275 to 291.

Block, W. M. and M. L. Morrison, 1998, "Habitat relationships of amphibians and reptiles in California oak woodlands," *Journal of Herpetology*, 32: pages 51 to 60.

attenuatus), western toad (*Bufo boreas*), southern alligator lizard *(Elgaria multicarinata)*, Sierran tree-frog, western fence lizard, gopher snake, and California kingsnake.

The riparian, stream, and freshwater marsh community supports tremendous biological diversity. Riparian woodland provides a diversity of wildlife with valuable nesting, cover, foraging, and movement habitat, all within close proximity to water. Overall, riparian vegetation provides important habitat for over 225 species of fish, amphibians, reptiles, birds, and mammals in California. Riparian zones have been identified as the most important habitats for landbird species in California.[17] The structural complexity and species diversity of riparian corridors provide habitat required for nesting, sheltering, and foraging. Insect abundance is often high within riparian corridors, providing food for insectivores such as vireos, warblers, swallows, wrens, and flycatchers. Riparian trees produce fruits and seeds for frugivores and seedeaters such as black-headed grosbeak, goldfinches, and song sparrows. Riparian habitats are considered to be particularly valuable for neo-tropical migratory songbirds, which have declined in recent decades.

4. Special-status Plant and Wildlife Species

Special-status plant and wildlife species are those listed under the State and federal Endangered Species Acts, plants listed by the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California, and wildlife designated as Species of Special Concern by the California Department of Fish and Game. The special-status species addressed in this EIR are based on a review of records from the California Natural Diversity Database (CNDDB), CNPS on-line inventory, and the Solano HCP Covered Species database. CNDDB and CNPS searches were based on the records in the Elmira, Allendale, Mt. Vaca, and Fairfield North US Geological Survey 7.5-minute quadrangles. Records from the Solano HCP Covered Species database were assessed over the entire County of Solano. An assessment was conducted to determine if each species was likely to occur in the EIR Study Area based on the location and status of known occurrences and suitable habitat.

a. Special-Status Plants

There are 33 special-status plant species that have occurrences either within or in the vicinity of the EIR Study Area. Table 4.4-2 lists species alphabetically by scientific name and identifies their current status, the natural communities and habitat types they could be associated with, and their potential to occur in the EIR Study Area. Of the 33 species assessed, 19 could potentially occur in the EIR Study Area and are all associated with vernal pool habitats.

[17] Riparian Habitat Joint Venture, 2000, *The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian Associated Birds in California*, Stinson Beach, CA: California Partners in Flight, Point Reyes Bird Observatory.

TABLE 4.4-2 SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State/RPR	Natural Community Associations	Habitat	Potential for Occurrence
Ferris's milk-vetch* *Astragalus tener var. ferrisiae*	–/–/1B	VFG&VP	Vernally mesic meadows and mildly alkaline flats in valley and foothill grassland, usually on dry, heavy clay, or adobe soil. Flowers April through May.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas, could potentially occur in remnant vernal pool habitat.
Alkali milk-vetch* *Astragalus tener. var. tener*	–/–/1B	VFG&VP	Grows in alkaline/saline soils in vernally wet playas, flats, and valley and foothill grassland. Flowers February through June.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas, could potentially occur in remnant vernal pool habitat.
Heartscale** *Atriplex cordulata*	–/–/1B	VFG&VP	Grows in sandy, saline, or alkaline flats or scalds, in chenopod scrub, meadows, and valley and foothill grassland. Blooms April through October, depending on local environmental conditions.	One extirpated (i.e. local extinction) occurrence in the EIR Study Area. Potential to occur in remnant vernal pool habitat.
Brittlescale** *Atriplex depressa*	–/–/1B	VFG&VP	Grows in relatively barren areas with alkaline clay soils within chenopod scrub, meadows, playas, vernal pools, and valley and foothill grassland. Occasionally, it is found in riparian marshes. Blooms from May through October, depending on local environmental conditions.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas, and could potentially occur in remnant vernal pool habitat.

* Solano HCP Covered Species ** Solano HCP Special Management Species

Status Designations:

Federal:

FE = Listed as "endangered" under the federal Endangered Species Act.
FT = Listed as "threatened" under the federal Endangered Species Act.
PE = Proposed for federal listing as "endangered."
PT = Proposed for federal listing as "threatened."
C = A candidate species under review for federal listing. Candidates include taxa for which USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

State:

SE = Listed as "endangered" under the California Endangered Species Act.
ST = Listed as "threatened" under the California Endangered Species Act.
SR = Listed as "rare" under the California Endangered Species Act.

California Rare Plant Rank (RPR):

1A = Plants of highest priority; plants presumed extinct in California.
1B = Plants of highest priority; plants rare and endangered in California and elsewhere.
2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants requiring additional information; a review list.
4 = Plants of limited distribution; a watch list.

Natural Community Abbreviations

VFG&VP = Valley floor grassland and vernal pool ICR = Inner Coast Range RSFWM = Riparian, stream, and freshwater marsh

TABLE 4.4-2 SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State/RPR	Natural Community Associations	Habitat	Potential for Occurrence
San Joaquin spearscale** *Atriplex joaquiniana*	–/–/1B	VFG&VP	Grows in seasonal alkali wetlands and alkali sinks in chenopod scrub, meadows, playas, and valley and foothill grassland, with Mediterranean *barley (Hordeum marinum* ssp, *gussoneanum*), alkali mallow (*Malvella leprosa*), and other alkali-associated plants. Blooms April through October, depending environmental conditions.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas, and could potentially occur in remnant vernal pool habitat.
Vernal pool smallscale* *Atriplex persistens*	–/–/1B	VFG&VP	Grows in alkaline grasslands as well as in large and small claypan and alkaline vernal pools. Blooms July through October.	One extant and one extirpated occurrence in the EIR Study Area, potential for additional occurrences in vernal pool habitat.
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	–/–/1B	ICR	Grows in thin, rocky soil on hillsides, usually on serpentine, grasslands, and woodlands. Blooms March to June.	No occurrences in the EIR Study Area and no suitable habitat present.
Big tarplant *Blepharizonia plumose*	–/–/1B	ICR	Grows in thin soils in oak savanna and grasslands. Blooms July to October.	No occurrences in the EIR Study Area and no suitable habitat present.

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Mt. Diablo fairy-lantern *Calochortus pulchellus*	–/–/1B	ICR	Grows in openings in chaparral, coastal scrub, and associated grasslands. Blooms April to June.	No longer considered to occur in Solano County and therefore unlikely to occur in the EIR Study Area.
Holly-leaved ceanothus *Ceanothus purpureus*	–/–/1B	ICR	Grows on dry, chaparral-covered, rocky, volcanic slopes. Flowers in early to late spring.	No occurrences in the EIR Study Area; because scrub and chaparral habitat are absent from the EIR Study Area, its occurrence is unlikely.
Pappose tarplant** *Centromadia parryi* ssp. *parryi*	–/–/1B	VFG&VP	Occurs most frequently in mesic areas in coastal prairie, meadow, and grassland habitats, often on alkaline substrates. Some disturbance appears to be necessary for its persistence. Blooms May to November.	Two extant occurrences in the EIR Study Area. Potential for additional occurrences in vernal pool habitat.
Hispid bird's-beak** *Cordylanthus mollis* ssp. *mollis*	–/–/1B	VFG&VP	Grows in saline or alkaline soils in vernal pools, meadows, sinks, inland playas, and valley and foothill grassland. Blooms June through September.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas; could potentially occur in remnant vernal pool habitat.

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Recurved larkspur** *Delphinium recurvatum*	–/–/1B	VFG&VP	Grows in alkaline areas, in chenopod scrub, cismontane woodland, and valley and foothill grassland. Often grows in vernally moist or inundated areas. Blooms March through May.	One extirpated occurrence in the EIR Study Area; could potentially occur in remnant vernal pool habitat.
Dwarf downingia** *Downingia pusilla*	–/–/1B	VFG&VP	Grows in vernal pools, playa pools, and on margins of vernal lakes and other mesic areas within valley and foothill grassland, both in alkaline (saline) and non-alkaline soils. Flowers March through May.	One extant occurrence in the EIR Study Area; potential for additional occurrences in vernal pool habitat.
Mt. Diablo buckwheat *Eriogonum truncatum*	–/–/1B	ICR	Occurs in sandy soils of oak savanna, grassland, scrub, and chaparral habitats on hillsides. Blooms April through September.	No occurrences in the EIR Study Area and no suitable habitat present.
Fragrant fritillary** *Fritillaria liliacea*	–/–/1B	ICR and VFG&VP	Grows in heavy clay soils (often with a serpentine influence) in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. This fritillary is one of the earliest spring flowers, blooming in February and March, occasionally into April.	No occurrences in the EIR Study Area, but they are in adjacent habitat area, and could potentially occur in remnant vernal pool habitat.

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Common Name *Scientific Name*	Status Federal/ State/RPR	Natural Community Associations	Habitat	Potential for Occurrence
Adobe-lily *Fritillaria pluriflora*	–/–/1B	ICR	Grows in chaparral, cismontane woodlands, and foothill grasslands, usually on clay soils and sometimes on serpentine. Blooms February through April.	One extirpated occurrence in the EIR Study Area; no suitable habitat present; unlikely to occur.
Boggs Lake hedge-hyssop* *Gratiola heterosepala*	–/SE/1B	VFG&VP	Grows on clay substrates in vernal pools, small playa-type pools, marshy areas, on the margins of reservoirs and lakes, and in human-made habitats such as borrow pits and cattle ponds. Blooms April through August.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas; could potentially occur in remnant vernal pool habitat.
Brewer's western flax *Hesperolinon breweri*	–/–/1B	ICR	Grows mostly on rocky, serpentine soils in chaparral, cismontane woodland, and valley and foothill grassland. Blooms May through July.	No occurrences in the EIR Study Area, and not likely to occur there because of the absence of serpentine soils.
Carquinez goldenbush** *Isocoma arguta*	–/–/1B	VFG&VP	Grows in alkaline soils, on flats and low hills in valley and foothill grassland. Often occurs on low benches near drainages and on mounds in swale areas. Blooms August through December.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas; could potentially occur in remnant vernal pool habitat.

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VFG&VP = Valley floor grassland and vernal pool ICR = Inner Coast Range RSFWM = Riparian, stream, and freshwater marsh

TABLE 4.4-2 SPECIAL-STATUS PLANT SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State/RPR	Natural Community Associations	Habitat	Potential for Occurrence
Groves of Northern California black walnut *Juglans hindsii*	–/–/1B	ICR	Grows in rocky and gravelly well-drained soils, by the coast, along rivers and streams, and occasionally up to the slopes of Napa. It is found in foothill woodlands and riparian areas.	No occurrences in the EIR Study Area and not likely to occur there because the location of sensitive walnut groves are well known.
Contra Costa goldfields* *Lasthenia conjugens*	FE/–/1B	VFG&VP	Grows in vernal pools, swales, and other depressions in open grassland and woodland communities, often in alkaline soils. Blooms from March through June, depending on environmental conditions.	No occurrences in the EIR Study Area; unlikely to occur, but potential habitat in southern portion of the EIR Study Area
Legenere* *Legenere limosa*	–/–/1B	VFG&VP	Grows in the bottoms of vernal pools and other wet depressions in grassland communities. Blooms April through June.	Occurrences adjacent to the EIR Study Area; could potentially occur in remnant vernal pool habitat.
Heckard's pepper-grass** *Lepidium latipes* var. *heckardii*	–/–/1B	VFG&VP	Grows on alkaline flats and in alkaline grasslands along the edges of vernal pools. Flowers March through May.	No occurrences in the EIR Study Area, but they are in adjacent habitat areas; could potentially occur in remnant vernal pool habitat.

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Baker's navarretia** *Navarretia leucocephala* ssp. *bakeri*	–/–/1B	VFG&VP	Grows in vernal pools and other wet depressions in cismontane woodland, lower montane coniferous forest, meadows, and valley and foothill grassland, in adobe or alkaline soils. Blooms May through July.	Three extirpated occurrences in the EIR Study Area. Potential for additional occurrences in vernal pool habitat.
Colusa grass* *Neostapfia colusana*	FT/SE/1B	VFG&VP	Grows in large or deep vernal pools, in lakes and shallow playas, and in saline/alkaline adobe clay soils. Blooms May through August, depending on environmental conditions.	No occurrences in the EIR Study Area and unlikely to occur in remaining habitat areas because of absence of large vernal pool areas.
San Joaquin Valley orcutt grass* *Orcuttia inaequalis*	FT/SE/1B	VFG&VP	Grows in vernal pools or larger playa pools in clayey or sandy, generally alkaline soils. Blooms May through August, depending on environmental conditions.	No occurrences in the EIR Study Area and unlikely to occur in remaining habitat areas due to absence of large vernal pools.
Bearded popcorn-flower** *Plagiobothrys hystriculus*	–/–/1A	VFG&VP	Habitat is not well understood. Found in grassy swales and may grow at upper vernal pool edges or moist sites in grasslands. Flowers in April and May.	No occurrences in the EIR Study Area, but known from adjacent habitat areas; could potentially occur in remnant vernal pool habitat.

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Common Name *Scientific Name*	Status Federal/ State/RPR	Natural Community Associations	Habitat	Potential for Occurrence
Rayless ragwort *Senecio aphanactis*	–/–/2	ICR	Grows on drying alkaline flats in chaparral, cismontane woodland, and coastal scrub communities. Blooms January through April.	No occurrences in the EIR Study Area; no suitable habitat; unlikely to occur.
Slender-leaved pondweed *Stuckenia filiformis*	-/-/2	RSFWM	Grows in shallow, clear water of lakes and drainage channels.	Not known from the EIR Study Area. No suitable habitat present.
Showy Indian clover *Trifolium amoenum*	FE/–/1B	ICR	Found in a variety of habitats including low, wet swales, grasslands, and grassy hillsides. Has been observed growing on serpentine soils. Blooms from April to June.	Three extirpated occurrences within and one adjacent to the EIR Study Area. Considered extirpated from Solano County.
Saline clover** *Trifolium depauperatum* var. *hydrophilum*	–/–/1B	VFG&VP	Grows in salt marshes and in alkaline soils in moist valley and foothill grasslands and vernal pools. Flowers April through June.	One extirpated occurrence in the EIR Study Area. Potential for additional occurrences in vernal pool habitat.

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Crampton's tuctoria or Solano grass* *Tuctoria mucronata*	FE/SE/1B	VFG&VP	Found in drying, alkaline/saline clay bottoms of vernal pools, lakes, and shallow playa pools. Is associated with other vernal pool and wetland plants, including the endangered Colusa grass (*Neostapfia colusana*). Olcott lake, where the original populations were found, is a large saline-alkaline playa pool within annual grassland. Solano grass blooms April through July.	No occurrences in the EIR Study Area and unlikely to occur in remaining habitat areas due to absence of large vernal pools.

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b. Special-Status Animals

There are 34 special-status animal species that have occurrences either within or in the vicinity of the EIR Study Area. Table 4.4-3 lists these species and identifies their current status, the natural communities and habitat types they could be associated with, and their potential to occur in the EIR Study Area. Of the 34 species assessed, 28 could potentially occur in the EIR Study Area. These include eight species primarily associated with vernal pool habitats; seven species primarily associated with riparian, stream, and freshwater marsh habitats; and twelve widespread species. Species addressed in the Solano HCP are also identified.

5. Sensitive Natural Communities

CDFG and CNPS have identified several native plant communities that are rare and/or diminishing within California. Although some of these communities represent important biological resources and may be unique to California, they have no legal, protective status. Regardless, substantial losses of some of these plant communities may be considered "significant" under CEQA. Plant communities that are considered sensitive by CDFG in the EIR Study Area are Northern Claypan Vernal Pool, Northern Hardpan Vernal Pool, Valley Needlegrass Grassland, and Freshwater Marsh, which were discussed in Sections B.1 and B.2.[18]

In addition, the USFWS has issued a recovery plan for vernal pool ecosystems of California and Southern Oregon. Two designated Core Recovery Areas are present in the EIR Study Area. As shown in Figure 4.4-3, the Vacaville Core Recovery Area is located in the northern portion of the existing city limits. The majority of vernal pool habitat within this core recovery area is located in the Michael Remy Vernal Pool Preserve. The remainder of the habitat within the core recovery area consists of vacant lots within industrial areas south of Midway Road. These vacant lots may contain remnant vernal pool habitat, but, as discussed further in Section B.6a, are categorized as low value habitat by the Solano HCP because of the existing infrastructure and past land work/leveling for the initial development of this industrial park. In addition, the Jepson Prairie Core Recovery Area extends from the southern portions of the EIR Study Area into the lowlands within the Vacaville-Fairfield Greenbelt east of Peabody Road. The portion of this Core Recovery Area between Peabody Road and Vanden Road is designated as having moderate conservation value in the Solano HCP.

[18] California Department of Fish and Game, 2001, *California Natural Diversity Data Base (CNDDB)*, Electronic Inventory.

TABLE 4.4-3 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Invertebrates				
Conservancy fairy shrimp* *Branchinecta conservation*	FE / –	VFG&VP	Occurs in ephemeral or temporary pools of somewhat turbid fresh water (vernal pools) that form in the cool, wet months of the year.	No occurrences in the EIR Study Area, but known to occur in adjacent areas, and could potentially occur in remnant vernal pool habitat.
Vernal pool fairy shrimp* *Branchinecta lynchi*	FT / –	VFG&VP	Inhabit pools with clear to tea-colored water, most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands, but sometimes in sandstone rock outcrops and alkaline vernal pools.	Several occurrences in the EIR Study Area, and could potentially occur in remnant vernal pool habitat.
Midvalley fairy shrimp** *Branchinecta mesovalleyensis*	- / CSC	VFG&VP	Inhabits small, shallow, ephemeral, grass-bottomed vernal pools and swales at elevations between approximately 20 and 90 meters above sea level.	No known occurrences in the EIR Study Area, but they are in adjacent habitat areas, and could potentially occur in remnant vernal pool habitat.
Delta green ground beetle* *Elaphrus viridis*	FE and CH / –	VFG&VP	Appears to prefer grassland habitat that is interspersed with vernal pools or playa pools.	No occurrences in the EIR Study Area and unlikely to occur in remaining habitat areas.

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Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Valley elderberry longhorn beetle* *Desmocerus californicus dimorphus*	FT and CH / –	RSFWM	Closely associated with blue elderberry (*Sambucus mexicana* or *S. velutina*), which is an obligate host for beetle larvae. Adult valley elderberry longhorn beetles are usually found upon or flying between elderberry plants.	Three occurrences in the EIR Study Area, and highly likely to occur in other riparian habitat areas or wherever there is an appropriately sized elderberry shrub.
Vernal pool tadpole shrimp* *Lepidurus packardi*	FT / –	VFG&VP	Inhabits seasonal, vernal pools or swales that form in slight depressions after being inundated following fall and winter rains. The pools contain clear to highly turbid water and have an impervious hardpan, claypan, or basalt layer beneath the soil surface that retains the water for a few months at a time.	One extant occurrence in the EIR Study Area, potential for additional occurrences in remaining vernal pool habitat areas.
Fish				
Chinook salmon – Sacramento River winter-run evolutionarily significant unit (ESU)* *Oncorhynchus tshawytscha*	FE / SE	RSFWM	Tends to spawn in the mainstems of rivers (or larger tributaries) in areas of gravel and cobble substrate. Primary conservation concerns are for passage/movement and water quality.	Absent, spawning habitat absent, and unlikely to occur.
Chinook salmon – Central Valley fall/late fall-run ESU* *Oncorhynchus tshawytscha*	Candidate / CSC	RSFWM	Tends to spawn in the mainstems of rivers (or larger tributaries) in gravel and cobble substrate. Conservation concerns are for water quality, passage, and riparian habitat protection.	Occasional fall and late-fall run salmon occur in the streams in the EIR Study Area. However, no suitable breeding or rearing habitat is present in the streams in and around Vacaville.

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Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Chinook salmon – Central Valley spring-run ESU* *Oncorhynchus tshawytscha*	FT / ST	RSFWM	Tends to spawn in the mainstems of rivers (or larger tributaries) in areas of gravel and cobble substrate. Primary conservation concerns are for passage/movement and water quality.	Absent, spawning habitat absent, and unlikely to occur.
Steelhead – Central California Coast ESU* *Oncorhynchus mykiss*	FT / –	RSFWM	Inhabits riparian, emergent, palustrine habitat. Spawning and rearing habitat is usually characterized by perennial streams with clear, cool to cold, fast-flowing water with a high dissolved oxygen content and abundant gravels and riffles. Breeding habitat present in Solano County; many streams in county may qualify as critical habitat. Conservation concerns are for water quality, passage, and riparian habitat protection.	Absent, spawning habitat absent, and unlikely to occur.
Amphibians/Reptiles				
California tiger salamander* *Ambystoma californiense*	FT/ ST	VFG&VP and ICR	Vernal pools and permanent waters in grasslands.	No occurrences in the EIR Study Area, but known to occur in adjacent habitat areas, and could potentially occur in remaining upland and vernal pool habitat areas.

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Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Western pond turtle** *Actinemys marmorata*	– /CSC	RSFWM, ICR, and VFG&VP	Uses permanent or nearly permanent waterbodies in a variety of habitat types. Occurs in ponds, marshes, rivers, streams, and irrigation ditches within grasslands, woodlands, and open forests.	Two occurrences in the EIR Study Area; highly likely to occur in other aquatic habitats throughout the EIR Study Area.
Foothill yellow-legged frog Rana boylii	– / CSC	RSFWM and ICR	Perennial creeks and streams usually with cobble bottoms.	Occurs in Ulatis and Alamo Creeks upstream of the EIR Study Area; unlikely to occur in the EIR Study Area, but individuals could move downstream.
Birds				
Tricolored blackbird* *Agelaius tricolor*	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Nests in dense cattails and tules, riparian scrub, and other low dense vegetation. Forage in grasslands and agricultural fields.	No breeding colonies within the EIR Study Area, but there are records of breeding colonies in adjacent areas. Likely to occur in the EIR Study Area.
Swainson's hawk* *Buteo swainsoni*	– / ST	Agriculture, VFG&VP, ICR, and RSFWM	Open grasslands and agricultural fields. Nest in large trees such as valley oak, cottonwood, walnut, or blue gum.	Several occurrences within the EIR Study Area
Mountain plover** *Charadrius montanus*	– / CSC	VFG&VP,	Valley floor grassland and vernal pool habitats.	No known occurrences in the EIR Study Area. Could potentially occur in remnant grassland habitat.

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Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Golden eagle *Aquila chrysaetos*	– / CP	ICR and VFG&VP	Prefers open terrain for hunting, such as grasslands, deserts, savannas, and early successional stages of forest and shrub habitats. Nests in rugged, open habitats with canyons and escarpments, typically on cliffs and rock outcroppings; however, they will also nest in large trees including oaks, sycamores, redwoods, pines, and eucalyptus.	Likely to occur in Inner Coast Range habitats and may occasionally forage over valley floor grasslands.
Burrowing owl* *Athene cunicularia*	– / CSC	Agriculture, VFG&VP, and ICR	Nest in burrows in areas of low-growing vegetation in grasslands and along the margins of agricultural fields.	Several occurrences in agricultural and urban parts of the EIR Study Area.
Northern harrier** *Circus cyaneus*	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Habitat types include brackish and freshwater marshes, alpine meadows, grasslands, prairies, and agricultural lands. Wintering habitat includes fresh and saltwater wetlands, coastal dunes, grasslands, deserts, meadows, and crop lands. Breeding habitat includes fresh water wetlands, coastal brackish wetlands, open wet meadows and grasslands, shrub-steppe, desert sinks, areas along rivers and lakes, and crop fields.	No known occurrences, but could potentially occur in the EIR Study Area. Unlikely to nest in the EIR Study Area because of degraded riparian habitat.
Yellow warbler *Setophaga petechia brewsteri*	–/ CSC	RSFWM	Nest in willows and riparian cover.	No known occurrences. Suitable habitat present.

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Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Yellow-breasted Chat** *Icteria virens*	–/ CSC	RSFWM	Requires dense riparian thickets of willows, vine tangles, and dense brush associated with streams, swampy ground, and the borders of small ponds.	No known occurrences. Could potentially occur in the EIR Study Area, but unlikely to nest because of degraded riparian habitat.
White-tailed kite *Elanus leucurus*	– / CP	RSFWM, VFG&VP, ICR, and Agriculture	Nests in grassland and marshland with trees.	Known from within and adjacent to the EIR Study Area. Potentially nests in riparian, stream and freshwater marsh, oak woodland, and oak savanna habitats.
Grasshopper sparrow** *Ammodramus savannarum*	–/ CSC	VFG&VP	Inhabit grasslands and marshes. Breeds in open fields and nests consist of a well-concealed open cup on the ground under vegetation.	One occurrence in the EIR Study Area, could potentially occur in vernal pool, valley floor, and upland grassland and oak savanna.
Song sparrow-Modesto population** *Melospiza melodia*	–/ CSC	RSFWM and VFG&VP	Primarily breeds in riparian habitat or wetlands.	No known occurrences, but could potentially occur in the EIR Study Area.
American peregrine falcon *Falco peregrinus anatum*	Delisted/CP	RSFWM, VFG&VP, ICR, and Agriculture	Inhabit open woodlands, grasslands, and marshland. Nests on cliffs, transmission towers, and tall bridges.	Incidental occurrences likely. Unlikely to nest in the EIR Study Area because of absence of known nests.

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PE = Proposed for federal listing as "endangered."
PT = Proposed for federal listing as "threatened."
C = A candidate species under review for federal listing. Candidates include taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

State:

SE = Listed as "endangered" under the California Endangered Species Act.
CP = California fully protected species; individual may not be possessed or taken at any time.
ST = Listed as "threatened" under the California Endangered Species Act.
CSC = California Species of Special Concern.

Natural Community Abbreviations

VFG&VP = Valley floor grassland and vernal pool
ICR = Inner Coast Range
RSFWM = Riparian, stream, and freshwater marsh

TABLE 4.4-3 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Yellow-headed blackbird Xanthocephalus xanthocephalus	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Breeds in wetlands and along other western lakes and marshes where tall reeds and rushes are present. Forages in wetlands, grasslands, and croplands near nests. In winter, large flocks forage in agricultural areas.	No known occurrences, but could potentially occur in the EIR Study Area.
*Loggerhead shrike*** Lanius ludovicianus	– / CSC	VFG&VP, ICR, Agriculture, and RSFWM	Open country for foraging; dense shrubs for nesting.	Several known occurrences in the EIR Study Area; likely to occur in other areas.
Mammals				
Pallid bat *Antrozous pallidus*	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Roosts in caves, tunnels, buildings; forages over variety of habitats.	Not known from the EIR Study Area, but known to occur in Fairfield. Potentially roosts in buildings, bridges and probably forages in the EIR Study Area.
Townsend's big-eared bat *Corynorhinus townsendii*	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Roosts in caves, tunnels, buildings; forages over variety of habitats.	Not known from the EIR Study Area. Potentially roosts in buildings and probably forages in the EIR Study Area.

* Solano HCP Covered Species ** Solano HCP Special Management Species

Status Designations

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TABLE 4.4-3 SPECIAL-STATUS ANIMAL SPECIES KNOWN OR SUSPECTED FROM THE EIR STUDY AREA VICINITY

Common Name *Scientific Name*	Status Federal/ State	Natural Community Associations	Habitat	Potential for Occurrence
Greater western mastiff-bat *Eumops perotis californicus*	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Roosts in crevices of large outcrops; forages over wide variety of habitats.	Not known from the EIR Study Area. Unlikely to roost in the EIR Study Area because of the absence of habitat. Potentially forages over the EIR Study Area.
Western red bat Lasiurus blossevillii	– / CSC	RSFWM, VFG&VP, ICR, and Agriculture	Prefers riparian areas where they roost in tree foliage.	Not known from the EIR Study Area, but known to occur in Fairfield. Potentially roosts in riparian areas and forages in orchards.

* Solano HCP Covered Species ** Solano HCP Special Management Species

Status Designations

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6. Biological Resource Conservation Areas

A countywide conservation analysis was conducted for the Solano HCP to identify specific conservation areas for each natural community. These conservation areas were then used to develop a conservation approach for each natural community, outline compensation or mitigation levels for covered activities, and determine the level of development compatible with the regional conservation goals and objectives. This section provides a description of each conservation area found within the EIR Study Area. Because Vacaville is a participant in the HCP, these areas are applicable to the Vacaville General Plan and this EIR. More detailed information concerning the methods of the conservation analysis can be found in Section 4 of the Draft Solano HCP.[19]

a. Valley Floor Grassland and Vernal Pool Conservation Areas

The HCP divides the valley floor grassland and vernal pool natural community into three different conservation areas: high, medium, and low. As shown in Figure 4.4-3, valley floor grassland and vernal pool habitat within the EIR Study Area fall within medium- and low-value conservation areas.

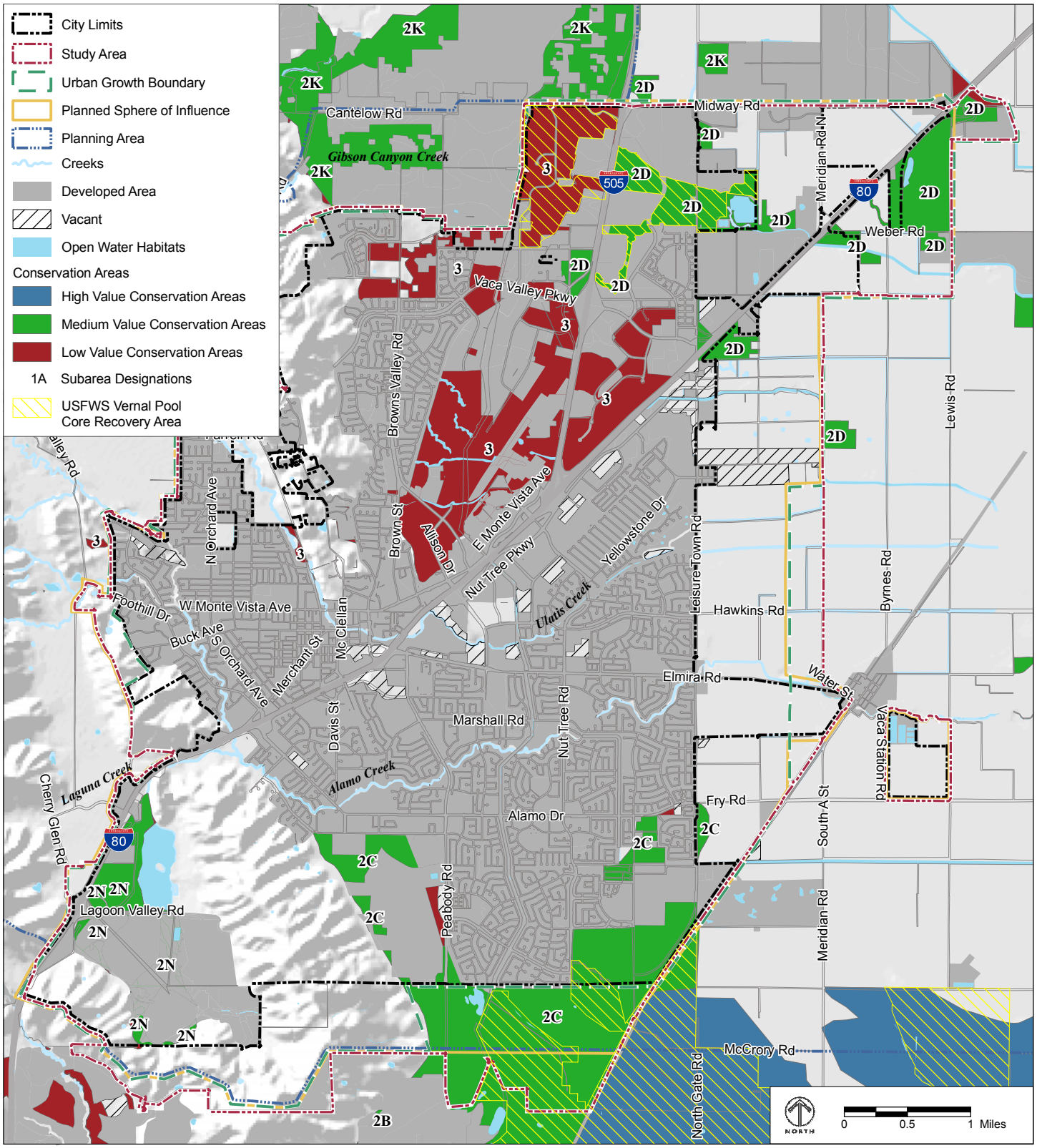
i. Medium-Value Conservation Areas

Medium-value conservation areas include highly to very highly disturbed lands located on historic vernal pool soils and adjacent valley floor grassland habitat located on non-vernal pool soils. These areas have been previously leveled and/or cultivated such that the natural soil profile has been altered, but the underlying impermeable layers may remain intact. Typically, medium-value conservation areas lie on the periphery of or adjacent to high value conservation areas, but are hydrologically and ecologically separated from these areas by roads, canals, ditches, and/or other development. Medium-value conservation areas contain suitable habitat and typically support at least some of the rare species associated with this community.

ii. Low-Value Conservation Areas

Low-value conservation areas primarily include small infill parcels and can include even relatively large blocks of land that have otherwise have been highly altered. These low-value areas are typically surrounded by existing development, have limited or no connectivity to other natural habitats, and do not support isolated populations of extremely rare or range limited species. Figure 4.4-3 shows the low-value conservation areas within the EIR Study Area.

[19] Solano County Water Agency, 2009, *Solano Multispecies Habitat Conservation Plan, Final Administrative Draft*, prepared by LSA Associates, Inc.



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-3

VERNAL POOL CONSERVATION AREAS

iii. California Tiger Salamander Conservation Areas

California tiger salamanders occur in a wide variety of habitat types; although they are primarily associated with vernal pools in Solano County, there are a few areas within the Inner Coast Range in which they may occur. Figure 4.4-4 shows the known and potential range of California tiger salamanders within the EIR Study Area. Based on the potential range of the species, there are Inner Coast Range areas within the EIR Study Area in which they could occur. These areas are important because they connect some of the medium-value subareas shown in Figure 4.4-3.

b. Riparian, Stream, and Freshwater Marsh Conservation Areas

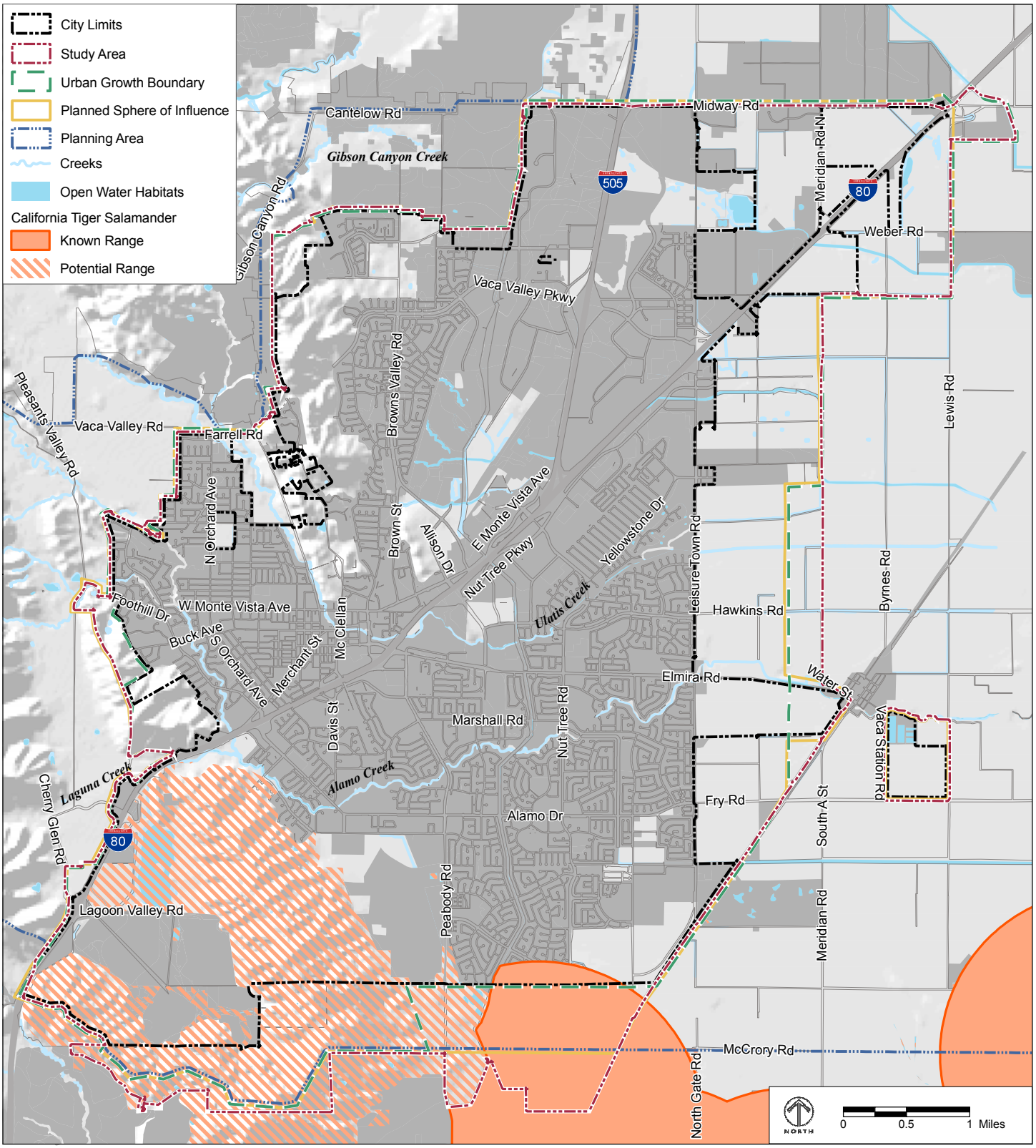
All stream habitats have high-conservation value because they contribute to regional water quality and can serve as movement corridors for wildlife. However, certain stream areas have been preserved in a more "natural" state, have been less impacted by urban development and intensive agriculture, support populations of special-status species, and are more suitable for restoration than others.

Instead of high-, medium-, and low-value conservation areas, the HCP subdivides priority drainages and watersheds into three categories based on site-specific conservation actions: conservation areas Riparian, Stream, and Marsh (RSM) 1, 2, and 3. The two main streams within the EIR Study Area are Alamo and Ulatis Creeks; as shown in Figure 4.4-5, these two creeks contain all three of these conservation categories within the EIR Study Area.

i. Conservation Area RSM 1

Conservation area RSM 1 encompasses the upper watersheds of streams that contain stands of riparian vegetation and have had limited effects from development in their watersheds. The primary conservation objective for these areas is preservation with an emphasis on avoiding and minimizing impacts to sensitive resources. The priority drainages and watersheds in this conservation category within the EIR Study Area are:

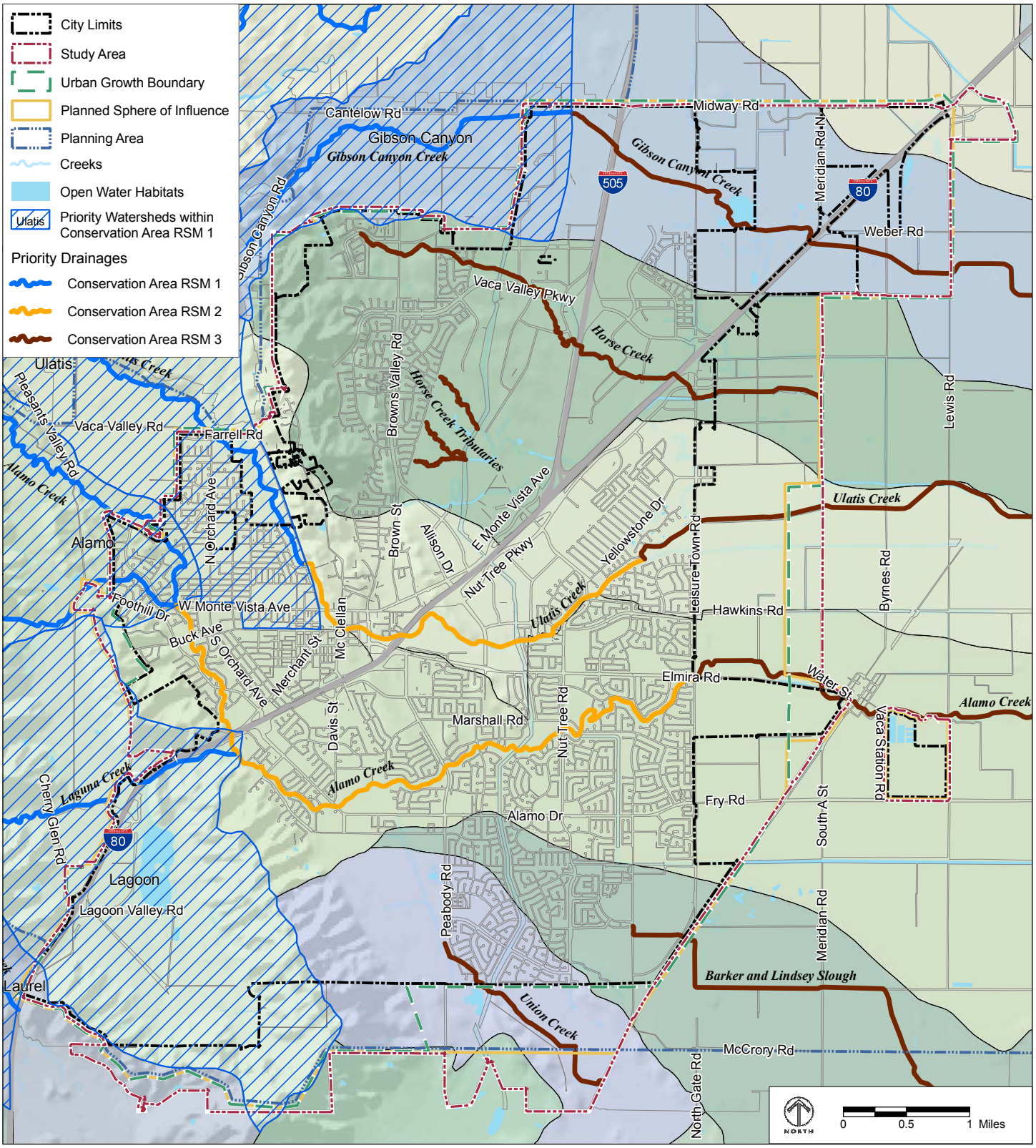
- Laguna Creek
- Alamo Creek, just downstream of the confluence with Encinosa Creek
- Ulatis Creek, upstream of Gibson Canyon Road
- Gibson Canyon Creek, headwaters to 0.3 miles west of Interstate 505



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-4

CALIFORNIA TIGER SALAMANDER KNOWN AND POTENTIAL RANGE



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-5

PRIORITY DRAINAGES AND WATERSHEDS

ii. Conservation Area RSM 2

Conservation area RSM 2 consists of urban creek areas. Much of the riparian habitat within and near cities is very narrow (i.e. only one or two tree canopies wide), and characterized by a significant component of non-native trees and shrubs.[20] Despite the high level of disturbance, urban streams provide important corridors linking high-value conservation areas together. Urban riparian habitat within Vacaville provides an important linkage between the less developed watersheds of the Inner Coast Range, the high-value vernal pool conservation areas, and Swainson's hawk irrigated agriculture conservation areas.

The conservation approach for riparian and stream habitat within and near cities focuses on invasive species control, riparian restoration, and maintenance of water quality and hydrogeomorphic processes. The urban creek areas targeted for riparian restoration and invasive species control within the EIR Study Area are:

- Alamo Creek, below the confluence of Encinosa Creek and Nut Tree Road
- Old Alamo Creek, between Nelson Park and Leisure Town Road
- Ulatis Creek, between Gibson Canyon Road and Ulatis Drive
- Gibson Canyon Creek
- Horse Creek and tributaries

iii. Conservation Area RSM 3

Conservation area RSM 3 drainages include stream reaches that meander through the alluvial fans, terraces, basins, and Delta and Bay marshlands of Solano County.[21] Historically, within the alluvial fans, terraces, and basins geographical province,[22] dense oak forests reportedly once covered the plains along the major streams and their fans, with high fans and terraces having more open stands of grasses and oaks. Lower lying basin deposits supported tules, reeds, and other water-tolerant plants.[23] Agricultural practices and development in these areas has resulted in the loss of most of the wetlands, floodplains, and riparian forests that historically bordered the larger rivers in this area. Most streams in this category have either been channelized or had their flows rerouted for flood control purposes. Therefore, the primary conservation actions for these areas are restoration of natural floodplain corridors that allow development of natural channel mean-

[20] LSA Associates. 2008. Riparian Habitat Assessment. June 30, 2008. Prepared for the Solano County Water Agency, Vacaville, CA.

[21] Noss, R., et al, 2002, Report of Science Advisors, Solano County Natural Community Conservation Plan/Habitat Conservation, prepared for the California Department of Fish and Game and Solano County Water Agency.

[22] Noss, R., et al, 2002, Report of Science Advisors, Solano County Natural Community Conservation Plan/Habitat Conservation, prepared for the California Department of Fish and Game and Solano County Water Agency.

[23] Burcham, L.T., 1957, *California Rangeland*, Handbook Number 296, Sacramento: California Department of Agriculture.

Bates, L.A., et al, 1977, *Soil Survey of Solano County*, USDA Soil Conservation Service and UC Agricultural Experiment Station.

der patterns, and restoration of riparian and freshwater marsh habitat where compatible with flood control objectives. Areas target for this type of restoration within the EIR Study Area are:

- Old Alamo Creek channels, east of Leisure Town Road to the Vacaville urban limit line.
- Old Ulatis Creek channel, east of Leisure Town Road to the Vacaville urban limit line.
- Horse Creek, east of Interstate 505.

c. Swainson's Hawk Conservation Areas

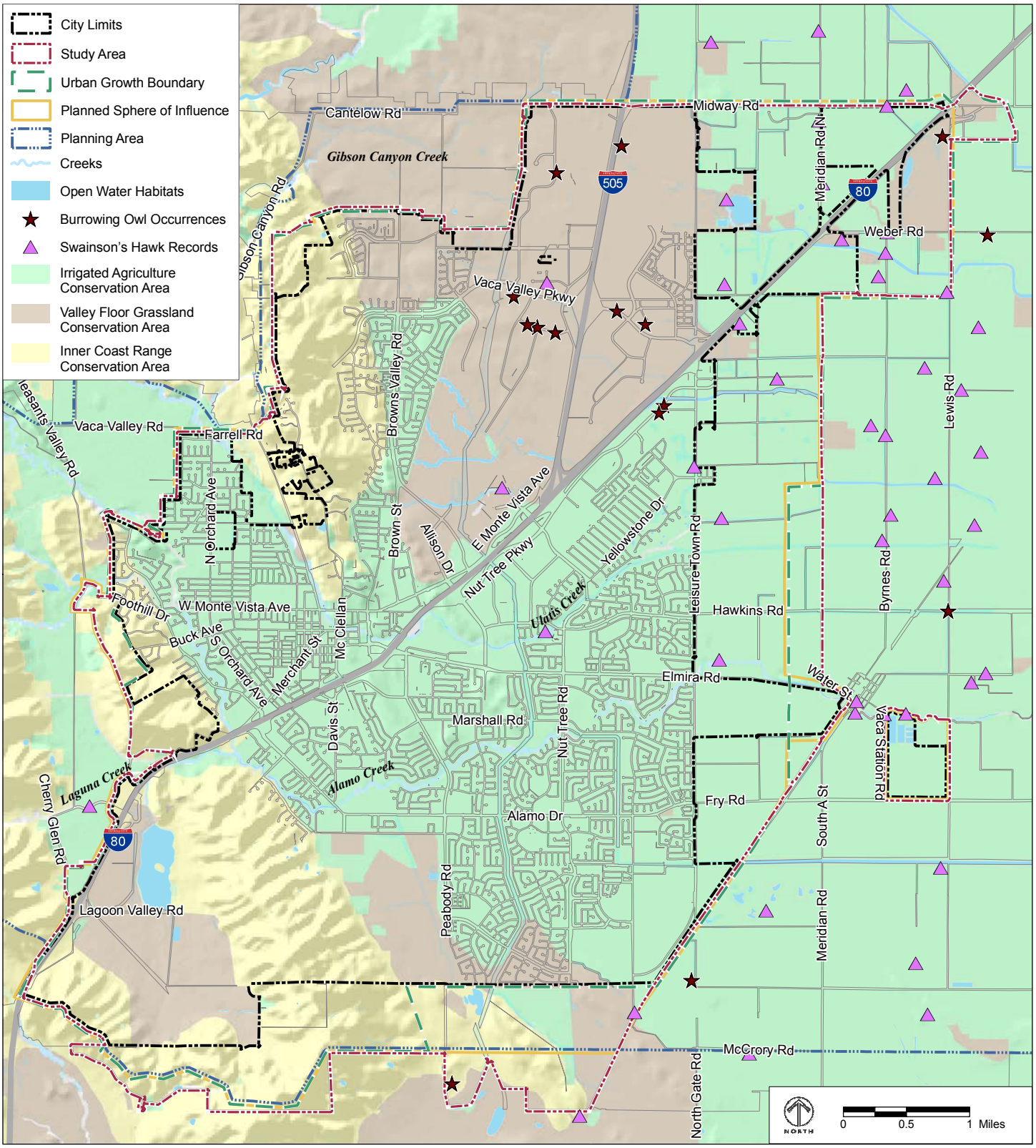
Swainson's hawk occurrences within Solano County are not uniformly distributed. This skewed distribution corresponds to differences in the quality of potential foraging habitat. In Solano County, agricultural landscapes have the highest density of hawk records and grassland/oak savanna areas have the lowest density of records. Clearly, not all potential foraging habitat within the county contributes equally to the conservation of Swainson's hawks; thus, it was necessary in the HCP process to define specific Swainson's hawk conservation areas based on the value of foraging habitat and distribution of Swainson's hawk records. As shown in Figure 4.6-6, three Swainson's hawk conservation areas were identified: the irrigated agriculture conservation area, the valley floor grassland conservation area, and the Inner Coast Range conservation area.

i. Irrigated Agriculture Conservation Area

The irrigated agriculture conservation area was identified by reviewing the known Swainson's hawk nesting distribution in Solano County, and mapping high quality irrigated and non-irrigated agricultural lands and adjacent grasslands. As shown in Figure 4.6-6, this conservation area encompasses all of the irrigated and non-irrigated agricultural land and some grassland habitat in the eastern portion of the EIR Study Area.

ii. Valley Floor Grassland Conservation Area

As shown in Figure 4.4-6, the valley floor grassland conservation area consists of the valley floor grassland and vernal pool habitat, mainly in the natural habitat remaining in the lands west of Interstate 505. Despite the large amount of open space, relatively few Swainson's hawk nests have been observed in valley floor grassland communities, due either to a lack of survey coverage and/or lower habitat quality.



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-6

SWAINSON'S HAWK AND BURROWING OWL CONSERVATION AREAS

iii. Inner Coast Range Conservation Area

Grassland and oak savanna habitat within the Inner Coast Range may provide suitable foraging and nesting habitat for Swainson's hawks, despite few records from these areas. One pair was observed in Lagoon Valley and another was recorded in Cordelia. However, if population expansion exceeds the carrying capacity of the irrigated agriculture and valley floor grassland conservation areas, then hawks may disperse into these currently unoccupied areas of the county. Therefore, grassland and oak savanna habitat in the Inner Coast Range may provide habitat for future populations of Swainson's hawk. Conservation of these areas may provide a stable source of foraging habitat for Swainson's hawk populations, as these areas are not susceptible to the market fluctuations that affect irrigated agricultural foraging habitat.

d. Burrowing Owl Conservation Areas

Burrowing owls are an open-country species, naturally inhabiting grasslands, open shrublands, and open woodlands, but have also adapted to human-modified landscapes, such as agricultural lands, vacant lots, disturbed fields, roadsides, and railroad rights-of-way. As a result, the EIR Study Area has an abundance of land that is known to, or could support, burrowing owls, as shown in Figure 4.4-6. Burrowing owl conservation is tied to the preservation and management of open agricultural lands, similar to Swainson's hawk habitats, as well as valley floor grassland and vernal pools and low-lying grassland communities associated with the Inner Coast Range. These three areas represent the main conservation areas for burrowing owls.

C. Standards of Significance

Implementation of the proposed General Plan and ECAS would have a significant impact with regard to biological resources if they would:

- Result in a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans (including the current Draft of the Solano HCP), policies, regulations, or by the CDFG or USFWS.
- Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.
- Result in a substantial adverse effect on federally regulated wetlands as defined by Section 404 of the Clean Water Act and/or State protected wetlands as defined by the Porter-Cologne Water Quality Control Act through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any applicable land use plans, policies, regulations, or ordinances, of an agency with jurisdiction over the project, adopted for the purpose of protecting biological resources or avoiding and mitigating impacts to biological resources.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

D. Impact Discussion

This section discusses potential impacts of the proposed General Plan on biological resources in the EIR Study Area. Implementation of the proposed ECAS would have minimal biological resource impacts and is discussed, where relevant, in the sections below.

This impact analysis considers all habitats within the following General Plan land use categories to potentially be converted to an incompatible land use under the proposed General Plan: residential, commercial, business/industrial, public/institutional, schools, public parks, private recreation, and urban reserve. Portions of the agricultural buffer (10 percent) were also included as having potential for conversion based on allowable uses for this designation under the proposed General Plan.

The largest overall effect under the General Plan is the potential conversion of 6,543 acres of habitat areas to more residential, commercial, or industrial uses within the city limits and Urban Growth Boundary (UGB) and with implementation of the avoidance, minimization, and mitigation measures contained within the Solano HCP. An additional 354 acres is also projected to be converted to other allowable uses under the General Plan (e.g. detention facilities and renewable energy facilities) within the Agricultural Buffer and Hillside Agriculture Land Use designations. This loss of habitat is roughly equally split between areas currently used primarily for agriculture and more natural habitat areas such as grasslands, oak woodlands, and oak savannas. Most of the undeveloped lands within the EIR Study Area provide habitat for one or more special-status species and/or wetlands that could be developed under the General Plan.

Table 4.4-4 shows the breakdown of acres of each vegetation type potentially affected by a "developed" land use designation under the General Plan for the UGB and the Agricultural Buffer and Hillside Agriculture Land Use designations.

TABLE 4.4-4 **HABITAT POTENTIALLY IMPACTED BY THE PROPOSED GENERAL PLAN***

Vegetation/Cover Type	UG (Includes City Limits) (Acres)	Agricultural and Hillside Agricultural Buffer Areas (Acres)	Total (Acres)
Grassland - Upland	200	20	220
Grassland - Valley Floor	1,190	12	1,202
Grassland - Vernal Pool System	38	4	42
Riparian, Stream and Marsh	30	3	33
Oak Woodland and Oak Savanna	390	4	394
Agriculture	3,090	309	3,399
Vacant Lots	1,587	0	1,587
Open Water	18	2	20
Grand Total	**6,543**	**354**	**6,897**

* Projected Land Conversions with implementation of the Solano HCP.

1. Project Impacts

The discussion of potential project impacts is organized by and responds to each of the potential impacts identified in the Standards of Significance.

a. Result in a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans (including the current Draft of the Solano HCP), policies, regulations, or by the CDFG or USFWS.

Impacts to special-status species, which are listed in Tables 4.4-2 and 4.4-3, are discussed below based on the natural community with which they are primarily associated, and then individually if there are additional specific impacts.

i. Valley Floor Grassland and Vernal Pool

Both direct and indirect impacts to valley floor grassland and vernal pool habitat would result from development allowed by the proposed General Plan, which would have the potential to directly and indirectly impact 19 special-status plant species, eight special-status animal species primarily associated with this broader natural community, and 13 species that are generally asso-

ciated with vernal pool habitats (impacts to these species are discussed in separate sections below). Special-status species known to occur in these areas include burrowing owl, Swainson's hawk, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

The vernal pool habitat within much of the EIR Study Area has been significantly degraded; therefore, it is not likely to support large populations of special-status species. However, small populations of many species persist and their presence cannot be ruled out without appropriately timed surveys. It was not feasible to survey the remaining vernal pool habitat within the EIR Study Area, and surveys would not be useful at this time since development under the proposed General Plan would take place over the course of many years and the conditions on each site will change over time. Therefore, all species associated with valley floor grassland and vernal pool habitat listed in Tables 4.4-2 and 4.4-3 are assumed to be potentially affected by development allowed by the proposed General Plan if vernal pool habitat is impacted.

Development allowed by the proposed General Plan would directly impact approximately 1,202 acres of valley floor grassland and 42 acres of wetland habitat within the valley floor grassland and vernal pool natural community. These impacts would occur within areas designated by the Solano HCP as medium value conservation areas, low value conservation areas, and isolated wetlands within agricultural areas.

In addition to the impact to 1,244 acres from direct loss or conversion, development allowed by the proposed General Plan would indirectly impact approximately 99 acres of upland habitat and 21 acres of wetland habitat within the valley floor grassland and vernal pool natural community. Indirect impacts include potential changes in hydrology, decreased water quality, changes in land use such as loss or alteration of livestock grazing, introduction of invasive species, increased disturbance through human use and pets, and habitat fragmentation and isolation. Indirect impacts were assessed by the relative distance to development, considering development within 250 feet of wetlands and uplands in medium value conservation areas and within 100 feet of wetlands in low value conservation areas, including agricultural areas.

a) Medium Value Conservation Areas

As summarized in Table 4.4-5, development allowed by the proposed General Plan has the potential to directly impact approximately 700 acres of medium value vernal pool habitat located throughout the EIR Study Area, including HCP Conservation Subareas 2C (Upper Union Creek Contra Costa Goldfield Buffer/Watershed Lands), 2D (East Vacaville), 2K (Vacaville Area Corning Series Soils), and 2N (Lagoon Valley); these HCP Conservation Areas are labeled in Figure 4.4-3.

TABLE 4.4-5 **POTENTIAL IMPACTS TO VALLEY FLOOR GRASSLAND AND VERNAL POOL HABITAT IN MEDIUM VALUE CONSERVATION AREAS**

Vernal Pool Conservation Subarea	Direct Impacts – Upland	Direct Impacts – Wetland	Total Direct Impacts
2C	70	0.5	70.5
2D	487	18.0	505.0
2K	2	0	2.0
2N	121	1.0	122.0
Total Acres	**680**	**19.5**	**699.5**

a) Low Value Conservation Areas

Development allowed by the proposed General Plan could directly impact approximately 500 acres of low value vernal pool habitat. These low-value conservation areas occur primarily within the undeveloped, northern portion of Centennial Park and undeveloped land within existing industrial parks, lying roughly between Interstate 505 and Browns Valley Road on the east and west, respectively, and the Nut Tree Airport and Midway Road.

b) Isolated Vernal Pools Surrounded by Agriculture

There are several isolated wetlands that fall outside of a Solano HCP Vernal Pool Conservation Area within areas mapped as agriculture. In these areas, the upland component would be considered foraging habitat for Swainson's hawks and burrowing owls, and there could be impacts to remnant vernal pool wetlands. Based on the HCP wetland mapping effort, there are an estimated 5.5 acres of wetlands within agricultural areas of Vacaville that could be impacted from development allowed by the proposed General Plan.

c) California Tiger Salamander Conservation Areas

Development allowed by the proposed General Plan could impact approximately 500 acres of suitable tiger salamander upland habitat and 20 acres of potential tiger salamander breeding habitat in the southeastern portions of the EIR Study Area. Direct effects to potential breeding habitat could include filling all or portions of the ponds, pools, and wetlands that provide suitable breeding habitat for California tiger salamanders. This potential habitat area is already fragmented from other nearby known population areas. Therefore, development within this area could lead to local extinction of the salamander, if even present now.

d) Impact Significance Determination

The proposed General Plan includes goals, policies, and actions that would reduce and mitigate potential impacts to special-status species associated with valley floor grassland and vernal pool habitats. Specifically:

- Policy COS-P1.1 supports efforts to prepare and implement the HCP.
- Policy COS-P1.5 requires new development proposals to provide baseline assessments prepared by qualified biologists, and specifies requirements about the baseline assessments.
- Policy COS-P1.6 requires that new development minimize the disturbance of natural habitats and vegetation, and requires revegetation of disturbed natural habitat areas with native or non-invasive naturalized species.
- Policy COS-P1.9 requires that new development include provisions to protect and preserve wetland habitats.
- Policy COS-P1.10 requires that, where avoidance of wetlands is not practicable, new development provide for off-site mitigation that results in no net loss of wetland acreage and functional value within the watersheds draining to the Delta.
- Policy COS-P1.11 requires that, as appropriate, new policy plans or specific plans contain a resource management component and associated funding mechanisms that includes policies to protect preserved natural communities.
- Policy COS-P1.12 directs the City to comply with all of the Avoidance and Minimization Measures listed in the Draft Solano HCP until the Solano HCP is adopted, and to require that development projects provide copies of required permits, or verifiable statements that permits are not required, from CDFG (2081 Individual Take Permit) and USFWS (Section 7 Take Authorization) prior to receiving grading permits or other approvals that would permit land disturbing activities and conversion of habitats or impacts to protected species.
- Action COS-A1.1 directs the City to adopt and implement the requirements of the HCP.
- Action COS-A1.4 directs the City to amend the Land Use and Development Code to require that all new Specific Plans include a resource management component that protects and preserves natural communities.

In addition, one of the main goals of the Solano HCP is to provide a comprehensive plan for addressing and mitigating the impacts of anticipated development, including direct and indirect impacts. When the Solano HCP is adopted, the City of Vacaville, as a required plan participant, will be required to implement the measures in the Solano HCP, helping to further reduce the projected impacts of implementing the proposed General Plan. Even if the HCP is not adopted,

key elements of the Solano HCP that are relevant to addressing species and habitat protection in Vacaville have been incorporated into the proposed General Plan policies.

Overall, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to special-status species associated with valley floor grassland and vernal pool habitats to a *less-than-significant* level.

ii. Riparian, Stream, and Freshwater Marsh

For riparian, stream, and freshwater marsh habitat, avoidance is always desirable, but it is not always practical. The primary potential direct impacts on riparian, stream, and freshwater marsh habitat from implementing the proposed General Plan include construction and installation of new or expanded road crossings, storm drain outfalls, utility corridors, and bike/pedestrian trails along riparian corridors. Approximately 33 acres of riparian, stream, and freshwater marsh habitat are anticipated to be impacted with implementation of the relevant General Plan policies and objectives, including implementation of the Solano HCP.

Indirect effects to riparian, stream, and freshwater marsh habitat include changes in channel morphology (e.g. down-cutting and bank erosion) from increased peak and base flows. If the avoidance and minimization measures and conservation measures in the Solano HCP are implemented, they will maintain peak and base flows by establishing buffers and detention basins and will result in substantial riparian and stream restoration. In addition, the buffers required by Section 14.12.174.050 of the Vacaville Land Use and Development Code would protect the remaining riparian resources, channel morphology, and the quality of in-stream habitat.

Impacts to riparian, stream, and freshwater marsh habitat could directly or indirectly affect the following special-status species: valley elderberry longhorn beetle, western pond turtle, foothill yellow-legged frog, tricolored blackbird, Swainson's hawk, short-eared owl, northern harrier, white-tailed kite, song sparrow (Modesto population), yellow-headed blackbird, loggerhead shrike, and special-status bat species. Several of these species are also dependent on other habitat types and are discussed in separate sections. The three species that are primarily associated with these habitat types are valley elderberry longhorn beetle, foothill yellow-legged frog, and western pond turtle.

a) Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is closely associated with blue elderberry, which is an obligate host for beetle larvae. Adult valley elderberry longhorn beetles are usually found on or flying between elderberry plants. Valley elderberry longhorn beetles have been documented from a number of areas in and around Vacaville, and elderberries are abundant along Ulatis and Alamo Creeks and many other areas in Vacaville. Direct effects to suitable habitat for valley elderberry longhorn beetles include the removal of bushes as a result of the construction and installation of

new or expanded road crossings, storm drain outfalls, utility corridors, and bike/pedestrian trails along riparian corridors. Valley elderberry longhorn beetles are also considered to be poor dispersers, and creating gaps in the riparian canopy through the removal of elderberry bushes and other riparian vegetation can create barriers to the beetles' movement. Invasive species such as Argentine ants, which are common in urbanized environments, have also been linked to reduced populations levels of the beetle.

b) Foothill Yellow-Legged Frog

Suitable habitat for the foothill yellow-legged frog is limited within the EIR Study Area, primarily occurring in the streams in the very western portion of Vacaville, including the West Hills, Vaca Mountains, and potentially the English Hills. Primary considerations for this species in these areas involve protection of water quality and stream/riparian habitats from urban development and the expansion of non-native predators, such as bullfrogs, crayfish, and warmwater fish. Development in the lower reaches of occupied watersheds, such as the Ulatis Creek and Alamo Creek watersheds, could create suitable habitat for non-native predators. These non-native predators could migrate upstream into habitat occupied by foothill yellow-legged frogs. This would result in a significant impact to this species.

c) Western Pond Turtle

Western pond turtles could occur in a variety of aquatic habitats throughout the EIR Study Area. In addition, they require upland habitat for overwintering and oviposition (i.e. egg-laying) sites. Oviposition sites require sandy soil in order to excavate a nest and may be near or far from the aquatic habitat. Development allowed by the proposed General Plan could result in direct and indirect impacts to western pond turtles. Direct impacts could include loss of aquatic habitat and loss of suitable substrate for laying eggs. Indirect impacts would be the greatest concern for western pond turtles in urban areas, including collection of turtles by children; mortality from pets; an increase in predation from raccoons, striped skunks, and opossums; and degradation of water quality.

d) Impact Significance Determination

The proposed General Plan includes goals, policies, and actions that would reduce and mitigate potential impacts to special-status species associated with riparian, stream, and freshwater marsh habitat. Specifically, Policies COS-P1.1, COS-P1.5, COS-P1.6, COS-P1.9, COS-P1.10, COS-P1.11, and COS-P1.12 and Action COS-A1.1, which were discussed in Section D.1.a.i.e, would mitigate impacts, as well as the following additional policies and actions:

- Policy COS-P1.3 directs the protection and creation of new wildlife corridors where feasible.
- Policy COS-P1.4 directs that mature trees and existing native non-agricultural trees be protected.

- Action COS-A1.2 directs the City to identify invasive, non-native species and prohibit the use of such species in landscaping in order to prevent them from becoming established or expanding their populations within the city.
- Action COS-A1.3 directs the City to amend the Land Use and Development Code to include tree protection measures for native trees and woodland habitat.
- Action COS-A1.7 directs the City to amend the Land Use and Development Code to require that, for each protected tree removed as part of a new development project, three native trees be planted in a protected mitigation area and preserved under a conservation easement.
- Action COS-A1.10 directs the City to amend the Land Use and Development Code to require additional tree protection measures during construction activities.
- Policy COS-P2.1 discourages undergrounding of creeks and encourage daylighting of existing culverted creeks.
- Policy COS-P2.2 requires buffering or landscaped setbacks and storm runoff interception in order to protect existing stream channels and riparian vegetation.
- Policy COS-P2.3 requires creekway and riparian area protection during construction, and creekway and riparian area restoration after construction.
- Policy COS-P2.5 encourages restoration and expansion of riparian and floodplain habitat within channelized streams and flood channels where feasible.
- Policy COS-P2.6 promotes invasive species control programs and directs that control programs be incorporated as part of on-going operational and maintenance activities along creek corridors.
- Action COS-A2.1 directs the City to develop a creek protection ordinance requiring development setbacks from creeks and protection of the creeks and associated riparian habitats during construction, and restoration after construction. As part of this ordinance, implement programs to limit invasive non-native species from becoming established or expanding within the city and evaluate public access along creekways to ensure protection of habitat resources and to ensure public safety within creek setback areas. The City will also update the City's Creekways Policy to be consistent with the Creek Protection Ordinance. (8.1-I4)
- Action COS-A2.2 directs the City to establish a maintenance district to ensure uniform maintenance, management, and invasive species control for selected channels and creeks.

In addition, the proposed ECAS includes measures that would minimize impervious surfaces, which would reduce stormwater and runoff impacts on creeks and riparian areas.

In addition, as described in Section D.1.a.i.d, the City of Vacaville, as a required plan participant of the Solano HCP, will implement the measures in the Solano HCP, which will further mitigate potential impacts of the proposed project. Therefore, implementation of the Solano HCP and the proposed General Plan and ECAS policies, actions, and measures, in combination with federal and State laws, would reduce potential impacts to special-status species associated with riparian, stream, and freshwater marsh habitats to a *less-than-significant* level.

iii. Swainson's Hawk

Development allowed by the proposed General Plan could impact approximately 6,844 acres of potential Swainson's hawk foraging habitat, including approximately 3,399 acres of irrigated agriculture, 1,244 acres of valley floor and vernal pool grassland, 614 acres of Inner Coast Range habitat, and 1,587 acres of vacant lots. Anticipated development under the General Plan could also result in the loss of between 18 and 20 known Swainson's hawk nest trees. In addition, the proposed ECAS includes measures to promote alternative energy development. Solar arrays and wind turbines in agricultural areas could remove Swainson's hawk habitat, and large wind turbines could kill birds.

The primary indirect effect on Swainson's hawks from development allowed by the proposed General Plan would be the increased human presence in areas that were formerly rural. Pairs that traditionally nested in rural areas subject to little human disturbance would be exposed to increased traffic levels and possibly increased harassment from humans. For example, pairs that nested in roadside tree rows would be subject to increased traffic levels (including heavy trucks and construction equipment) as urbanization spreads into outlying agricultural lands.

The proposed General Plan includes goals, policies, and actions that would reduce and mitigate potential impacts to Swainson's hawks. Specifically, Policies COS-P1.1 and COS-P1.4 and Actions COS-A1.1 and COS-A1.2, which were discussed in Sections D.1.a.i.e and D.1.a.ii.d, would mitigate impacts. In addition, Goal COS-3 and its associated policies would protect agricultural lands in the Planning Area. In addition, the proposed ECAS directs the City to continue to continue to enhance a landscape buffer at the Easterly Wastewater Treatment Plant through extensive tree plantings, which could improve habitat for Swainson's hawks.

In addition, as described in Section D.1.a.i.e, the City of Vacaville, as a required plan participant of the Solano HCP, will implement the measures in the Solano HCP, which will further mitigate potential impacts of the proposed project. Therefore, implementation of the Solano HCP and the proposed General Plan and ECAS policies, actions, and measures, in combination with federal and State laws, would reduce potential impacts to Swainson's hawks to a *less-than-significant* level.

iv. Burrowing Owl

Burrowing owls occur in a variety of locations in an around Vacaville. Typical habitat includes vacant lots or grassland areas, often with short to sparse vegetation cover, and around the edges of agricultural fields. Burrowing owls rely on a variety of overhead structure for cover, such as underground burrows of ground squirrels, debris piles, and old tires. They are present in Vacaville as both a resident/nesting species and as a winter migrant.

Development allowed by the proposed General Plan could impact approximately 6,844 acres of potential burrowing owl foraging habitat, including approximately 3,399 acres of irrigated agriculture, 1,244 acres of valley floor and vernal pool grassland, 614 acres of Inner Coast Range habitat, and 1,587 acres of vacant lots. Urban development allowed under the proposed General Plan would convert these habitats and could result in the loss of 14 burrow sites known to support burrowing owls within the last ten years, and possibly more unknown sites. In addition, the proposed ECAS includes measures to promote alternative energy development. Solar arrays and wind turbines in agricultural areas could remove burrowing owl habitat, and large wind turbines could kill owls.

The primary indirect effect of development allowed by the proposed General Plan on burrowing owls would be further habitat fragmentation and isolation of breeding pairs from large blocks of suitable foraging and nesting habitat. Pairs within small, isolated habitat fragments (e.g. urban vacant lots) surrounded by development are more vulnerable to predation by non-native predators and disturbance by humans than those that nest in agricultural areas or large areas of grassland. Urbanization also results in increased densities of non-native predators, such as domestic dogs and cats and red foxes, which have been identified by several researchers as burrowing owl predators.[24] Increased vehicle traffic in formerly rural areas would result in a commensurate increase in burrowing owls' vulnerability to vehicular collisions, which can be a significant source of mortality in some populations. This risk is exacerbated by owls' tendency to forage and perch along roads at night.

The proposed General Plan policies and actions described in Sections D.1.a.i.e, D.1.a.ii.d, and D.1.a.iii would mitigate impacts to burrowing owls. These General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for addressing and mitigating the direct and indirect impacts of anticipated development. As such, development allowed by the proposed General Plan would be sufficiently mitigated. Therefore, implementation of the Solano HCP and the proposed General Plan policies and ac-

[24] Haug, E.A., B.A. Millsap, and M.S. Martell, 1993, "Burrowing owl (*Speotyto cunicularia*)," in *Birds of North America, No. 61*, eds. A. Poole and F. Gill, Philadelphia, PA and Washington, D.C: Academy of Natural Sciences and American Ornithologists' Union.

tions, in combination with federal and State laws, would reduce potential impacts to burrowing owls to a *less-than-significant* level.

v. Tricolored Blackbird

Tricolored blackbirds usually nest in large flocks in dense vegetation near open water; in emergent wetland vegetation, especially cattails and tules; in thickets of willow, blackberry, wild rose, tall herbs, and willow; and in some agricultural crops. The species frequents open habitats, such as croplands and grassy fields, during the non-breeding season.[25]

While there are no known tricolored blackbird occurrences within the EIR Study Area, the species is mobile and relocates colonies regularly; therefore, they can be present in an area one year and not the next. The foraging habitat of tricolored blackbirds primarily consists of agricultural fields and grasslands, including those surrounding vernal pools. Therefore, development allowed by the proposed General Plan could potentially impact 4,643 acres of potential tricolored blackbird habitat, including 1,244 acres of valley floor grassland and vernal pool and 3,399 acres of irrigated agriculture. In addition, the proposed ECAS includes measures to promote alternative energy development. Solar arrays and wind turbines in agricultural areas could remove tricolored blackbird habitat, and large wind turbines could kills birds.

Potential indirect effects of development allowed by the proposed General Plan on tricolored blackbirds include mortality from pets; increased predation from raccoons, striped skunks, and opossums; and increased disturbance from human activity.

The proposed General Plan policies and actions described in Sections D.1.a.i.e, D.1.a.ii.d, and D.1.a.iii would mitigate impacts to tricolored blackbirds. As with the potential impacts to other special-status species discussed above, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to tricolored blackbirds to a *less-than-significant* level.

vi. Yellow-headed Blackbird, Short-Eared Owl, Northern Harrier, and Loggerhead Shrike

Yellow-headed blackbirds, short-eared owls, northern harriers, and loggerhead shrikes are widespread and can occur in a variety of habitat types, including brackish and freshwater marshes, grasslands, oak woodlands, oak savannahs, riparian edges and woodlands, and agricultural lands. The following habitat types provide suitable habitat for these species: essentially all of the valley floor and vernal pool grasslands; the grassland, oak savanna, and oak woodland within the Inner Coast Range; and agricultural areas, generally excluding orchards and vineyards. Development

[25] Granholm, S.L., 1990, *California's wildlife, birds, tricolored blackbird*, California Statewide Wildlife Habitat Relationships System, California Interagency Wildlife Task Group, Department of Fish and Game, Sacramento, California. Available at: http://www.dfg.ca.gov/whdab/B520.html.

allowed by the General Plan could result in the loss of 6,897 acres of potential foraging habitat for these species in these habitat types. In addition, the proposed ECAS includes measures to promote alternative energy development. Solar arrays and wind turbines in agricultural areas could remove habitat, and large wind turbines could kill birds.

The proposed General Plan policies and actions described in Sections D.1.a.i.e, D.1.a.ii.d, and D.1.a.iii would mitigate impacts to yellow-headed blackbirds, short-eared owls, northern harriers, and loggerhead shrikes. As with the potential impacts to other special-status species discussed above, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to these species to a *less-than-significant* level.

vii. Pallid Bat, Townsend's Big-Eared Bat, Greater Western Mastiff-Bat, and Western Red Bat

Development allowed by the proposed General Plan could potentially affect roosting habitat for the pallid bat, Townsend's big-eared bat, greater western mastiff bat, and western red bat. Pallid bats, greater western mastiff bats, and Townsend's big-eared bats potentially roost in the buildings of existing developed areas. Redevelopment under the proposed General Plan could result in the removal of existing buildings, which would result in a temporary loss of roosting habitat and harm to individual bats if removal were to occur when bats are present. Western red bats could potentially roost in riparian areas. Removal of riparian vegetation through development allowed by the proposed General Plan could potentially result in a temporary loss of roosting habitat or direct mortality to individual bats. All of these species potentially forage over the EIR Study Area, so development allowed by the proposed General Plan could result in a loss of foraging habitat. In addition, the proposed ECAS includes measures to promote alternative energy development. Large wind turbines could kill bats.

The proposed General Plan policies and actions described in Sections D.1.a.i.e, D.1.a.ii.d, and D.1.a.iii would reduce impacts to foraging habitat and potential roosting habitat of the pallid bat, Townsend's big-eared bat, Greater Western Mastiff-Bat, and western red bat. In addition, proposed Policy COS-P1.13 and Action COS-A1.6 specifically provide protections for special-status species, including pre-construction roost surveys, timing requirements when maternity roots are encountered, and bat roost recreation requirements. Therefore, the impact related to special-status bat species would be *less than significant*.

viii. Non-native Species

Development allowed by the General Plan could facilitate the colonization of non-native species in adjacent natural and agricultural areas throughout the EIR Study Area, thereby reducing the value of these areas to special-status species.

The California Invasive Plant Council (CAL-IPC) estimates that invasive plants alone cost the State of California a minimum of $82 million dollars a year, not including costs associated with various plant diseases or exotic animals.[26] Non-native plant species could disperse from the landscaping of new development areas allowed by the proposed General Plan into nearby agricultural lands and natural areas, including riparian areas protected as open space. Non-native plants displace native species and reduce the area's wildlife value. In open spaces, if invasive plants become established in disturbed or out-of-the-way areas, they would become more difficult to eradicate or control. From these areas, they provide a source of propagules (e.g. seeds, stems or buds that can propagate a new plant) that would continue to invade natural areas and displace habitat of special-status species.

In addition, new sedimentation/detention basins could provide breeding habitat for American bullfrogs. The young of the bullfrogs could disperse into native habitat and reduce the value of that habitat for wildlife. Bullfrogs are a predator on native wildlife and may impact special-status species such as juvenile western pond turtles and foothill yellow-legged frogs.

The proposed General Plan includes the following policies that, if effectively implemented, would significantly reduce the potential for the spread of invasive non-native species:

- Policy COS-P1.7 encourages new development to incorporate native vegetation into landscape plans.
- Policy COS-P1.8 prohibits the use of invasive, non-native species, as identified by the State or County Department of Agriculture or other authoritative sources, in landscaping on public property or in common areas in private developments.

These policies, in addition to Policies COS-P1.4, COS-P1.6, COS-P1.9, COS-P1.11, COS-P2.3, COS-P2.5, and COS-P2.6, and Actions COS-A1.1, COS-A1.2, COS-A2.1, and COS-A2.2, which are described in Sections D.1.a.i.e and D.1.a.ii.d, would reduce and mitigate potential impacts from non-native species to a *less-than-significant* level.

b. Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

Impacts to riparian habitat and other sensitive natural communities are discussed below.

[26] California Invasive Plant Council, *Economic Impacts of Invasive Plants in California*, available at http://www.cal-ipc.org/ip/research/cost.php, accessed June 27, 2012.

i. Vernal Pools and Other Seasonal Wetlands

Development allowed by the proposed General Plan could directly impact an estimated 1,202 acres of grassland habitat and 42 acres of wetland habitat within the valley floor grassland and vernal pool natural community. These impacts would occur within medium value conservation areas, low value conservation areas, and isolated wetlands within agricultural areas. Development allowed by the proposed General Plan could potentially indirectly impact approximately 99 acres of upland habitat and 21 acres of wetland habitat within the valley floor grassland and vernal pool natural community. Some of the low value vernal pool habitat potentially impacted by development allowed by the proposed General Plan falls within the Vacaville Core Recovery Area for vernal pool ecosystems. Most of the low value vernal pool habitat within the Vacaville Core Recovery Area designated for development consists of vacant lots within industrial complexes. These vacant lots may contain remnant vernal pool habitat wetlands, but they have been disturbed during previous grading and leveling activities.

The proposed General Plan policies and actions described in Section D.1.a.i.e would mitigate impacts to vernal pools and other seasonal wetlands. These General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for addressing and mitigating the direct and indirect impacts of anticipated development. Therefore, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to vernal pools and other seasonal wetlands to a *less-than-significant* level.

ii. Riparian Habitats

As described in Section D.1.a.ii, the primary potential direct impacts to riparian habitats from development allowed by the proposed General Plan include construction and installation of new or expanded road crossings, storm drain outfalls, utility corridors, and bike/pedestrian trails along riparian corridors. Development allowed by the proposed General Plan is estimated to directly impact approximately 33 of the 145 acres of riparian habitats within the EIR Study Area with implementation of the avoidance and minimization requirements contained in the Solano HCP. An additional 20 acres of agricultural drainage ditches and other open water habitats also could be directly impacted by development activities.

Also, as described in Section D.1.a.ii, potential indicated impacts on riparian habitat include changes in channel morphology (e.g. down-cutting and bank erosion) from increased peak and base flows. However, if the avoidance and minimization measures and conservation measures in the Solano HCP are implemented, they will maintain peak and base flows by establishing buffers and detention basins and will result in substantial riparian and stream restoration. In addition, the buffers required by Section 14.12.174.050 of the Vacaville Land Use and Development Code would protect the remaining riparian resources, channel morphology, and the quality of in-stream habitat.

The proposed General Plan policies and actions described in Section D.1.a.ii.d would mitigate impacts to riparian habitats. These proposed General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for addressing and mitigating the direct and indirect impacts of anticipated development on riparian habitats and associated species. Therefore, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to riparian habitats to a *less-than-significant* level.

iii. Oak Woodlands

Oak woodlands and oak savannas within the EIR Study Area occur in the English Hills and in the hills around Lagoon Valley. Development allowed by the proposed General Plan could potentially impact up to 394 acres of oak woodland and oak savanna habitat. In addition, oak woodlands are not covered under the Solano HCP.

The proposed General Plan includes goals, policies, and actions that would reduce potential impacts to oak woodland and oak savanna habitat, including Policies COS-P1.4 and COS-P1.6 and Action COS-A1.2, which are described in Sections D.1.a.i.e and D.1.a.ii.d. In addition, the proposed General Plan includes Policy COS-P1.14 and Actions COS-A1.6 and COS-A1.7, which require clustering of development to minimize impacts on woodlands, oak woodland and oak savanna habitat mitigation at a 3:1 ratio, and long-term management plans for impacted oak woodland and oak savanna habitats.

In addition, all trees, including oak trees, over 31 inches in circumference at 4.5 feet above the ground, are to some extent protected under Section 14.09.131 of the Vacaville Land Use and Development Code, which requires a permit for their removal. However, this code section does not protect smaller trees, which are typical of oak woodlands in the EIR Study Area. The proposed General Plan also includes actions to strengthen this section of the Land Use and Development Code. Specifically, Actions COS-A1.8 and COS-A1.9 require that three native species be planted for every protected tree removed as part of a development project. These actions also outline a monitoring plan for these mitigation trees, and strengthen the requirements for protecting trees during construction.

Overall, the proposed General Plan policies would reduce impacts on oak woodlands and oak savannas to a *less-than-significant* level.

iv. Native Perennial Grassland

Native perennial grassland is limited to small stands of relict native perennial grasses. Generally, researchers have classified an area with 10 percent relative cover of native grasses as a sensitive natural community. Stands of native grasses could potentially occur within the EIR Study Area and may be impacted by development allowed by the proposed General Plan.

The proposed General Plan policies and actions described in Section D.1.a.i.e would mitigate impacts to native perennial grasslands. These General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for addressing and mitigating the direct and indirect impacts of anticipated development. Therefore, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to vernal pools and other seasonal wetlands to a *less-than-significant* level.

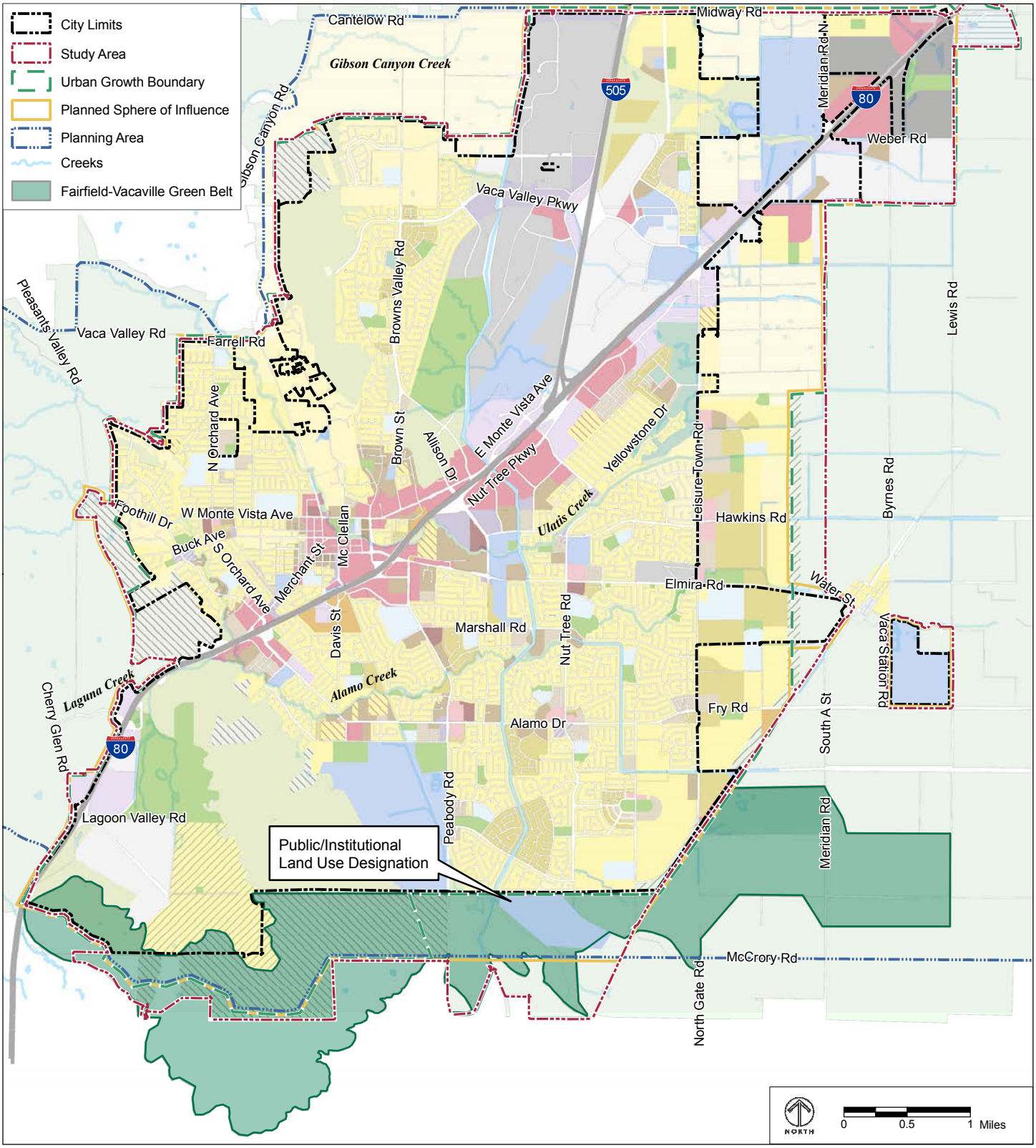
c. Result in a substantial adverse effect on federally regulated wetlands as defined by Section 404 of the Clean Water Act and/or State protected wetlands as defined by the Porter-Cologne Water Quality Control Act through direct removal, filling, hydrological interruption, or other means.

Because of historic and cumulative losses of wetlands, the loss of even degraded wetlands would be considered a significant impact, unless appropriately mitigated. Development allowed by the proposed General Plan could directly impact an estimated 42 acres of vernal pool wetlands and indirectly impact 21 acres of vernal pool wetland habitat. Approximately 33 acres of riparian, stream, and freshwater marsh habitat are anticipated to be impacted with implementation of the relevant General Plan policies and objectives, including implementation of the Solano HCP.

The proposed General Plan policies and actions described in Sections D.1.a.i.e and D.1.a.ii.d would mitigate impacts to wetlands. These proposed General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for addressing and mitigating the direct and indirect impacts of anticipated development. Therefore, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to wetlands to a *less-than-significant* level.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The Solano HCP identifies six key corridor areas throughout Solano County. As shown in Figure 4.4-7, one of these corridors, the Vacaville-Fairfield Greenbelt, falls within the EIR Study Area. The Vacaville-Fairfield Greenbelt provides connectivity between the lowlands of the Jepson Prairie and the uplands of the Vaca Mountains. Habitat within this corridor includes vernal pool and valley floor grasslands, Inner Coast Range grasslands, oak savanna, and oak woodland. The westernmost California tiger salamander was recorded within this corridor in northeastern Fairfield. Maintaining this corridor is essential for California tiger salamanders to disperse west into the Inner Coast Range. Swainson's hawks, burrowing owls, and several other special-status bird species may also use this corridor.



SOURCE: Solano Habitat Conservation Plan (June 2012).

FIGURE 4.4-7

FAIRFIELD-VACAVILLE GREEN BELT

As shown in Figure 4.4-7, development allowed by the proposed General Plan could result in the development of approximately 44 acres within this corridor. In addition, the location of the potential impacts within the corridor could significantly impede the movement of California tiger salamanders and other wildlife.

The proposed General Plan policies and actions described in Sections D.1.a.i.e and D.1.a.ii.d would mitigate impacts to wildlife corridors. These proposed General Plan policies and actions, including support for implementation of the Solano HCP, provide a comprehensive approach for maintaining wildlife movement corridors through urban areas. Therefore, implementation of the Solano HCP and the proposed General Plan policies and actions, in combination with federal and State laws, would reduce potential impacts to wildlife corridors to a *less-than-significant* level.

e. Conflict with any applicable land use plans, policies, regulations, or ordinances, of an agency with jurisdiction over the project, adopted for the purpose of protecting biological resources or avoiding and mitigating impacts to biological resources.

The proposed General Plan would not conflict with any policies or ordinances protecting biological resources. The biological resource requirements in the various federal, State, and local regulations and policies that are described in Section A would remain intact following implementation of the proposed project. In addition, the proposed General Plan includes numerous policies to protect biological resources that are regulated under the policies and regulations described above in Section A. Thus, the proposed General Plan would have a *less-than-significant impact* regarding conflicts with policies or ordinances protecting biological resources.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

The Solano HCP is not an adopted conservation plan. Nevertheless, the City of Vacaville, being a plan participant, has used the draft plan to develop goals, policies, and actions, such that the proposed General Plan will be consistent with the HCP once it is adopted. Specifically, Policy COS-P1.1 supports efforts to prepare and implement the HCP, and Action COS-A1.1 directs the City to adopt and implement the requirements of the HCP. This policy and action would mitigate potential impacts related to conflicts with an adopted HCP to a *less-than-significant* level.

2. Cumulative Impacts

Development allowed by the proposed General Plan could contribute to the cumulative loss of habitat for a number of special-status species and sensitive habitats, including riparian habitats and wetlands.

One of the major goals of the Solano HCP is to provide a comprehensive plan for addressing and mitigating the cumulative impacts of this anticipated development, including direct and indi-

rect cumulative impacts. The Solano HCP anticipates that, within the jurisdictions of the Solano HCP plan participants (the Cities of Vacaville, Fairfield, Suisun, Dixon, and Rio Vista), an estimated 16,000 acres of agricultural lands, grasslands, oak savannas and woodlands, vacant lots, and riparian habitats, which provide known or potential habitat for a variety of rare, threatened, and endangered species, will be converted to urban uses over the next 30 years. Within the Vacaville UGB, all areas designated for development by the proposed General Plan lie within the geographic area assumed for this future urban growth under the Solano HCP.

Solano County is not an HCP plan participant. The 2008 Solano County General Plan has the potential to allow the conversion of up to 23,940 acres of habitat areas to urbanized or industrial uses, or an additional 7,940 acres of potential impacts to habitat within the county is above what is considered and mitigated for in the Solano HCP. While the County is not a participant in the Solano HCP, the 2008 County General Plan FEIR includes measures compatible with the Solano HCP for mitigating the additional 7,940 acres of potential impacts to habitat within the county.

As directed by the proposed Policy COS-P1.1 and Action COS-A1.1, the City of Vacaville, as a required plan participant, will implement the measures in the Solano HCP, thereby reducing the proposed General Plan's contribution to the cumulative impacts of this loss/conversion of habitats for the anticipated development within the county to a *less-than-significant* level.

While the cumulative impacts associated with the loss and conversion of habitat are less than significant, the cumulative impacts of proposed development within the EIR Study Area, combined with anticipated development in the nearby Northeast Fairfield Specific Plan Area, could result in a significant impact to a key wildlife corridor, the Vacaville-Fairfield Greenbelt corridor. As described in Section D.1.d, the Vacaville-Fairfield Greenbelt provides connectivity between the lowlands of the Jepson Prairie and the uplands of the Vaca Mountains, and maintaining this corridor is essential for many wildlife to move between the valley floor and Inner Coast Range. The area in the proposed General Plan south of the city limits, east of Peabody Road and west of Vanden Road that is designated Public/Institutional, as shown in Figure 4.4-7, combined with the area planned for development in the Northeast Fairfield Specific Plan, could preclude retention of a viable corridor for maintaining connectivity between these two regions of the county, resulting in a *significant* impact.

Impact BIO-1: The proposed General Plan, in combination with the Northeast Fairfield Specific Plan, could preclude retention of an important wildlife corridor.

The area designated Public/Institutional by the proposed General Plan in this wildlife corridor is owned by the Solano Irrigation District (SID), a public entity. While there are no formal plans in place, due to the nature of this agency, future land use would likely include facilities that sup-

port SID's water service. Because SID would not be able to use this land for other purposes that would be compatible with a wildlife corridor, no mitigation is available, and the impact is *significant and unavoidable*.

E. Full Buildout

Because the impact analysis provided in Section D is a spatial analysis that considered all areas that could potentially be developed under the proposed General Plan, the impacts described for the horizon year of 2035 in Section D would be similar to the impacts at full buildout. However, indirect impacts from development, such as changes in water quality and invasive species, may be significantly greater than the conditions in 2035 because it is anticipated that only a percentage of full buildout will actually be constructed by 2035. However, as discussed in Chapter 3, Project Description, it is unlikely that full buildout would ever occur under the proposed General Plan, and an analysis of full buildout is not required by CEQA.

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