3.4 - Biological Resources

3.4.1 - Introduction

This section describes the existing biological setting and potential effects from project implementation on the project site and the Off-site Improvement Area. This section also identifies mitigation measures to reduce these potential effects to less than significant levels. Descriptions and analysis in this section are based, in part, on a revised Biological Resources Assessment (BRA) prepared by ECORP Consulting, Inc. (ECORP) in November 2017, an updated BRA prepared by Madrone Ecological Consulting, LLC (Madrone) on September 23, 2019, which included protocol-level special-status plant surveys during 2018 and 2019, a Special-status Plant Species Survey Report for the Off-site Improvement Area prepared by Madrone in September 2019, a Tree Survey conducted in July 2015 by Ed Brennan, Consulting Arborist, and a San Joaquin Kit Fox Survey performed by H. T. Harvey & Associates on February 22, 2019, all of which are contained in Appendix D.

The project site is located in the City of Antioch, within the *Antioch South, California*, United States Geological Survey (USGS) 7.5-minute Topographical Quadrangle Map.

3.4.2 - Environmental Setting

Records Searches and Pedestrian Survey to Identify Existing Biological Resources

Literature Review

Biologists examined existing environmental documentation for the project site and immediate vicinity. This documentation included the arborist report noted above, relevant biological studies for the area, literature pertaining to habitat requirements of special-status species potentially occurring near the site, and federal and State register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW).

Soils

Biologists also reviewed United States Department of Agriculture (USDA) soil surveys to establish if soil conditions on the project site are suitable for any special-status plant species. These soil profiles include major soil series with similar thickness, arrangement, and other important characteristics. These series are further subdivided into soil mapping units that provide specific information regarding soil characteristics.

Special-status Wildlife and Plant Species

Biologists compiled a list of threatened, endangered, and otherwise special-status species previously recorded within the general project vicinity. The list was based on a search of the CDFW California Natural Diversity Database (CNDDB), a special-status species and plant community account database, and the California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California database for the Antioch South, California USGS 7.5-minute topographic quadrangle map. The database search results can be found in Attachment B of the BRA (Appendix D). Additionally, Biologists utilized the Western Bat Working Group (WBWG) Species Matrix, and the East Bay Chapter of the CNPS Database of Rare, Unusual and Significant Plants of

Alameda and Contra Costa Counties.[1] The CNDDB Biogeographic Information and Observation System (BIOS) database[2] was used to determine the distance between known recorded occurrences of special-status species and the project site.

Trees

Biologists reviewed applicable City ordinances pertaining to tree preservation and protective measures and their tree replacement conditions or permits required, such as by Article 12 Section 9-5.1205 of the City of Antioch Municipal Code. Additionally, a tree survey was conducted by Ed Brennan, Consulting Arborist in July 2015 (Appendix D).

Jurisdictional Waters and Wetlands

Biologists reviewed the investigation of waters of the United States from June 3, 2014, by Live Oak Associates, Inc. Additionally, a letter was received from the United States Army Corps of Engineers (USACE) dated February 23, 2016, with an approved jurisdictional determination, concurring with the Live Oak Associates, Inc. report (Appendix D). This approved jurisdictional determination is limited to the project site west of Deer Valley Road; it does not cover the Off-site Improvement Area to the east of Deer Valley Road, where an additional 0.016 acre of seasonal wetland has been identified.

Field Surveys

Numerous rare plant surveys have been conducted on the project site and the off-site improvement areas. Monk & Associates (M&A) Biologists completed focused rare plant surveys within the project site on March 23 and 25, April 28 and 29, and July 14 and 15, 2015. The plant species found within the project site were identified to species level. A list of all vascular plant taxa encountered within the project site was recorded in the field. Plants that needed further evaluation were collected and keyed at the M&A laboratory. Final determinations for collected plants were made by keying specimens using standard references such as The Jepson Manual, 2nd Edition.[3,4] More recently, Madrone Biologists conducted protocol-level special-status plant surveys within the project site and Off-site Improvement Areas in 2018 and 2019.[5,6] Madrone Biologists and Botanists conducted special-status plant surveys of the Project Area on September 6 and 7, 2018; March 18 and 19, May 13, 15, and 29, and September 9, 2019. Madrone Biologists followed CDFW Protocols,[7] USFWS Guidelines,[8] and CNPS Survey Guidelines[9] in conducting their surveys. During these surveys,

[1] California Native Plant Society (CNPS). East Bay Chapter CNPS. 2019. Inventory of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties. Website: https://ebcnps.org/database-of-rare-unusual-and-significant-plants-of-alameda-and-contra-costa-counties/. Accessed October 8, 2019.

[2] California Department of Fish and Wildlife (CDFW). 2019. Biogeographic Information and Observation System (BIOS). Website: https://www.wildlife.ca.gov/Data/BIOS. Accessed October 8, 2019.

[3] Baldwin, B. et al. 2012. The Jepson Manual: Vascular Plants of California. Berkeley: University of California Press. County of San Bernardino (Bernardino). 2007 (amended 2015).

[4] Monk & Associates, Inc. (M&A). 2015. DRAFT Biological Assessment for The Ranch, City of Antioch, Contra Costa County.

[5] Madrone Ecological Consulting, LLC (Madrone). 2019. Biological Resources Assessment for The Ranch in Antioch.

[6] Madrone Ecological Consulting, LLC (Madrone). 2019. Special-status Plant Survey Report for City of Antioch Regional Infrastructure Improvements.

[7] California Department of Fish and Game (CDFG). 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. California Natural Resources Agency, Sacramento, CA. November 24, 2009.

[8] United States Fish and Wildlife Service (USFWS). 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. January 2000.U.S. Fish and Wildlife Service (USFWS). 1998. Endangered Species Recovery Program, Recovery Plan for Upland Species of the San Joaquin Valley, California. California State University, Stanislaus.

[9] California Native Plant Society (CNPS) 2001. Inventory of rare and endangered plants of California (6th Edition). Rare plant scientific

Madrone Biologists also conducted vegetation community mapping to assess the suitability of habitats on-site to support special-status species. Vegetation communities were classified in accordance with *The Manual of California Vegetation, 2nd Edition,*[10] and plant taxonomy was based on the nomenclature in the *Jepson eFlora.*[11]

While no protocol level surveys for the San Joaquin kit fox have been conducted, numerous reconnaissance surveys for species have been conducted within the Study Area. The most recent survey was conducted on February 22, 2019, by H.T. Harvey & Associates. The surveys were conducted utilizing trained scent dog surveys for San Joaquin kit fox within the Study Area. Two teams each consisting of one trained scent dog and one Biologist surveyed the entire 551.0-acre project area for sign of San Joaquin kit fox.

Physical Habitat/Vegetation

Habitat is an area consisting of a combination of resources (e.g., food, cover, water) and environmental conditions (e.g., temperature, precipitation, presence, or absence of predators and competitors) that promotes occupancy by individuals of a species and enables those individuals to survive and reproduce. Thus, habitat arises from interaction among soils, hydrology, climate, and vegetation. Soils, hydrology, and climate are addressed in other sections of this Environmental Impact Report (EIR); this habitat discussion includes information regarding vegetation.

City of Antioch

Habitat communities in the City of Antioch consist primarily of grasslands and oak woodland. Habitat including scrub and agricultural land are found sporadically throughout the City. Brackish marsh and stabilized interior dunes are mainly found to the north of the City in association with the Sacramento/San Joaquin Delta.[12]

Project Site

The majority of the project site consists of annual brome grassland with Sand Creek running west to southeast through the center of the project site. The project site ranges from rolling hills to flat terrain, with elevations ranging from approximately 200 feet to 500 feet above mean sea level (MSL). The majority of the project site is undeveloped and used for livestock grazing. One single-family residence is located on the site, in addition to several barns and outbuildings.

Off-site Improvement Area

The proposed project would include the installation of a new sewer main, which would extend eastward and connect to an existing off-site trunk main, as shown in Exhibit 2-14. All on-site and off-site sewer improvements would be constructed within public right-of-way or within public utility easements within private roadways, as needed. Topography within the off-site improvement area ranges from gently rolling hills to flat terrain, with elevations ranging from approximately 200 feet to

advisory committee, David P. Tibor, convening editor. California Native Plant Society. Sacramento, CA.

[10] Sawyer, J., Keeler-Wolf, T. and Evens, J., 2009. A manual of California vegetation, 2nd Edition. California Native Plant Society (CNPS), Sacramento, CA.

[11] Jepson Flora Project (eds.) 2019. Jepson eFlora. Website: http://ucjeps.berkeley.edu/eflora/. Accessed September 2019.

[12] City of Antioch. 2003. General Plan EIR. Biological Resources. Figure 4.3.1. Accessed June 21, 2019.

220 feet above MSL. The Off-site Improvement Area is comprised of portions of Deer Valley Road and Sand Creek Road as well as adjacent undeveloped areas to the east of Deer Valley Road.

Wildlife

Wildlife species observed within the project site during the 2017 site visits include American crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), killdeer (*Charadrius vociferus*), barnswallow (*Hirundo rustica*), western meadowlark (*Sturnella neglecta*), Bullock's oriole (*Icterus bullockii*), house finch (*Haemorhous mexicanus*), black phoebe (*Sayornis nigricans*), turkey vulture (*Cathartes aura*), and California ground squirrel (*Otospermophilus beecheyi*). In addition, vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packard*i), California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytoni*), western spadefoot (*Spea hammondii*), golden eagle (*Aquila chrysaetos*), Swainson's hawk (*Buteo swainsoni*), and burrowing owl (*Athene cunicularia*) pellets were observed during Madrone's 2018 and 2019 surveys. A complete list of wildlife species observed within the project site during the 2017 site visits is provided as Attachment D of the revised BRA.

Vegetation Communities

The 2019 Madrone BRA identified seven vegetation communities and land cover types within the project site and Off-site Improvement Area, including alkali weed (*Cressa truxillensis*), annual brome grassland, California goldfields dwarf plantain, ruderal community vegetation, eucalyptus woodland, valley oak woodland, and developed land that are described in further detail below. (Exhibit 3.4-1)

Alkali Weed-Salt Grass Playas and Sinks

Both ponds in the project site and the portion of ephemeral drainage west of Empire Mine Road are dominated by saltgrass (*Distichlis spicata*), perennial ryegrass (*Festuca perennis*), Mediterranean barley, alkali mallow (*Malvella leprosa*), and alkali weed. Other common plant species in these areas include California button-celery (*Eryngium aristulatum* var. *aristulatum*), brass buttons (*Cotula coronopifolia*), alkali popcorn flower (*Plagiobothrys leptocladus*), salt marsh sand spurrey (*Spergularia marina*), and crownscale (*Atriplex coronata*). These features would be classified as alkali weed-salt grass sinks (*Cressa truxillensis—Distichlis spicata* Herbaceous Alliance) in accordance with the *Manual of California Vegetation, 2nd Edition*.[13] This alliance is considered a Sensitive Natural Community by CDFW.[14]

Annual Brome Grassland

As stated above, the majority of the project site is composed of annual brome grassland. Annual brome grasslands on-site are dominated primarily by non-native annual grass species, including ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), wild oat (*Avena fatua*), foxtail barley (*Hordeum murinum*), and perennial ryegrass. Common forb species within the annual brome grasslands include common gumplant (*Grindelia camporum*), turkey mullein (*Croton setiger*), California burclover (*Medicago polymorpha*), and redstemmed filaree (*Erodium cicutarium*). Heavy clay inclusions within this community are dominated by sparse, low-growing forbs, such as California burclover, rose clover

[13] Sawyer, J., Keeler-Wolf, T. and Evens, J., 2009. A manual of California vegetation, 2nd Edition. California Native Plant Society (CNPS), Sacramento, CA.

[14] California Department of Fish and Wildlife (CDFW). 2018. California Sensitive Natural Communities List. Dated October 15, 2018.

(*Trifolium hirtum*), and Douglas' microseris (*Microseris douglasii* ssp. *douglasii*). Scattered non-native trees occur occasionally within this community, and some isolated native trees including California buckeye *(Aesculus californicus*), blue oak (*Quercus douglassii*), valley oak (*Quercus lobata*), and interior live oak (*Q. wislizeni*) occur along Sand Creek. Where these native trees form stands, they were mapped as valley oak woodland, as described below. The annual brome grasslands are only lightly grazed in the hills but are very heavily grazed in the flat valley bottom by the end of summer.

Developed

Developed portions of the project site include the paved Empire Mine Road, Sand Creek Road, Deer Valley Road, the single-family residence and the driveway to the residence, heavily impacted pastures, and associated outbuildings and vehicle storage yards. Many of these areas are characterized as bare dirt or paved, while others are occupied by ruderal vegetation (non-native forbs and grasses characteristic of recently disturbed sites). Dominant plant species within the ruderal areas include yellow star-thistle (*Centaurea solstitialis*), stinkwort (*Dittrichia graveolens*), Russian thistle (*Salsola tragus*), perennial ryegrass, and wild oat.

Eucalyptus Woodland

A grove of planted blue gum (*Eucalyptus globulus*) occurs along the western boundary of the project site. Little to no vegetation occurs in the understory of this community.

California Goldfields-Dwarf Plantain-Small Fescue Flower Fields

A small area of California Goldfields-Dwarf Plantain-Small Fescue Flower Fields occurs on a north-facing slope just to the north of the Eucalyptus Woodland on the western side of the project site. This unique area occurs on highly expansive clay soils, supports almost no grass, and dominant plant species include dwarf plantain (*Plantago erecta*), few-flowered evax (*Hesperevax sparsiflora*), California burclover, rose clover, shining navarretia (*Navarretia nigelliformis* ssp. *radians*), and chaparral fairyfan (*Clarkia affinis*).

Valley Oak Woodland

Valley oak woodland occurs in several small isolated patches along Sand Creek within the project site, but not within the Off-site Improvement Area. These patches are dominated by valley oak, California buckeye, and interior live oak. Understory species are largely similar to species found in the surrounding wild oats grassland, but some more mesic species are found as well, such as Douglas' mugwort (*Artemisia douglasiana*), California buttercup (*Ranunculus californicus*), and California figwort (*Scrophularia californica*). This community is considered a Sensitive Natural Community by the CDFW.[15]

Ruderal

Ruderal vegetation occurs adjacent to Deer Valley Road and Sand Creek Road within the eastern portion of the project site and the Off-site Improvement Area. This vegetation community is composed primarily of nonnative forbs and grasses characteristic of recently disturbed sites.

[15] California Department of Fish and Wildlife (CDFW). 2018. California Sensitive Natural Communities List. Dated October 15, 2018.

Dominant plant species within the ruderal vegetation communities in the project site include yellow star-thistle, stinkwort, Russian thistle, perennial ryegrass, and wild oat.

Soils

According to the Natural Resources Conservation Service (NRCS) Soil Survey Database,[16] six soil mapping units occur within the project site: (AbD) Altamont Clay, 9 to 15 percent slopes, Major Land Resource Area (MLRA) 15; (AbE) Altamont Clay, 15 to 30 percent slopes, MLRA 15; (AcF) Altamont-Fontana Complex, 30 to 50 percent slopes; (BdE) Briones Loamy Sand, 5 to 30 percent slopes; (CaA) Capay Clay, 0 to 3 percent slopes, MLRA 17; and (RbA) Rincon Clay Loam, 0 to 2 percent slopes, MLRA 14. (CaA) Capay Clay, 0 to 3 percent slopes, MLRA 17; and (RbA) Rincon Clay Loam, 0 to 2 percent slopes, MLRA 14 occur within the Off-site Improvement Area (Exhibit 3.4-2).

None of these soils is derived from serpentine parent material.[17] None of the components of these soil mapping units are considered saline or alkaline,[18] but inclusions of alkaline soils were observed in the northwestern portion of the project site, which was mapped as Altamont clay, and Altamont Fontana complex.

Sensitive Natural Communities

Sensitive Natural Communities are those Natural Communities that the CDFW has ranked S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable). Of the vegetation communities described above, two have been designated as Sensitive Natural Communities by the CDFW: alkali weed-salt grass sinks and valley oak woodland.

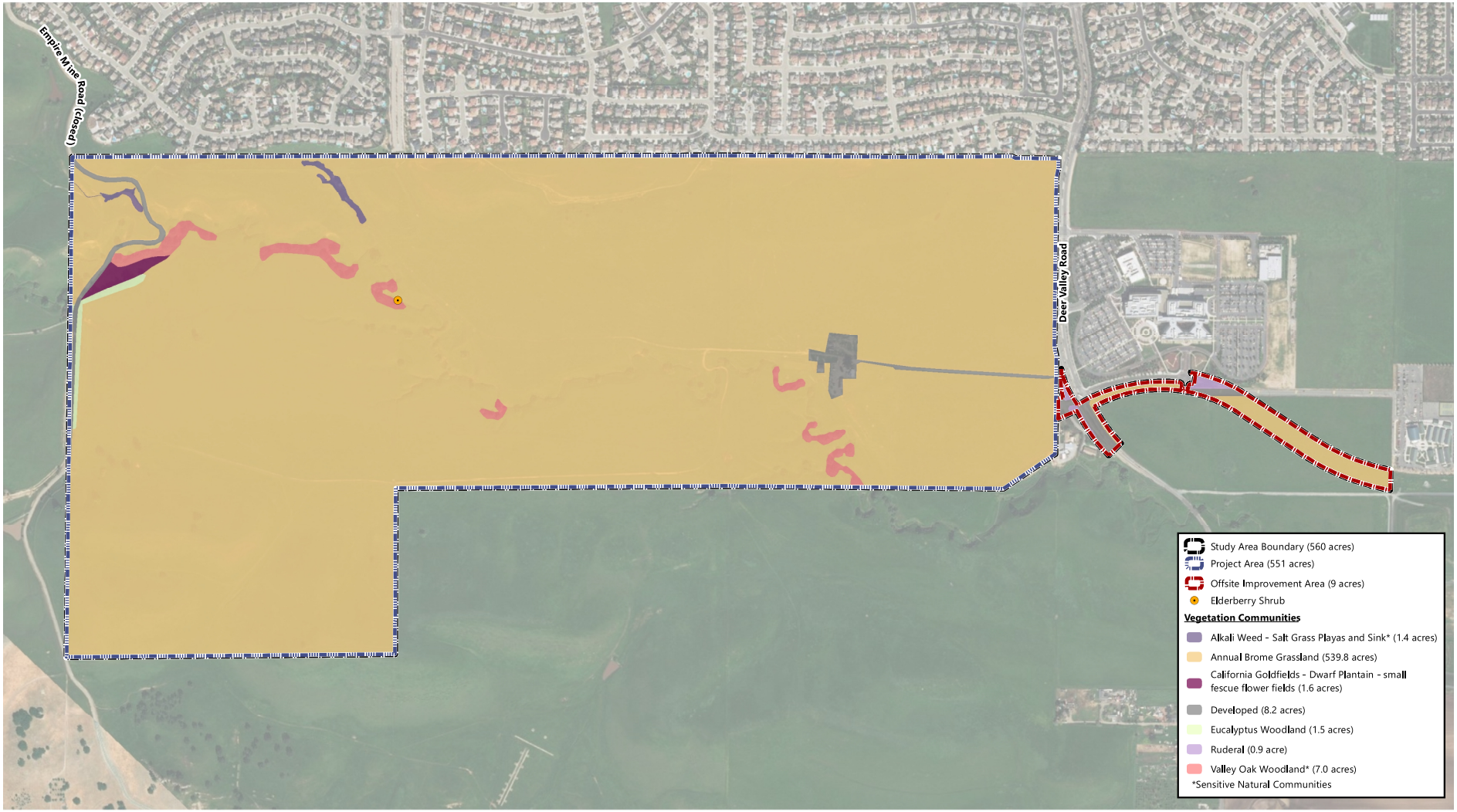
City of Antioch

While the City of Antioch is largely developed, portions of undeveloped lands are considered to be sensitive. The Sand Creek Focus Area is the main sensitive biological community within the City of Antioch. The City of Antioch General Plan EIR states that sensitive communities within the City include native grasslands, vernal pools, stabilized interior dunes, seasonal wetlands, freshwater seeps, freshwater marshes, salt brackish marshes, alkaline floodplains, alkali seeps, valley oak woodlands, and riparian woodland.[19]

Project Site

The project site is located within the Sand Creek Focus Area (Focus Area), which contains one or more sensitive biological communities.[20] The West Sand Creek Initiative was developed to protect nearly 1,244.00 acres of the Focus Area from future development and prohibits development on ridges and hills throughout the Focus Area and along Sand Creek. Although the West Sand Creek Initiative was stricken by the lower court, the project mimics the exact development footprint proposed for the project site in the West Sand Creek Initiative and thus, similarly protects a majority of the sensitive biological communities within the project area.

[16] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS). 2019. Web Soil Survey. Available http://websoilsurvey.nrcs.usda.gov/.
[17] Ibid.
[18] Ibid.
[19] City of Antioch. 2003. General Plan EIR. Biological Resources. Accessed October 3, 2019.
[20] City of Antioch. 2003. General Plan. Resource Management Element. Accessed June 21, 2019.



Source: Madrone Ecological Consulting, LLC (Madrone), February 27, 2020.

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Exhibit 3.4-1
Vegetation Communities

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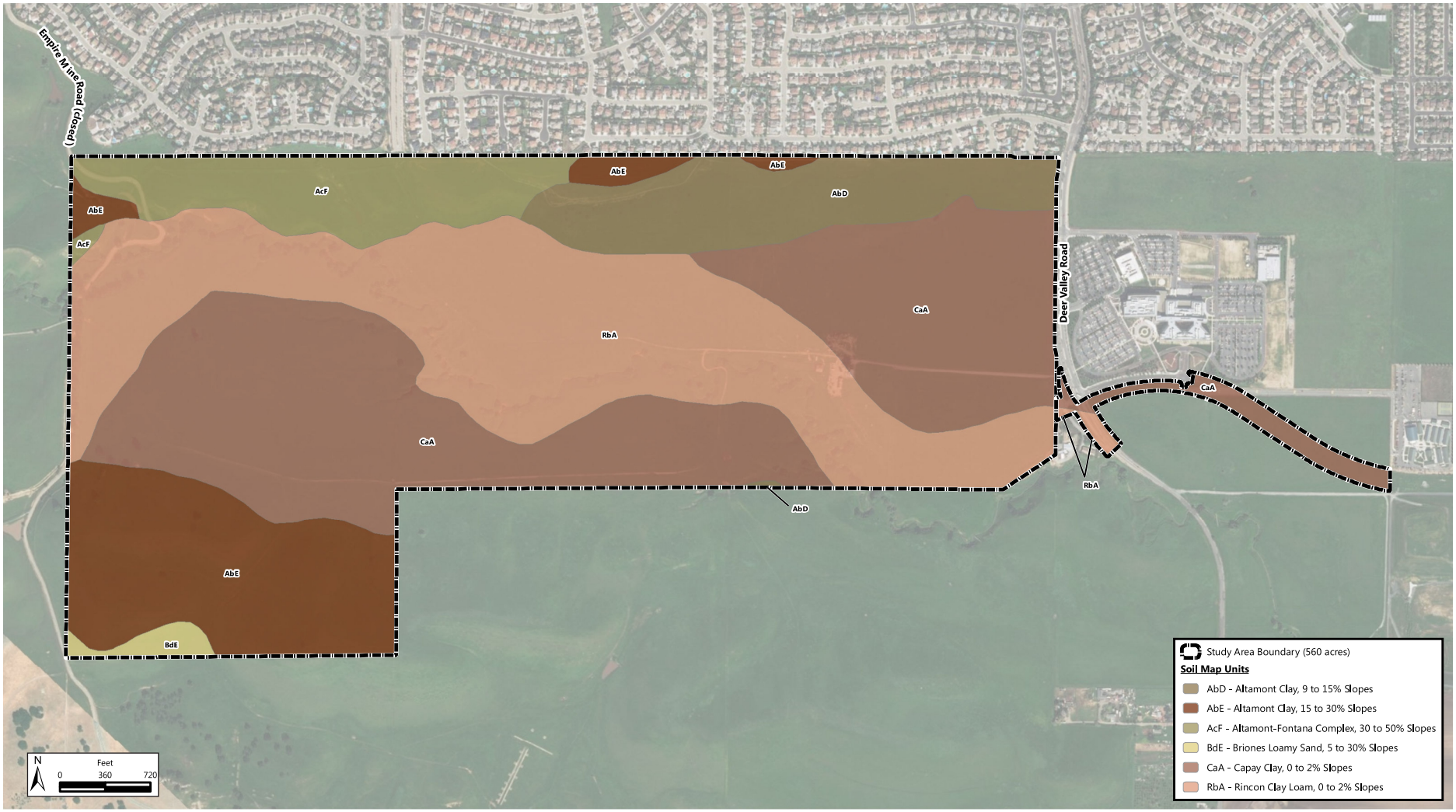

Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-2
Soils

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Wetlands and Waters of the United States and the State

Wetlands and waters of the United States and waters of the State are protected as hydrological resources, but also often provide habitat for common and special-status species. Types of water features include open water, developed open water, tidal marsh, seasonal wetland, wetlands swale, and waters.

City of Antioch

Within the City of Antioch, wetlands, waters of the United States, and waters of the State occur primarily near the San Joaquin River and within the southern portion of the City.[21]

Project Site

An approved jurisdictional determination has been issued for the project site by the USACE (Attachment D of the BRA), and a protocol-level aquatic resources delineation has been conducted for the off-site infrastructure areas by Madrone.[22] A total of 5.059 acres of aquatic resources were mapped within the project site, and an additional 0.016 acre was mapped within the Off-site Improvement Area, and are shown in Exhibit 3.4-3, and Table 3.4-1.[23] A description of each of the aquatic resources types is included below.

Table 3.4-1: Aquatic Resources Mapped within the Project Site and Off-site Improvement Area

Resource Type	Acreage within the Project Site
Seasonal Wetland	1.013
Seasonal Wetland Swale	0.286
Seep	0.030
Ephemeral Drainage	0.473
Intermittent Drainage	1.903
Pond	1.373
Total Acres	**5.076**[1]

Note:
[1] Rounding of the individual numbers results in a small summation discrepancy. The underlying GIS data confirms that the total is 5.076 acres.

Seasonal Wetland

Seasonal wetlands are ephemerally wet due to accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short and they are commonly dominated by nonnative annual and sometimes perennial hydrophytic species. There are several seasonal wetlands located in the Off-site Improvement Area along Deer Valley Road. These shallow features are dominated by annual grasses and hydrophytic forbs including perennial ryegrass. On-site, several

[21] City of Antioch.2003. General Plan EIR. Biological Resources. Figure 4.3.1. Accessed June 21, 2019.
[22] Madrone Ecological Consulting, LLC. 2019a. Aquatic Resources Delineation Report. City of Antioch Regional Infrastructure Improvements. Prepared for The City of Antioch. Dated February 2019.
[23] United States Army Corps of Engineers (USACE). 2016. Approved Jurisdictional Determination for the Ranch Residential Development Site. Dated February 23, 2016.

shallow seasonal wetlands occur near the farmhouse and are mostly unvegetated due to heavy cattle grazing. There are two relatively deep seasonal wetlands located in the central eastern portion of the site. These features appear to have been modified by the installation of earthen berms to make them deeper. There is a cluster of seasonal wetlands located within the southeastern portion of the project site south of Sand Creek. These wetlands are relatively shallow and appear to be natural features.

Seasonal Wetland Swale

Seasonal wetland swales are generally linear wetland features that convey precipitation runoff and support a predominance of hydrophytic vegetation, but do not exhibit an ordinary high water mark (OHWM). These are typically inundated for short periods during, and immediately after, rain events. However, they usually maintain soil saturation for longer periods during the wet season. One seasonal wetland swale occurs in the northern central portion of the project site. Hydrology for this feature is driven by an existing storm water outfall from the development to the north. This seasonal wetland swale is a narrow, moderate-gradient feature dominated by perennial ryegrass and black mustard (*Brassica negra*).

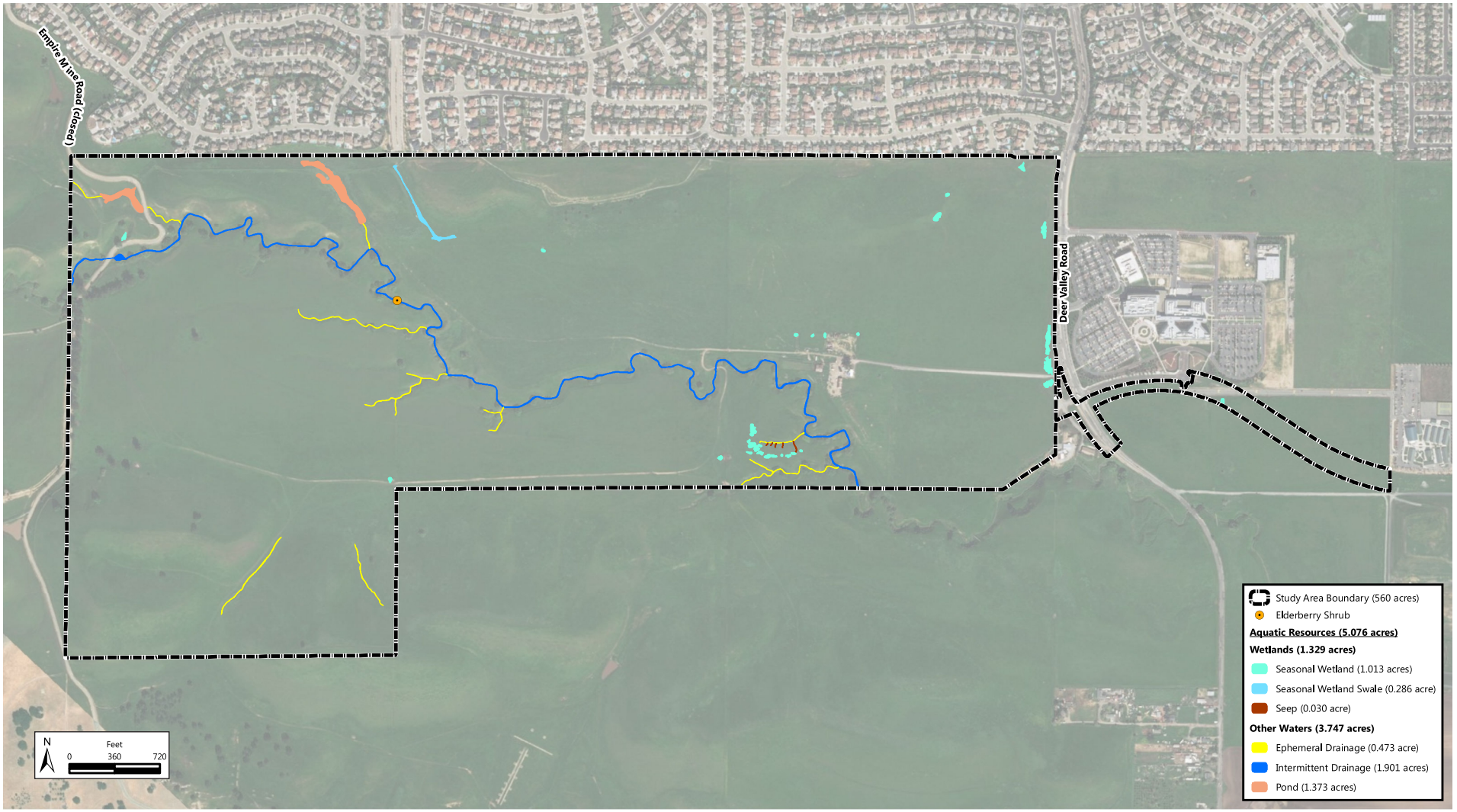
Intermittent Drainage (Sand Creek)

Intermittent drainages are linear features that exhibit a bed and bank and an OHWM. Intermittent drainages differ from ephemeral drainages in that they flow for longer duration, typically weeks or months following rainfall events, and are often influenced by groundwater. This usually results in greater quantities and duration of flow relative to ephemeral drainages. One intermittent drainage, Sand Creek, occurs within the project site and Off-site Improvement Area.

Sand Creek flows from west to east across the central portion of the project site. Sand Creek is an intermittent stream that conveys precipitation runoff during and shortly after rain events. The duration of water flow within the creek ranges from a few days to several weeks after rain events and the duration of water flow is directly linked to the amount of precipitation received.

Sand Creek is highly incised within the project site and contains a primary low-flow channel that ranges from 8 to 10 feet deep and averages 12 feet in width. A secondary flood-plain terrace ranges from approximately 30 to 70 feet in depth and 30 to 70 feet in width. The banks of Sand Creek are generally steep and range from 15 to 60 percent. The bed of Sand Creek is generally unvegetated due to high-volume and high-velocity flows. These flows tend to scour vegetation and soil from the primary channel. As another indicator of the generally flashy flow regime of Sand Creek, rack lines located within the channel were observed as high as 12 to 15 feet above the bed of the creek.[24] Within the project site, there is one large plunge pool within the channel of the creek that remains inundated for long durations. This plunge pool is located immediately east (downstream) of Empire Mine Road. Both California red-legged frog and western spadefoot have been observed within this plunge pool. Sand Creek is a highly incised intermittent drainage with steep banks and little to no vegetation within the channel. The banks of Sand Creek are quite tall, and in most areas, are occupied by species typical of the surrounding annual brome grassland. In addition, a few trees, shrubs, and forbs have established along these banks, including California buckeye, coast live oak (*Quercus agrifolia*), valley oak, California rose (*Rosa californica*), California sagebrush (*Artemisia californica*), and Douglas' mugwort.

[24] Monk & Associates, Inc. (M&A). 2015. DRAFT Biological Assessment for The Ranch, City of Antioch, Contra Costa County.



Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-3
Aquatic Resources

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Ephemeral Drainage

Ephemeral drainages are linear features that exhibit a bed and bank and an OHWM. These features typically convey runoff for short intervals, during and immediately following rain events, and are not influenced by groundwater sources at any time during the year. Ephemeral drainages occur in the two westernmost portions of the project site. These features are sparsely vegetated. Vegetated portions of ephemeral drainages within the off-site infrastructure area are dominated by species typical of the surrounding annual brome grasslands.

Pond

Two ponds are located within the northwestern portion of the project site. These features were man-made by the placement of an earthen berm within an existing ephemeral drainage. The seasonal pond fills during the winter and remains inundated until summer to early fall. Vegetation observed below the OHWM of the ponds consists of salt grass, perennial ryegrass, Mediterranean barley, alkali-mallow, and alkali weed. Above the OHWM vegetation consisted mostly of annual grassland species with a few scattered black willows (*Salix gooddingii*).

Both of the ponds in the project site would be classified as alkali weed-salt grass sinks. This alliance is considered a Sensitive Natural Community by CDFW.[25]

Seep

There are five small seeps located on a hillside south of Sand Creek near the cluster of seasonal wetlands. These narrow linear features appear to be influenced mostly by surface water draining from the adjacent uplands toward Sand Creek. Vegetation within these features is mostly perennial ryegrass with scattered coyote-thistle (*Eryngium vaseyi*).

Special-status Species

Habitat, whether aquatic or terrestrial, supports ecological functions and processes to preserve biological communities (i.e., wildlife) that live within it for all or a portion of their life cycle. Special-status species, whether plants, wildlife, or fish, are considered sufficiently rare that they require special consideration and/or protection and have been or should be listed as rare, threatened, or endangered by the federal and/or state governments. The following discussion focuses on the occurrence or potential for occurrence of special-status species within the project area. Special-status species are defined as those species that are listed as threatened or endangered as follows:

- Listed as threatened or endangered, or proposed or candidates for listing by the USFWS or National Marine Fisheries Service (NOAA);
- Listed as threatened or endangered and candidates for listing by the CDFW;
- Identified as Fully Protected species or Species of Special Concern by the CDFW;
- Identified as Medium or High priority species by the WBWG;[26]

[25] California Department of Fish and Wildlife (CDFW). 2018. California Sensitive Natural Communities List. Dated October 15, 2018.
[26] Western Bat Working Group (WBWG). 2019. Species Matrix and Species Accounts. Website: http://wbwg.org/. Accessed September 2019.

- Plant species considered to be rare, threatened, or endangered in California by the CNPS and CDFW:
  - **Rank 1A:** Plants presumed extinct
  - **Rank 1B:** Plants rare, threatened, or endangered in California and elsewhere
  - **Rank 2A:** Plants extirpated in California, but common elsewhere
  - **Rank 2B:** Plants rare, threatened, or endangered in California, but more common elsewhere
  - **Rank 3:** Plants about which the CNPS needs more information—a review list; and
- Plant species considered to be locally rare by CNPS.

While the locally rare plant species are locally of sufficient rarity to be considered under CEQA, Statewide, they are more common. As a result, these species are not tracked by the spatially-searchable CNDDB or the CNPS Inventory. There are 45 A-ranked plant species that are not California Rare Plant Rank (CRPR)-listed included in the Database of Rare, Unusual, and Significant Plants of Alameda and Contra Costa Counties for the Marsh Creek/Lone Tree Valley area (which includes Sand Creek). While these species were surveyed for during the 2018-2019 protocol-level plant surveys of the site, they are not included in Table 2 for brevity (with the exception of the one species that was documented on-site during the surveys).[27]

Special-status Plants on the Project Site

The Special-status Species Table identified 61 special-status plant species. Of the 61 special-status plant species with the potential to occur within the vicinity of the Study Area, 35 species were determined to not be present due to the lack of suitable habitat; 22 of the remaining 26 species were determined to be absent from the Study Area as they were not observed during the 2018-2019 special-status plant surveys. The remaining four species were documented within the Study Area during the 2018-2019 special-status plant surveys. Occurrences of special-status plant species occurring within the project site and surrounding area are shown in Exhibit 3.4-4. All species within the Special-status Species Table can be found in Table 2 of the updated BRA by Madrone (Appendix D).

M&A Botanists documented crownscale, shining navarretia, and San Joaquin spearscale *(Extriplex joaquinana)* during their surveys from 2013–2015. A Madrone Botanist searched the location that San Joaquin spearscale was documented by M&A several times throughout the summers of 2018 and 2019 and could not locate any San Joaquin spearscale plants. It is unknown how many plants M&A Biologists observed during their surveys, but the population was indicated by a single dot on the map in their report. It is possible that if the population was comprised of a single plant, the heavy cattle use in the area (as this is the last source of water for cattle in mid-summer) could have extirpated the population.

Additionally, Madrone determined that three special-status plant species and one A-ranked locally rare plant are present within the project site, based on Madrone's observations during the 2018 and 2019 plant surveys, which were conducted on September 6 and 7, 2018; March 18 and 19; May 13, 14, 15, and 29; and September 9, 2019. The three special-status species include crownscale, big tarplant (*Blepharizonia plumosa*), and shining navarretia. Angle-stem buckwheat (*Eriogonum*

[27] Madrone Ecological Consulting, LLC. 2019. Biological Resources Assessment for The Ranch in Antioch. Prepared for Richland Planned Communities. Accessed October 10, 2019.

angulosum) is an A-ranked locally rare plant species that was documented on-site. These four plant species present on-site and the remaining 26 special-status species found in the updated BRA Special-status Species Table with the potential to occur are discussed in detail below.

Angle-stem buckwheat

Angle-stem buckwheat is a common species that is not listed pursuant to either the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA) or designated as a CRPR species. It is listed as a "locally rare" species by the East Bay Chapter of the CNPS as the project site is located at the far northern end of the species' range. This species is an herbaceous annual that occurs in clay soils within valley grassland, foothill woodland, Joshua tree woodland, and pinyon-juniper woodland.[28] Angle-stem buckwheat blooms in mid to late summer. Angle-stem buckwheat was not a target species for this survey; however, angle-stem buckwheat was documented on the steep south-facing cliffs just north of Sand Creek.

Crownscale

Crownscale is not listed pursuant to either FESA or CESA but is designated as a CRPR 4.2 species. This species is an herbaceous annual that occurs in alkaline and often clay soils within chenopod scrub, valley and foothill grasslands, and vernal pools.[29] Crownscale blooms from March through October and is known to occur at elevations ranging from approximately 3 feet to 1,936 feet above MSL.[30]

Crownscale was documented along the fringes of the alkali weed-salt grass sinks in the northwestern portion of the project site.

Big tarplant

Big tarplant is not federally or State-listed, but it is classified as a CRPR List 1B.1 species. This species is an herbaceous annual that occurs in valley and foothill grasslands, usually in clay soil.[31] Big tarplant blooms from July through October and is known to occur from approximately 98 feet to 1,657 feet above MSL.[32]

A single plant of this species was observed in the hills in the southern portion of the project site during a late-season special-status plant survey conducted in September 2018. This area was resurveyed in September of 2019 and one small population consisting of three plants was observed. Protocol-level surveys of the Off-site Improvement Areas conducted by Madrone failed to detect any occurrence of the tarplant.

Shining navarretia

Shining navarretia is not federally or California listed, but it is classified as a CRPR List 1B.2 species. This annual herb is primarily associated with vernal pools and other mesic areas in cismontane woodland

[28] CalFlora. 2019. Taxon page for Eriogonum angulosum. Website: https://www.calflora.org/cgibin/species_query.cgi?where-calrecnum=3194. Accessed September 2019.
[29] California Native Plant Society (CNPS). 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website: http://www.rareplants.cnps.org. Accessed September 2019.
[30] California Native Plant Society (CNPS). 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website: http://www.rareplants.cnps.org. Accessed September 2019.
[31] Ibid.
[32] Ibid.

and valley and foothill grassland, often on clay soils.[33] Shining navarretia occurs at elevations between approximately 210 feet and 3,280 feet, and typically blooms from April through July.[34]

Suitable habitat for this species is present on heavy clay soils in the flat portions of the annual brome grasslands throughout the project site as well as the California Goldfields-Dwarf Plantain-Small Fescue Flower Fields. This species was previously documented in abundance within the project site by M&A,[35] predominantly within openings in the flat Annual Brome Grassland to the south of Sand Creek. During the 2019 surveys, Madrone resurveyed all areas of suitable habitat to obtain sub-meter accurate location data and accurate population counts for this species. Many of the populations of shining navarretia originally observed by M&A were re-documented. Additional discrete populations of this species were observed just to the north of Sand Creek, and at the far eastern boundary of the project site. Thousands of shining navarretia were observed during the 2019 surveys and are present within the area site in isolated locations on heavy clay soils.

San Joaquin spearscale

Suitable habitat for this species is present in the alkali weed-salt grass sinks in the northwestern portion of the project site, and this species was previously detected by M&A in the eastern pond.[36] Despite a thorough search of the eastern pond (including a targeted search of this location on June 5, 2018, and again in 2019), this species was not detected. It is anticipated that heavy cattle use in the area could have extirpated the population.

Special-status Plant Species within the Off-site Improvement Area

The Off-site Improvement Area was surveyed by Madrone Ecological Consulting between 2018 and 2019 for 11 target special-status plant species, including big tarplant, dwarf downingia, Jepon's coyote thistle, spiny-sepaled button-celery, diamond-petaled California poppy, fragrant fritillary, Diablo helianthella, Brewers western flax (*Hesperolinon breweri)*, showy golden madia, Shining navarretia, and Bearded popcornflower. No special-status plant species or plant species noted as Locally Rare were observed during the special-status plant surveys within the Off-site Improvement Area. The results of the botanical survey for the 11 target special-status plant species are described in further detail below.

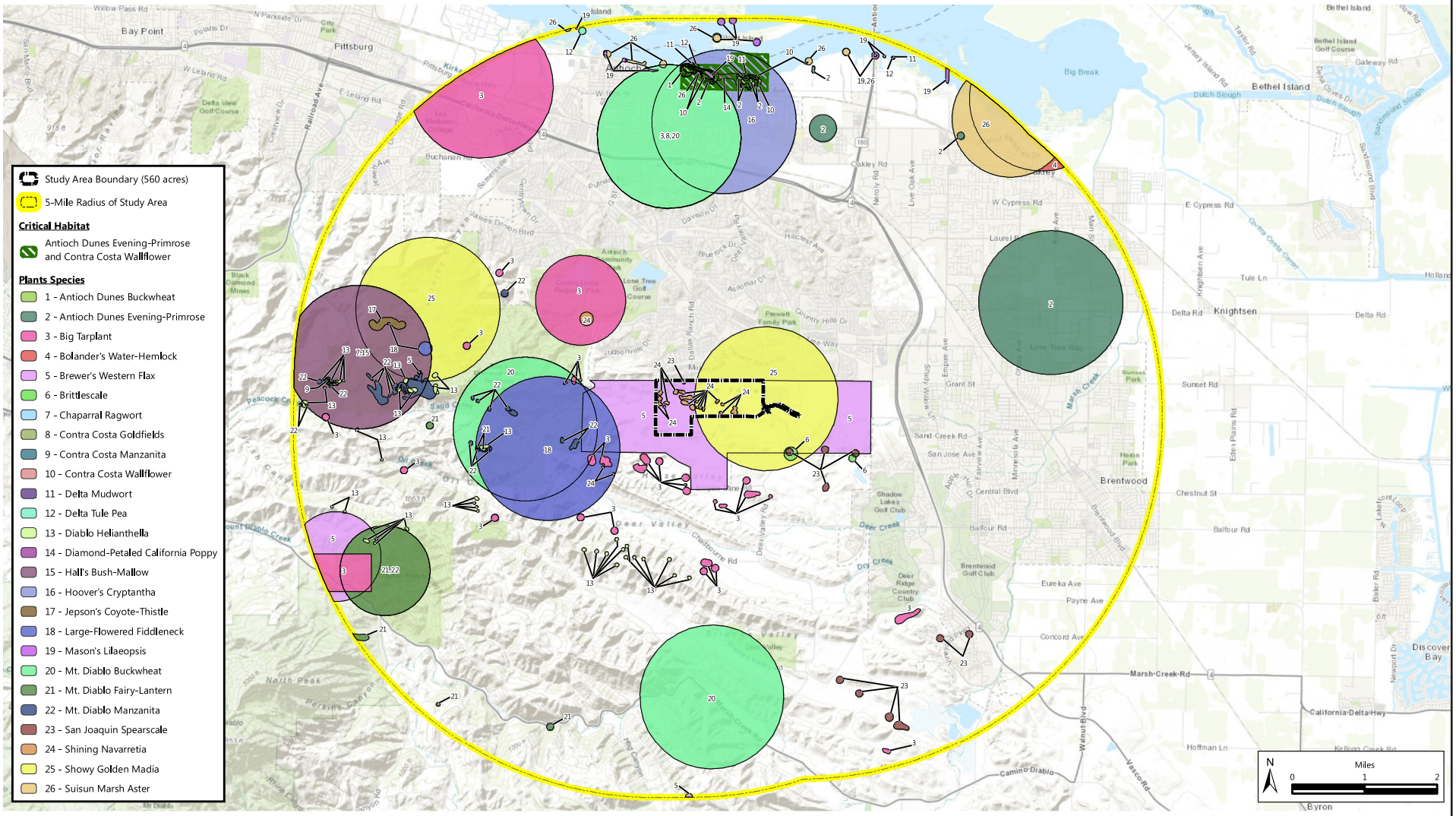
Big tarplant

Suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Dwarf downingia

Marginally suitable habitat for this species is present in the seasonal wetlands and other aquatic resources within the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

[33] California Native Plant Society (CNPS). 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website: http://www.rareplants.cnps.org. Accessed September 2019.
[34] Ibid.
[35] Monk & Associates (M&A). 2018. Special-status Plant Survey Report, The Ranch Project Site, Antioch, Contra Costa County, California. Prepared for Richland Planned Communities, Inc.
[36] Ibid.



Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-4
CNDDB Occurrences of Special Status Plant Species and Critical Habitats

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Jepson's coyote thistle

Marginally suitable habitat for this species is present in the seasonal wetlands and other aquatic resources within the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Spiny-sepaled button-celery

Marginally suitable habitat for this species is present in the seasonal wetlands and other aquatic resources within the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Diamond-petaled California poppy

Marginally suitable habitat for this species is present in the annual brome grasslands around the Alkali Weed–Salt Grass Sink in the northwestern portion of the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Fragrant fritillary

Marginally suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Diablo helianthella

Marginally suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Brewers western flax

Marginally suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. The Off-site Improvement Area falls within CNDDB Occurrence No. 32 for this species.[37] This species was documented by Live Oak Associates somewhere in the Sand Creek Focus Area in 2002.[38] Madrone was not able to locate the map showing the location of these plants within the Sand Creek Focus Area, but given that this site is only a small portion of that area, the marginal nature of the habitat within this Off-site Improvement Area, and the much higher quality habitat in the hills to the south of the Off-site Improvement Area, we find it unlikely that Brewer's western flax was observed within the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Showy golden madia

Suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. The Off-site Improvement Area falls within CNDDB Occurrence No. 25 for showy golden madia.[39] This occurrence includes two records from Hoover in 1938 and 1941, from "Lone Tree Valley" and "1 mi N of Lone Tree Valley."[40] Given that these occurrences have not been

[37] California Natural Diversity Database (CNDDB). 2018. RareFind 5. California Department of Fish and Wildlife. Dated July 26, 2018. Accessed December 3, 2019.
[38] Ibid.
[39] Ibid.
[40] California Natural Diversity Database (CNDDB). 2018. RareFind 5. California Department of Fish and Wildlife. Dated July 26, 2018.

documented since 1941, the CNPS Inventory considers showy golden madia to be extirpated in Contra Costa County.[41] This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Shining navarretia

Suitable habitat for this species is present in the annual brome grasslands throughout the Off-site Improvement Area. Although this species has not previously been documented within the Off-site Improvement Area, it has been documented in relative abundance on the project site. The Madrone Botanist visited these known populations of shining navarretia and found that very few of the previously mapped populations appear to have emerged in 2018, and those that did emerged quite late and senesced quickly. This was a trend noted on numerous sites visited by Madrone Biologists during the spring of 2018; other upland navarretia species that are usually quite prevalent were sparse. Madrone conjectured that it may have been due to the unusual precipitation regime in 2018. As a result, Madrone did not feel that the 2018 surveys were conclusive for this species; therefore, they conducted an additional survey of the Off-site Improvement Area on 14 May 2019, targeting this species only. On that date, shining navarretia was prevalent on the project site. However, this species was not observed during either the 2018 or 2019 follow-up special-status plant survey of the Off-site Improvement Area.

Bearded popcornflower

Marginally suitable habitat for this species is present in the seasonal wetlands and other aquatic resources within the Off-site Improvement Area. This species was not observed during the 2018 special-status plant surveys of the Off-site Improvement Area.

Special-status Wildlife at the Project Site

Based on queries of the CNDDB and other information sources, the BRA returned records of 26 special-status wildlife species that occur within the project site. Table 2 of the updated BRA provides a list of all special-status wildlife species, consisting of invertebrates, fish, amphibians, reptiles, birds, and mammals, that are known to occur or have the potential to occur within 5 miles of the project site based on their local and regional distribution. Occurrences of special-status wildlife species occurring within the project site and surrounding area are shown in Exhibit 3.4-5. Twenty-six special-status wildlife species have the potential to occur within the project site. The 26 species are broken down below.

Invertebrates

Crotch bumblebee

The Crotch bumblebee is a candidate species for CDFW listing. This species was historically common in the Central Valley of California, but now appears to be absent from most of it, especially in the center of its historic range.[42] The hillsides and areas along Sand Creek contain suitable foraging flower populations and abundant ground squirrel burrows that represent potential nesting and overwintering habitat. Due to the fact that crotch bumblebee is currently absent from most of the Central Valley of California, there is low potential for this species to occur within the project site.

Accessed December 3, 2019.

[41] California Native Plant Society (CNPS). 2018. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org. Accessed May through July 2018.

[42] Williams, P. H., R. W. Thorp, L. L. Richardson, and S. R. Colla. 2014. The Bumble bees of North America: An Identification guide. Princeton University Press, Princeton.

Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-5
CNDDB Occurrences of Special Status Wildlife Species and Critical Habitats

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Western bumblebee

The western bumblebee (*Bombus occidentalis)* is candidate species for CDFW listing. The hillsides and areas along Sand Creek contain suitable foraging flower populations and abundant ground squirrel burrows that represent potential nesting and overwintering habitat. While the Western bumblebee was historically known throughout the mountains and northern coast of California, it is now largely confined to high elevation sites and a small handful of records on the northern California coast.[43] Due to the fact that western bumblebee is currently absent from most of the Central Valley of California, there is low potential for this species to occur within the project site.

Vernal pool fairy shrimp

Vernal pool fairy shrimp is a federally threatened species. The seasonal wetlands within the project site represent suitable habitat for the species, and vernal pool fairy shrimp has been documented within the project site.

Vernal pool tadpole shrimp

Vernal pool tadpole shrimp is a federally endangered species. The seasonal wetlands within the project site represent suitable habitat for the species, and vernal pool tadpole shrimp has been documented within the project site.

Valley elderberry longhorn beetle

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)* is a federally listed species. A single elderberry shrub is located along the north bank of Sand Creek within the central portion of the project site. The shrub was surveyed in 2016 and no sign (exit holes) of elderberry longhorn beetle was observed. Therefore, this species has low potential to occur within the project site.

Amphibians

California tiger salamander

California tiger salamander is a State and federally threatened species. The two ponds, plunge pool within Sand Creek, and the deeper seasonal wetlands within the project site represent suitable breeding habitat. The annual brome grassland within the project site contains abundant ground squirrel burrows and represents suitable upland habitat for the species. Madrone Biologists observed hundreds of larvae California tiger salamanders within the easternmost pond in Spring 2019 during the special-status plant surveys. This species is present within the project site.

California red-legged frog

California red-legged frog (*Ambystoma californiense*) is a federally threatened species. The plunge pool within Sand Creek and the two ponds within the project site represent potential breeding habitat, and Sand Creek represents potential dispersal habitat for the species. This species was documented within Sand Creek at the Empire Mine Road Crossing within the project proposed site. Thus, the California red-legged frog is present within the project site.

[43] Williams, P. H., R. W. Thorp, L. L. Richardson, and S. R. Colla. 2014. The Bumble bees of North America: An Identification guide. Princeton University Press, Princeton.

Western spadefoot

Western spadefoot (*Spea hammondii)* is a Species of Special Concern. The two ponds and the deeper seasonal wetlands within the project site represent potential breeding habitat for the species. Western spadefoot larvae were observed in Spring 2019 in the plunge pool within Sand Creek. This species is present within the project site.

Reptiles

Western pond turtle

Western pond turtle *(Actinemys marmorata)* is a Species of Special Concern. The single plunge pool and two ponds within the project site represent potential habitat for western pond turtle. All three features are ephemeral and dry in the late summer to fall. There is moderate potential for this species to occur within the project site.

Northern California legless lizard

Northern California legless lizard (*Aniella pulchra)* is a Species of Special Concern. The annual brome grasslands throughout the project site are only marginally suitable due to the lack of sandy, loose soils. There is low potential for this species to occur within the project site.

Alameda whipsnake

Alameda whipsnake (*Masticophis lateralis eurycanthus)* is a federally and State threatened species. The project site contains marginally suitable foraging/dispersal habitat due to the long distance to the nearest chaparral or coastal scrub. There is low potential for this species to occur within the project site.

Blainville's horned lizard

Blainville's horned lizard (*Phrynosoma blainvillii)* is a Species of Special Concern. The annual brome grassland within the project site represents marginally suitable habitat for the species. Therefore, there is low potential for this species to occur.

Mammals

Pallid bat

Pallid bat (*Antrozous pallidus*) is a Species of Special Concern. It has no special State or federal status or listing. The trees along Sand Creek and the structures in the vicinity of the farmstead provide suitable roosting habitat for this species, and adjacent open areas provide foraging habitat. There is high potential for this species to occur within the project site.

Townsend's big-eared bat

Townsend's big-eared bat (*Corynorhinus townsendii*) is a Species of Special Concern. It has no special State or federal status or listing. The structures in the vicinity of the farmstead provide suitable roosting habitat for this species, as these bats prefer to roost in abandoned mines, hollow trees and abandoned structures. While the adjacent open areas provide foraging habitat, they are not premiere habitat as they are not planted with crops. There is low potential for this species to occur on-site.

Western red bat

Western red bat (*Lasiurus blossevillii*) is a Species of Special Concern. It has no special State or federal status or listing. The trees along Sand Creek provide suitable roosting habitat for this species, and adjacent open areas provide foraging habitat. There is high potential for this species to occur on-site.

American badger

The American badger (*Taxidea taxus*) is a Species of Special Concern. Annual brome grasslands throughout the project site represent suitable, but not ideal, habitat for this species. Therefore, there is moderate potential to this species occur within the project site.

San Joaquin kit fox

San Joaquin kit fox (*Corynorhinus townsendii*) is a State threatened and federally endangered species. While annual brome grasslands throughout the project site represent suitable habitat for this species, special surveys for this species did not identify any kit fox or sign of kit fox within the project site. A San Joaquin kit fox survey for the project was conducted on February 22, 2019. No San Joaquin kit fox scat was detected during the surveys. The CNDDB and prior survey efforts support a determination that San Joaquin kit foxes are absent from the project site. The high detection rate of the scent-detection dogs used for the survey, the absence of detections on more than 9 miles of survey transects on the project site, and an extremely low estimated rate of non-detection provide additional evidence that San Joaquin kit foxes do not occupy the project site. There is low potential for this species to occur within the project site.

The San Joaquin Kit Fox survey area locations are mapped in Exhibit 3.4-6.

Birds

Tricolored blackbird

Tricolored blackbird (*Agelaius tricolor)* is State threatened and a Species of Special Concern. While dense vegetation does not occur within the project site, this species may forage seasonally. There is low potential for this species to occur on-site.

Grasshopper sparrow

Grasshopper sparrow (*Ammodramus savannarum*) is a Species of Special Concern. It has no special State or federal status or listing. Annual Brome grassland within the project site provides suitable nesting habitat, and therefore this species has high potential to occur on-site.

Golden eagle

Golden eagle (*Aquila chrysaetos*) is not a State or federally listed species. The annual brome grasslands throughout the project site represent suitable foraging habitat, but there are no trees sufficient to accommodate a golden eagle nest. Golden eagle has been observed foraging and perching on the steep hillsides on-site. While there is very low potential for the species to nest on-site, they still forage on-site.

Short-eared owl

Short-eared owl (*Asio flammeus*) is a Species of Special Concern. It has no special State or federal status or listing. Although the annual grassland within the project site does not provide suitable nesting habitat, it provides suitable winter foraging habitat for this species. However, the owl does forage on-site.

Burrowing owl

Burrowing owl (*Athene cunicularia*) is a Species of Special Concern. It has no special State or federal status or listing. Many ground squirrel (*Spermophilis beechyi*) burrows were observed within the annual brome grasslands, which represent suitable nesting habitat. Burrowing owl pellets were observed on-site at a low perch (pipe sticking out of the ground) within the eastern annual brome grassland. No burrowing owl was directly observed within the project site, but it is evident that this species is present.

Swainson's hawk

Swainson's hawk is a State threatened species. The trees on-site provide suitable nesting habitat, and the annual grasslands represent suitable foraging habitat. The nearest documented occurrence of nesting Swainson's hawk was within the last 5 years in 2016, approximately 2.4 miles south of the project site.[44] Swainson's hawk has been observed soaring and foraging over the project site. There is high potential for this species to be present within the project site.

Northern harrier

Northern harrier (*Circus cyaneus*) is a Species of Special Concern. It has no special State or federal status or listing. The harrier prefers nesting in open wetlands or marshy meadows. The project site is comprised mainly of annual brome grasslands, which are heavily grazed throughout the project site, Thus, there is a low potential for suitable nesting habitat, While, the grasslands provide suitable foraging habitat, there are no occurrences of the northern harrier within a 5-mile radius. Therefore, there is low potential for northern harrier to occur on-site.

White-tailed kite

While-tailed kite (*Elanus leucurus*) has no special State or federal status or listing. The trees on-site provide suitable nesting habitat, and the annual grasslands represent suitable foraging habitat. There is high potential for this species to occur on-site.

Loggerhead shrike

Loggerhead shrike (*Lanius ludovicianus*) is a Species of Special Concern. It has no special State or federal status or listing. Shrubs and trees near Sand Creek within the project site represent suitable nesting habitat, and the annual brome grasslands throughout the project site represent suitable foraging habitat. There is high potential for this species to occur on-site.

[44] California Natural Diversity Database (CNDDB). 2019. RareFind 5. California Department of Fish and Wildlife. Dated September 2019.

Source: H.T. Harvey & Associates, March 2019.

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Exhibit 3.4-6
San Joaquin Kit Fox Survey Area Locations

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Migratory and Nesting Birds

Trees found within the project site provide suitable nesting habitat for avian species, including those protected under the Migratory Bird Treaty Act (MBTA). Some species protected under the MBTA that could occur on the project site include burrowing owl and Swainson's hawk.

Wildlife Movement Corridors

City of Antioch

Remaining areas of natural land are found in the southern portion of the City. The existing habitat corridor in the Lone Tree Valley has already been affected by development, specifically in the Brentwood area, which blocks the eastern end of this corridor.

Project Site

The annual grassland within the project site provides a large area of open space along Sand Creek. The annual grassland and Sand Creek may be used by both aquatic and terrestrial species as a wildlife movement corridor. The off-site infrastructure areas are small, disjunct areas along existing roads and infrastructure and are not likely used as major wildlife movement corridors.

Regulated Trees

Project Site

According to the Tree Survey, 181 of the 255 trees identified within the project site are indigenous trees as identified in the City of Antioch Tree Ordinance.[45,46] The indigenous trees in the project site consist of native oaks (coast live oak, blue oak, valley oak, and interior live oak) and California buckeye.[47] There are also various planted and ornamental trees such blue gum eucalyptus, manna gum (*Eucalyptus viminalis*), black locust (*Robinia pseudoacacia*), and others.[48] Some of these planted and ornamental trees are protected under the City of Antioch Tree Ordinance as "mature trees" or "landmark trees" because they are over 26 inches diameter at breast height (DBH) or 48 inches DBH, respectively.[49,50] In particular, several large eucalyptus trees located along the project site's western boundary, and several indigenous oak trees (mainly within the Sand Creek corridor) were observed.

A tree survey was not conducted for the Off-site Improvement Area, but to the extent there are any protected trees on-site, the City of Antioch Tree Ordinance would apply.

As discussed in this EIR, a Protected Tree is any tree required to be preserved as a condition of an approval from a regular development application.

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[45] City of Antioch. 2017. City of Antioch Code of Ordinances; Title 9, Chapter 5, Article 12 Tree Preservation and Regulations. Website: http://library.amlegal.com/nxt/gateway.dll/California/antioch/cityofantiochcaliforniacodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:antioch_ca. Accessed 31 August 2019.

[46] Brennan, E. 2015. Tree Preservation Report for The Ranch, Antioch, California. Prepared for Richland Communities, Inc. July 29, 2015.

[47] Ibid.

[48] Ibid.

[49] City of Antioch. 2017. City of Antioch Code of Ordinances; Title 9, Chapter 5, Article 12 Tree Preservation and Regulations. Website: http://library.amlegal.com/nxt/gateway.dll/California/antioch/cityofantiochcaliforniacodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:antioch_ca. Accessed 31 August 2019.

[50] Brennan, E. 2015. Tree Preservation Report for The Ranch, Antioch, California. Prepared for Richland Communities, Inc. July 29, 2015.

3.4.3 - Regulatory Framework

Federal

Federal Endangered Species Act

The United States Congress passed FESA in 1973 to protect species that are endangered or threatened with extinction. FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct (FESA § 3[19]).). "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 Code of Federal Regulations [CFR] § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR § 17.3). Actions that result in take can result in civil or criminal penalties.

FESA and the Clean Water Act (CWA) Section 404 Guidelines prohibit the issuance of wetland permits for projects that jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. The USACE must consult with the USFWS and/or the NOAA when threatened or endangered species under their jurisdiction may be affected by a proposed project. In the context of the proposed project, FESA consultation would be initiated if development resulted in take of a threatened or endangered species or if issuance of a Section 404 permit or other federal agency action could result in take of an endangered species or adversely modify critical habitat of such a species.

Migratory Bird Treaty Act

Raptors (birds of prey), migratory birds, and other avian species are protected by a number of State and federal laws. The federal MBTA prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior.

Clean Water Act

The USACE regulates the discharge of dredge or fill material into waters of the United States under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into waters of the United States, including, but not limited to, the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; fill for intake and outfall pipes and subaqueous utility lines (33 CFR § 328.2(f)). In addition, Section 401 of the CWA (33 United States Code [USC] 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Waters of the United States include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Boundaries between jurisdictional waters and uplands are determined in a variety of ways, depending on which type of waters is present. Methods for delineating wetlands and non-tidal waters are described below.

- Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR § 328.3(b)) Presently, to be a wetland, a site must exhibit three wetland criteria: hydrophytic vegetation, hydric soils, and wetland hydrology existing under the "normal circumstances" for the site.
- The lateral extent of non-tidal waters is determined by delineating the OHWM (33 CFR § 328.4(c)(1)). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR § 328.3(e)).

State

California Endangered Species Act

The State of California enacted CESA in 1984. CESA is similar to FESA but pertains to State-listed endangered and threatened species. CESA requires State agencies to consult with the CDFW when preparing CEQA documents. The purpose of CESA is to ensure that the lead agency actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available (Fish and Game Code [FGC] § 2080). CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows the CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. CESA allows the CDFW to authorize exceptions to the State's prohibition against take of a listed species if the take is incidental to carrying out an otherwise lawful project that has been approved under CEQA (FGC § 2081).

California Fish and Game Code

The California Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (FGC § 86). Except for take related to scientific research, all take of fully protected species is prohibited. Fully protected fish species are protected under Fish and Game Code, Section 5515; fully protected amphibian and reptile species are protected under Section 5050; fully protected bird species are protected under Section 3511; and fully protected mammal species are protected under Section 4700. Fish and Game Code, Section 3503, prohibits the killing of birds or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Fish and Game Code, Sections 2062 and 2067, define "endangered and threatened species."

The CDFW is a trustee agency that has jurisdiction under Fish and Game Code, Section 1600, *et seq*. Under Fish and Game Code, Sections 1602 and 1603, a private party must notify the CDFW if a proposed project would "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds . . . except when the department has been notified pursuant to Section 1601." Additionally, the CDFW may assert jurisdiction over native riparian habitat adjacent to aquatic features, including native trees over 4 inches in diameter DBH. If an existing fish or wildlife resource may be substantially adversely affected by the activity, the CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into a streambed alteration agreement with the CDFW identifying the approved activities and associated mitigation measures.

California Department of Fish and Wildlife Species of Concern

In addition to formal listing under FESA and CESA, species receive additional consideration by the CDFW and local lead agencies during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFW. It tracks species in California whose numbers, reproductive success, or habitats may be threatened. In addition to Species of Special Concern, the CDFW identifies animals that are tracked by the CNDDB but warrant no federal interest and no legal protection. These species are identified as "California Special Animals."

Porter-Cologne Water Quality Control Act

Section 13260(a) of the Porter-Cologne Water Quality Control Act (contained in the California Water Code) requires any person discharging waste or proposing to discharge waste, other than to a community sewer system, within any region that could affect the quality of the waters of the State (all surface and subsurface waters) to file a report of waste discharge. The discharge of dredged or fill material may constitute a discharge of waste that could affect the quality of waters of the State.

Historically, California relied on its authority under Section 401 of the CWA to regulate discharges of dredged or fill material to California waters. That section requires an applicant to obtain "water quality certification" from the California State Water Resources Control Board (State Water Board) through its nine local Regional Water Quality Control Boards (RWQCBs) to ensure compliance with State water quality standards before certain federal licenses or permits may be issued. The permits subject to Section 401 include permits for the discharge of dredged or fill material (CWA Section 404 permits) issued by the USACE. Waste discharge requirements under the Porter-Cologne Water Quality Control Act were typically waived for projects that required certification. However, where only waters of the State exist (i.e., isolated waters), RWQCBs may be required to issue a Report of Waste Discharge), depending on whether any exemptions apply.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the Native Plant Protection Act (NPPA), which directed the CDFW to carry out the Legislature's intent to "preserve, protect, and enhance endangered plants in this state." The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting,

transporting, or selling such plants. The CESA expanded on the original NPPA and enhanced legal protection for plants. The CESA established categories for threatened and endangered species, and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, the State of California employs three listing categories for plants: rare, threatened, and endangered.

The CNPS maintains a rank of plant species native to California that has low population numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. Potential impacts to populations of CNPS ranked plants receive consideration under CEQA review. The following identifies the definitions of the CNPS ranks:

- **Rank 1A:** Plants presumed Extinct in California
- **Rank 1B:** Plants Rare, Threatened, or Endangered in California and elsewhere
- **Rank 2:** Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere
- **Rank 3:** Plants about which we need more information—A Review List
- **Rank 4:** Plants of limited distribution—A Watch List

All plants appearing on CNPS List ranked 1 or 2 are considered to meet CEQA Guidelines Section 15380 criteria. While only some of the plants ranked 3 and 4 meet the definitions of threatened or endangered species, the CNPS recommends that all Rank 3 and Rank 4 plants be evaluated for consideration under CEQA.

Local

City of Antioch General Plan

The City of Antioch General Plan outlines the following objectives and policies related to biological resources.

Land Use Element

- **Policy 4.4.6.7t:** Adequate buffer areas adjacent to the top of banks along Sand Creek shall protect sensitive plant and amphibian habitats and water quality shall be provided. Adequate buffer areas shall also be provided along the edge of existing areas of permanently preserved open space adjacent to the Sand Creek Focus Area, including but not limited to Black Diamond Mines Regional Park. Buffers established adjacent to existing open space areas shall be of an adequate width to minimize light/glare, noise, fire safety, public safety, habitat, public access impacts within the existing open space areas consistent with the provisions of Section 10.5, Open Space Transitions and Buffers Policies of the General Plan.
- **Policy 4.4.6.7u:** Because of the sensitivity of the habitat areas within the Sand Creek Focus Area, and to provide for mitigation of biological resources impacts on lands in natural open space, a Resource Management Plan attached as Appendix A to this General Plan shall be prepared and approved prior to issuance of the first building permit for the Sand Creek Focus Area properties.
- **Policy 4.4.6.7b.v:** A viable, continuous grassland corridor between Black Diamond Mines Regional Preserve and Cowell Ranch State Park shall be retained in the Restricted Development Area using linkages in the southwestern portion of the Lone Tree Valley (within

the Sand Creek drainage area), Horse Valley, and the intervening ridge. The primary goal of preserving such a corridor is to allow for wildlife movement between Black Diamond Mines Regional Preserve and Cowell Ranch State Park. Completion of such a corridor is contingent upon the cooperation with the City of Brentwood and Contra Costa County, each of whom may have land use jurisdiction over portions of this corridor.

- **Policy 4.4.6.7x:** To mitigate the impacts of habitat that would be lost to future development within the Focus Area, an appropriate amount of habitat shall be preserved on- or off-site per the compensatory provisions of the Framework Resources Management Plan prepared for the Sand Creek Focus Area (attached as Appendix A of the General Plan).
- **Policy 4.4.6.7z:** Chaparral, scrub, and rock outcrop community within the western portion of the Sand Creek Focus Area (west of Empire Mine Road), as well as adjacent grassland community that is suitable habitat for the Alameda whipsnake (*masticophis lateralis euryxanthus*) shall be retained in natural open space. Within other portions of the Focus Area, the chaparral, scrub, and rock outcrop shall be retained in natural open space contiguous to the required grassland linkage to protect the grassland linkage south of the chaparral, scrub, and outcrop community.
- **Policy 4.4.6.7b.aa:** Within the western portion of the Focus Area (west of Empire Mine Road), the oak woodland and savanna community shall be preserved in natural open space. Within other portions of the Focus Area, the oak woodland and savanna community shall be preserved in natural open space where it overlaps the rock outcrop community.

Resource Management Element

- **Policy 10.3.2e:** Require proposed development projects containing significant natural resources (e.g. sensitive natural habitats, habitat linkages, steep slopes, cultural resources, wildland fire hazards, etc.) to prepare Resource Management Plans to define appropriate responses to General Plan policies calling for their protection or preservation. The purpose of the RMP is to look beyond the legal status of species at the time the plan is prepared, and provide a long-term plan for conservation and management of the natural communities found onsite. Resource Management Plan shall accomplish the following:
  - Determine the significance of the resources that are found on-site and their relationship to resources in the surrounding area, including habitat linkages and wildlife movement corridors;
  - Define areas that are to be maintained in long-term open space based on the significance of on-site resources and their relationship to resources in the surrounding area; and
  - Establish mechanisms to ensure the long-term protection and management of lands retained in open space.
- **Objective 10.4.1:** Preserve natural streams and habitats supporting rare and endangered species of plants and animals.
- **Policy 10.4.2a:** Comply with the Federal policy of no net loss of wetlands through avoidance and clustered development. Where preservation in place is found not to be feasible (such as where a road crossing cannot be avoided, or where shore stabilization or creation of shoreline trails must encroach into riparian habitats), require 1) on-site replacement of wetland areas, 2) off-site replacement, or 3) restoration of degraded wetland areas at a minimum ratio of one

acre of replacement/restoration for each acre of impacted onsite habitat, such that the value of impacted habitat is replaced.

- **Policy 10.4.2b:** Preserve in place and restore existing wetlands and riparian resources along the San Joaquin River and other natural streams in the Planning Area, except where a need for structural flood protection is unavoidable.
- **Policy 10.4.2c:** Require appropriate setbacks adjacent to natural streams to provide adequate buffer areas ensuring the protection of biological resources, including sensitive natural habitat, special-status species habitats and water quality protection.
- **Policy 10.4.2d:** Through the project approval and environmental review processes, require new development projects to protect sensitive habitat areas, including, but not limited to, oak woodlands, vernal pools, and native grasslands. Ensure the preservation in place of habitat areas found to be occupied by State and federally protected species.
- **Policy 10.4.2e:** Limit uses within preserve and wilderness areas to resource-dependent activities and other uses compatible with the protection of natural habitats (e.g., passive recreation and public trails).
- **Policy 10.4.2f:** Through the project review process, permit the removal of healthy, mature oak trees on a case-by-case basis only where it is necessary to do so.
- **Policy 10.4.2g:** Preserve heritage trees throughout the planning area.
- **Policy 10.5.1c:** In designing buffer areas, the following criteria shall be considered and provided for (when applicable) within the buffer areas to avoid or mitigate significant impacts.
  - Habitat Management: How will proposed development affect habitat values on adjacent open space and resource areas? How will development prevent the spread of introduced animals and plant pests into adjacent open space and resource areas? How will proposed development affect wildlife migration corridors between or within open space and/or resource areas?

City of Antioch Code of Ordinances

Title 9, Chapter 5, Article 12 Section 9-5.1205: Tree Preservation and Regulation

According to the City of Antioch's Zoning Ordinance, Article 12: Tree Preservation and Regulation (Section 9-5.1205), tree removal for the proposed project is evaluated as part of the "regular development application process." In deciding whether to approve the removal of a tree, or require its preservation, the City considers if the tree being evaluated is considered a landmark, indigenous, mature, or established tree. In addition, the City would also evaluate the tree's appearance, species type, and aesthetic compatibility with the proposed project.

The trees, in which the City authorizes removal, must be replaced. The City's Tree Preservation and Regulation Ordinance requires two 24-inch box trees for each established tree, two 48-inch box trees for each mature tree, and the City Council has discretion in determining the appropriate ratio of box tree replacement for any landmark or indigenous trees. The City of Antioch's Tree Ordinance defines six categories of trees:

- An established tree is any tree that is at least ten inches in diameter, at diameter at breast height (DBH). DBH is measured 4.5 feet above natural or finished grade.

- An indigenous tree is a naturally growing tree of the following species: Blue Oak (*Quercus douglasii*), Valley Oak (*Quercus lobata*), Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*), California Buckeye (*Aesculus californica*), and California Bay (*Umbellularia californica*)
- A landmark tree is any tree that is at least 48 inches in DBH and/or is over 40 feet in height.
- A mature tree is any tree that is at least 26 inches in DBH.
- A street tree is any tree planted within a public right-of-way and/or a tree planting easement.
- A Protected Tree is any tree required to be preserved as a condition of an approval from a regular development application.

Title 9, Chapter 4, Section 9-4.617: Street Trees

The City's Design Requirements under the Subdivision Ordinance require the removal of all trees that conflict with grading, utilities, or improvements in the public right-of-way. Therefore, trees within any right-of-way that would conflict with roadway improvements proposed as part of the project must be removed.

California Native Plant Society—Locally Rare Plants

A list of locally rare plant species has been developed by the East Bay Chapter of the CNPS.[51] The plant species included in this database are locally rare and are usually included in CEQA analysis.

3.4.4 - Methodology

2017 Biological Resources Assessment prepared by ECORP Consulting, Inc.

The BRA prepared for the proposed project by ECORP is based on a review of biological resource databases, inventories, regional literature on both plants and animals and limited site reconnaissance. The purpose of the BRA prepared specifically for the proposed project was to assess the potential for occurrence of special-status plant and animal species or their habitat, and to assess the potential for sensitive habitats such as wetlands within the project area. The BRA was peer reviewed by Live Oak Associates, Inc. (see Appendix D).[52]

Prior to conducting the field portion of the assessment, the following species lists were queried to determine the special-status species that had been documented within or in the project site vicinity. Results of the database searches are included as Attachment B of the BRA:

- CDFW CNDDB for the "Antioch South, California" and surrounding eight 7.5-minute USGS quadrangles;[53]

[51] California Native Plant Society (CNPS). East Bay Chapter. The Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties. Website: https://ebcnps.org/database-of-rare-unusual-and-significant-plants-of-alameda-and-contra-costa-counties/. Accessed September 2019.

[52] Live Oak Associates, Inc. Peer review for the proposed The Ranch project in Antioch (Cowan Ranch), Antioch, Contra Costa County, California (PN 2160-01). November 13, 2017.

[53] California Department of Fish and Wildlife (CDFW). 2017. Rarefind Natural Diversity Data Base Program. Version 5, commercial version. California Natural Diversity Database. The Resources Agency, Sacramento. Accessed August 2017.

- USFWS IPaC Resource Report List;[54] and
- CNPS electronic Inventory of Rare and Endangered Plants of California was queried for the "Antioch South, California" 7.5-minute USGS quadrangle, and the eight surrounding USGS topographic quadrangles.[55]

The ECORP BRA included information from a Biological Assessment previously completed by M&A, which was drafted in 2015. The M&A Biological Assessment included protocol-level special-status plant surveys, as well as observations of special status wildlife.

In addition to the aforementioned studies, Live Oak Associates, Inc. completed jurisdictional wetland delineations for the on-site project areas in 2014. The study methodology used was consistent with the USACE guidance, the *1987 Corps of Engineers Wetlands Delineation Manual*[56] and the *Regional Supplement to the Corp of Engineers Wetland Delineation Manual, Arid West Region (Version 2.0)*.[57]

Updated Biological Resources Assessment prepared by Madrone Ecological Consulting

As mentioned earlier, Madrone prepared an updated BRA dated September 2019 which includes a list of special-status species with potential to occur within the project site that was developed by conducting a query of the CNDDB, IPaC,[58] CNPS Rare and Endangered Plant Inventory query of the "Antioch South, California" USGS topo quadrangle[59] and the eight surrounding quadrangles, WBWG Species Matrix,[60] and East Bay Chapter of the CNPS: The Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties.[61] The BRA also included updated species lists, results of protocol special-status plant surveys, SJKF surveys, and incorporated comments that CNPS and CDFW made to the 2017 ECORP BRA.

Several biological studies over several years have been conducted within the project site and were reviewed during the preparation of the updated BRA. The full list of biological studies referenced can be found within the Updated BRA located in Appendix D.

Special-status Plant Survey Report for the Off-site Infrastructure Area Prepared by Madrone Ecological Consulting

Special-status plant species surveys for the Off-site Improvement Area were conducted in accordance with USFWS Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed,

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[54] United States Fish and Wildlife Service (USFWS). 2017a. USFWS Resource Report List. Information for Planning and Conservation. Internet website: http://ecos.fws.gov/ipac/. Accessed August 2017.

[55] California Native Plant Society (CNPS). 2017. Inventory of Rare and Endangered Plants in California (online edition, v7-14). California Native Plant Society. Sacramento, CA. Available online: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed August 2017.

[56] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army. Washington D.C. 100 pp.

[57] United States Army Corp of Engineers (USACE). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. Department of the Army.

[58] United States Fish and Wildlife Service (USFWS). 2019. IPaC Trust Resource Report for the Study Area. Website: http://ecos.fws.gov/ipac/. Accessed September 6, 2019.

[59] California Native Plant Society (CNPS). 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org. Accessed September 2019.

[60] Western Bat Working Group (WBWG). 2019. Species Matrix and Species Accounts. Website: http://wbwg.org/. Accessed September 2019.

[61] California Native Plant Society (CNPS). East Bay Chapter. The Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties. Website: https://ebcnps.org/database-of-rare-unusual-and-significant-plants-of-alameda-and-contra-costa-counties/. Accessed September 2019.

Proposed and Candidate Plants,[62] CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities,[63] and the CNPS Botanical Survey Guidelines.[64]

A list of special-status plant species with potential to occur within the Off-site Improvement Area was developed by reviewing the following literature, and then refining the list based on habitats present within the Off-site Improvement Area:

- CNPS Rare and Endangered Plant Inventory[65] query of CRPR Lists 1A, 1B, 2A, 2B, and 3 within the "Antioch South, California" USGS topo quadrangle and eight surrounding quadrangles; and
- The CNDDB occurrences of special-status plant species within 5 miles of the Off-site Improvement Area.[66]

Meandering pedestrian surveys were conducted throughout the Off-site Improvement Area. The surveys were floristic in nature, which means that all plant species observed on-site were identified to the taxonomic level necessary to determine rarity. Thus, if a special-status plant was present but not on the target list (such as CNPS List 4 plant species, locally rare plant species, or special-status plants not previously documented in the vicinity), it would have been detected and documented. Plant taxonomy was based on the nomenclature in the Jepson eFlora.[67] Vegetation communities were classified according to the Manual of California Vegetation, 2nd Edition.[68] Qualifications for the botanist that conducted the survey, a list of reference populations of target plants visited, and a comprehensive list of all plant species observed during surveys of the Off-site Improvement Area is included in Appendix D.

San Joaquin Kit Fox Survey Conducted by H.T. Harvey & Associates

On February 22, 2019, H.T. Harvey & Associates conducted scent dog surveys for San Joaquin kit fox within the project site. Two teams each consisting of one trained scent dog and one Madrone Biologist surveyed the entire 551.0-acre project site for sign of San Joaquin kit fox.

[62] United States Fish and Wildlife Service (USFWS). 1996. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. Sacramento, CA.

[63] California Department of Fish and Wildlife (CDFW). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Dated March 2018.

[64] California Native Plant Society (CNPS). 2001. CNPS botanical survey guidelines. Pages 38-40 in California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (D.P. Tibor, editor). 6th Edition. Special Publication No. 1, California Native Plant Society, Sacramento, 387 pp.

[65] Ibid.

[66] California Native Plant Society (CNPS). 2018. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed May through July 2018].

[67] Jepson Flora Project (eds.) 2018. Jepson eFlora. Website: http://ucjeps.berkeley.edu/eflora/. Accessed May through November 2018.

[68] Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, 2nd Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

3.4.5 - Impacts and Mitigation Measures

Significance Criteria

According to 2019 CEQA Guidelines Appendix G, to determine whether impacts related to biological resources are significant environmental effects, the following questions are analyzed and evaluated. Would the proposed project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

c) Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

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 wildlife nursery sites?

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

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?

Approach to Analysis

Impacts on biological resources were evaluated based on the likelihood that special-status species, sensitive habitats, wildlife corridors, and protected trees are present on the project site, and the likely effects of project construction or operation on these resources. For the purposes of this EIR, the word "substantial" as used in the significance thresholds above is defined by the following three principal components:

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

In this Biological Resources Analysis, the project site is defined as all areas directly affected by project development, including the Off-site Improvement Area.

Impact Evaluation

Special-status Species

Impact BIO-1: **The project could have a substantial adverse effect, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.**

Construction

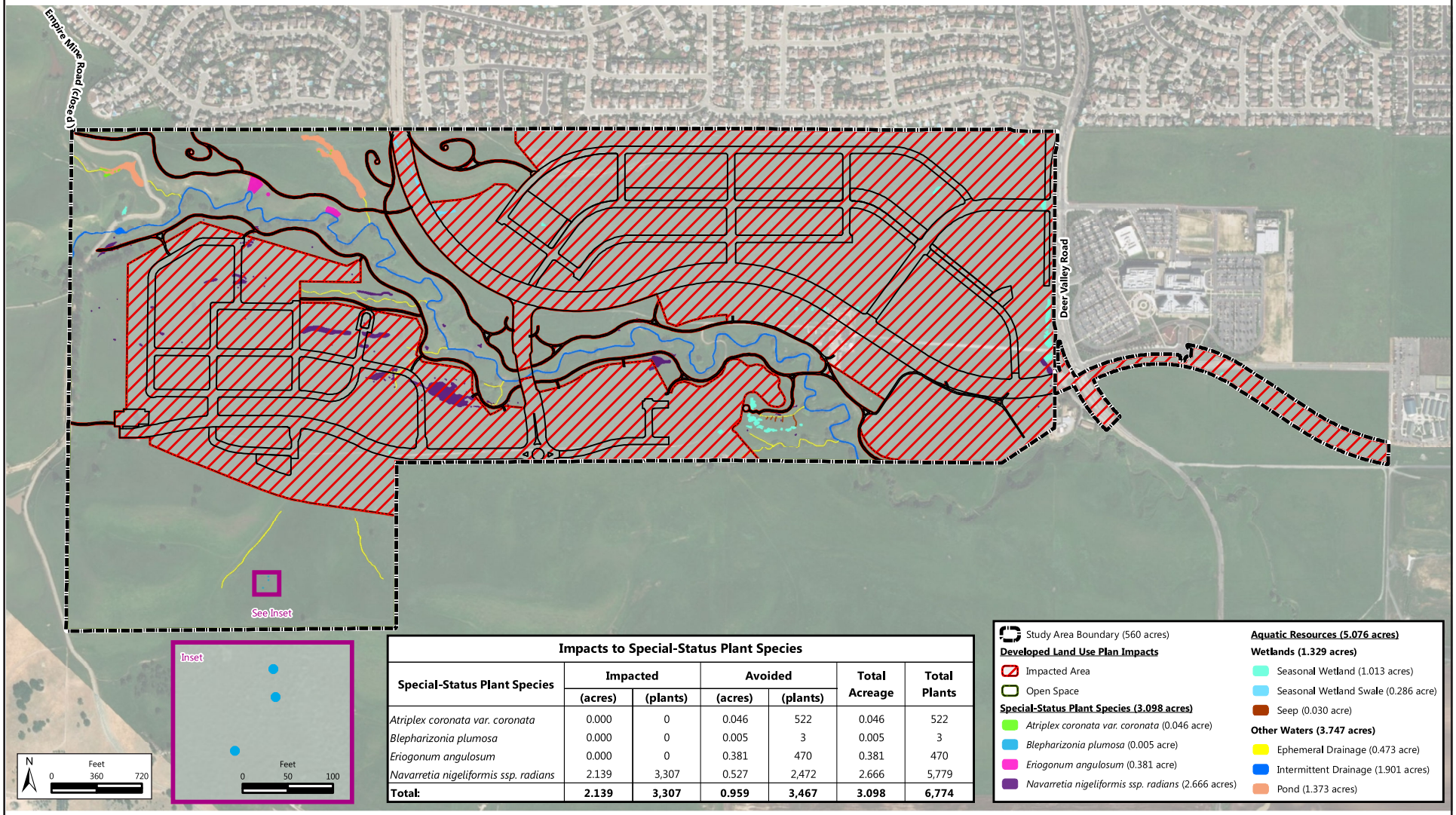
An impact to special-status plant and wildlife species would be considered significant if proposed project operations resulted in a substantial, adverse change in any of the physical conditions (such as habitat) within the area affected by the project. Each potential special-status species that has the potential to be impacted is discussed in detail below.

Special-status Plant Species

M&A documented three special-status plant species during their surveys from 2013-2015, including shining navarretia, San Joaquin spearscale, and crownscale. Additionally, Madrone observed three special-status plant species during their surveys in 2018 and 2019 including crownscale, big tarplant, and shining navarretia, in addition to angle-stem buckwheat, an A-ranked locally rare species. All other special-status plant species were absent from the site in the 2018 and 2019 surveys, including San Joaquin spearscale, although it was determined that the site contains marginal suitable habitat for some species. Notably, the location of San Joaquin spearscale identified by M&A will be preserved as open space and remain unimpacted by the project.

Three special-status species, including shining navarretia, crownscale, and big tarplant, and a locally rare species, angle-stem buckwheat, were present during the 2018 and 2019 plant surveys and have the potential to occur on-site. While all of the known on-site populations of crownscale, big tarplant, and angle-stem buckwheat will be preserved within the project's open space areas, some of the shining navarretia populations will be directly or indirectly impacted by the development footprint, as shown in Exhibit 3.4-7.

Because the proposed project could result in adverse effects to shining navarretia, this represents a potentially significant impact. No special-status plant species were observed within the Off-site Improvement Area during the 2018 and 2019 surveys. Impacts to special-status plant species are shown in Exhibit 3.4-7. Implementation of Mitigation Measure (MM) BIO-1, which requires avoidance and/or replacement and preservation via a conservation easement, would reduce impacts to shining navarretia to a less than significant level. Options 1 and 2 are equally effective in reducing impacts to a less than significant level if Option 2 succeeds. However, Option 1 is the most effective option, as there is no risk of failure. Additionally, if project construction occurs after the City of Antioch has adopted an HCP/NCCP, the project shall comply with the provisions of the adopted document to the extent that all project impacts would be mitigated to a less than significant level.



Impacts to Special-Status Plant Species

Special-Status Plant Species	Impacted		Avoided		Total Acreage	Total Plants
	(acres)	(plants)	(acres)	(plants)		
Atriplex coronata var. coronata	0.000	0	0.046	522	0.046	522
Blepharizonia plumosa	0.000	0	0.005	3	0.005	3
Eriogonum angulosum	0.000	0	0.381	470	0.381	470
Navarretia nigeliformis ssp. radians	2.139	3,307	0.527	2,472	2.666	5,779
Total:	**2.139**	**3,307**	**0.959**	**3,467**	**3.098**	**6,774**

Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-7
Impacts to Special-Status Plants

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Special-status Wildlife Species

It was also determined that 26 special-status wildlife species, including Crotch bumblebee, western bumblebee, vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, California tiger salamander, California red-legged frog, western spadefoot, western pond turtle, Northern California legless lizard, Alameda whipsnake, Blainville's horned lizard, tricolored blackbird, grasshopper sparrow, golden eagle, short-eared owl, burrowing owl, Swainson's hawk, northern harrier, white-tailed kite, loggerhead shrike, pallid bat, Townsend's big-eared bat, western red bat, American badger, and San Joaquin kit fox, in addition to birds protected under the MBTA are present or have the potential to occur on-site. The Special-status Species Table within the 2019 BRA (Appendix D) provides the habitat description and rationale of potential special-status species to occur on-site, in addition to previous on-site occurrences. Implementation of MM BIO-2a through MM BIO-2n would reduce impacts to special-status wildlife species to a less than significant level through specific protocols for each species, or compliance with the HCP/NCCP adopted by the City of Antioch if project construction occurs after adoption of the City's plan.

Operation

Project operation has the potential to affect special-status wildlife species. Project lighting and activities could potentially disrupt special-status species within the project area. As mentioned in Section 3.1, Aesthetics, the proposed project has been designed to include significant setbacks from the western boundary of the project site as well as the Sand Creek Corridor to minimize potential impacts, including light and glare, on the natural environment. In addition, as mentioned in Section 3.11, Noise, project operational noise impacts would be reduced with implementation of MM NOI-1b, MM NOI-1c, and MM NOI-1d.

Therefore, project operation would not result in any adverse effects to any candidate, sensitive, or special status species within the project area. As such, impacts would be less than significant with mitigation incorporated.

Level of Significance Before Mitigation

Potentially Significant

Mitigation Measures

Special-status Plant Species

MM BIO-1a The project Applicant hired a qualified Biologist to conduct protocol surveys of the shining navarretia in the 2018-2019 and submitted them to the City for independent peer review. (See Appendix D) To the extent construction moves forward within 5 years of these surveys, they shall be deemed valid and no further surveys shall be required. However, if construction does not occur on affected areas on or before 5 years of the protocol surveys, the project Applicant shall hire a qualified Biologist to survey the project area prior to construction. All survey results shall be submitted to the City of Antioch Planning Division prior to approval of grading permits. Where populations are outside of the project footprint, qualified Biologists shall demarcate these areas for complete avoidance.

Where shining navarretia populations are within the project footprint, this shall be considered a direct impact. If the project will avoid the mapped populations, but will impact a portion of the avoidance zone, then that will be considered an indirect impact.

The project Applicant shall have the following options to mitigate for direct and/or indirect impacts to the shinning navarretia. Options one and two are listed by order of effectiveness:

Option 1. The project Applicant shall identify one or more existing, unprotected populations of shining navarretia in Contra Costa County (or nearest other jurisdiction) and acquire land that supports those populations. Under this Option, once the proposed mitigation area is approved by the City of Antioch Planning Division, the mitigation habitat shall be protected by a recorded conservation easement and managed in accordance with a long-term management plan, the goal of which is to maintain the shining navarretia population and its habitat. The project Applicant shall provide an endowment in favor of the conservation easement holder to fund the long-term management outlined in the long-term management plan. As this option would preserve an existing, established population, there would be no temporal loss, and no risk of failure. As a result, the mitigation ratio for this option would be 1:1. Alternatively, the project Applicant may purchase mitigation credits (at a 1:1 ratio) from an established mitigation bank for all directly impacted shining navarretia locations.

Option 2. The project Applicant shall mitigate for any direct impacts at a ratio of 3:1 (preserved habitat: impacted habitat), and for any indirect impacts at a 1:1 ratio. The ratio shall be reduced to 1.5:1 if the project Applicant chooses to develop a monitoring plan, monitor the relocated seeds/plants in accordance with that plan, and meet established success criteria for successful establishment of a new population of the impacted special-status plant. The success criterion for Option 2 would be 1:1 replacement of special-status plants by Year 5 or later following transplantation. This would require documentation of the number of plants within the proposed impact area such that the number of impacted plants could be compared to the number of established plants at the mitigation site. The monitoring plan and monitoring reports shall be submitted to the City of Antioch Planning Division for review and approval. If the success criteria are not met, additional habitat shall be set aside as set forth under Option 1. As population sizes for annual plants can vary widely from year to year, population counts shall be conducted in the last 3 years of monitoring, and the highest count shall be at least equivalent to the number of impacted plants.

Option 3. As an alternative Options 1 and 2, the project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the shining navarretia would be fully mitigated, including payment of applicable fees, provided that the California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Special-status Wildlife Species

Crotch and western bumblebee

MM BIO-1b To avoid take of crotch and western bumblebee species the project Applicant shall implement one of the following options:

Option 1. Prior to each phase of construction, a qualified Biologist shall conduct a take avoidance survey for active bumblebee colony nesting sites. In order to maximize detection of active bee colonies, the take avoidance survey shall be conducted during the spring, summer, or fall during appropriate weather (not during cool overcast, rainy, or windy days). The Biologist shall walk the entire area proposed for grading and inspect all ground squirrel burrows for bumblebee activity. The survey shall specifically target the slopes that face west to southwest as these areas are specifically utilized by western bumblebee. If any bumblebees are identified during the survey, they shall be identified to species.

All active colonies of crotch bumblebee or western bumblebee shall be avoided and no work shall occur within 50-feet of the colony, unless pursuant to consultation with the California Department of Fish and Wildlife (CDFW) an Incidental Take Permit is obtained prior to disturbance. If a colony can be fully avoided and work will not occur within 50 feet of the colony, no mitigation shall be required.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the western bumblebee would be fully mitigated, including payment of applicable fees, provided that California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Vernal pool fairy shrimp and vernal pool tadpole shrimp

The proposed project will result in the loss of approximately 0.687 acre of potential habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. To mitigate for the loss of potential habitat, the project Applicant shall employ the following mitigation:

MM BIO-1c Prior to the issuance of any grading permit, the project Applicant shall implement one of the following options:

Option 1. Consult with the United States Fish and Wildlife Service (USFWS) regarding impacts of the project on vernal pool fairy shrimp and vernal pool tadpole shrimp. The project Applicant shall obtain the appropriate take authorization (Section 7 or 10 of the Federal Endangered Species Act [FESA], as appropriate) from the USFWS prior to issuance of grading permits. The project Applicant shall comply with all terms of the endangered species permits, including any mitigation requirements, which shall be determined during consultation with USFWS.

Mitigation may be accomplished through permittee-responsible mitigation and/or through the preservation of vernal pool fairy shrimp habitat at USFWS-approved ratios at a USFWS-approved mitigation bank. A minimum ratio of 1:1 mitigation shall be required.

Option 2. The project Applicant shall demonstrate compliance with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts on the fairy and tadpole shrimp would be fully mitigated, including payment of applicable fees, provided that the California Department of Fish and Wildlife (CDFW) and USFWS have approved the conservation plan.

Valley elderberry longhorn beetle

There is one elderberry shrub located within the project site, on the banks of Sand Creek, which will be located in the protected on-site open space. To ensure there are no impacts to any elderberry shrub, and thus, the valley elderberry longhorn beetle, the project Applicant shall comply with the following mitigation measure:

MM BIO-1d The project Applicant shall implement one of the following options:

Option 1. The elderberry shrub within the project site shall be avoided. Although there were no signs of the valley elderberry longhorn beetle, the following measures will ensure that there are no significant impacts to valley elderberry longhorn beetle:

All elderberry shrubs (which are defined for the purposes of this section as those with stems greater than 1 inch in diameter) shall be avoided completely during project construction with a buffer of at least 20 feet, and the following avoidance and minimization measures [as outlined in the Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle[69] shall be implemented for all work within 165 feet of a shrub:

- All areas to be avoided during construction activities shall be fenced and/or flagged as close to construction limits as feasible.
- Activities that could damage or kill an elderberry shrub (e.g., trenching, paving, etc.) shall receive an avoidance area of at least 20 feet from the drip-line.
- A qualified Biologist shall provide training for all contractors, work crews, and any on-site personnel on the status of the valley elderberry longhorn beetle, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance, prior to the commencement of work.
- A qualified Biologist shall monitor the work area at project appropriate intervals to assure that all avoidance and minimization measures are implemented.
- As much as feasible, all activities within 165 feet of an elderberry shrub shall be conducted between August and February.

[69] United States Fish and Wildlife Service (USFWS). 2017. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle. Dated May 2017.

- Elderberry shrubs shall not be trimmed.
- Herbicides shall not be used within the drip-line of the shrub. Insecticides shall not be used within 100 feet of an elderberry shrub.
- Mechanical weed removal within the drip-line of the shrub shall be limited to the season when adults are not active (August–February) and shall avoid damaging the elderberry shrub.

If either a 20-foot diameter avoidance area around the elderberry shrub is found later to not be feasible or an elderberry shrub must be removed to accommodate construction, then the project Applicant shall notify the City and implement additional mitigation measures required by the Framework[70] after consultation with the United States Fish and Wildlife Service (USFWS).

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts on the elderberry beetle would be fully mitigated, including payment of applicable fees, provided that the California Department of Fish and Wildlife (CDFW) and USFWS have approved the conservation plan.

California tiger salamander

The proposed project will result in the loss of 0.423 acre of potential breeding habitat for the California tiger salamander and approximately 344.6 acres of potential upland habitat. To ensure this loss is mitigated, the project Applicant shall comply with the following mitigation measure:

MM BIO-1e Prior to the commencement of construction activities, the project Applicant shall implement one of the following options:

Option 1. The project Applicant shall obtain take coverage from the United States Fish and Wildlife Service (USFWS) under Sections 7 or 10 of the Federal Endangered Species Act (FESA) for any impacts to the California tiger salamander and/or its habitat. In addition, the project Applicant shall obtain take coverage from the California Department of Fish and Wildlife (CDFW) under Section 2081 of the California Fish and Game Code for any impacts to the California tiger salamander and/or its habitat. Any required compensatory mitigation shall be determined during consultation with USFWS and CDFW and may include permittee-responsible mitigation and/or the purchase of mitigation credits from a USFWS- and CDFW-approved mitigation bank. Should consultation with the USFWS and CDFW result in required mitigation measures in conflict with the measures included here, USFWS and CDFW measures shall take precedence. A minimum ratio of 1:1 shall apply.

The project Applicant shall preserve both aquatic habitat and upland habitat that are either known to be California tiger salamander breeding habitat and upland habitat, or which have the proper hydrology to support breeding California tiger salamander,

[70] Ibid.

on off-site mitigation properties and within the on-site open space or as otherwise required as a result of consultation with the USFWS.

Project activities shall occur during the dry season (May 1 through October 15) unless otherwise authorized by the CDFW and USFWS;

Prior to the start of construction, a qualified Biologist shall conduct a training program for all construction personnel including contractors and subcontractors. The training shall include, at a minimum, a description of the California tiger salamander and its habitat within the project area; an explanation of the species status and protection under State and federal laws; the avoidance and minimization measures to be implemented to reduce take of this species; communication and work stoppage procedures in case a listed species is observed within the project site; and an explanation of the importance of the Environmentally Sensitive Areas (ESAs) and Wildlife Exclusion Fencing (WEF). A fact sheet conveying this information shall be prepared and distributed to all construction personnel by the Biologist. The training shall provide interpretation for non-English speaking workers. The same instruction shall be provided to any new workers before they are authorized to perform project work.

Prior to the start of each phase of construction, ESAs (defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed) shall be clearly delineated using high visibility orange fencing. The ESA fencing shall remain in place throughout the duration of the construction and shall be regularly inspected and fully maintained at all times by the project Applicant's contractor.

A qualified Biologist shall be on-site during all activities that may result in take of California tiger salamander. The qualifications of the Biologist(s) shall be submitted to the USFWS and CDFW for review and approval at least 30 calendar days prior to the date earthmoving is initiated at the project site.

Prior to the start of each phase of construction, WEF shall be installed at the edge of the project footprint in all areas where sensitive species could enter the construction area. The location of the fencing shall be determined by the contractor and the qualified Biologist. The WEF shall remain in place throughout the duration of the project phase and shall be regularly inspected and fully maintained by the project Applicant's contractor. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion, the WEF shall be completely removed and the area cleaned of debris and trash and returned to natural conditions. Exceptions to the foregoing fencing measures include work sites where the duration of work activities is very short (e.g., 3 days or less),occur during the dry season, and the installation of exclusion fencing will result in more ground disturbance than from project activities. In this case, the boundaries and access areas and sensitive habitats

may be staked and flagged (as opposed to fully fenced) by the qualified Biologist prior to disturbance and species monitoring would occur during all project activities.

If a water body is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than 5 millimeters and the intake shall be placed within a perforated bucket or other method to attenuate suction to prevent California tiger salamander from entering the pump system. Pumped water shall be managed in a manner that does not degrade water quality and then upon completion released back into the water body, or at an appropriate location in a manner that does not cause erosion. No rewatering of the water body is necessary if sufficient surface or subsurface flow exists to fill it within a few days, or if work is to be completed during the time of year the water body would have dried naturally.

When constructing a road improvement within California tiger salamander habitat, the project Applicant shall enhance or establish wildlife passage for the California tiger salamander across roads, highways, or other anthropogenic barriers. This may include upland culverts, tunnels, and other crossings designed specifically for wildlife movement, as well as making accommodations in curbs (no vertical faced curbs), median barriers, and other impediments to terrestrial wildlife movement at locations most likely to be beneficial to the California tiger salamander.

Preconstruction surveys shall be provided to the City of Antioch Planning Division, and shall be conducted by a USFWS or CDFW approved Biologist within 72 hours of the initiation of any ground disturbing activities and vegetation clearing that may result in take of the California tiger salamander. All suitable aquatic and upland habitat, including refugia habitat such as small woody debris, refuse, burrow entries, etc., shall be duly inspected. The approved Biologist(s) shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of the California tiger salamander. Where feasible and only on a case-by-case basis, rodent burrows and other ground openings suspected to contain Central California tiger salamanders that would be destroyed from project activities may be carefully excavated under supervision of the Biologist. If the California tiger salamander is observed, the approved Biologist shall implement the species observation and handling protocol outlined below.

At least 15 days prior to initiation of ground disturbance activities the project Applicant's Biologist shall prepare and submit a Relocation Plan for the California tiger salamander for the USFWS and CDFW written approval. The plan shall include protocol to be followed should a California tiger salamander be encountered during project activities. The Relocation Plan shall contain the name(s) of the approved Biologist(s) to relocate the California tiger salamander, method of relocation, a map, and description of the proposed release site(s) within 300 feet from the project, unless at a distance otherwise agreed to by the USFWS and CDFW, and written permission from the landowner to use their land as a relocation site.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the California tiger salamander would be fully mitigated, including payment of applicable fees, provided that the CDFW and USFWS have approved the conservation plan.

California red-legged frog

While all potential California red-legged frog breeding habitat within the project area will be preserved, approximately 0.005 acre of California red-legged frog dispersal habitat will be impacted by the construction of the proposed bridges over Sand Creek. Additionally, impacts to uplands within 300 feet of Sand Creek may represent potential upland habitat for California red-legged frog. To mitigate for the loss of aquatic and upland habitat for this species, and the species itself, the project Applicant shall comply with the following mitigation measure:

MM BIO-1f Prior to issuance of any grading permits, the project Applicant shall implement one of the following options:

Option 1. The project Applicant shall consult with the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) regarding impacts to California red-legged frog from the proposed project. The project Applicant shall obtain the appropriate take authorization from the USFWS (Section 7 or 10 of the Federal Endangered Species Act [FESA]) and/or from the CDFW (Section 2081 of the California Fish and Game Code). The project Applicant shall comply with all required compensatory mitigation determined during consultation with the USFWS and CDFW, and provide proof of compliance to the City of Antioch Planning Division.

Should consultation with the USFWS result in required mitigation measures in conflict with the measures included here, USFWS measures shall take precedence.

Approximately 1.40 acres of California red-legged frog aquatic habitat shall be preserved on-site as part of the proposed project.

Prior to the start of construction, a qualified Biologist shall conduct a training program for all construction personnel including contractors and subcontractors. The training shall include, at a minimum, a description of the California red-legged frog and their habitats within the project site; an explanation of the species status and protection under State and federal laws; the avoidance and minimization measures to be implemented to reduce take of this species; communication and work stoppage procedures in case a listed species is observed within the project site; and an explanation of the importance of the Environmentally Sensitive Areas (ESAs) and Wildlife Exclusion Fencing (WEF). A fact sheet conveying this information shall be prepared and distributed to all construction personnel. The training shall provide interpretation for non-English speaking workers. The same instruction shall be provided to any new workers before they are authorized to perform project work.

Prior to the start of each phase of construction, ESAs (defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed) shall be construction activities are ongoing, and shall be regularly inspected and fully maintained at all times.

A qualified Biologist shall be on-site during all activities that may result in take of the California red-legged frog. The qualifications of the Biologist(s) shall be submitted to the USFWS for review and approval at least 30 calendar days prior to the date earthmoving is initiated at the project site.

Prior to the start of each phase of construction, WEF shall be installed at the edge of the project footprint in all areas where sensitive species could enter the construction area. The location of the fencing shall be determined by the contractor and the qualified Biologist prior to the start of staging or ground disturbing activities. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion, the WEF shall be completely removed and the area cleaned of debris and trash and returned to natural conditions. An exception to the foregoing fencing measures is that for work sites where the duration of work activities is very short (e.g., 3 days or less) and that occur during the dry season, and the installation of exclusion fencing will result in more ground disturbance than from project activities. In this case, the boundaries and access areas and sensitive habitats may be staked and flagged (as opposed to fenced) by the qualified Biologist prior to disturbance and species monitoring would occur during all project activities at that site.

No more than 24 hours prior to the date of initial ground disturbance, a preconstruction survey for the California red-legged frog shall be conducted by the qualified Biologist at the project site. The results shall be provided to the City of Antioch Planning Division. The survey shall consist of walking the project limits and within the project site to ascertain the possible presence of the species. The Biologist shall investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, subadults, juveniles, tadpoles, or eggs are found, the Biologist shall contact the USFWS to determine if moving any of the individuals is appropriate. In making this determination, the USFWS shall consider if an appropriate relocation site exists. Only USFWS-approved Biologists may capture, handle, and monitor the California red-legged frog.

To the extent practicable, initial ground-disturbing activities shall be avoided between November 1 and March 31 because that is the time period when the California red-legged frog are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31,

the project Applicant shall ensure that daily monitoring by the USFWS-approved Biologist is completed.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the California red-legged frog would be fully mitigated, including payment of applicable fees, provided that CDFW and USFWS have approved the conservation plan.

Western spadefoot

Approximately 0.423 acre of potential western spadefoot aquatic habitat will be directly impacted by the proposed project. To mitigate for this loss, the project Applicant shall comply with the following mitigation measure:

MM BIO-1g Prior to initiation of construction activity, the project Applicant shall implement one of the following options:

Option 1. The project Applicant shall retain a qualified Biologist to survey all suitable aquatic habitat within the project site (including features proposed for avoidance) by sampling the features thoroughly with dipnets during March or early April, when spadefoot tadpoles would be present. In addition, one nocturnal acoustic survey of all areas within 300 feet of suitable aquatic habitat shall be conducted. Acoustic surveys shall consist of walking through the area and listening for the distinctive snore-like call of this species. The results shall be provided to the City of Antioch Planning Division. Timing and methodology for the aquatic and acoustic surveys shall be based on those described in Distribution of the western spadefoot in the Northern Sacramento Valley of California, with Comments on Status and Survey Methodology.[71] If both the aquatic survey and the nocturnal acoustic survey are negative, further mitigation is not necessary.

If western spadefoot are observed within aquatic habitat proposed for impact, the tadpoles shall be captured by a qualified Biologist and relocated either to aquatic habitat to be avoided on-site (and implement the fencing requirement outlined below), or to an off-site open space preserve with suitable habitat in the vicinity of the project site. If western spadefoot are observed within aquatic habitats proposed for avoidance, then the project Applicant shall install a keyed in silt fence along the edge of the proposed impact area within 300 feet of the occupied aquatic habitat to prevent metamorphose individuals from dispersing into the construction area.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the

[71] Shedd, J.O. 2017. Distribution of the Western Spadefoot in the Northern Sacramento Valley of California, with Comments on Status and Survey Methodology (PDF Download Available). Website: https://www.researchgate.net/publication/312153742_Distribution_of_the Western_Spadefoot_Spea_hammondii_in_the_Northern_Sacramento_Valley_of_California_with_Comments_on_Status_and_Survey_Methodology. Accessed February 14, 2018.

extent that all project impacts to the western spadefoot would be fully mitigated, including payment of applicable fees, provided that the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Western pond turtle

A majority of the on-site western pond turtle habitat will be preserved within the on-site open space. However, approximately 0.005 acre of western pond turtle habitat will be impacted by the construction of two bridges over Sand Creek. To mitigate for the construction impacts to this species, the project Applicant shall comply with the following mitigation measure:

MM BIO-1h Prior to construction activities, the project Applicant shall implement one of the following options:

Option 1. Within 14 days prior to the initiation of any construction activities for each phase, a qualified Biologist shall conduct preconstruction surveys for northwestern pond turtles. The results shall be provided to the City of Antioch Planning Division. If northwestern pond turtles are found prior to the initiation of, and/or during, construction activities, a qualified Biologist shall relocate them outside of the project site, subject to review and approval by the appropriate resource agencies (i.e., California Department of Fish and Wildlife [CDFW]).

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the western pond turtle would be fully mitigated, including payment of applicable fees, provided that the CDFW and the United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Northern California legless lizard, Alameda whipsnake, and coast horned lizard

There is very low potential for Northern California legless lizard, the Alameda whipsnake or the coast horned lizard to be present within the project area. However, in order to avoid direct mortality of these species, the project Applicant shall comply with the following mitigation measure:

MM BIO-1i Prior to construction, the project Applicant shall implement one of the following options:

Option 1. Within 14 days prior to the initiation of any construction activities for each phase of the project, a qualified Biologist shall conduct preconstruction surveys for northern California legless lizard, Alameda whipsnake, and coast horned lizard. The results shall be provided to the City of Antioch Planning Division. If Alameda whipsnake is identified during the survey, it will be allowed to leave the work area on its own, subject to confirmation by a qualified Biologist. If Northern California legless lizard or coast horned lizard are found during the survey, a qualified Biologist shall relocate them to suitable habitat outside of the project site, subject to review and approval by the appropriate resource agencies (i.e., California Department of

Fish and Wildlife [CDFW] and/or the United States Fish and Wildlife Service [USFWS], and the City of Antioch Planning Division).

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the lizards and whipsnake would be fully mitigated, including payment of applicable fees, provided that the CDFW and the USFWS have approved the conservation plan.

Nesting raptors and songbirds

To protect nesting raptors and songbirds during construction, the Applicant shall implement one of the following options:

The following nest survey requirements (MM BIO-2j through MM BIO-2l) shall apply if construction activities take place during the typical bird breeding/nesting season (typically February 15 through September 1).

Swainson's hawk

At the time of publication of this EIR, a Swainson's hawk nest was reported in the California Natural Diversity Database (CNDDB) approximately 1.05 miles east of the project site (CNDDB Occurrence No. 1681); however, this occurrence is only of foraging adults, and no nesting was observed.[72] The nearest documented occurrence of nesting Swainson's hawk within the last 5 years (2016) is CNDDB Occurrence No. 2692 located approximately 2.4 miles south of the project site. Another active Swainson's hawk nest was documented in 2016 approximately 2.5 miles north of the project site (CNDDB Occurrence No. 2690). Approximately 344.6 acres of suitable foraging habitat for Swainson's hawk will be impacted by the proposed project. Because the project site has a high potential for both nesting and foraging by the Swainson's hawk, the project Applicant shall comply with the following mitigation measure:

MM BIO-1j **Option 1.** Where construction activities will occur during nesting and breeding season (typically February 15 through September 1), the project Applicant shall conduct a targeted Swainson's hawk nest survey throughout all accessible areas within 0.25 mile of the proposed construction area no later than 14 days prior to construction activities. The results shall be provided to the City of Antioch Planning Division. If active Swainson's hawk nests are found within 0.25 mile of a construction area, construction shall cease within 0.25 mile of the nest until a qualified Biologist determines that the young have fledged, or it is determined that the nesting attempt has failed. If the project Applicant desires to work within 0.25 mile of the nest, the project Applicant shall consult with the California Department of Fish and Wildlife (CDFW) to determine if the nest buffer can be reduced. The project Applicant, the Biologist, and the CDFW shall collectively determine the nest avoidance buffer and what (if any) nest monitoring is necessary. If an active Swainson's hawk nest is found within the project site prior to construction and is in a

[72] California Natural Diversity Database (CNDDB). 2019. RareFind 5. California Department of Fish and Wildlife. Dated September 2019.

tree that is proposed for removal, then the project Applicant shall implement additional mitigation recommended by a qualified Biologist based on CDFW Guidelines and obtain any required permits from the CDFW.

Prior to project construction, a qualified Biologist shall conduct a review of Swainson's hawk nest data available in the California Natural Diversity Database (CNDDB) and contact the CDFW to determine if they have any additional nest data. A Biologist shall conduct a survey of these nests to determine if they are still present and provide the City with a summary of the findings. If it is determined that the project site is within 10 miles of an active Swainson's hawk nest (an active nest is defined as a nest with documented Swainson's hawk use within the past 5 years), the project Applicant shall mitigate for the loss of suitable Swainson's hawk foraging habitat by implementing one of the below measures:

Active nest identified within 1 mile of the project site: 1 acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. Protection shall be via purchase of mitigation bank credits or other land protection mechanism acceptable to the City.

Active nest identified within 5 miles (but greater than 1 mile) of the project site: 0.75 acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. Protection shall be via purchase of mitigation bank credits or other land protection mechanism acceptable to the City.

Active nest identified within 10 miles (but greater than 5 miles) of the project site: 0.5 acre of suitable foraging habitat shall be protected for each acre of suitable foraging habitat developed. Protection shall be via purchase of mitigation bank credits or other land protection mechanism acceptable to the City.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the Swainson's hawk would be fully mitigated, including payment of applicable fees, provided that the CDFW and the United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Burrowing owl

The project site has a high potential for both nesting and foraging by the burrowing owl. Where construction activities will occur during nesting and breeding season (typically February 15 through September 1), the project Applicant shall implement one of the following options:

MM BIO-1k **Option 1.** A targeted take avoidance burrowing owl nest survey shall be conducted of all accessible areas within 500 feet of the proposed construction area within 14 days prior to construction activities utilizing 60 foot transects as outlined in the Staff

Report on Burrowing Owl Mitigation.[73] The results shall be provided to the City of Antioch Planning Division.

If an active burrowing owl nest burrow (i.e., occupied by more than one adult owl, and/or juvenile owls are observed) is found within 250 feet of a construction area either before or during construction, no construction shall occur within 250 feet of the nest burrow until a qualified Biologist determines that the young have fledged or it is determined that the nesting attempt has failed. If the project Applicant desires to work within 250 feet of the nest burrow, the project Applicant shall consult with the California Department of Fish and Wildlife (CDFW) to determine if the nest buffer can be reduced. During the non-breeding season (late September through the end of January), the project Applicant may choose to conduct a survey for burrows or debris that represent suitable nesting habitat for burrowing owls within areas of proposed ground disturbance, exclude any burrowing owls observed, and collapse any burrows or remove the debris in accordance with the methodology outlined by the CDFW.

If any nesting burrowing owl are found during the pre-construction survey, mitigation for the permanent loss of burrowing owl foraging habitat (defined as all areas of suitable habitat within 250 feet of the active burrow) shall be accomplished at a 1:1 ratio. The mitigation provided shall be consistent with recommendations in the 2012 CDFW Staff Report and may be accomplished within the Swainson's hawk foraging habitat mitigation area if burrowing owls have been documented utilizing that area, or if the Biologist, the City, and the CDFW collectively determine that the area is suitable.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to the burrowing owl would be fully mitigated, including payment of applicable fees, provided that the CDFW and the United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

MM BIO-1l Prior to construction activities, the project Applicant shall implement one of the following options to reduce impacts to Swainson's hawk and Burrowing owl:

Survey Report

Option 1. For any nesting raptor or songbird pre-construction survey conducted pursuant to Mitigation Measure (MM) BIO-2i through MM BIO-2k, a report summarizing the survey(s), including those for Swainson's hawk and burrowing owl, shall be provided to the City and the California Department of Fish and Wildlife (CDFW) within 30 days of the completed survey. The survey report shall be valid for one construction season. If no nests are found, no further mitigation is required.

[73] California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. Dated March 7, 2012.

Where birds are nesting during construction and construction activities cause a nesting bird do any of the following in a way that would be considered a result of construction activities: vocalize, make defensive flights at intruders, get up from a brooding position, or fly off the nest, the exclusionary buffer shall be increased such that activities are far enough from the nest to stop this agitated behavior. The exclusionary buffer shall remain in place until the chicks have fledged or as otherwise determined by a qualified Biologist in consultation with the CDFW.

Construction activities may only resume within the buffer zone after a follow-up survey by the biologist has been conducted and a report has been prepared indicating that the nest (or nests) are no longer active, and no new nests have been identified.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to nesting birds would be fully mitigated, including payment of applicable fees, provided that the CDFW and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Other birds

Other raptor and songbird species such as the northern harrier, white-tailed kite, and loggerhead shrike have a low potential to nest and/or forage on the project area. To ensure these species are protected, the project Applicant shall implement one of the following options:

MM BIO-1m **Option 1.** A pre-construction nesting bird survey shall be conducted by a qualified Biologist on the project site and within a 500-foot radius of proposed construction areas, where access is available, no more than 3 days prior to the initiation of construction. The results shall be provided to the City of Antioch Planning Division. If there is a break in construction activity of more than 2 weeks, subsequent surveys shall be conducted.

If active raptor nests are found, no construction activities shall take place within 500 feet of the nest until the young have fledged. If active songbird nests are found, a 100-foot no disturbance buffer shall be established. These no-disturbance buffers may be reduced if a smaller buffer is proposed by the Biologist and approved by the City (and California Department of Fish and Wildlife (CDFW) if it is a tricolored blackbird nesting colony) after taking into consideration the natural history of the species of bird nesting, the proposed activity level adjacent to the nest, habituation to existing or ongoing activity, and nest concealment (are there visual or acoustic barriers between the proposed activity and the nest). A qualified Biologist shall visit the nest as needed to determine when the young have fledged the nest and are independent of the site or the nest can be left undisturbed until the end of the nesting season.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, to the extent that all project impacts to raptors and songbirds would be are fully mitigated, including payment of applicable fees, provided that the CDFW and the United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Roosting bats

MM BIO-1n Prior to construction activities, the project Applicant shall implement one of the following options:

Option 1. A qualified Biologist shall conduct a bat habitat assessment of all potential roosting habitat features, including trees within the proposed development footprint. This habitat assessment shall identify all potentially suitable roosting habitat, and may be conducted up to 1 year prior to the start of construction. The results shall be provided to the City of Antioch Planning Division.

If potential roosting habitat is identified (cavities in trees) within the areas proposed for development, the Biologist shall survey the potential roosting habitat during the active season (generally April through October or from January through March on days with temperatures in excess of 50°F (degrees Fahrenheit) to determine presence of roosting bats. These surveys are recommended to be conducted utilizing methods that are considered acceptable to the California Department of Fish and Wildlife (CDFW) and bat experts, including but not limited to evening emergence surveys, acoustic surveys, inspecting potential roosting habitat with fiber optic cameras or a combination thereof.

If roosting bats are identified within any of the trees planned for removal, or if presence is assumed, the trees shall be removed outside of pup season only on days when temperatures are in excess of 50°F. Pup season is generally during the months of May through August. Two-step tree removal shall be utilized under the supervision of the qualified Biologist. Two-step tree removal involves removal of all branches of the tree that do not provide roosting habitat on the first day, and then the next day cutting down the remaining portion of the tree.

Additionally, all other tree removal shall be conducted from January through March on days with temperatures in excess of 50°F to avoid potential impacts to foliage-roosting bat species.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, including payment of applicable fees, to the extent that all project impacts to

roosting bats would be fully mitigated, provided that the CDFW and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

American badger

Prior to construction activities, the project Applicant shall implement one of the following options:

MM BIO-1o **Option 1.** Within 48 hours prior to the initiation of any construction activities for any project phase, a qualified Biologist shall conduct a preconstruction-level American badger den survey within the project site. The results shall be provided to the City of Antioch Planning Division. If American badger or burrows with American badger sign are found within the project site or Off-site Improvement Area during the preconstruction surveys, consultation with the California Department of Fish and Wildlife (CDFW) shall occur prior to the initiation of any construction activities to determine an appropriate burrow excavation and/or relocation method. If American badger burrows are not found, further measures are not necessary. All survey results shall be submitted to the City of Antioch Planning Division prior to the initiation of any construction activities or where construction has been halted for 30 days or more.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, including payment of applicable fees, to the extent that all project impacts to the American badger would be fully mitigated, provided that the CDFW and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Worker Environmental Awareness Training

MM BIO-1p Prior to any ground-disturbing or vegetation-removal activities, the project Applicant shall implement one of the following options:

Option 1. The project Applicant shall hire a qualified Biologist to conduct a Worker Environmental Awareness Training (WEAT) with the construction crews. The WEAT shall include the following information: discussion of the California Endangered Species Act (CESA) and Federal Endangered Species Act (FESA), the Clean Water Act, the project permits and California Environmental Quality Act (CEQA) documentation, and associated mitigation measures; consequences and penalties for violation or noncompliance with these laws and regulations; identification of special-status wildlife, location of any avoided waters of the United States; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a special-status wildlife species.

The WEAT shall also discuss the different habitats used by the species' different life stages and the annual timing of these life stages. A handout summarizing the WEAT information shall be provided to workers to keep on-site for future reference. Upon completion of the WEAT training, workers shall sign a form stating that they attended the training, understand the information presented and will comply with

the regulations discussed. Workers shall be shown designated "avoidance areas" during the WEAT training, and worker access shall be restricted to outside of those areas to minimize the potential for inadvertent environmental impacts.

Option 2. The project Applicant shall comply with a habitat conservation plan and/or natural community conservation plan if developed and adopted by the City, including payment of applicable fees, to the extent that all project impacts to special-status wildlife species would be fully mitigated, provided that the California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) have approved the conservation plan.

Mitigation Measures to Reduce Operational Impacts to Special-status Species

MM NOI-1b Traffic Noise Reduction Measure

The proposed project shall construct a soundwall along rear yards of residential lots fronting Deer Valley Road. The soundwall shall be a minimum of 8-foot high, as measured from the finished grade of the proposed residential pads. The soundwall should be located so as to block the line of sight from rear yards for all proposed residences located within 160 feet of the centerline of Deer Valley Road.

MM NOI-1c Mechanical Equipment Noise Reduction Measure

To reduce potential operational stationary noise impacts from mechanical ventilation equipment at the proposed residential homes, mechanical ventilation equipment must be located a minimum of 15 feet from the boundary of the project site, or must be shielded by a noise-reducing barrier. If a noise barrier is required, the barrier shall be a minimum of 5 feet in height, extending 2 feet beyond the sides of the equipment and located between the equipment and the receiving property line.

MM NOI-1d Commercial Operation Noise Reduction Measure

The commercial land uses shall be designed so that on-site mechanical equipment (i.e., HVAC units, compressors, generators) and area-source operations (e.g., parking lots) are located no closer than 100 feet from the nearest residential dwelling unit or provide shielding from nearby noise sensitive land uses to meet the City's normally acceptable threshold of 60 A-weighted decibel (dBA) Community Noise Equivalent Level (CNEL). Shielding shall have a minimum height sufficient to completely block line-of-sight between the on-site noise source and the nearest residential dwelling to meet the City's noise standards. Based on the size and placement of the HVAC units (i.e., ground level or roof top), barrier heights may range between 3 to 6 feet.

Level of Significance After Mitigation

Less Than Significant

Sensitive Natural Communities

Impact BIO-2: **The project could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.**

Construction/Operation

An impact to sensitive natural communities or riparian habitat would be considered significant if the proposed project construction or operation resulted in a substantial, adverse change in any of the physical conditions (such as removal of vegetation) within the area affected by the project. Potential impacts to sensitive natural communities or riparian habitat that have the potential to be impacted are discussed in detail below.

A total of 350.20 acres of terrestrial vegetation communities would be impacted, and 210.20 acres would be avoided by the proposed project, as shown in Exhibit 3.4-8. Impacts to terrestrial vegetation communities are shown below in Table 3.4-2. No sensitive natural vegetation communities will be impacted by the project.

Table 3.4-2: Impacts and Avoidance of Terrestrial Vegetation Communities within the Project Site

Vegetation Community	Impacted Acreage	Avoided Acreage	Total Acreage
Annual Brome Grassland	343.50	196.30	539.80
Developed	5.6	2.60	8.20
Valley Oak Woodland*	0.0	7.0	7.0
California Goldfields—Dwarf Plantain—Small Fescue Flower Fields	0.2	1.4	1.6
Eucalyptus Woodland	0.0	1.5	1.5
Alkali Weed-Salt Grass Playas and Sink*	0.0	1.4	1.4
Ruderal	0.9	0.0	0.9
Total	**350.20**	**210.20**	**560.40**

Note:
* Sensitive Natural Community

A total of 1.041 acres of aquatic resources would be impacted by the project, and 4.035 acres would be avoided, as shown in Exhibit 3.4-9. Impacts to aquatic resources are shown in Table 3.4-3 below.

Table 3.4-3: Impacts and Avoidance of Aquatic Resources within the Project Site

Aquatic Resource Type	Impact Acreage	Avoidance Acreage	Total Project Acreage
Intermittent Drainage (Sand Creek)	0.005	1.896	1.901
Pond	0.000	1.373	1.373
Seasonal Wetland	0.680	0.333	1.013
Ephemeral Drainage	0.076	0.397	0.473
Seasonal Wetland Swale	0.280	0.006	0.286
Seep	0.000	0.030	0.030
Total	**1.041**	**4.035**	**5.076**

Note:
[1] Rounding may result in small summation errors.

Sand Creek flows through the project site. In addition, ephemeral tributaries, seasonal wetland pools, wetland seeps, seasonal wetlands, and intermittent drainages also occur across the site. Of the approximately 5.076 acres of aquatic resources mapped within the project site, 1.041 acres would be impacted by the proposed project, and 4.035 acres would be avoided in the open space areas.

Because the proposed project may result in the fill or disturbance of these 1.041 acres of aquatic resources, implementation of MM BIO-3 is required to reduce potential impacts through consultation with State and federal regulatory agencies an adherence to any compensatory permitting requirements imposed. Impacts related to effects on aquatic resources would be less than significant with implementation of mitigation.

Level of Significance Before Mitigation

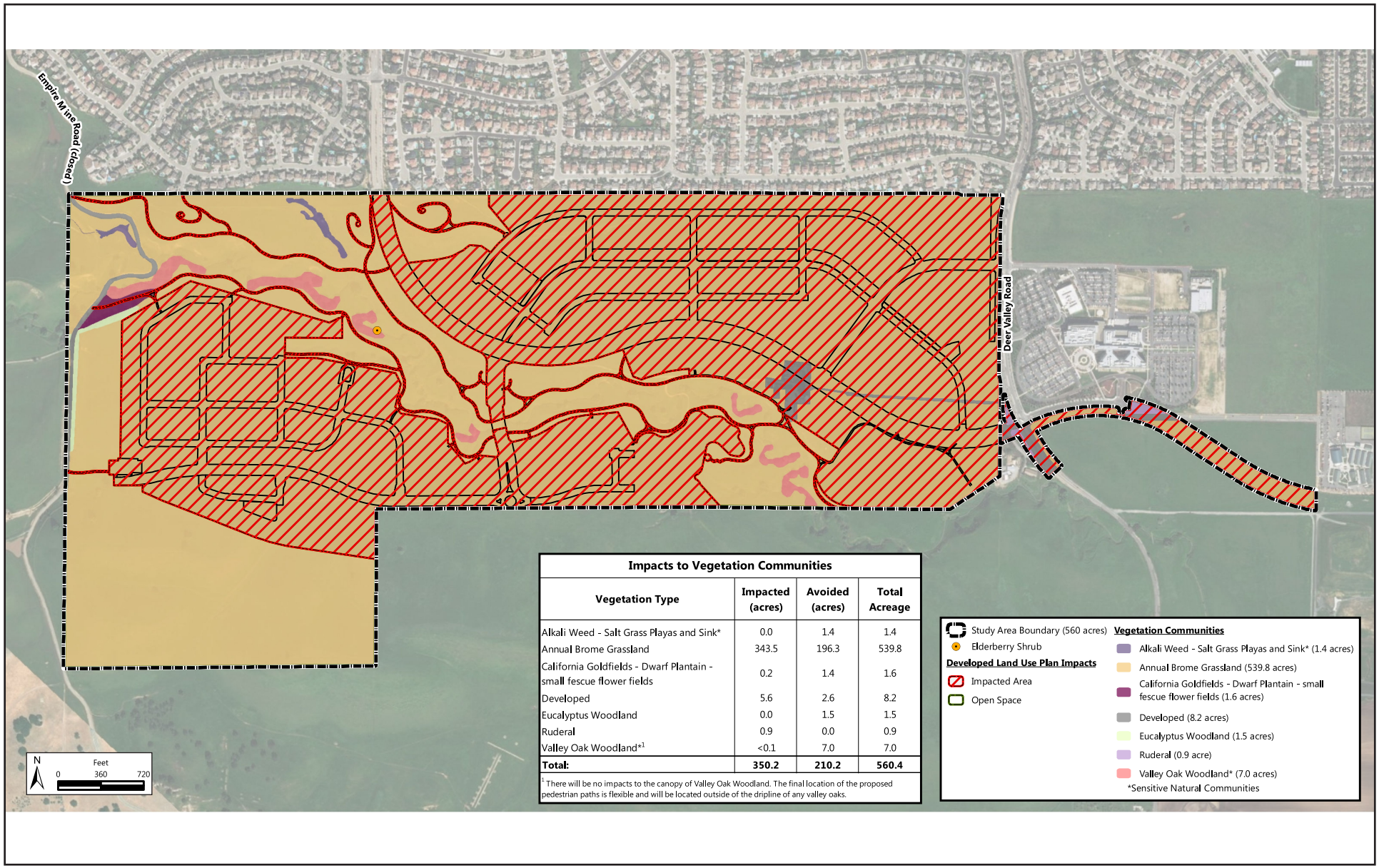
Less Than Significant

Mitigation Measures

Implementation of MM BIO-3 below.

Level of Significance After Mitigation

Less Than Significant



Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-8
Vegetation Communities Impacts

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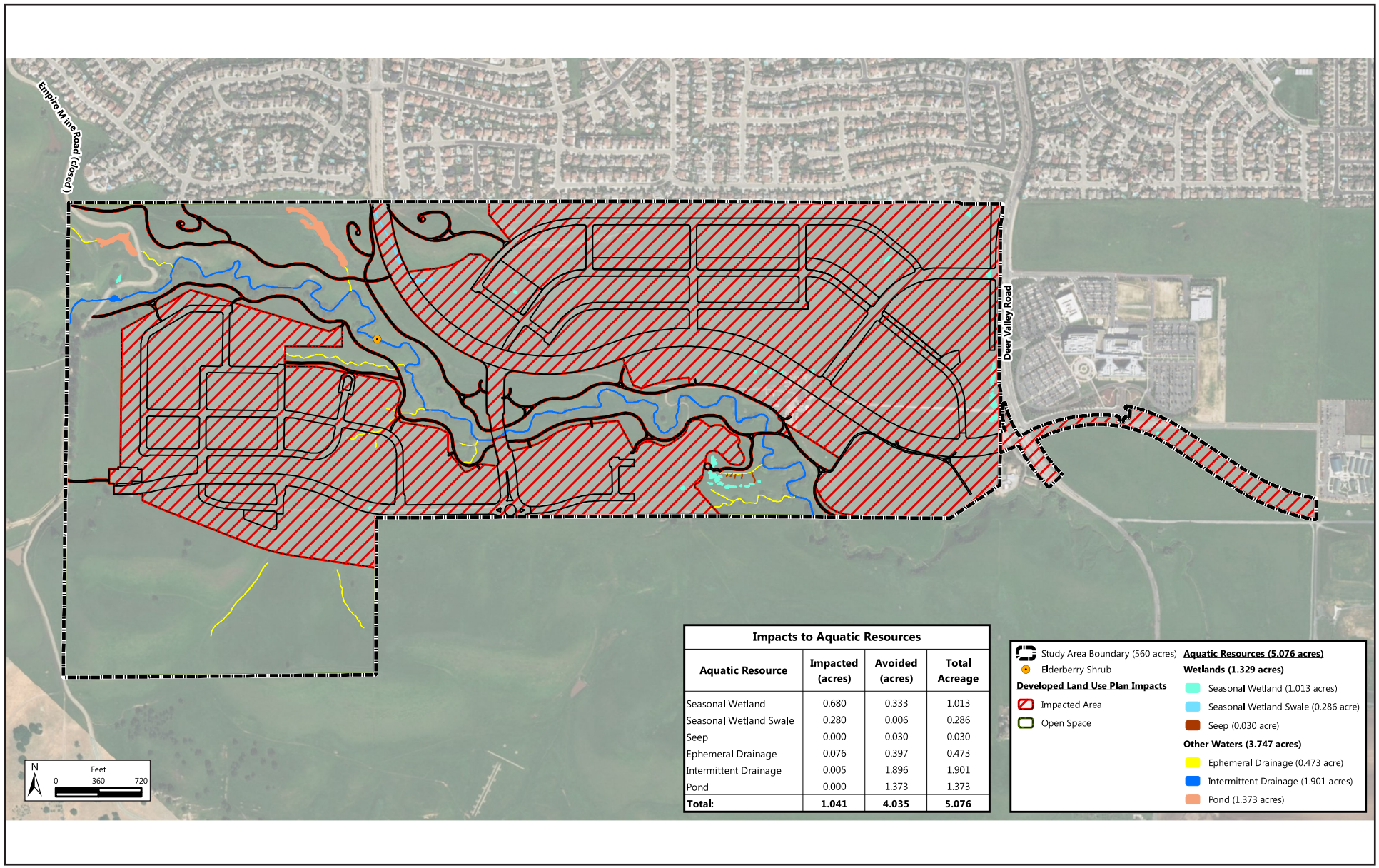

Source: Madrone Ecological Consulting, LLC (Madrone) September 2019.

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Exhibit 3.4-9
Aquatic Resources Impacts

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Wetlands

Impact BIO-3: **The project could have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool coastal, etc.) through direct removal, filling, hydrological interruption, or other means.**

Construction/Operation

Impacts to State or federally protected wetlands would be considered significant if the proposed project operations resulted in a substantial, adverse change in any of the physical conditions (i.e. fill) of wetlands.

A total of 5.076 acres of aquatic resources have been mapped within the project site, including the Off-site Improvement area. As mentioned above, 1.041 acres will be impacted by the proposed project, and 4.035 acres will be avoided and preserved within open space areas.

Furthermore, 3.948 acres of potentially jurisdictional waters of the United States have been mapped and verified by the USACE within the project site, which includes 1.901 acres of intermittent tributary (Sand Creek), 0.340 acre of ephemeral tributary (tributaries to Sand Creek), 1.372 acres of impoundment, 0.303 acre of seasonal wetland pool, and 0.030 acre of wetland seep. An additional 1.111 acres of non-jurisdictional waters were also verified by the USACE within the project site, which includes 0.132 acre of non-tributary ephemeral drainage, 0.286 acre of isolated wetland drainage, 0.588 acre of seasonal wetland pool, and 0.105 acre of non-wetland seasonal pool.

Prior to any impacts to these features, both a Section 404 permit and a Section 401 water quality certification permit would need to be obtained from the USACE and RWQCB, respectively.

Although the proposed project would include development of much of the upland areas within the project site, the areas classified as jurisdictional seasonal wetland pools, wetland seeps, and impoundments would be preserved within open space areas on the project site.

Additionally, development within the project site would include setbacks averaging 125 feet from the centerline of Sand Creek (a 250-foot-wide corridor) to avoid potential impacts to the jurisdictional ephemeral and intermittent wetland areas associated with Sand Creek. Although disturbance within Sand Creek and wetland areas would be generally avoided, the proposed project would include development of up to two vehicle bridges, a pedestrian bridge, and two outfall structures in or over Sand Creek. Construction of up to two vehicle bridges and the pedestrian bridge are anticipated to include the placement of riprap to secure the sides of the creek, which would be considered a fill of wetland areas associated with Sand Creek. The proposed locations of each of the bridge improvements are identified on each of the land plan exhibits. The proposed locations of the stormwater outfall structures are shown in Appendix H (Stormwater Control Plan).

In addition, there is a very small seasonal wetland (approximately 0.016 acre) just south of Kaiser Permanente Antioch Medical Center that will be filled as part of the off-site improvements for the proposed project. Considering the above, the proposed project may result in fill or other disturbance of waters of the United States and waters of the State, and the project would result in a significant impact to waters of the United States and waters of the State. Implementation of MM BIO-3 would

reduce impacts to on- and off-site wetlands to a less than significant level through consultation with State and federal regulatory agencies an adherence to any compensatory permitting requirements imposed as part of the issuance of a 404 permit, 401 water quality certification, and 1602 Lake and Streambed Alteration Agreement. This would ensure that aquatic resources would be reduced to a less than significant level through minimization and avoidance measures.

Level of Significance Before Mitigation

Potentially Significant

Mitigation Measures

MM BIO-3 Prior to the issuance of a grading permit for the project, the project Applicant shall obtain all required resource agency approvals for the project, including as follows:

The project Applicant shall obtain for a Section 404 permit from the United States Army Corps of Engineers (USACE). Waters that will be impacted shall be replaced or rehabilitated on a "no-net-loss" basis. Habitat restoration, rehabilitation, and/or replacement shall be at a location and by methods acceptable to the USACE.

The project Applicant shall apply for and obtain a Section 401 water quality certification from the Regional Water Quality Control Board (RWQCB) and adhere to the certification conditions.

The project Applicant shall apply for and obtain a Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW). The information provided will include a description of all of the activities associated with the proposed project, not just those closely associated with the drainages and/or riparian vegetation. Impacts will be outlined in the application and are expected to be in substantial conformance with the impacts to biological resources outlined in this document. Impacts for each activity will be identified as temporary or permanent with a description of the proposed mitigation for the associated biological resource impacts. Information regarding project-specific drainage and hydrology changes resulting from project implementation will be provided as well as description of stormwater treatment methods. Minimization and avoidance measures shall be proposed as appropriate and may include preconstruction species surveys and reporting; protective fencing around avoided biological resources; worker environmental awareness training; seeding disturbed areas adjacent to open space areas with native seed; and installation of project-specific stormwater Best Management Practices (BMPs). Mitigation may include restoration or enhancement of resources on- or off-site, purchase of habitat mitigation credits from an agency-approved mitigation/conservation bank, purchase of off-site land approved by resource agencies for mitigation, working with a local land trust to preserve land, or any other method acceptable to the CDFW.

Level of Significance After Mitigation

Less Than Significant

Fish and Wildlife Movement Corridors

Impact BIO-4: **The project would not 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 wildlife nursery sites.**

Construction

Wildlife corridors are linear and/or regional habitats that provide connectivity to other natural vegetation communities within a landscape fractured by urbanization and other development. Wildlife corridors have several functions. First, wildlife corridors provide avenues along which wide-ranging animals can travel, migrate, and breed, allowing genetic interchange to occur. Second, populations can move in response to environmental changes and natural disasters. Last, individuals can recolonize habitats from which populations have been locally extirpated. All three of these functions can be met if both regional and local wildlife corridors are accessible to wildlife. Regional wildlife corridors provide foraging, breeding, and retreat areas for migrating, dispersing, immigrating, and emigrating wildlife populations. Local wildlife corridors also provide access routes to food, cover, and water resources within restricted habitats.

The project is centered around Sand Creek, which is located within the greater Lone Tree Valley. The Creek itself does not provide habitat for endangered fish such as salmon as it only fills after rain, and then almost immediately ceases flow. In short, its flow is too intermittent to provide habitat for fish. However, Lone Tree Valley represents a potential wildlife corridor for highly mobile vertebrate species to move from the lower foothills of the San Joaquin Valley to suitable habitat within the hills to the north and east of Mount Diablo (Black Diamond Mines Regional Preserve area). Special-status species such as California tiger salamander, California red-legged frog, western pond turtle, American badger, and San Joaquin kit fox as well as common species such as Columbian black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and gray fox (*Urocyon cinereoargenteus*) may also use the Lone Tree Valley and the Sand Creek corridor for seasonal or daily migration. Much of the existing Lone Tree Valley within the project site will be developed with residential neighborhoods and roads. These features may lead to a decrease in special-status and common species migration. This could lead to species populations being cut off from potential breeding locations and may lead to a bottleneck in gene flow. Additionally, it may also lower the likelihood of species such as San Joaquin kit fox from recovering from portions of their historic range (Black Diamond Mines Regional Preserve). Notably, however, wildlife that uses the annual grasslands on the project site as a movement corridor will be still be able to use the Sand Creek corridor, the Restricted Development Area (open space) on the southern portion of the site, and the annual grassland surrounding the project site for dispersal. Furthermore, the entire northwestern portion of the site, where a number of aquatic resources are located just north of Sand Creek, will remain undeveloped in open space. Also, the Sand Creek Corridor will not be developed for the project; it will be fully preserved with an average 125-foot-wide set back from center of the stream throughout the project area (a 250-foot-wide corridor). The vehicular bridges connecting the southern development area to the northern development area and the pedestrian bridge located near the norther detention basin are planned to span Sand Creek. Thus, any use of the Creek bed for wildlife corridor will remain unimpeded. The off-site infrastructure area is a small, disjunct area along existing roads and infrastructure and is not likely used as a major wildlife

movement corridor. Still, certain species will experience reduced annual grasslands due to the project development footprint. Therefore, implementation of MM BIO-4 is required to ensure that impacts related to wildlife movement corridors would be less than significant. With implementation of MM BIO-4, the proposed project would have less than significant impacts related to wildlife movement because it would allow unimpeded movement of species through the existing Sand Creek Corridor.

Operation

Impacts to migration as a result of project operation have the potential to occur. As mentioned above under the construction analysis, the proposed project would incorporate a 250-foot-wide corridor along Sand Creek. Additionally, implementation of MM BIO-4, which would reduce migratory hindrance through limiting the locations of temporary and permanent fencing included in the project, would reduce impacts to a less than significant level.

Level of Significance Before Mitigation

Potentially Significant

Mitigation Measures

MM BIO-4 No permanent or temporary fencing shall be erected that will hinder migratory wildlife from utilizing the Sand Creek corridor. Utility and bridge crossings of Sand Creek shall be designed to be free spanning of the creek.

Level of Significance After Mitigation

Less Than Significant

Local Biological Resources Policies/Ordinances Consistency

Impact BIO-5: The project could conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Construction/Operation

An on-site tree survey was conducted in 2015 by certified arborist Ed Brennan, which identified 16 tree species and 255 individual trees.[74] Attachment E of the updated BRA in Appendix D provides a map of the trees within the project site. (There are no trees located within the off-site improvement area). Approximately 181 of the 255 trees identified within the project site are native trees as identified in the City of Antioch Tree Ordinance.

The native trees in the project site consist of native oaks (coast live oak, blue oak, valley oak, and interior live oak) and California buckeye. Various planted and ornamental trees such as blue gum eucalyptus, manna gum, black locust, and others also exist in the project site.

[74] Brennan, E. 2015. Tree Preservation Report for The Ranch, Antioch, California. Prepared for Richland Communities, Inc. July 29, 2015.

Some of the planted and ornamental trees are protected under the City of Antioch Tree Ordinance as "mature trees" or "landmark trees" because the trees exceed the 26-inches diameter at breast height (DBH) or 48 inches DBH respective thresholds.

The eucalyptus tree windrow located on the western border of the project site will be preserved. Most of the native oak trees are located within the Sand Creek Corridor setback areas and will be preserved. However, there are 13 trees located within the footprint of the project site that may need to be removed for project infrastructure purposes. (See Attachment E of the updated BRA in Appendix D for a map of the trees and a table of the tree survey data). These trees include eight non-native trees and five native trees. The project Applicant will work with the design team to preserve and incorporate as many of these trees into the project design as feasibly possible; the City will review any proposed tree removals as part of the entitlement process. Implementation of MM BIO-5 would ensure that local trees within the project would remain protected. As such, impacts would be less than significant.

Level of Significance Before Mitigation

Potentially Significant

Mitigation Measures

MM BIO-5 The project Applicant shall preserve and incorporate existing trees into the project design to the extent feasible. If any Protected Trees (i.e., indigenous trees, street trees, mature trees, and/or landmark trees) are required to be removed due to project-related activities, the removal shall be mitigated in accordance with the City of Antioch Code of Ordinances Title 9, Chapter 5, Article 12 Section 9-5.1205: Tree Preservation and Regulation by either paying the requisite fee as outlined in the City's ordinance, or through conducting on-site plantings at the ratios required by the City's Tree Ordinance.

Efforts shall be made to save trees where feasible. This shall include the use of retaining walls, planter islands, pavers, or other techniques commonly associated with tree preservation. The Improvement Plans shall include a note and show placement of temporary construction fencing around trees to be saved: The project Applicant shall install a 4-foot tall, brightly colored (typically orange), synthetic mesh material fence (or an equivalent) approved by the City at the following locations prior to any construction equipment being moved on-site or any construction activities taking place: at the limits of construction; outside the Protected Zone of all native oaks, California buckeye, or landmark trees; within 50 feet of any grading, road improvements, underground utilities, or other development activity; or as otherwise shown on the tentative subdivision map. Any encroachment within these areas, including Protected Zones of trees to be saved, shall first be approved by the City of Antioch Community Development Director. Grade cuts and fills, hardscapes, structures, and utility lines shall be located outside of the drip line of any trees being preserved. All required protective fencing shall be installed prior to the commencement of grading any particular phase.

Level of Significance After Mitigation

Less Than Significant

Habitat/Natural Community Conservation Plan Consistency

Impact BIO-6:	**The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.**

Construction/Operation

In July 2007, the ECCC HCP/NCCP was adopted by Contra Costa County, other member cities, the USFWS, and the CDFW. The City of Antioch, however, declined to participate in the HCP/NCCP. While the City is attempting to obtain coverage under the ECCC HCP/NCCP, the process is long, and the City is only in the beginning stages. Thus, the project site is not located in an area with an approved HCP/NCCP, or local, regional, or State HCP.

If the City has adopted an HCP prior to the start of project construction, and both the City and all resource agencies have approved the HCP, the proposed project would be required to comply with all provisions of the HCP to the extent such impacts could be mitigated by the HCP, and compliance would reduce any impacts to a less than significant level. However, because no HCP/NCCP currently governs the project site, construction impacts related to the consistency with a conservation plan would have no impact on any such plan.

Level of Significance

No Impact

3.4.6 - Cumulative Impacts

The geographic scope of the cumulative impact assessment on biological resources is the approximately 2,800-acre Sand Creek Focus Area. The Focus Area includes Lone Tree Valley, Horse Valley, and Sand Creek, which meanders generally in a west-east direction. The project site is 551.5 acres, and thus comprises approximately 19 percent of the entire Focus Area. However, only 346 acres of the project site (or 12 percent of the total Focus Area) would be developed under the proposed project, and a 250-foot-wide corridor along Sand Creek would be preserved.

Special-status Plant Species

According to Exhibit 3.4-7, implementation of the proposed project would result in the loss of 2.666 acres of shining navarretia. It is unknown whether the plant occurs elsewhere on the unsurveyed portions of the cumulative area. As a result, the project's contribution to the cumulative loss of shining navarretia would be potentially cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-1 would reduce the project's cumulative contribution to the loss of shining navarretia to a less than significant level.

Special-status Wildlife Species

The proposed project and the Focus Area as a whole provides habitat for many special-status wildlife species including Crotch and western bumblebee, vernal pool fairy shrimp, vernal pool tadpole

shrimp, valley elderberry longhorn beetle, California tiger salamander, California red-legged frog, western spadefoot, western pond turtle, Northern California legless lizard, Alameda whipsnake, coast horned lizard, nesting and foraging raptors and songbirds (including western burrowing owl and Swainson's hawk), roosting bats, American badger, and San Joaquin kit fox.

The valley elderberry longhorn beetle lives in elderberry shrubs. As noted above, only one on-site elderberry shrub has been identified and it would be fully avoided by the proposed project as it is located within the Sand Creek corridor and not within development limits. However, to ensure full protection of elderberry shrubs (and any potential beetles), MM-BIO-2c shall be implemented. Thus, the proposed project would have less than significant contribution to any cumulative impact to the valley elderberry longhorn beetle.

The project area has a very low potential for Crotch bumblebee, western bumblebee, northern California legless lizard, Alameda whipsnake, coast horned lizard, American badger, and San Joaquin kit fox. Furthermore, MM BIO-2a, BIO-2h, BIO-2-i through 2-l, BIO-2o and BIO-2p would ensure avoidance and minimization measures should these species be encountered on-site. Thus, the project's cumulative impacts to these species is less than significant.

Like much of the Sand Creek Focus Area, the project site contains suitable habitat for California red-legged frog, western pond turtle, and nesting raptors and songbirds including burrowing owl. However, all suitable aquatic habitat for California red-legged frog and western pond turtle (barring 0.005 acres where the bridges would be constructed) would be avoided by the proposed project. Avoidance and minimization measures would also be implemented to avoid nesting birds and raptors. With the implementation of the proposed avoidance and minimization measures for these species contained in MM BIO-2e, MM BIO-2g, and MM BIO-2i through MM BIO-2l, the proposed project's cumulative impacts to these species is less than significant.

The proposed project would impact approximately 0.680 acre of suitable habitat for vernal pool tadpole shrimp and vernal pool fairy shrimp and avoid 0.333 acre. It is unknown how many acres of suitable habitat for vernal pool tadpole shrimp and vernal pool fairy shrimp are present within the entire Focus Area. The proposed project's contribution to the cumulative loss of vernal pool tadpole shrimp and vernal pool fairy shrimp could be potentially cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-2b would reduce the project's cumulative contribution to a less than significant impact on vernal pool and tadpole shrimp.

The proposed would impact approximately 0.423 acre of aquatic and 344.6 acres of upland habitat for California tiger salamander (approximately 12.7 percent of the Focus Area). It is assumed that most, if not all, of the upland habitats within of the Focus Area represents suitable upland habitat for California tiger salamander. The proposed project's contribution to the cumulative loss of California tiger salamander would be cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-2d would reduce the project's cumulative contribution to a less than significant impact on the California tiger salamander.

The proposed project would impact approximately 0.423 acre of suitable habitat for western spadefoot. It is unknown how many acres of suitable habitat for western spadefoot are present

within the entire Focus Area. The proposed project's contribution to the cumulative loss of western spadefoot could be potentially cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-2f would reduce the project's cumulative contribution to a less than significant impact on the western spadefoot.

The proposed project would impact approximately 344.6 acres of suitable foraging habitat for raptors including Swainson's hawk (approximately 12.7 percent of the Focus Area). It is assumed that most, if not all, of the upland habitats within the Focus Area represents suitable foraging habitat for Swainson's hawk. The proposed project's contribution to the cumulative loss of foraging habitat for Swainson's hawk would be cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-2i would reduce the project's cumulative contribution to a less than significant impact on the Swainson's hawk.

The proposed project would impact potential bat roost habitat consisting of large trees and structures, however, it is unknown how many bat roosts are present within the entire Focus Area. The proposed project's contribution to the potential cumulative loss of bat roosts could be potentially cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-2n would reduce the project's cumulative contribution to a less than significant impact on roosting bats.

Additionally, the proposed project has the potential to impact special-status species during operation. Projects located within the Sand Creek Focus Area would be required implement mitigation similar to MM NOI-1, MM NOI-1c, and MM NOI-1d to reduce potential cumulative operational impacts to a less than significant level.

Adherence to the mitigation measures related to special-status plant and wildlife species identified above would reduce all potentially cumulatively considerable impacts to a less than significant level.

Sensitive Natural Communities or Riparian Habitat

Sensitive natural communities within the Focus Area are primarily the oak woodlands to the west of the proposed project, woodlands in the narrow riparian fringe along Sand Creek, and the alkaline sinks that are scattered throughout the Focus Area. Sensitive natural communities within the project site include valley oak woodland (in a narrow riparian fringe along Sand Creek) and several Alkali Weed-Salt Grass Playas and Sinks. All of these would be avoided by project development. With avoidance of Sand Creek, the proposed project in conjunction with other projects would not result in cumulative impacts to sensitive natural communities or riparian habitat. Therefore, the proposed project would have less than significant cumulative impacts to Sensitive Natural Communities or riparian habitat. (See below for cumulative impacts to aquatic resources.)

Aquatic Resources

The majority of aquatic resources within the Focus Area are comprised of Sand Creek itself, and ponds that have been constructed on tributaries to the creek. All of these aquatic resources have been avoided by construction within the Focus Area to date, and this project also proposes to largely avoid those resources. Small depressional seasonal wetlands are scattered throughout the

grasslands in the Focus Area; these are the resources primarily impacted by construction to-date and proposed for impact by the proposed project. The proposed project would impact approximately 1.041 acre of aquatic resources, including seasonal wetlands, a large seasonal wetland swale (which formed as the result of adjacent development to the north), ephemeral and intermittent drainages, and a small portion of Sand Creek. Because it is unknown how many acres of aquatic resources are present within the entire Focus Area, the proposed project's contribution to the cumulative loss of aquatic resources could be potentially cumulatively considerable, and thus, a potentially significant cumulative impact. MM BIO-3 would reduce the proposed project's cumulative contribution to a less than significant impact on aquatic resources by requiring the project Applicant to conduct surveys, to obtain regulatory permits, and to mitigate all impacts to aquatic resources to a less than significant level.

Fish and Wildlife Movement Corridors

Fish are not present in Sand Creek given it only has intermittent flows after storms. Accordingly, the proposed project would not have any impact on fish migration.

However, development within the project site and the Sand Creek Focus Area could lead to a decrease in special-status and common species migration due to the creation of urban landscapes that could act as barriers. This could lead to species populations being cut off from potential breeding locations and may lead to a bottleneck in gene flow and may also lower the likelihood of species such as San Joaquin kit fox to reoccupy portions of their historic range (Black Diamond Mines Regional Preserve). The Sand Creek corridor and Horse Valley are the most important corridors for wildlife movement within the Sand Creek Focus Area. The proposed project would not affect Horse Valley in any way. In addition, the proposed project has been designed to protect and preserve a 250-foot-wide corridor abutting Sand Creek to ensure free flow of wildlife within and adjacent to it. Moreover, the majority of the southern portion of the project site, as well as a large swath of land along the western boundary of the project site would be designated as open space and serve as a continued wildlife corridor to adjacent open space areas. As such, any wildlife movement occurring within the Sand Creek Focus Area would not be minimally affected by the proposed project as a wide corridor for movement would be available.

Finally, MM BIO-4 would prohibit any exclusionary fencing from being installed along the creek corridor which could prohibit migration throughout the open space corridor provided. Accordingly, the proposed project in conjunction with other projects in the Focus Area would not result in a cumulatively significant impact to wildlife movement corridors.

Local Tree Policies or Ordinances

The proposed project, in addition to other development projects in the City of Antioch would be subject to compliance with the City of Antioch Tree Ordinance and policies outlined in the General Plan related to biological resources. Compliance of the project and cumulative projects to the City of Antioch Tree Ordinance and general plan policies, in addition to providing mitigation for the loss of any trees would reduce potential impacts to a less than significant level. The proposed project would comply with all policies and ordinances in place for purposes of protecting biological resources.

Thus, cumulative impacts regarding conflicts with local, regional, or state policies or ordinances protecting biological species would be less than significant.

Habitat and Natural Community Conservation Plan Consistency

The City of Antioch does not participate in the HCP/NCCP, but is in the process of adopting an HCP/NCCP, which mirrors the East Contra Costa HCP/NCCP. Thus, the proposed project is not inconsistent with any HCP/NCCP as there is not one that governs. If and/or when Antioch adopts an HCP/NCCP, the proposed project has been conditioned to comply with the biological requirements and mitigate accordingly, to the extent the HCP/NCCP would fully mitigate the biological impacts at issue. Similarly, cumulative projects in the City of Antioch would be required to comply with all provisions of the HCP/NCCP if adopted by the City of Antioch and if construction occurs after the time of adoption, to the extent the HCP/NCCP would fully mitigate the impacts sought to be mitigated. Therefore, cumulative projects in conjunction with the project would not conflict with an HCP or NCCP. Cumulative impacts would be less than significant.

Level of Cumulative Significance Before Mitigation

Potentially Significant (Special-status Plant Species, Special-status Wildlife Species, Aquatic Resources)

Cumulative Mitigation Measures

Implementation of MM BIO-1a through MM BIO-1p, MM BIO-3, MM BIO-4 MM NOI-1b, MM NOI-1c, and MM NOI-1d.

Level of Cumulative Significance After Mitigation

Less Than Significant