MATHER SPECIFIC PLAN PROJECT

Supplemental Draft Environmental Impact Statement

Prepared by
U.S. Army Corps of Engineers
Sacramento District

April 2015

TABLE OF CONTENTS

Mather Specific Plan Project
Supplemental Draft EIS

		Page
1.	**Introduction**	**1-1**
1.1	Background and Purpose of the Supplemental Draft Environmental Impact Statement	1-1
1.2	Content of the Supplemental Draft EIS	1-2
1.3	Relationship to the Draft EIS	1-2
3.0	**Affected Environment**	**3-1**
3.5	Biological Resources	3.5-1
3.6	Aquatic Resources	3.6-1
4.0	**Environmental Consequences**	**4-1**
4.5	Biological Resources	4.5-1
4.6	Aquatic Resources	4.6-1
5.0	**Consultation, Coordination and List of Preparers**	**5-1**

Appendices

H. Mather Air Force Base Transfer Biological Opinion

List of Figures

3.5-1	Habitat Types on the Project Site	3.5-3
3.5-2	Suitable Vernal Pool Habitat and Critical Habitat	3.5-21
3.5-3	Distribution of Vernal Features by Rank	3.5-24
3.5-4	Vernal Features Ranking	3.5-25
3.6-1	Waters of the U.S.	3.6-2
3.6-2	Soil Types	3.6-3
4.5-1	Potential Effects to Habitat for Vernal Pool Species – Alternative A	4.5-3
4.5-2	Potential Effects to Habitat for Vernal Pool Species – Alternative B	4.5-17
4.5-3	Potential Effects to Habitat for Vernal Pool Species – Alternative C	4.5-27
4.6-1	Potentially Affected Waters of the U.S. – Alternative A	4.6-3
4.6-2	Potentially Affected Waters of the U.S. – Alternative B	4.6-7
4.6-3	Potentially Affected Waters of the U.S. – Alternative C	4.6-13

Page

List of Tables

3.5-1	Habitat Types within Project Site	3.5-2
3.5-2	List of Potentially Affected Species	3.5-12
3.5-3	Critical Habitat within the Mather Core Recovery Area	3.5-20
3.6-1	USACE Jurisdictional Features within the Project Site	3.6-5
4.5-1	Effects to Habitat for Vernal Pool Species – Alternative A	4.5-2
4.5-2	Habitat Compensation Requirements by Land Use Type – Alternative A	4.5-6
4.5-3	Effects to Mather Recovery Area Habitat – Alternative A	4.5-9
4.5-4	Effects to Vegetation and Habitats – Alternative A	4.5-10
4.5-5	Effects to Habitat for Vernal Pool Species – Alternative B	4.5-15
4.5-6	Habitat Compensation Requirements by Land Use Type – Alternative B	4.5-20
4.5-7	Effects to Mather Recovery Area Habitat – Alternative B	4.5-21
4.5-8	Effects to Vegetation and Habitats – Alternative B	4.5-22
4.5-9	Effects to Habitat for Vernal Pool Species – Alternative C	4.5-25
4.5-10	Habitat Compensation Requirements by Land Use Type – Alternative C	4.5-29
4.5-11	Effects to Mather Recovery Area Habitat – Alternative C	4.5-30
4.5-12	Effects to Vegetation and Habitats – Alternative C	4.5-31
4.6-1	Effects to Waters of the U.S. - Alternative A	4.6-2
4.6-2	On-Site Preservation - Alternative A	4.6-5
4.6-3	Preservation to Impact Ratio - Alternative A	4.6-5
4.6-4	Effects to Waters of the U.S. - Alternative B	4.6-9
4.6-5	On-Site Preservation - Alternative B	4.6-10
4.6-6	Preservation to Impact Ratio - Alternative B	4.6-10
4.6-7	Effects to Waters of the U.S. - Alternative C	4.6-11
4.6-8	On-Site Preservation - Alternative C	4.6-12
4.6-9	Preservation to Impact Ratio - Alternative C	4.6-12

CHAPTER 1
Introduction

1.1 Background and Purpose of the Supplemental Draft Environmental Impact Statement

In June 2012, the U.S. Army Corps of Engineers (USACE), Sacramento District published the Mather Specific Plan Project Draft Environmental Impact Statement (EIS), pursuant to the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508); USACE NEPA regulations (33 CFR Part 230); and Implementation Procedures for the USACE Regulatory Program (33 CFR Part 325, Appendix B).

The Sacramento County (County) Office of Economic Development and Marketing, as the Applicant, submitted to the USACE seven separate permit applications for implementation of the Mather Specific Plan (i.e., the Applicant's Preferred Alternative). The land within the boundaries of the Mather Specific Plan (hereafter referred to as the "project site") includes approximately 5,749 acres in eastern Sacramento County, California. The Draft EIS assessed the potential impacts to the human environment that may result from implementing three mixed-used development alternatives (including the Applicant's Preferred Alternative) and a No Action alternative. The three mixed-use development alternatives include the following land uses: airport commercial, commercial development, parks and recreation, aggregate extraction, university village/residential, regional sports park and infrastructure, including roadways. Under the No Action alternative, infill development at Mather Airport and aggregate extraction in the southwestern corner of the project site could occur.

Following publication of the Draft EIS, a re-delineation of waters of the U.S. was conducted which added aquatic features and revised the shape or size of other aquatic features within the project site. USACE jurisdictional features identified within the project site increased from 198.5 acres to 208.8 acres.

The CEQ Regulations for Implementing NEPA require a supplemental EIS when:

- The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or,
- There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, or,

- When the agency determines that the purposes of NEPA will be furthered by doing so (40 CFR Section 1502.9[c]).

USACE has determined that the increased acreage of waters of the U.S. identified within the project site represents significant new information relevant to environmental concerns and that circulation of a supplemental Draft EIS would further the purposes of NEPA. As this information relates to the biological and aquatic resources sections of the Draft EIS, USACE has determined that these sections should be recirculated.

1.2 Content of the Supplemental Draft EIS

The Supplemental Draft EIS consists of the chapters and sections described below.

Chapter 1, Introduction: Chapter 1 describes the purpose and organization of the Supplemental Draft EIS.

Section 3.5, Biological Resources: This section updates the Affected Environment discussion for Biological Resources, including special-status species.

Section 3.6, Aquatic Resources: This section updates the Affected Environment discussion for Aquatic Resources.

Section 4.5, Biological Resources: This section updates the Environmental Consequences discussion for Biological Resources, including special-status species.

Section 4.6, Aquatic Resources: This section updates the Environmental Consequences discussion for Aquatic Resources.

Chapter 5, Consultation, Coordination and List of Preparers: This chapter identifies the agencies and authors involved in preparation of this Supplemental Draft EIS.

1.3 Relationship to the Draft EIS

The Draft EIS was circulated for a 45-day public review period from June 29, 2012 to August 13, 2012. A public meeting on the Draft EIS was conducted by USACE from 4 p.m. to 7 p.m. on July 25, 2012, in Main Conference Room A at 10590 Armstrong Avenue, Mather, California 95655. During the public review period, comments were received on the Draft EIS.

The Supplemental Draft EIS will also be circulated for a 45-day public review period. Written comments during the review period should be sent to the following address:

Kathleen Dadey
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1350
Sacramento, California 95814
email: Kathleen.A.Dadey@usace.army.mil

If comments are provided via e-mail, please include the “Mather Specific Plan EIS” in the subject line, attach comments in MS Word format and include the commenter’s address.

Following public review of the Supplemental Draft EIS, a Final EIS will be prepared in which USACE will provide responses to substantive comments on the Draft and Supplemental Draft EIS and describe any revisions. The Final EIS will be made available for public review.

After public review, USACE intends to make a permit decision regarding the proposed infrastructure, and other decisions as appropriate, and publish a Record of Decision.

This page intentionally left blank

CHAPTER 3.0
Affected Environment

This page intentionally left blank

3.5 Biological Resources

The assessment of existing conditions and analysis of potential effects is based upon field surveys, a review of applicable databases, species literature, and several technical reports. The profiles of biological resources in this section provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**. This section focuses upon special-status species and their habitats. Additional information about wetlands and other waters of the U.S. that are regulated under Section 404 of the Clean Water Act is addressed in **Section 3.6**, Aquatic Resources.

3.5.1 Existing Setting

3.5.1.1 Regional Setting

The project site is located along the eastern edge of the Sacramento Valley within the Sacramento Valley Vernal Pool Region. The project site is also located in the Hardpan Terraces ecological subregion. Regional natural plant communities within this subregion include California annual grassland, needlegrass grassland and northern hardpan vernal pools. Climate is typically hot and semi-arid to subhumid. Mean annual precipitation is approximately 10 to 25 inches. Mean annual temperature ranges from 58 to 62 degrees Fahrenheit (Miles and Goudey, 1997).

3.5.1.2 Project Site Setting

The project location and general setting are described in **Section 1.2**. The project region is characterized as primarily flat with a discernible slope towards the southwest; however the project site exhibits a slightly undulating topography characterized by vernal swales and pools intersected by small drainages and creeks. Overall, site elevations range from 65 feet above sea level in the southwestern corner to 150 feet above sea level along the eastern border (U.S. Geological Survey [USGS], 1980 and 1992).

3.5.1.3 Vegetative Communities and Wildlife Habitats

The plant community descriptions and nomenclature used in this section generally follow the classification system of *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988) and the classification provided in Sawyer and Keeler-Wolf's *A Manual of California Vegetation* (1995). The California Wildlife Habitat Relationships (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly occurring birds, mammals, reptiles, and amphibians.

A number of biological studies have been conducted previously within portions of the project site. These resulted in the following reports: *Mather Field Airport Natural Resources Assessment* (Wetlands Research Associates, 2004c), *Final Report for Mather Field Vernal Pool Study* (Jones & Stokes, 2001), and the *South Mather Wetlands Management Plan* (Sacramento County, 2012). In addition, wetlands and other waters of the U.S. were delineated in 2004 (Wetlands Research Associates, 2004a and 2004b). In 2011, an additional delineation was conducted which re-evaluated the two previous delineations and added additional aquatic features (Sacramento

County, 2011). In 2012 and 2013, another re-delineation was conducted which added aquatic features and revised the shape or size of other aquatic features (Sacramento County, 2013). Aquatic features on the project site were re-verified by the Corps in February 2013.

Vegetation within the project site was also classified through remote sensing techniques by Sacramento County for the South Sacramento Habitat Conservation Plan (Sacramento County, 2007). Existing vegetation types within the project site were derived from these data sources in addition to field investigations. Field conditions were verified by ESA biologists in July 2010 and subsequently mapped (**Figure 3.5-1** and **Table 3.5-1**).

TABLE 3.5-1
HABITAT TYPES WITHIN PROJECT SITE

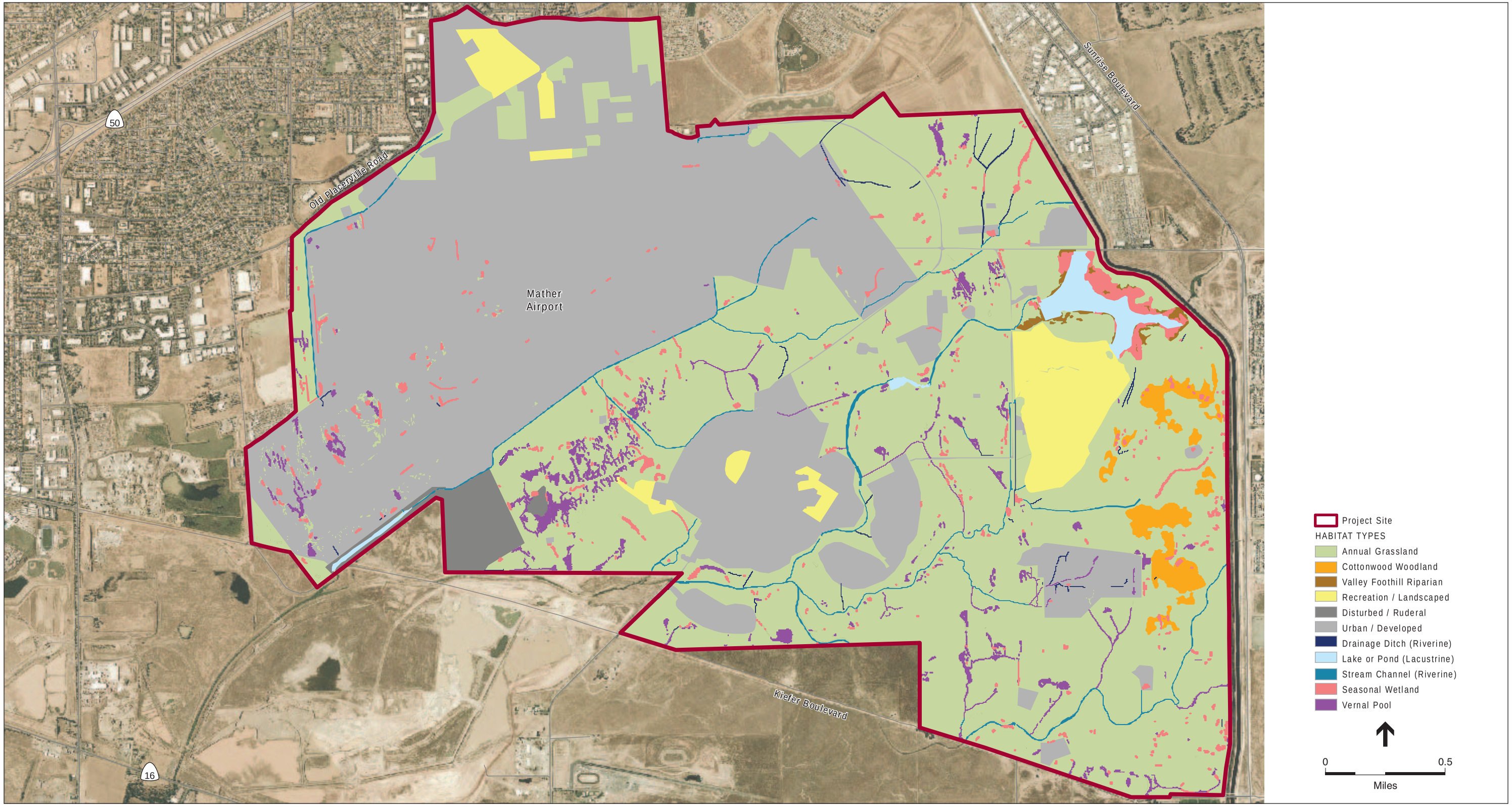
Habitat Type	Acres[1]	Percent Composition
Annual Grassland	2775.8	48.3%
Cottonwood Woodland	72.7	1.3%
Disturbed / Ruderal	87.3	1.5%
Drainage Ditch (Riverine)	2.5	<0.1%
Lake / Pond (Lacustrine)	40.9	0.7%
Recreation / Landscaped	216.7	3.8%
Seasonal Wetland	61.53	1.1%
Stream Channel (Riverine)	29.9	0.5%
Urban/Developed	2,373.6	41.3%
Valley Foothill Riparian	14.4	0.3%
Vernal Pool / Vernal Swale	73.9	1.3%
Total	**5749.4**	**100.0%**

[1]All acres approximate.
SOURCE: Sacramento County, 2007; Sacramento County, 2013; ESA, 2013

Annual Grassland / California Annual Grassland Series

Annual grassland habitat type makes up the majority of the project site. Annual grasslands have been modified by past land uses, including off-road vehicle use, military uses and dumping. Other areas were modified by grading activities conducted for roadway improvements, residential developments, recreation facilities, and construction of the Folsom South Canal. This vegetation type is dominated by non-native annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that have replaced native perennial grasslands and scrub as a result of human disturbance. On the project site, non-native annual grassland surrounds vernal pool complexes, providing an important upland element that may be used for species movement and dispersal between pools.

Common grass species that have been documented within the project site include silver hairgrass (*Aira caryophyllea*), slender wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and Italian ryegrass (*Lolium multiflorum*). Native wildflowers documented in the project site include elegant brodiaea (*Brodiaea elegans*), Fremont's tidy-tips (*Layia fremontii*), miniature lupine (*Lupinus bicolor*), vinegar weed (*Trichostema lanceolatum*), white-tipped clover



SOURCE: WRA, 2004a; WRA, 2004b; NAIP, 2006; Sacramento County, 2013; and ESA, 2013

Mather Specific Plan Project Supplemental Draft EIS . 209259

Figure 3.5-1
Habitat Types on the Project Site

This page intentionally left blank

(*Trifolium variegatum*), white hyacinth (*Triteleia hyacinthina*), and butter and eggs (*Triphysaria eriantha*). Invasive plants documented in the project site include yellow starthistle (*Centaurea solstitialis*), milk thistle (*Silybum marianum*), Italian thistle (*Carduus pycnocephalus*), medusahead grass (*Taeniatherum caput-medusae*), yellow glandweed (*Parentucellia viscosa*), barbed goatgrass (*Aegilops triuncialis*), and stinkwort (*Dittrichia graveolens*).

Cottonwood Woodland / Fremont Cottonwood Series

Within the project site, this habitat type occurs in scattered patches near the east boundary within historically disturbed areas. This community also occurs as patches along some of the intermittent streams where oaks are sometimes present within the open canopy (WRA, 2004c).

Fremont cottonwood (*Populus fremontii*) is the sole or dominant tree in the canopy of this native vegetation community. The canopy is continuous or open and the understory is variable, typically consisting of annual grassland species or scattered coyote brush (*Baccharis pilularis*) shrubs. While this community typically occurs where soils are intermittently or seasonally flooded or saturated, such as riparian areas, within the project site it is not associated with a more typical riparian or wetland community and primarily occurs where groundwater is shallow. Other native species that are present in these stands include narrowleaf willow (*Salix exigua*), arroyo willow (*S. lasiolepis*), and California sycamore (*Platanus racemosa*), although in many of these stands the understory is lacking a shrub component and consists primarily of annual grassland species (WRA, 2004c).

Disturbed / Ruderal

This habitat type includes those areas that have been substantially graded, excavated, or in other ways disturbed by past land uses. Within the project site, this includes old settling ponds near the southwest corner. These areas are currently barren or support weedy species such as prickly lettuce (*Lactuca serriola*), hyssop loosestrife (*Lythrum hyssopifolia*), curly dock (*Rumex crispus*), wild radish (*Raphanus sativus*), and black mustard (*Brassica nigra*).

Drainage Ditches and Stream Channels (Riverine)

Various types of ditches and drainages are found on the project site, including roadside ditches and storm drains. Morrison Creek is the primary stream channel within the project site. Various small ephemeral tributaries also feed into Morrison Creek. These riverine communities are typically characterized by a mixture of species commonly found in lacustrine, seasonal wetland, and freshwater marsh communities.

Common species found within or adjacent to these channels include water primrose (*Ludwigia peploides*), willow smartweed (*Persicaria lapathifolia*), and algae. Along channel edges and on banks common species include creeping spikerush (*Eleocharis macrostachya*), Bermuda grass (*Cynodon dactylon*), pennyroyal (*Mentha pulegium*), Italian ryegrass, Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), and hyssop loosestrife. Within more heavily disturbed roadside ditches and drainages, a variety of ruderal species as described in the disturbed / ruderal community are also present.

Lakes / Ponds (Lacustrine)

Open water, or lacustrine, habitat in the project site occurs in Mather Lake, a small impoundment of a tributary to Morrison Creek. The margins of Mather Lake also support emergent marsh, seasonal wetlands, and riparian species.

Recreation

Within the project site, recreation habitats include Mather Golf Course and several small community parks. Mather Golf Course provides limited habitat opportunities for wildlife, with turf, landscape trees, and open water being the primarily habitat constituents. Landscaped areas typically receive a high degree of maintenance, including mowing, chemical application, irrigation, and pest control. It is similar to urban landscapes due to the high amount of human activity.

Seasonal Wetland

The seasonal wetland vegetation community has some similarities to the vernal pool habitat type (see below), but differs due to differences in topography, duration of inundation, and/or plant species composition. This community occurs in shallow depressions within annual grassland (either due to natural topographic features or previous site disturbance) or in man-made drainage ditches and supports annual hydrophitic plant species, but generally in much lower numbers and/or with much less native species diversity than that of vernal pools. Within the project site, common plant species in the seasonal wetland community include Vasey's coyote thistle, Fitch's spikeweed (*Centromadia fitchii*), and creeping spikerush, but the dominant plant species include non-native plants such as Mediterranean barley, Italian ryegrass, and hawkbit (*Leontodon saxatilis*).

Urban / Developed

Within the project site, urban habitats make up the second largest habitat type. Urban habitats include Mather Airport and surrounding developed areas, the Independence at Mather residential development, communication facilities, roadways, and other paved areas. While some of these areas include patches of annual grassland habitat (such as areas at the end of the airport runway), they are functionally serving as urban environments due to the high amount of human activity within their immediate vicinity.

Urban or developed habitats are those dominated by plant species introduced by humans and established or maintained by human disturbances or activities. On such sites, the native vegetation has been removed and replaced by landscaping or urban development. Grassy areas are common, and generally consist of Kentucky bluegrass (*Poa pratensis*), red top (*Agrostis alba*), and creeping red fescue (*Festuca rubra*). Various shrub species have been planted, including juniper (*Juniperus* sp.) and oleander (*Nerium oleander*). Landscape trees are common in the residential areas and include ash species (*Fraxinus* spp.), gum trees (*Eucalyptus* spp.), poplars (*Populus* spp.), fan palms (*Washingtonia filifera*), cedars (*Cedrus* spp.), and several pine species (*Pinus* spp.).

Valley Foothill Riparian / Mixed Willow Series

This native vegetation community consists of an open to dense, broadleafed, winter-deciduous shrubby streamside thicket dominated by Fremont cottonwood and arroyo willow. The densest

stands have little understory or herbaceous component but do support occasional patches of emergent species including rushes, sprikerushes, bulrush, and cattail, while the more open stands have grassy understories vegetated by non-native annual grass species. Within the project site, this vegetation community most commonly occurs as patches along the shores of Mather Lake (WRA, 2004c).

Vernal Pool

Vernal pools are ephemeral wetlands that form in shallow depressions underlain by an impervious or restrictive soil layer near the surface that impedes the percolation of water. Vernal pools pond during the wet season and become dry in late spring or early summer. Germination and growth begin with winter rains, often continuing even when inundated. The vernal pools within the project site have been classified as northern hardpan vernal pools (Holland, 1986), and have formed on old, very acidic, iron-silica cemented hardpan soils.

Vernal pools are present throughout the project site, however the highest density and, in general, highest functioning vernal pools are present between Mather Airport and Independence at Mather. Additional discussion regarding vernal pool functions within the project site is included in **Section 3.5.1.7**, Suitable Habitat for Vernal Pool Species. Within the proposed Preserve, there are two different groups of vernal pools (eastern vs. western) that are distinguished by elevation and soil types.

Vernal pools within the eastern part of the proposed Preserve occur on thin, rocky soils mainly classified as Redding Gravelly Loam. These pools tend to be shallow and pond water for a shorter period of time, relative to pools in other parts of the proposed Preserve. They also tend to be more similar to those pools located outside of the proposed Preserve to the east within the proposed University Village and Regional Sports Park land use areas. These pools are typically vegetated by white navarretia (*Navarretia leucocephala*) and other vernal pool plant species including Fremont's goldfields (*Lasthenia fremontii*), slender popcorn-flower (*Plagiobothrys stipitatus*), and dwarf woolly-heads (*Psilocarphus brevissimus*). There are also substantial blooms of Douglas' mesamint (*Pogogyne douglasii*) among these pools. While this plant does not have a special-status ranking, it is restricted in Sacramento County to only a handful of locations. Two special-status plant species that have been documented within these pools are described in Section 3.5.1.6. These are Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) and Boggs Lake hedge-hyssop (*Gratiola heterosepala*).

Pools found in the western part of the proposed Preserve differ in that they occur at a lower elevation and are concentrated on soils mainly mapped as Hedge Loam soils. These pools are also affected by hydrologic modifications created by a berm running through the vernal pools in an east/west direction along the route of an existing sewer pipeline. These pools are inundated longer and support a different suite of species than other pools within the proposed Preserve (WRA, 2004c). The plant species observed within these pools are dominated by vernal pool buttercup (*Ranunculus bonariensis* var. *trisepalus*). There is also a large component of iris-leaf rush (*Juncus xiphioides*) due to the longer ponding duration. The vast majority of the legenere (*Legenere limosa*) populations, a special-status species, occur among these pools. Other plant species

observed include creeping spikerush, coyote thistle (*Eryngium castrense*), and smooth goldfields (*Lasthenia glaberrima*).

Pools within the proposed Airport Commercial Area are similar in size to pools found in the western part of the proposed Preserve, have formed on similar soils, and support a similar suite of plants. Pools in protected areas west of the Mather Airport runway more closely resemble pools found in the eastern part of the proposed Preserve and are characterized by similar plant species composition, soils, and geomorphic settings. Both legenere and Ahart's dwarf rush have been reported from these pools (WRA, 2004a).

Additionally, the project site contains a number of features that have been previously mapped as "vernal marsh" and "vernal swale" (WRA, 2004a). Vernal marshes are similar to vernal pools in that they support many of the same species; however, the growing season for vernal marsh vegetation is typically later than in vernal pools, with peak blooms occurring into the late spring and early summer, one to two months after the peak vernal pool flowering period. This native vegetation community consists of low-growing hydrophytic plant species, dominated (more than 50 percent cover) by perennial species but also containing annual herbs. Within the project site, this vegetation community generally occurs in depressions deeper than those which support northern hardpan vernal pool or seasonal wetland vegetation communities (WRA, 2004b). The dominant species in this community are creeping spikerush and/or iris-leaved rush, both native emergent perennial plants; other common native species observed in these aquatic features on the project site include dwarf woolly-heads and Vasey's coyote thistle (*Eryngium vaseyi*) (WRA, 2004b).

Vernal swales are somewhat linear, concave depressions that form in topographically complex grasslands and commonly connect to vernal pools, seasonal wetlands, or water courses. Vernal swales are characterized by soil and hydrologic conditions similar to those of vernal pools; vernal swales are found throughout the project site and generally support many of the same plants as vernal pools.

The vernal pools in the project site have the potential to support a number of special-status plant species, including slender Orcutt grass (*Orcuttia tenuis*) and Sacramento Orcutt grass (*Orcuttia viscida*). In particular, the larger, deeper vernal pools which retain water until May or June provide optimal conditions for all member of the Orcuttieae tribe (USFWS, 2005).

Many of the wildlife species occurring in vernal pools are adapted to ephemeral habitat conditions. A number of invertebrates have been observed in and around the vernal pools on site and include aquatic beetles (*Dystiscidae* and *Hydrophilidae*), snails (*Gastropoda*), clam shrimp (*Cyzicus californicus*), seed shrimp (*Ostracoda*), dragon flies (*Anisoptera*), and solitary bees (*Andrenidae*), as well as special-status species such as vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), California linderiella (*Linderiella californica*), midvalley fairy shrimp (*Branchinecta mesovallensis*) and Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*). Additional species of wildlife are discussed in Section 3.5.1.5.

3.5.1.4 Sensitive Habitats

For the purpose of this EIS, sensitive habitats include a) areas of special concern to federal, state, or local agencies, b) areas regulated under Section 404 of the federal Clean Water Act, and c) areas protected under state and local regulations and policies. Federally designated critical habitat for species listed under the ESA is discussed in Section 3.5.1.6 below. Habitat types on the project site that would be considered sensitive by regulatory agencies include vernal pools and vernal swales, other seasonal wetlands, and valley foothill riparian areas. Riparian habitats are considered by state and federal regulatory agencies to represent a sensitive and declining resource. There are scattered oaks throughout the project site, some of which are locally protected by the Sacramento County Tree Ordinance.

3.5.1.5 Wildlife

Approximately 20 species of mammals have been recorded in the project site (USAF, 1992). Species common to the site include the black-tailed jackrabbit (*Lepus californicus*), Audobon's cottontail (*Sylvilagus audobonii*), raccoon (*Procyon lotor*), and California ground squirrel (*Otospermophilus beecheyi*). Coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), and badger (*Taxidea taxus*) have also been documented. Other mammals that commonly occur include Botta's pocket gopher (*Thomomys bottae*), broad-footed mole (*Scapanus latimanus*), California meadow vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), and deer mouse (*Peromyscus maniculatus*).

Various bird species are known to make use of the project site, many as year-round residents and many as winter residents and transient visitors. Raptors on the site are generally transient rather than residents due to the lack of suitable nesting sites. The red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), sharpshinned hawk (*Accipiter striatus*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), great-horned owl (*Bubo virginianus*), and short-eared owl (*Asio flammeus*) have all been documented on the site. Prairie falcons (*Falco mexicanus*) may occasionally hunt on the site. The burrowing owl (*Athene cunicularia*) is known to nest in open areas of the project site. Additional species that have been observed foraging in the area include golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), white-tailed kite (*Elanus leucurus*), and loggerhead shrike (*Lanius ludovicianus*).

Mather Lake and other waters attract numerous waterfowl species, including mallards (*Anas platyrhynchos*), teals (*Anas* spp.), American coots (*Fulica americana*), common mergansers (*Mergus merganser*), and hooded merganser (*Lophodytes cucullatus*). Wading birds such as the great blue heron (*Ardea herodias*) are attracted to the lake's shallow shoreline and abundant prey. The belted kingfisher (*Ceryle alcyon*) also preys on the lake's fish. Birds that inhabit the project site's grasslands include the western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocephalus*), yellow-billed magpie (*Pica nuttalli*), California quail (*Callipepla californica*), and mourning dove (*Zenaida macroura*). Many birds that are well-adapted to urban environments inhabit residential and landscaped areas. These species include the house sparrow (*Passer domesticus*), barn swallow (*Hirundo rustica*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), American crow (*Corvus brachyrhynchos*) and rock pigeon (*Columba livia*).

Snakes assumed to be present within the project site include the California kingsnake (*Lampropeltis getula californiae*), Pacific gopher snake (*Pituophis catenifer catenifer*), western rattlesnake (*Crotalus viridis*), and western yellow-bellied racer (*Coluber constrictor mormon*). The northwestern pond turtle (*Clemmys marmorata marmorata*) has been documented within Mather Lake, and likely occurs in Morrison Creek during wet periods. Southern alligator lizard (*Elgaria multicarinata*) and western fence lizard (*Sceloporus occidentalis*) have also been observed in the project site. Amphibians known to occur on the project site include spadefoot (*Spea hammondii*), western toad (*Bufo boreas*), Sierran treefrog (*Pseudacris sierra*), and bullfrog (*Rana catesbeiana*).

3.5.1.6 Wildlife Corridors

Wildlife corridors are established migration routes commonly used by resident and migratory species for passage from one location to another. Maintaining the continuity of established wildlife corridors is important to a) sustain species with specific foraging requirements, b) preserve a species' distribution potential, and c) retain diversity among many wildlife populations. Habitat loss, fragmentation, and degradation resulting from a change in land use or habitat conversion can alter the use and viability of wildlife movement corridors. According to Beier and Loe (1992), wildlife habitat corridors should fulfill several functions. They should maintain connectivity for daily movement, travel, mate-seeking, and migration; plant propagation; genetic interchange; population movement in response to environmental change or natural disaster; and recolonization of habitats subject to local extirpation.

The riparian corridors along Morrison Creek and its tributaries provide suitable habitat for resident wildlife, but do not provide for large-scale migratory movement, and/or dispersal for common or rare fish and wildlife species due to fragmentation caused by Douglas Road, Eagles Nest Road, Independence at Mather, Kiefer Boulevard and Excelsior Road.

The overall value of the project site as a wildlife movement corridor for terrestrial wildlife is limited by these roads and residential development and existing land uses surrounding the project site, including residential, industrial and commercial uses.

The vernal pool landscape in the southern and eastern portions of the project site provides an important connection to other areas of vernal pool habitat to the south. This includes those areas within the Mather Core Area of the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005). Providing continuity with the larger vernal pool landscape to the south is important to ensure that vernal pool species on the project site do not become isolated geographically and genetically from neighboring populations.

3.5.1.7 Potentially Affected Species and Habitats

Methodology

A list of special-status plant and wildlife species that have the potential to occur within the vicinity of the project site was compiled based on a background information search for previously documented special-status species within the project vicinity. The California Natural Diversity Database (CNDDB) Rarefind program (California Department of Fish and Game [CDFG], 2012) and the U.S. Fish and Wildlife Service (USFWS) online list (USFWS, 2012b) were queried for the Carmichael and Buffalo Creek, California 7.5-minute quadrangles (**Appendix D**). Project site habitats were also evaluated for their suitability to support special status species. The results of these assessments are summarized in **Table 3.5-2**. Conclusions regarding habitat suitability and species occurrence are based on a reconnaissance-level assessment conducted by ESA biologists in the summer of 2010, as well as previous survey results, existing literature and database searches. Potentially affected species are shown in **bold**.

Federally-Listed Species

Federally-listed species are plants and animals that are legally protected under ESA (see Section 3.5.2.1 below) and include the following:

- Plants or animals listed or proposed for listing as threatened or endangered under ESA (50 Code of Federal Regulations [CFR] §17.12 [listed plants], §17.11 [listed animals] and various notices in the Federal Register [FR; proposed species]).
- Plants or animals that are candidates for possible future listing as threatened or endangered under ESA (61 FR 40, February 28, 1996).

Based on a review of special-status fish, wildlife and plant species in the Carmichael and Buffalo Creek 7.5-minute quadrangles (USFWS, 2012b), a total of six federally listed and protected species have the potential to occur within the project region. Of these, two are known to occur within the project site (vernal pool fairy shrimp and vernal pool tadpole shrimp). Federally listed and protected species that may be affected by the proposed alternatives include:

Listed Species

- vernal pool fairy shrimp (*Branchinecta lynchi*), Threatened
- valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Threatened
- vernal pool tadpole shrimp (*Lepidurus packardi*), Endangered
- slender Orcutt grass (*Orcuttia tenuis*), Threatened
- Sacramento Orcutt grass (*Orcuttia viscida*), Endangered

Protected Species

- Golden eagle (*Aquila chrysaetos*), Protected under the Bald Eagle Protection Act

TABLE 3.5-2
LIST OF POTENTIALLY AFFECTED SPECIES

Species	Status Federal/ State/ CNPS	Suitable Habitat	Potential for Project to Effect
FEDERALLY LISTED SPECIES			
Invertebrates			
Branchinecta conservatio **Conservancy fairy shrimp**	FE/--/--	Occurs in large, turbid vernal pools in the northern two-thirds of the Central Valley. Pools are typically astatic and are formed in old, braided alluvium.	Not likely to affect. Currently this species does not occur in the Mather Core area.
Branchinecta lynchi **Vernal pool fairy shrimp**	FT/--/--	Occurs in vernal pools, seasonally ponded areas within vernal swales, rock outcrop ephemeral pools, playas and alkali flats from Shasta County through most of the length of the Central Valley to Tulare County. Pools are grass or mud bottomed, with clear to tea-colored water, and are often in basalt flow depression pools in grasslands	May effect. Suitable habitat is present in the project site and the species has been recorded from several vernal pools within the project site.
Desmocerus californicus dimorphus **Valley elderberry longhorn beetle**	FT/--/--	Breeds and forages exclusively on elderberry shrubs (*Sambucus mexicana*) typically associated with riparian forests, riparian woodlands, elderberry savannas, and other Central Valley habitats. Occurs only in the Central Valley of California. Prefers to lay eggs in elderberries 2–8 inches in diameter; some preference shown for "stressed" elderberries.	May effect. Suitable habitat is present in the project site. There are no known occurrences of this species within project site. The nearest recorded occurrence is 1.5 miles north of the project site.
Lepidurus packardi **Vernal pool tadpole shrimp**	FE/--/--	Occurs in vernal pools containing clear to highly turbid water.	May effect. Suitable habitat is present in the project site and the species has been recorded from numerous vernal pools within the project site.
Fish			
Hypomesus transpacificus Delta smelt	FT/ST/--	Open surface waters in the Sacramento/San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Found in Delta estuaries with dense aquatic vegetation and low occurrence of predators.	No effect. No suitable habitat within the project site.
Oncorhynchus mykiss Central Valley steelhead	FT/--/--	This evolutionary significant unit (ESU) enters the Sacramento and San Joaquin Rivers and their tributaries from July to May; spawning from December to April. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.	No effect. No suitable habitat within the project site.
Oncorhynchus tshawytscha Central Valley spring-run Chinook salmon	FT/ST/--	This ESU enters the Sacramento and San Joaquin Rivers and tributaries March to July; spawning from late August to early October. Young move to rearing areas in and through the Sacramento and San Joaquin Rivers, Delta, and San Pablo and San Francisco Bays.	No effect. No suitable habitat within the project site.

TABLE 3.5-2
LIST OF POTENTIALLY AFFECTED SPECIES

Species	Status Federal/ State/ CNPS	Suitable Habitat	Potential for Project to Effect
Oncorhynchus tshawytscha Sacramento River winter-run Chinook salmon	FE/SE/--	This ESU enters the Sacramento River December to May; spawning peaks May and June. Upstream movement occurs more quickly than in spring run population. Young move to rearing areas in and through the Sacramento River, Delta, and San Pablo and San Francisco.	No effect. No suitable habitat within the project site.
Amphibians			
Ambystoma californiense California tiger salamander, central population	FT/CSC/--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.	Not likely to affect. Suitable habitat exists in the project site, although populations have not been documented in this area and surveys of pools have not detected larvae of this species. The nearest recorded occurrence is 12.5 miles southeast of the project site
Rana draytonii California red-legged frog	FT/CSC/--	Breeds in slow moving streams, ponds, and marshes with emergent vegetation and an absence or low occurrence of predators.	Not likely to affect. Potential habitat for this species (perennial streams, ponds, and Mather Lake) is populated by exotic predators, such as bullfrogs and centrarchids. There are no known occurrences in the project site vicinity.
Reptiles			
Thamnophis gigas Giant garter snake	FT/CT/--	Found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields, and occasionally in slow-moving creeks in California's interior.	Not likely to affect. Project site is located outside of the extant range of this species and the nearest recorded occurrence is approximately 10 miles to the southwest. Ditches are well maintained and provide limited habitat opportunities for the species.
Birds			
Aquila chrysaetos **Golden eagle**	BEPA/CFP/--	Forages in open terrain such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats.	May effect. Suitable nesting habitat is not present; however the species has been observed foraging within the project site along Eagles Nest Road.
Plants			
Orcuttia tenuis **Slender Orcutt grass**	FT/CE/1B.1	Small annual grass found in vernal pools in valley and foothill grasslands. Blooms: May-September. Elevation: 100 to 5,750 ft.	May effect. Suitable habitat is present within the project site, although no known occurrences have been recorded within the project site. The nearest recorded occurrence is within one mile of the project site.
Orcuttia viscida **Sacramento Orcutt grass**	FE/CE/1B.1	Small annual grass found in vernal pools in valley and foothill grasslands. Blooms: May-June. Elevation: 100 to 350 ft.	May effect. Suitable habitat is present within the project site, although no known occurrences have been recorded within the project site. The nearest recorded occurrence is within one mile of the project site.
Critical Habitat			
Branchinecta lynchi- **Vernal pool fairy shrimp**	Critical Habitat		May effect. Critical Habitat unit occurs within project site.

TABLE 3.5-2
LIST OF POTENTIALLY AFFECTED SPECIES

Species	Status Federal/ State/ CNPS	Suitable Habitat	Potential for Project to Effect
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	Critical Habitat		No effect. Critical Habitat does not occur near the project site.
***Lepidurus packardi* Vernal pool tadpole shrimp**	Critical Habitat		May effect. Critical Habitat unit occurs within project site.
Oncorynchus mykiss Central Valley steelhead	Critical Habitat		No effect. Critical Habitat does not occur near the project site.
***Orcuttia tenuis* Slender Orcutt grass**	Critical Habitat		May effect. Critical Habitat unit occurs within project site.
***Orcuttia viscida* Sacramento Orcutt grass**	Critical Habitat		May effect. Critical Habitat unit occurs within project site.
STATE/LOCAL PROTECTED SPECIES			
Amphibians			
***Spea hammondii* Western spadefoot**	--/CSC/--	Occurs seasonally in grasslands, prairies, chaparral, and woodlands, in and around wet sites. Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	May effect. Suitable habitat is present in the project site and the species has been recorded from several vernal pools within the project site.
Reptiles			
***Actinemys marmorata marmorata* Western pond turtle**	--/CSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	May effect. Suitable habitat is present in the project site and the species has been recorded within the project site.
Birds			
***Agelaius tricolor* Tricolored blackbird**	--/CSC/--	Nests in colonies within vicinity of fresh water/ marshy areas. Colonies prefer heavy growths of cattails and tules.	May effect. Suitable nesting habitat is present within the project site. The species has been observed south of Mather Lake and along the southeastern border of the project site.
***Asio flammeus* Short-eared owl**	--/CSC/--	Require open country that supports concentrations of rodents and herbaceous cover sufficient to conceal their ground nests from predators. Suitable habitats may include salt- and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures.	May effect. Suitable nesting habitat is present within the project site, and has been documented within the project site.
***Athene cunicularia* Western burrowing owl**	--/CSC/--	Found in open grasslands with low vegetation, golf courses, and disturbed/ruderal habitat in urban areas.	May effect. Suitable nesting habitat is present within the project site, and burrowing owls are known to nest throughout the project site.
***Buteo swansoni* Swainson's hawk**	--/CT/--	Forages in open and agricultural fields and nests in mature trees usually in riparian corridors.	May effect. Suitable nesting habitat is present within the project site, although no known nesting occurrences have been recorded within the project site. The species has been observed foraging over grasslands within the project site.

TABLE 3.5-2
LIST OF POTENTIALLY AFFECTED SPECIES

Species	Status Federal/ State/ CNPS	Suitable Habitat	Potential for Project to Effect
Circus cyaneus **Northern harrier**	--/CSC/--	Forages in grasslands, freshwater marsh; nests in agricultural fields and other open habitat.	May effect. Suitable nesting habitat is present within the project site, although no known nesting occurrences have been recorded within the project site. The species has been observed foraging and perching throughout the project site.
Elanus leucurus **White-tailed kite**	--/CFP/--	Forages in open grasslands and agricultural fields and marshes. Nests in scattered mature trees within foraging habitat.	May effect. Suitable nesting habitat is present within the project site, and the species has been recorded nesting at Mather Lake. The species has been observed foraging throughout the project site.
Lanius ludovicianus **Loggerhead shrike**	--/CSC/--	Breed mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground. Require tall shrubs, trees, fences or power lines for hunting perches; open areas of short grasses, forbs, or bare ground for hunting; and large shrubs or trees for nest placement.	May effect. Suitable nesting and foraging habitat within project site. The species has been observed foraging and perching throughout the project site.
Riparia riparia Bank swallow	--/ST/--	Banks of rivers, creeks, lakes, and seashores; nests in excavated dirt tunnels near the top of steep banks.	No effect. No suitable nesting habitat within the project site.
Mammals			
Taxidea taxus **American badger**	--/CSC/--	Found in dry, open grasslands, fields, and pastures.	May effect. Suitable habitat is present within the project site. Although this species has not been observed within the project site, several dens have been documented in the banks of drainage channels in the project site, one south of Independence at Mather and two east of Eagles Nest Road.
Plants			
Gratiola heterosepala **Boggs Lake hedge-hyssop**	--/CE/1B.2	Annual herb found along the margins of marshes and swamps and in vernal pools with clay soil. Blooms April-August. Elevation: 30 to 7,800 ft.	May effect. Suitable habitat is present within the project site, and the species has been recorded from several vernal pools within the project site. This species has not been observed with the project site since 2000.
Juncus leiospermus* var. *ahartii **Ahart's dwarf rush**	--/--/1B.2	Annual herb found along vernal pool margins and vernal swales. Blooms March-May. Elevation: 100 to 750 ft.	May effect. Suitable habitat is present within the project site, and the species has been recorded from several vernal pools within the project site.
Legenere limosa **Legenere**	--/--/1B.1	Annual herb found in vernal pools. Blooms April-June. Elevation: 0 to 2,900 ft.	May effect. Suitable habitat is present within the project site, and the species has been recorded from several vernal pools within the project site
Sagittaria sanfordii **Sanford's arrowhead**	--/--/1B.2	Perennial, rhizomatous, emergent herb found in marshes, swamps, and assorted shallow freshwater habitats. Blooms: May-October. Elevation: 0 to 2,000 ft.	May effect. Suitable habitat is present within the project site, and this species has been observed growing along a perennially wet drainage within the project site.

TABLE 3.5-2
LIST OF POTENTIALLY AFFECTED SPECIES

Species	Status Federal/ State/ CNPS	Suitable Habitat	Potential for Project to Effect
Natural Communities			
Northern Hardpan Vernal Pool	Natural Community		May effect. Natural community occurs within project site.

STATUS CODES:

Federal
FE = Endangered
FT = Threatened
FC = Candidate
BEPA = Bald Eagle Protection Act

State
CE = Endangered
CT = Threatened
CR = Rare
CFP = Fully Protected
CSC = (CA) Department of Fish and Game Special Concern species

California Native Plant Society
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 = Plants about which we need more information--a review list
List 4 = Plants of limited distribution--a watch list

0.1 = Seriously endangered in California
0.2 = Fairly endangered in California
0.3 = Not very endangered in California

SOURCE: CDFG, 2012, USFWS, 2012b

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp are small, aquatic crustaceans. They feed on algae, bacteria, protozoa, rotifers, and bits of detritus (USFWS, 2010a). Vernal pool fairy shrimp are found in a variety of vernal pool habitats, ranging from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.5 acre. These types of pools are most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands (USFWS, 2010a).

The species is known to occupy a wide range of vernal pool types, thus its historic distribution likely coincided with the historic distribution of Central Valley, southern California, and southern Oregon vernal pools. In California, current known populations extend from Shasta County through most of the Central Valley to Tulare County, and in coastal valleys from Solano County to San Luis Obispo County. A few additional isolated populations exist in southern California. Although vernal pool fairy shrimp are distributed more widely than other listed vernal pool species, they are generally uncommon throughout their range and are rarely abundant where they are found (USFWS, 2005).

Vernal pool fairy shrimp have been recorded from several vernal pools within the project site.

Vernal Pool Tadpole Shrimp

Vernal pool tadpole shrimp are small, aquatic crustaceans, and can be identified by the large, shield-like carapace that covers the anterior half of their bodies. They feed on living organisms such as fairy shrimp and organic detritus (USFWS, 2010a). Compared to other vernal pool crustaceans the vernal pool tadpole shrimp has a long life span, maturing at a minimum of 25 days and taking an average of 54 days to reproduce. Vernal pool tadpole shrimp are found in a variety of vernal pool types, ranging from clear to highly turbid water, temperatures from 50 to 84 degrees Fahrenheit, and sizes from small to very large (USFWS, 2010a). They have been found in a variety of geologic formations and soil types; however, the majority have been found on High Terrace landforms and in Redding and Corning soils (USFWS, 2005).

This species probably historically occurred wherever appropriate vernal pool habitat existed throughout the Central Valley and Central Coast regions (USFWS, 2005). Currently, this species is known to occur within the Central Valley from east of Redding in Shasta County to Merced County, with isolated occurrences in Fresno, Kings, and Tulare Counties. In the Central Coast region they are known from Alameda County and San Francisco National Wildlife Refuge (USFWS, 2005). There are several occurrences recorded in the CNDDB scattered through the Central Valley from Shasta to northwestern Tulare County (CDFG, 2010).

Vernal pool habitat is abundant within the project site, and vernal pool fairy shrimp have been recorded from several vernal pools within the project site.

Slender Orcutt Grass

Slender Orcutt grass is a member of the Orcuttieae tribe in the Poaceae family. It is a small annual grass that grows as single stems or in small tufts and blooms from May to September. As with all

members of the tribe Orcuttieae, slender Orcutt grass seeds can remain dormant for at least three to four years and germinate underwater after they have been immersed for prolonged periods. In general, years of above-average rainfall promote larger populations of Orcuttieae but population sizes vary by species and by pool. Slender Orcutt grass generally occurs in vernal pools between 35 and 1,760 meters in elevation. Large pools that retain water until May or June create optimal conditions for *Orcuttia*, and within such pools Orcutt grass species tend to occur in patches that are devoid of other plant species. The range of this species is primarily limited to the inner north Coast Ranges, the Cascade Range foothills, and the Modoc Plateau, but it is also known to occur in Sacramento County (Hickman, 1993; California Native Plant Society [CNPS], 2010).

Vernal pools on the project site may provide suitable habitat for slender Orcutt grass; however, there are no known populations of this species within the site. The nearest recorded occurrence is less than one mile east of the project site.

Sacramento Orcutt Grass

Sacramento Orcutt grass is another member of the Orcuttieae tribe. It is a small sticky and strongly aromatic annual herb in the grass family that typically flowers from April through June. This species is endemic to vernal pools between 30 and 100 meters in elevation. The life history of this species is nearly identical to that of other species in the tribe Orcuttieae and is summarized under the description of slender Orcutt grass, above. The most significant difference is that this species is less likely to germinate in years of below-normal precipitation than other members of its tribe. The range of this species is limited to Sacramento County (Hickman, 1993; CNPS, 2010).

Vernal pools on the project site may provide suitable habitat for Sacramento Orcutt grass; however, there are no known populations of this species within the project site. The nearest recorded occurrence is less than one mile east of the project site.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is completely dependent on its host plant, elderberry (*Sambucus* spp.), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. The beetle, a wood borer, is rarely observed. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived (USFWS, 1999).

Records for this species are restricted to small, scatted populations along the Sacramento, American, San Joaquin, Kings, Kaweah, and Tule Rivers and their tributaries. However, the species has the potential to occupy shrubs below 3,000 feet in elevation within the Central Valley and Sierra Nevada foothills. For this reason, elderberry shrubs of sufficient size (measuring at least one inch in diameter at ground level) are considered suitable habitat for this species.

Elderberry shrubs are present on the project site which provide suitable habitat for valley elderberry longhorn beetle; however, there are no known occurrences of this species within the project site. The nearest recorded occurrence is 1.5 miles north of the project site.

Golden Eagle

The golden eagle is an uncommon, permanent resident and migrant throughout California (except in the center of the Central Valley where it is a winter visitor). Golden eagles nest in open areas on cliffs and in large trees, often constructing multiple nests in one breeding territory (Zeiner et al., 1988–1990). They forage in open terrain such as grasslands, deserts, savannahs, and early successional stages of forest and shrub habitats (Zeiner et al., 1988–1990).

The grassland habitat within the project site could provide potential winter foraging habitat; however, suitable nesting habitat is absent. A wintering golden eagle was observed foraging adjacent to the project site.

State and Local Special-Status Species

State and local special-status species are plants and animals that are legally protected under the California Endangered Species Act (CESA) or other state or local regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. These species include the following categories:

- Plants or animals listed or proposed for listing by the State of California as threatened or endangered under the CESA (see Section 3.5.2.2 below) (14 California Code of Regulations [CCR] 670.5);
- Plants listed as rare or endangered under the California Native Plant Protection Act (see Section 3.5.2.3 below) (California Fish and Game Code, Section 1900 et seq.);
- Plants that meet the definitions of rare and endangered under the California Environmental Quality Act (CEQA). CEQA Section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if not on one of the official lists (State CEQA Guidelines, Section 15380);
- Plants considered under the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (Lists 1A, 1B, and 2 in CNPS, 2010) (see Section 3.5.2.3 below);
- Animal species of special concern to CDFG (see Section 3.5.2.2 below); and
- Animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]) (see Section 3.5.2.2 below).

Based upon the CNDDB database search for special-status species as well as an analysis of habitat suitability within the project site, ESA identified 14 state and local special-status species that have the potential to occur within and/or adjacent to the project site. These species include western spadefoot, western pond turtle, tricolored blackbird, short-eared owl, western burrowing owl, Swainson’s hawk, northern harrier, white-tailed kite, loggerhead shrike, American badger, Bogg’s Lake hedge-hyssop, Ahart’s dwarf rush, legenere, and Sanford’s arrowhead. A description of suitable habitat and likelihood for development on the project site to affect these species is included in **Table 3.5-2**.

Critical Habitat

The federal Endangered Species Act (ESA) (see Section 3.5.2.1 below) requires the federal government to designate critical habitat for any species it lists under the ESA. Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. Within the project site, critical habitat has been identified for vernal pool fairy shrimp, vernal pool tadpole shrimp, slender Orcutt grass, and Sacramento Orcutt grass. This includes the Mather Unit for vernal pool tadpole shrimp and fairy shrimp, and the Southeast Sacramento Valley Unit for slender Orcutt grass and Sacramento Orcutt grass. The Mather Unit contains all four Primary Constituent Elements (PCE) indentified in the final rule designating critical habitat for vernal pool tadpole shrimp and fairy shrimp while the Southeast Sacramento Valley Unit contains both of the PCE for slender Orcutt grass and Sacramento Orcutt grass (FR 71:7118-7316). The USFWS defines primary constituent elements are those physical and biological features of a landscape that a species needs to survive and reproduce. When designating critical habitat, the USFWS identifies special management considerations as threats or impacts important to management and recovery. The special management considerations identified for these units include: habitat conversion for urban or agricultural uses, changes in hydrology, grazing, off-road vehicle use, and invasive species. The amount of critical habitat within the project site is summarized in **Table 3.5-3** and **Figure 3.5-2**.

TABLE 3.5-3
CRITICAL HABITAT WITHIN THE MATHER CORE RECOVERY AREA

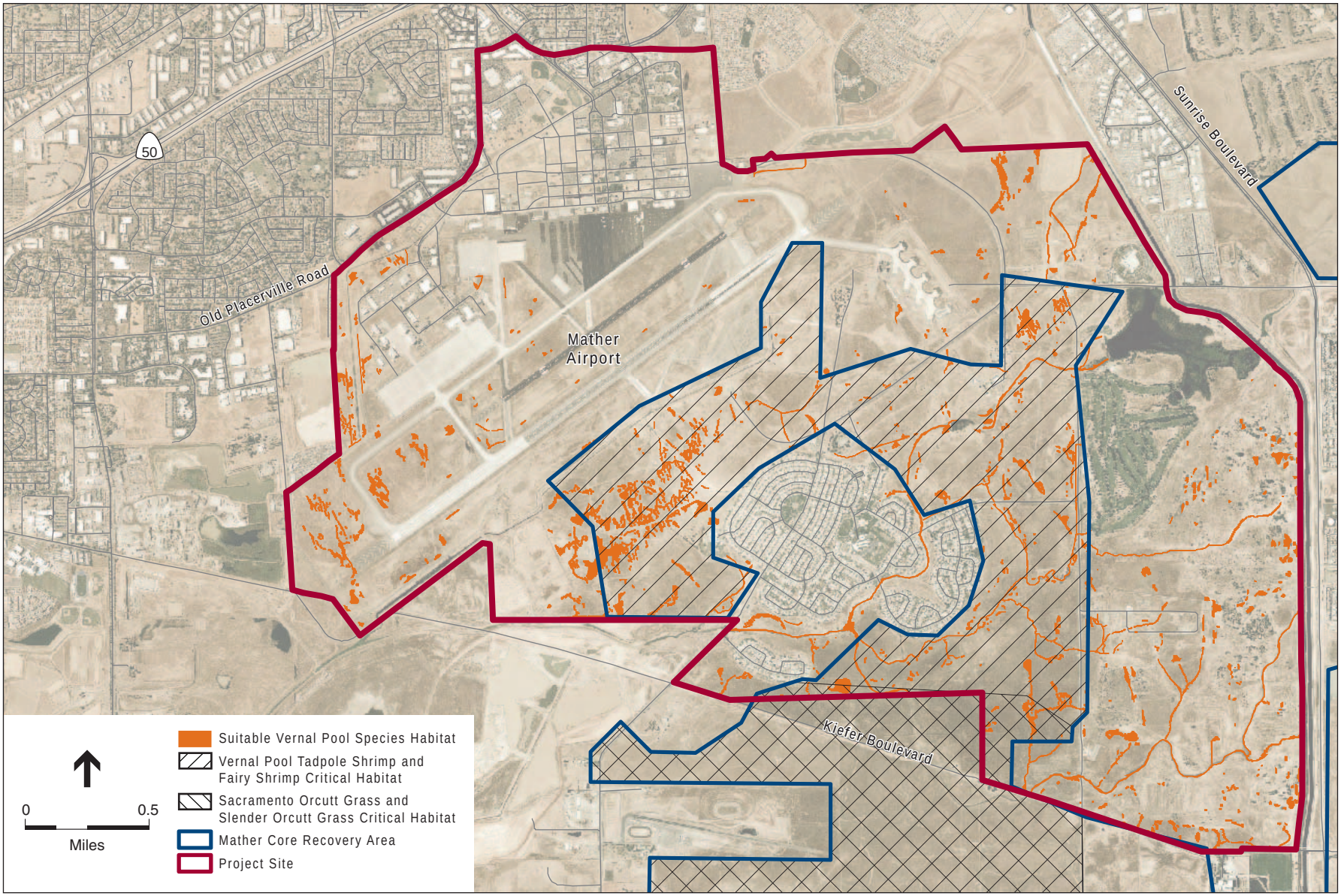
Critical Habitat Unit / Species	Acres within Project Site	Acres of Suitable Habitat
Mather Critical Habitat Unit / Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp	1,362	57.4
Southeast Sacramento Valley Critical Habitat Unit / Slender Orcutt Grass and Sacramento Orcutt Grass	72	4.3

SOURCE: USFWS, 2006; Sacramento County, 2013.

Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon

The *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005) was released by USFWS on December 15, 2005. This plan features 33 species of plants and animals that occur exclusively or primarily within vernal pool ecosystems, including the federally listed vernal pool fairy shrimp, tadpole shrimp and orcutt grasses. The plan outlines recovery priorities and provides goals, objectives, strategies, and criteria for recovery. One of the overall objectives of the recovery plan is to promote natural ecosystem processes and functions by protecting and conserving intact vernal pools and vernal pool complexes. Habitat protection under the recovery plan includes the protection of the topographic, geographic, and edaphic features that support hydrologically interconnected systems of vernal pools, swales, and other seasonal wetlands within an upland matrix that together form hydrologically and ecologically functional vernal pool complexes.

As shown in **Figure 3.5-2**, suitable habitat for vernal pool species is abundant within the project site. Habitat quality ranges from highly suitable for vernal pool species between Mather Airport



SOURCE: NAIP, 2006; Sacramento County, 2013; and ESA, 2013

Figure 3.5-2
Suitable Vernal Pool Habitat and Critical Habitat

and Independence at Mather to marginally suitable. For this evaluation, all seasonal wetlands were considered suitable habitat for vernal pool species, although it is recognized that some seasonal wetlands lack habitat elements necessary for vernal pool species (such as pool depth and duration). In addition, Morrison Creek and its tributaries were considered as suitable habitat due to their function as potential corridors for species dispersal.

The project site is within the Mather Core Recovery Area identified in the recovery plan. Core areas are specific areas USFWS has deemed necessary for preservation to recover listed vernal pool species. This is based on the premise that these areas represent viable populations or will contribute to habitat connectivity and therefore increase opportunities for dispersal and genetic exchange. Recovery efforts are to be focused on the core areas within each vernal pool region. Core areas are further ranked as Zone 1, 2, or 3 in order of their overall priority for recovery. The Mather Core Area is ranked as Zone 1, meaning that it has the highest priority for recovery. Protection of Zone 1 core areas has been designated as a Priority 1 action by USFWS biologists because they believe that within each Zone 1 core area, protection of species occurrences and suitable vernal pool habitat is necessary to prevent extinction or irreversible decline of at least one species covered in the recovery plan.

Core areas were identified as Zone 1 in cases where they were occupied by very narrowly endemic species (i.e., few populations and narrow or disjunct distributions that are known to be, or are likely to be, genetically or ecologically distinct) or where the core area supported a high diversity of the species covered by the plan. The Mather Core Area is listed as a Priority 1 area because of the presence of Sacramento Orcutt grass and a “high number of rare species in the area.” USFWS’s recovery plan lists Sacramento Orcutt grass, slender Orcutt grass, vernal pool fairy shrimp, and vernal pool tadpole shrimp as listed species in the area. Specifically, the plan calls for the protection of 95 percent of suitable habitat for vernal pool tadpole shrimp, slender Orcutt grass, and Sacramento Orcutt grass, and protecting 85 percent of suitable habitat for vernal pool fairy shrimp. Habitat to be protected includes both occupied and unoccupied suitable habitat that serves as corridors for dispersal, opportunities for metapopulation dynamics, reintroduction/introduction sites, and protection of undiscovered populations. Thus, although not an adopted policy or regulation, the USFWS has stressed these targets for projects in the region to help ensure species recovery.

Within the project site, the Mather Core Area contains approximately 57.4 acres of suitable habitat for vernal pool tadpole shrimp and vernal pool fairy shrimp. Within the project site, the Mather Core Area contains approximately 4.3 acres of suitable habitat for slender Orcutt grass and Sacramento Orcutt grass (**Figure 3.5-2**). The recovery plan has goals of protecting approximately 48.8 acres (85 percent) of vernal pool fairly shrimp habitat, 54.5 acres (95 percent) of vernal pool tadpole shrimp and 4.1 acres (95 percent) of slender Orcutt grass and Sacramento Orcutt grass habitat within the project site.

Vernal Pool Fairy Shrimp Critical Habitat. Vernal pool fairy shrimp was listed as threatened on September 19, 1994 (59 FR 48136). Critical habitat for the vernal pool fairy shrimp was originally designated in a final rule published in 68 FR 46683 on August 6, 2003. A revised final rule for critical habitat, with a re-evaluation of non-economic exclusions, was published in 70 FR 11140 on March 8, 2005. Economic exclusions from the 2003 final rule were evaluated in 70 FR

46923, published on August 11, 2005. Administrative revisions with species-by-unit designations were published in 71 FR 7117 on February 10, 2006, providing 35 critical habitat units for the vernal pool fairy shrimp totaling 597,821 acres. On May 31, 2007, the USFWS published a clarification of the economic and non-economic exclusions for the 2005 final rule designating critical habitat for four vernal pool crustaceans and eleven vernal pool plants in California and southern Oregon (72 FR 30269). The project site is located within designated critical habitat for vernal pool fairy shrimp. The conservation goals for the Mather Core Area set forth in the Recovery Plan include protecting 85 percent of suitable habitat for vernal pool fairy shrimp.

Vernal Pool Tadpole Shrimp Critical Habitat. Vernal pool tadpole shrimp was listed as endangered on September 19, 1994 (59 FR 48136). Critical habitat for the vernal pool tadpole shrimp was proposed on September 24, 2002 (67 FR 60033). The final rule to designate critical habitat for the vernal pool tadpole shrimp was designated in a final rule published in 68 FR 46683 on August 6, 2003. A revised final rule for critical habitat, with a re-evaluation of non-economic exclusions, was published in 70 FR 11140 on March 8, 2005. Economic exclusions from the 2003 final rule were evaluated in 70 FR 46923, published on August 11, 2005. Administrative revisions with species-by-unit designations were published in 71 FR 7117 on February 10, 2006, providing 18 critical habitat units for the vernal pool fairy shrimp totaling 228,785 acres. On May 31, 2007, the USFWS published a clarification of the economic and non-economic exclusions for the 2005 final rule designating critical habitat for four vernal pool crustaceans and eleven vernal pool plants in California and southern Oregon (72 FR 30269). The project site is located within designated critical habitat for vernal pool tadpole shrimp. The conservation goals for the Mather Core Area set forth in the Recovery Plan include protecting 95 percent of suitable habitat for vernal pool tadpole shrimp.

Slender Orcutt Grass Critical Habitat. Slender Orcutt grass was listed as threatened on March 26, 1997 (62 FR 14338). Critical habitat for slender Orcutt grass was originally designated in a final rule published in 68 FR 46683 on August 6, 2003. Economic exclusions from the 2003 final rule were evaluated in 70 FR 46923, published on August 11, 2005. Administrative revisions with species-by-unit designations were published in 71 FR 7117 on February 10, 2006, providing six critical habitat units totaling 94,213 acres. The project site is located within designated critical habitat for slender Orcutt grass. The conservation goals for the Mather Core Area set forth in the Recovery Plan include protecting 95 percent of suitable habitat for slender Orcutt grass.

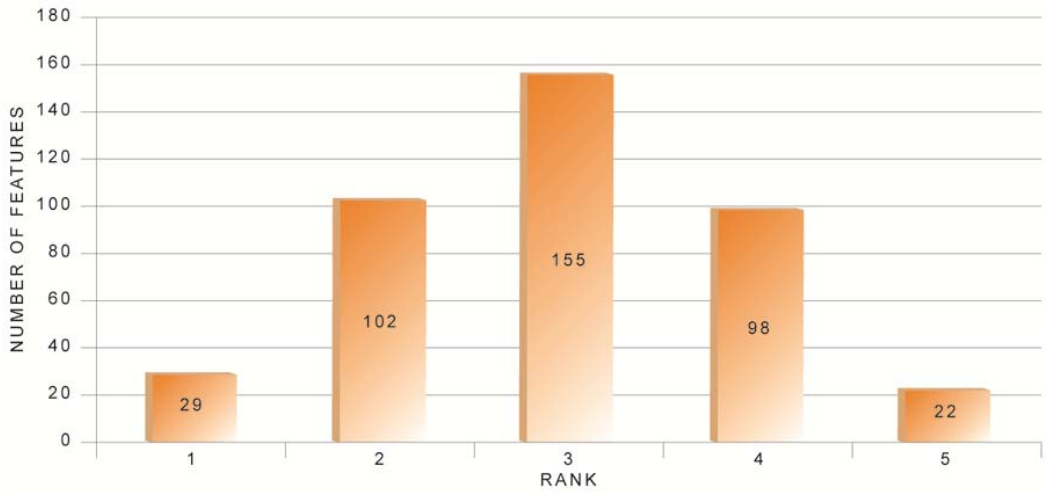
Sacramento Orcutt Grass Critical Habitat. Sacramento Orcutt grass was listed as endangered on March 26, 1997 (62 FR 14338). Critical habitat for slender Orcutt grass was originally designated in a final rule published in 68 FR 46683 on August 6, 2003. Economic exclusions from the 2003 final rule were evaluated in 70 FR 46923; published on August 11, 2005. Administrative revisions with species-by-unit designations were published in 71 FR 7117 on February 10, 2006, providing three critical habitat units totaling 33,273 acres. The project site is located within designated critical habitat for Sacramento Orcutt grass. The conservation goals for the Mather Core Area set forth in the Recovery Plan include protecting 95 percent of suitable habitat for Sacramento Orcutt grass.

Suitable Habitat for Vernal Pool Species

Sacramento County conducted a natural resource assessment which included an evaluation of the "vernal features" on the project site, including vernal pools, vernal swales, and other features

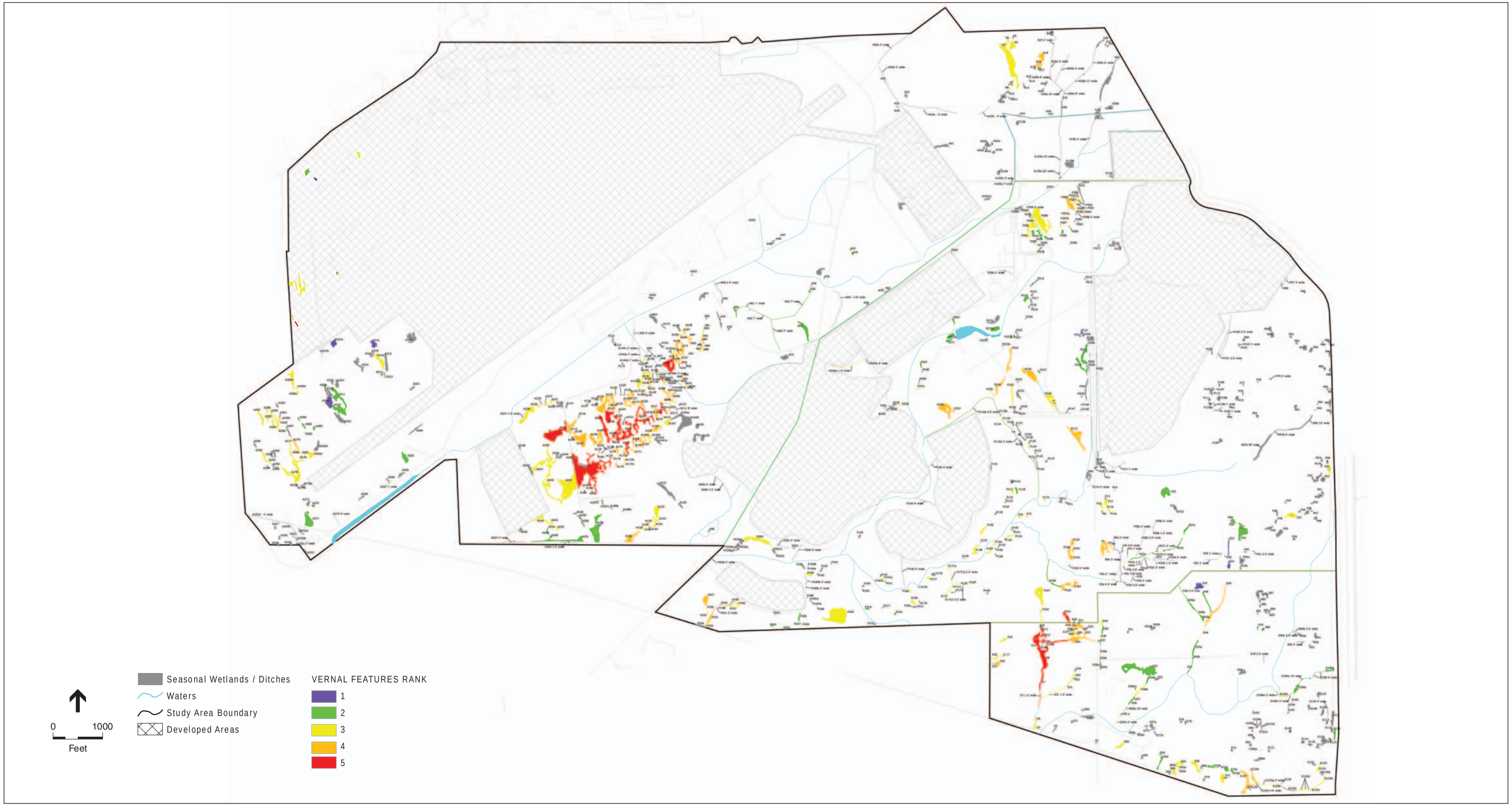
considered suitable habitat for vernal pool species, to determine their relative importance as habitat for special-status species (WRA, 2004c). The study considered a variety of criteria to weigh the relative importance of each feature, including documented presence of special-status species, potential to support additional rare wildlife species, native plant species diversity, extent of existing habitat disturbance, character of adjacent uplands, and hydrologic and topographic connectivity to other wetland features. Each feature was then ranked on a scale of 1 to 5, with 5 representing the highest relative score for vernal pool ecological function. The results of this analysis are presented in **Figure 3.5-3** and **Figure 3.5-4.**

As shown in **Figure 3.5.4**, most of the highest ranking vernal features are located south of Mather Airport and west of the Independence at Mather residential development. Several high ranking features also occur immediately east and north of Independence at Mather and near Eagles Nest Road in the southern portion of the project site. Features near the east boundary of the project site tend to have lower rankings for relative ecological function, likely due to past land disturbances, such as the construction of the Folsom South Canal.



Mather Specific Plan Project. 209259

Figure 3.5-3
Distribution of Vernal Features by Rank



SOURCE: WRA, 2004c; and ESA, 2012

Figure 3.5-4
Vernal Features Rankings

This page intentionally left blank

3.5.2 Regulatory Setting

The project site falls within the general geographic range of a number of "special-status" plants and animals. In this assessment, special-status species are those species that are federally listed or proposed as threatened or endangered. Special-status species also includes those species considered by State or local resource agencies or conservation groups, such as CDFG and CNPS, as being rare or in decline. An endangered plant or wildlife species is one that is considered in danger of becoming extinct throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered within the foreseeable future. Species have also been listed by the State of California as threatened, endangered or fully protected (from take), while CDFG has identified species of special concern (those species that may be rare or in decline). Finally, CNPS also maintains a list of plant species that may be rare, regionally unique, or in decline.

3.5.2.1 Federal

Federal Endangered Species Act

The ESA grants protection over species that are formally listed as threatened endangered, or proposed for listing. The primary protective requirement in the case of projects requiring federal permits, authorizations, or funding, is Section 7 of ESA, which requires federal lead agencies to consult (or "confer" in the case of proposed species or proposed critical habitat) with the USFWS (and National Oceanic Atmospheric Administration [NOAA] Fisheries where marine species may be affected) to ensure that their actions do not jeopardize the continued existence of federally listed species. In addition to Section 7 requirements, Section 9 of the ESA protects listed wildlife species from "take". Take is broadly defined as those activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect [a protected species], or attempt to engage in any such conduct." USFWS regulations at 50 CFR §17.3 provide further definitions of harass and harm. Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR §17.3).

Harm is defined as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR §17.3). An activity can be in violation of take prohibitions even if the activity is unintentional or accidental. Significant modification or degradation of occupied habitat for listed species, or activities that prevent or significantly impair essential behavioral patterns, including breeding, feeding, or sheltering, are also considered "take" under the ESA. Federal agencies may receive authorization for the incidental take of listed species under Section 7 through the issuance of a Biological Opinion from the USFWS and/or NOAA Fisheries. State, local, and private entities may receive incidental take authorization under an approved Habitat Conservation Plan (HCP). For the Applicant's Preferred Alternative, the U.S. Army Corps of Engineers (USACE) is the lead federal agency responsible for consultation with the USFWS under Section 7 of ESA.

The USFWS issued a final Biological Opinion for the disposal of the former Mather Air Force on January 24th, 2012 (Appendix H). The USFWS concluded that that disposal of the former Mather

Air Force Base is not likely to jeopardize the continued existence of vernal pool fairy shrimp, vernal pool tadpole shrimp, Sacramento Orcutt grass, slender Orcutt grass, and is not likely to destroy or adversely modify designated vernal pool fairy shrimp critical habitat, and vernal pool tadpole shrimp critical habitat.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful to take or attempt to take any migratory bird, any part, nest, or egg of any such bird except under the terms of a permit issued by the U. S. Department of the Interior. In total, 836 bird species are protected by the MBTA, 58 of which are currently legally hunted as game birds. A migratory bird is any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle.

The Bald Eagle Protection Act

The Bald Eagle Protection Act (16 U.S.C. 668-668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald and golden eagles, including their parts, nests, or eggs. The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Executive Order 11312: Invasive Species

Executive Order 11312 directs all federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of federal agencies and departments and a supporting Invasive Species Advisory Committee composed of state, local and private entities. The Invasive Species Council

and Advisory Committee oversee and facilitate implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

Executive Order 11990: Protection of Wetlands

Executive Order 11990 established the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

3.5.2.2 State

California Endangered Species Act

Pursuant to CESA and Section 2081 of the California Fish and Game Code, a permit from the CDFG is required for a project that could result in the take of a state-listed threatened or endangered

species (i.e., species listed under CESA). Under CESA, the definition of "take" includes an activity that would directly or indirectly kill an individual of a species, but the state definition does not include "harm" or "harass," as the federal definition does. As a result, the threshold for take under the CESA is typically higher than that under the ESA. Under CESA, CDFG maintains a list of threatened species and endangered species (California Fish and Game Code 2070). The CDFG also maintains two additional lists: (1) a list of candidate species that are species CDFG has formally noticed as being under review for addition to either the list of endangered species or the list of threatened species; and (2) a list of "species of special concern;" these lists serve as "watch lists."

California Fish and Game Code

The California Fish and Game Code protects a variety of species from take. Certain species are considered *fully protected*, meaning that the code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. It also is possible for a species to be protected under the California Fish and Game Code, but not fully protected.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (Fish and Game Code Sections 1900–1913) is intended to preserve, protect, and enhance endangered or rare native plants in California and gives the CDFG authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations.

Vascular plants listed as rare or endangered by CNPS (2009), but which have no designated status or protection under federal or state endangered species legislation, are defined as follows:

- **List 1A:** Plants Believed Extinct.
- **List 1B:** Plants Rare, Threatened, or Endangered in California and elsewhere.
- **List 2:** Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere.
- **List 3:** Plants About Which More Information is Needed - A Review List.
- **List 4:** Plants of Limited Distribution - A Watch List.

In general, plants appearing on CNPS List 1 or 2 are considered to be rare by local standards and therefore are addressed within the document.

3.5.2.3 Local

Sacramento County Swainson's Hawk Ordinance

Sacramento County's Swainson's Hawk Ordinance establishes requirements and guidelines for the mitigation of Swainson's hawk foraging habitat within the unincorporated areas of the County. This ordinance applies to projects five acres or greater that are not within an approved Habitat Conservation Plan area and have been determined to result in a significant impact or significant cumulative impact to Swainson's hawk foraging habitat.

Sacramento County Tree Ordinance

Sacramento County's Tree Ordinance requires project proponents to obtain a permit from the Director of Public Works if the project will trench, grade, or place fill within the dripline of any

oak or landmark tree, or to remove any tree in a designated urban area. The ordinance is designed to protect living native oak trees that have at least one trunk six inches or more dbh (defined as 4.5 feet above ground level), living native oaks with an aggregate diameter of at least 10-inches dbh, and landmark trees.

Proposed South Sacramento Habitat Conservation Plan (SSHCP)

The project site is located within the proposed SSHCP area. The SSHCP is intended to provide a regional approach to issues related to urban development, habitat conservation, agricultural production, and open space planning. The process for developing the SSHCP was initiated in 1995. The SSHCP is not yet scheduled for completion. Participation by project proponents within the SSCHP boundary is voluntary.

References

Beier, P. and S. Loe, 1992. A Checklist for Evaluating Impacts to Wildlife Movement Corridors. Wildlife Society Bulletin 20(4):434-440.

California Department of Fish and Game (CDFG), 2012. California Natural Diversity Database (CNDDB) Rarefind Version 4.0. California Department of Fish and Game, Biogeographic Data Branch. Sacramento, CA. Accessed May 22, 2012.

California Native Plant Society (CNPS), 2010. Inventory of Rare and Endangered Plants (online edition, v7-10c 8-24-10). California Native Plant Society, Sacramento, California. Available online at: http://www.cnps.org/inventory. Accessed September 7, 2010.

Hickman, James C (Ed.), 1993. The Jepson Manual. University of California Press, Berkeley, CA.

Holland, R.F., 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency.

Jennings, M. R., and M. P. Hayes, 1994. Amphibian and reptile species of special concern in California. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA., p. 225.

Jones & Stokes, Associates, Inc. 2001. Final Report for Mather Field Vernal Pool Study. Sacramento, CA. Prepared for Sacramento County.

Mayer, K. E., and W.F. Laudenslayer, Jr., 1988. A Guide to Wildlife Habitats of California. State of California Resources Agency, California Department of Fish and Game. Sacramento, CA. Availabe online at: http://www.dfg.ca.gov/whdab/html/wildlife_habitats.html. Accessed May 2008.

Miles, S. R. and C. B. Goudey, 1997. Ecological Subregions of California: Section and Subsection Descriptions. USDA Forest Service, Pacific Southwest Region Publication R5-EM-TP-005. San Francisco, CA.

National Agriculture Imagery Program (NAIP), 2006. Aerial photography imaging services.

Sacramento County, 2007. South Sacramento Habitat Conservation Plan Habitat Cover-Types GIS Data. Sacramento, California.

Sacramento County, 2011. Mather Field Wetland Re-Verification. Department of Environmental Review and Assessment. March 2011.

Sacramento County, 2012. South Mather Wetlands Management Plan. Prepared by the Sacramento County Office of Economic Development and Marketing. March 2012.

Sawyer, J. O. and T. Keeler-Wolf, 1995. A Manual of California Vegetation. California Native Plant Society Press. Sacramento, CA.

U.S. Air Force (USAF), 1992. Mather Air Force Base Disposal and Reuse Final Environmental Impact Statement. Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS), 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento, CA.

USFWS, 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1. Portland, Oregon.

USFWS, 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants; Final Rule. Federal Register 71:7118-7166.

USFWS, 2010a. Endangered Species Accounts. Prepared by Endangered Species Division of the Sacramento Fish & Wildlife Office. Available online at: http://sacramento.fws.gov/es/spp_info.htm. Accessed September 7, 2010.

USFWS), 2012a. Biological Opinion for the Disposal of the former Mather Air Force Base, Sacramento County, California.

USFWS, 2012b. Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Carmichael and Buffalo Creek California USGS 7.5-minute Topographic Quadrangles. Sacramento Fish and Wildlife Service, Endangered Species Division. Available online at: http://www.fws.gov/sacramento/es/spp_list.htm. Accessed May 22, 2012.

U.S. Geological Survey (USGS), 1980. Buffalo Creek, CA Quadrangle Map. 7.5 Minute Series.

USGS, 1992. Carmichael, CA Quadrangle Map. 7.5 Minute Series.

Wetlands Research Associates, Inc. (WRA), 2004a. Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act: Mather Field Study Area, Sacramento County, California. San Rafael, California. Originally published October 2002. Revised February 3, 2004.

WRA, 2004b. Delineation of the Potential Jurisdictional Wetlands under Section 404 of the Clean Water Act - Mather Field Airport Project Site, Sacramento County, California. San Rafael, California. October 18, 2004.

WRA, 2004c. Mather Field Natural Resource Assessment: Phase I and II. San Rafael, California. Prepared for Sacramento County.

Zeiner, D.C., W.F. Laudenslayer, and K.E. Mayer, 1988-1990. California's Wildlife. Vols I, II, and III. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game. Sacramento, California.

This page intentionally left blank

3.6 Aquatic Resources

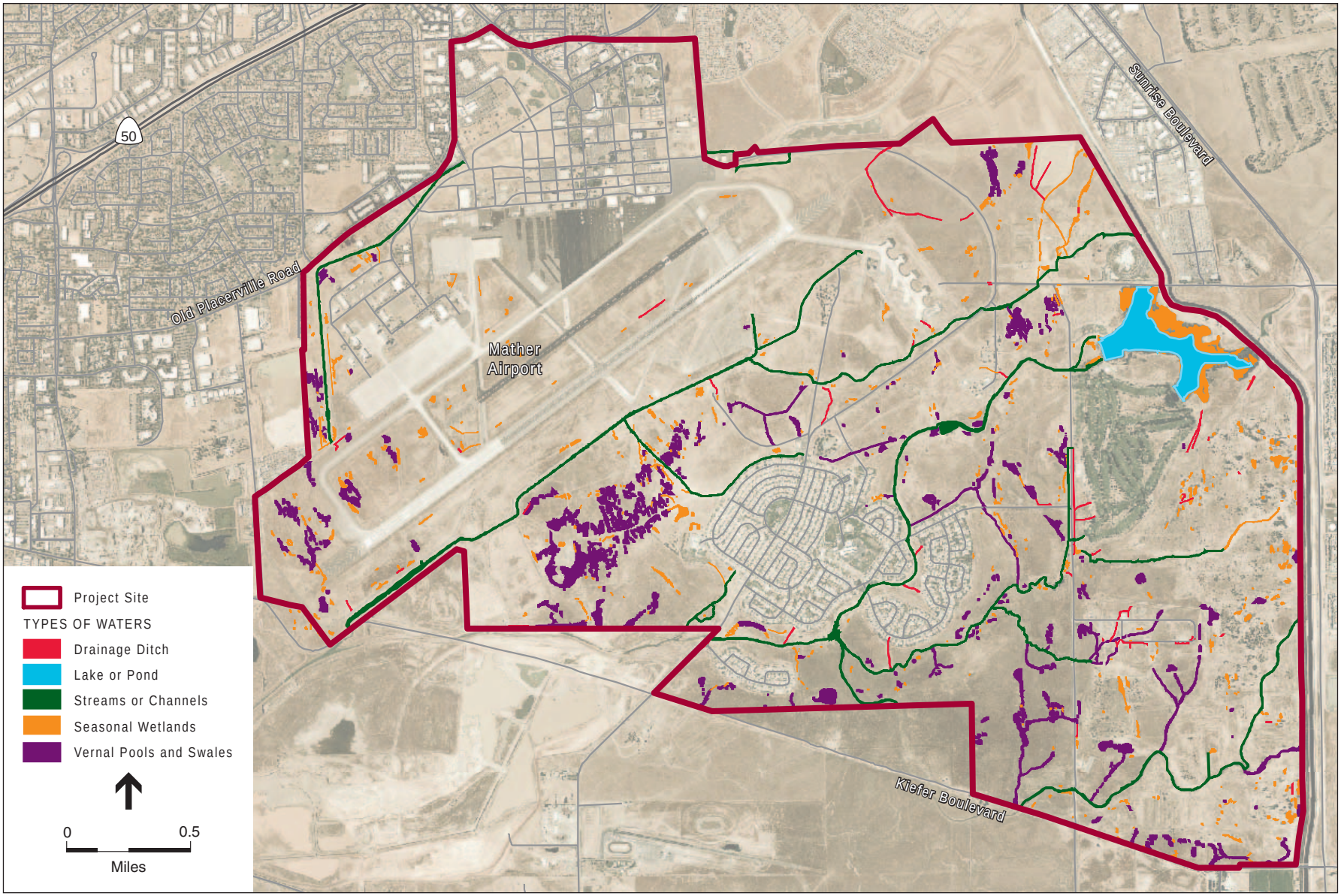
The assessment of existing conditions and analysis of potential effects is based on the current verified jurisdictional delineation and previous wetland assessments. The general and specific profiles of aquatic resources contained in this section provide the environmental baseline by which direct, indirect, and cumulative environmental effects are identified and measured in **Chapter 4.0**. This section focuses upon wetlands and other waters of the U.S. that are regulated under Section 404 of the Clean Water Act.

3.6.1 Existing Setting

3.6.1.1 Jurisdictional Delineations

Wetlands and other waters of the U.S. within the project site were formally delineated in accordance with the methodology prescribed in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987). Most of the project site was originally delineated in 2002 as described in the *Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act, Mather Field Study Area* (WRA, 2004a). The U.S. Army Corps of Engineers (USACE) verified this delineation in February 2004. Wetlands in the area of Mather Airport were delineated separately as described in the *Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act, Mather Airport Project Site* (WRA, 2005). USACE verified this delineation in October 2006. In 2011, an additional delineation was conducted which re-evaluated the two previous delineations and added additional aquatic features (Sacramento County, 2011). In 2012 and 2013, another re-delineation was conducted which added aquatic features and revised the shape or size of other aquatic features (Sacramento County, 2013). Aquatic features on the project site were re-verified by the Corps in February 2013.

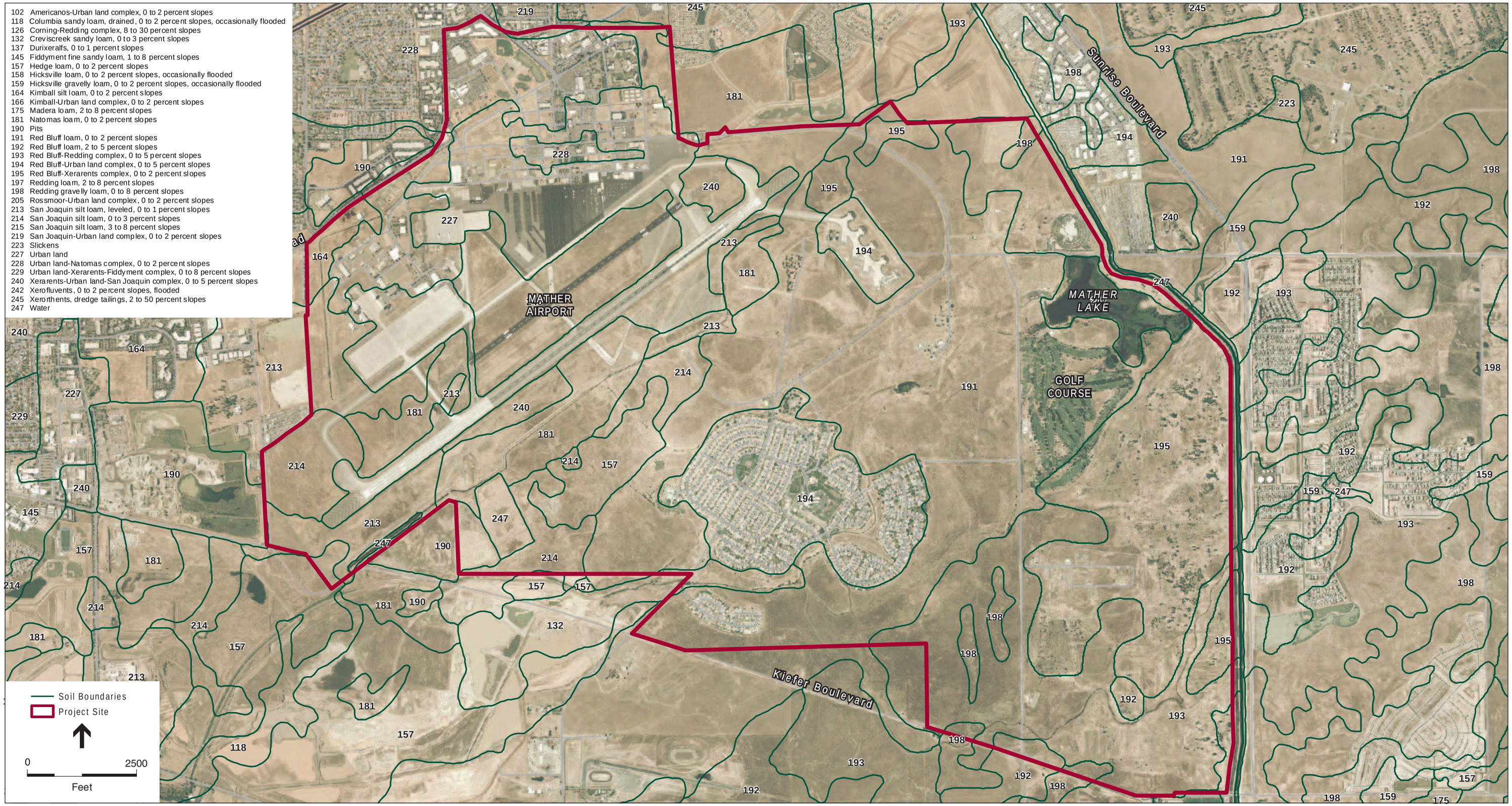
A total of 208.8 acres of water features occur within the project site. USACE-verified jurisdictional features include a total of 135.5 acres of wetlands and 73.3 acres of other waters of the U.S. A summary of USACE-verified jurisdictional features and their extent within the project site is presented in **Table 3.6-1**, and includes seasonal wetland, vernal pool, and open water (drainage ditch, lake/pond, and stream channel). The biological elements of these features are described in more detail in **Section 3.5**. **Figure 3.6-1** shows the location of all wetlands and waters of the U.S. within the project site, while **Figure 3.6-2** presents the soil types present.



SOURCE: NAIP, 2011; Sacramento County, 2013; and ESA, 2013

Mather Specific Plan Project Supplemental Draft EIS . 209259

Figure 3.6-1
Waters of the U.S.



SOURCE: NAIP, 2006; and ESA, 2011

Mather Specific Plan Project Supplemental Draft EIS . 209259

Figure 3.6-2
Soils Types

This page intentionally left blank

TABLE 3.6-1
USACE JURISDICTIONAL FEATURES WITHIN THE PROJECT SITE

Type of Jurisdictional Feature	Acres[1]
Wetlands	
Seasonal Wetland	61.5
Vernal Pool	73.9
Total area of wetlands:	**135.5**
Other Waters	
Drainage Ditch	2.5
Lake/Pond	40.9
Stream Channel	29.9
Total area of other waters:	**73.3**
Total area of jurisdictional features:	**208.8**

1. All acres approximate. Totals are subject to rounding.
SOURCE: Sacramento County, 2013.

Wetlands

Seasonal Wetlands

Seasonal wetlands are relatively shallow topographic depressions that pond for a short duration, support a fairly low diversity of plant species, and tend to support species with a high tolerance for disturbance. Seasonal wetlands are freshwater wetlands that support ponded or saturated soil conditions during winter and spring and are dry through the summer and fall. Seasonal wetlands are defined by a hydrologic regime that is dominated by saturation, rather than inundation. Seasonal wetlands inundate for short periods of time following a storm event but the primary hydrologic regime is one of saturation. Vegetation is characterized by species of annual and perennial, native and non-native grasses and forbs that begin their growth as aquatic or semi-aquatic plants, that make a transition to a dry-land environment as the pool dries. Wetland plant species that are either low-growing, tenacious perennials that tolerate disturbance or annuals that tolerate seasonal wetness often colonize seasonal wetlands. Upland grasses and forbs can become established while the features desiccate. Although seasonal wetlands and vernal pools share similar hydrologic characteristics, species composition of seasonal wetlands is typically more ruderal in nature. Therefore, seasonal wetlands are not considered vernal pools, which support a more specialized and less common native flora (WRA, 2004a).

Vernal Pools

Vernal pools are ephemeral wetlands that form in shallow depressions underlain by an impervious or restrictive soil layer near the surface that restricts the percolation of water. At the project site, the vernal pools are underlain by claypans (e.g., Xerarents-Urban land-San Joaquin complex) and hardpans (e.g., Redding gravelly loam) and some soils, such as San Joaquin silt loam, have both claypan and an underlying hardpan (Figure 3.6-2) (WRA, 2004b). They pond during the wet season and become dry in late spring. Vernal pools typically are distinguished by a unique assemblage of species adapted to the extreme conditions created by the cycles of inundation and drying. Vernal pools differ in species composition from seasonal wetlands during the early spring when growing

conditions are appropriate for vernal pool species. Vernal pool habitat typically occurs in defined depressions that sustain ponded conditions for a long duration in the winter and early spring rainy season, but then dry up by early to late May. Typically, these depressions are sustained hydrologically by rainfall and surface runoff as well as shallow subsurface flow.

Other Waters of the U.S.

Open water in the project site occurs within constructed ditches; natural ephemeral or intermittent channels or swales; a reservoir (Mather Lake); and man-made ponds. Although many of the constructed open water features are periodically maintained to increase capacity for water conveyance, some of the more naturalized features still support emergent wetland and marsh species.

Channels within the project site were delineated based on clear evidence of regular sustained flows, which included the presence of a defined bed and bank, scouring and deposition of sands and gravel substrates, and in most features the absence of upland vegetation and topsoil. Field indicators of the ordinary high water mark were used as a basis for defining the landward extent of the channels.

The man-made ponds in the project site sustain ponding for long duration during the growing season, but eventually dry up in middle to late summer in most years. Most of these features were artificially created by previous excavation and berm construction activities. Mather Lake and a small impoundment on Morrison Creek downstream of Mather Lake are permanent features.

3.6.2 Regulatory Setting

3.6.2.1 Federal

Section 404 of the Clean Water Act

The USACE is the agency responsible for regulating the discharge of dredged or fill material into jurisdictional wetlands and other waters of the U.S. under Section 404 of the Clean Water Act. The U.S. Environmental Protection Agency (EPA) has overall responsibility for the Clean Water Act.

Wetlands are ecologically complex habitats that support a variety of plant and animal life. The federal government defines wetlands as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR §328.3(b) and 40 CFR §230.3). Under normal circumstances, the federal definition of wetlands requires evidence of three parameters: wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of jurisdictional wetlands include freshwater marsh, seasonal wetlands, and vernal pools that have a significant nexus to navigable waterways.

“Other waters of the U.S.” refer to aquatic features that are regulated by the Clean Water Act but are not wetlands (33 CFR §328.3). To be considered jurisdictional, these features must exhibit an ordinary high-water mark, and be tributary to or possess a significant nexus to a navigable waterway. Examples of other waters of the U.S. include rivers, creeks, intermittent channels, ponds and lakes.

Section 404 of the Clean Water Act provides the statutory mechanism for the USACE to permit the discharge of dredged or fill material into waters of the United States. Projects that would result in the placement of dredged or fill material into waters of the U.S. require a permit from the USACE. The USACE may either issue individual permits on a case-by-case basis or general permits at a program level. As described previously, for this project, the USACE has determined that issuing permits pursuant to Section 404 would be considered a major federal action under the National Environmental Policy Act, and therefore has prepared this EIS to evaluate the effects of those actions.

Section 404(b)(1) of the Clean Water Act

Under Section 404(b)(1) of the Clean Water Act, the Corps must comply with the guidelines developed by EPA when approving discharges. The Section 404(b)(1) Guidelines contain the substantive criteria for permitting dredged and fill material discharges under the Clean Water Act (40 CFR Part 230). As part of the public review process, the Corps is required to determine whether a project complies with Section 404(b)(1) Guidelines. The Section 404(b)(1) Guidelines prohibit the discharge of dredged or fill materials to waters of the United States if there is a "practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse consequences" (40 CFR §230.10(a)). Practicable alternatives include activities that do not involve a discharge of fill into waters of the United States or involve a discharge at another location(s) in waters of the United States. An alternative is "practicable" if it is "available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes" (40 CFR §230.10(a)(2)).

If a proposed activity would involve a discharge into a special aquatic site such as a wetland, the Section 404(b)(1) Guidelines distinguish between those projects that are water dependent and those that are not. A water dependent project is one that requires access to water to achieve its basic purpose. A marina is an example of a water dependent project. A non-water dependent project is one that does not require access to water for its basic purpose. A university/school is an example of a non-water dependent project. None of the land uses included in the Applicant's Preferred Alternative or other alternatives are water dependent.

The Section 404(b)(1) Guidelines establish two "presumptions" for non-water dependent projects that propose a discharge into a special aquatic site: 1) that a practicable alternative is available that does not involve discharge into a special aquatic site; and 2) that all practicable alternatives to a proposed discharge which do not involve a discharge into a special aquatic site would have less adverse impact to aquatic resources. The applicant has the burden of clearly demonstrating that these presumptions do not apply in a particular case (40 CFR §230.10(a)(3)).

A Memorandum of Agreement (MOA) between the EPA and the USACE Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (1990) summarizes the "sequencing" structure set forth by the Section 404(b)(1) Guidelines: first, avoid impacts to waters, second, minimize impacts, and third, provide compensatory mitigation for unavoidable impacts. In March 2008, the EPA and USACE issued the Compensatory Mitigation Rule (33 CFR Part 332) that provides new standards to ensure no-net-loss of wetlands and

emphasizes use of the best available science. This rule reinforces the goal to first avoid and then minimize impacts to waters.

In addition to the above provisions, the Section 404(b)(1) Guidelines also prohibit discharges that cause or contribute to violation of water quality standards, violate any toxic effluent limit under Section 307 of the Clean Water Act, jeopardize the continued existence of any listed species, or destroy or modify listed species' critical habitat (40 CFR §230.10(b)).

Executive Order 11990: Protection of Wetlands

Executive Order 11990 established the protection of wetlands and riparian systems as the official policy of the federal government. It requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

3.6.2.2 State

Section 401 Water Quality Certification/Porter-Cologne Water Quality Control Act

Under Section 401 of the Federal Clean Water Act, applicants for a federal license or permit to conduct activities which may result in the discharge of a pollutant into waters of the United States must obtain certification from the applicable state water quality agency. For California the State Water Resources Control Board (SWRCB), acting through the appropriate RWQCB, must certify that a USACE permit action does not exceed state water quality objectives.

Discharges to wetlands and "other waters of the state" are also subject to state regulation under the California Porter-Cologne Water Quality Control Act (Porter-Cologne; Ca. Water Code, Div. 7, §§ 13000–14958). Water Code section 13260 requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of waste discharge (Water Code § 13260(a)(1)). The term "waters of the state" is defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code § 13050(e)). Therefore, whether or not USACE has jurisdiction under Section 404 of the Clean Water Act, the SWRCB and RWQCB have jurisdiction to regulate waters of the state by issuing Waste Discharge Requirements or waivers thereof. Pursuant to Resolution No. 2008-0026, the SWRCB is developing a policy to protect wetland and riparian areas in support of water quality benefits within the state; this policy has not yet been finalized.

References

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Engineer Waterways Experiment Station, Vicksburg, MS.

National Agriculture Imagery Program (NAIP), 2006 and 2009. Aerial photography imaging services.

Sacramento County, 2011. Mather Field Wetland Delineation Re-Verification 2011 and associated GIS data files. Department of Environmental Review and Assessment. Sacramento, CA. March 2011.

Sacramento County, 2013. Mather Field Wetland Delineation Re-Verification 2012 and associated GIS data files. Department of Environmental Review and Assessment. Sacramento, CA. January 2013.

Wetlands Research Associates (WRA), Inc. 2004a. Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act: Mather Field Study Area, Sacramento County, California. San Rafael, CA. Originally published October 2002. Revised February 3, 2004.

WRA, Inc. 2004b. Mather Field Natural Resource Assessment, Phases I and II. San Rafael, CA.

WRA, Inc. 2005. Delineation of the Potential Jurisdictional Wetlands under Section 404 of the Clean Water Act - Mather Field Airport Project Site, Sacramento County, California. San Rafael, CA. Draft October 2004. Revised November 2005.

This page intentionally left blank

CHAPTER 4.0

Environmental Consequences

This page intentionally left blank

4.5 Biological Resources

This section analyzes the potential effects of alternatives on biological resources, including federally listed species and critical habitat, migratory birds, and special status species of state and local concern. Effects to wetlands and other waters of the United States (U.S.) are addressed in **Section 4.6**. The analysis of potential effects is based on the biological setting described in **Section 3.5**.

4.5.1 Alternative A – Applicant's Preferred Alternative

Impact 5.1: Effects to Federally Listed Vernal Pool Species and Critical Habitat

Vernal pools and seasonal wetlands throughout the project site are known to support populations of the federally listed vernal pool fairy shrimp and vernal pool tadpole shrimp, and provide suitable habitat for conservancy fairy shrimp, Sacramento Orcutt grass, and slender Orcutt grass. This alternative would result in direct and indirect effects to suitable habitat for these species as well as the known populations. Direct effects would occur if a pool or a portion of a pool is affected by site grading or other ground disturbing activities. In calculating direct effects to habitat for vernal pool species, it is assumed that if any portion of a pool is directly affected by site grading or other ground disturbing impacts, then the entire pool is directly affected. This differs from the methodology used to calculate direct impacts to wetlands and other waters of the U.S., as described in Section 4.6. Indirect effects may occur if proposed activities within 250 feet of suitable habitat alter the surface and/or subsurface hydrology of the area (USFWS, 1996a). Potential direct and indirect effects to suitable habitat for vernal pool species (as defined in Section 3.5) are summarized in **Table 4.5-1** and **Figure 4.5-1**.

Based on this evaluation, development under Alternative A would result in the direct loss of approximately 40.68 acres of suitable habitat for vernal pool species. Of these acres, approximately 18.13 acres are classified as vernal pools or swales, with the remainder (22.55 acres) classified as seasonal wetlands and channels. Furthermore, development under Alternative A would indirectly affect up to 4.26 acres of habitat for vernal pool species located in the proposed Preserve and at Mather Airport.

In addition to the above effects, designated critical habitat for vernal pool tadpole shrimp and fairy shrimp would also be affected by Alternative A. Up to 4.98 acres of critical habitat for vernal pool tadpole shrimp and fairy shrimp would be directly affected and up to 2.89 acres of critical habitat would be indirectly affected, as discussed under Impact 5.2, below. These impact calculations are a subset of those described above. No designated critical habitat for slender Orcutt grass and Sacramento Orcutt grass would be affected by Alternative A.

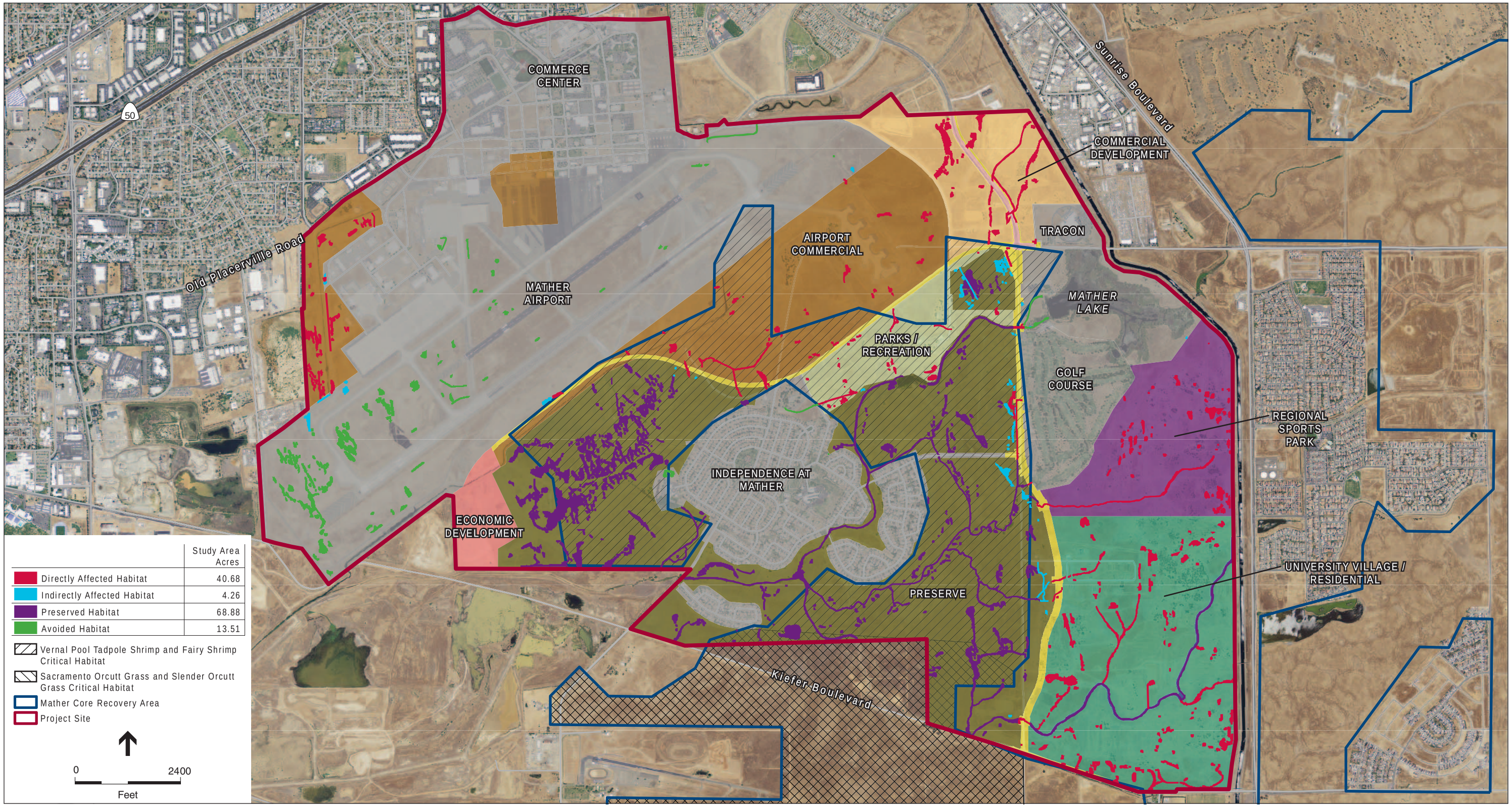
The direct loss of suitable habitat for these species, including the direct take of species, represents a significant, adverse impact. In addition, the proximity of proposed activities to habitat for vernal pool species presents the possibility of secondary effects to the habitat due to project-related disturbance. Deterioration of habitat for vernal pool species could result from the introduction of non-native invasive plant species, decreases in water quality due to erosion or sedimentation, changes in surface or subsurface hydrology, and human intrusion. Therefore, potential indirect effects to suitable habitat are also considered a significant, adverse impact.

TABLE 4.5-1
EFFECTS TO HABITAT FOR VERNAL POOL SPECIES – ALTERNATIVE A

Land Use	Direct Effects (Acres)	Indirect Effects (Acres)
Airport Commercial	*6.62*	*0.82*
Seasonal Wetland	4.11	0.20
Vernal Pools and Swales	2.52	0.62
Commercial Development	*6.50*	*0.00*
Seasonal Wetland	3.64	0.00
Vernal Pools and Swales	2.86	0.00
Economic Development	*0.00*	*0.00*
Parks Recreation	*1.92*	*0.52*
Seasonal Wetland	0.79	0.14
Vernal Pools and Swales	1.13	0.38
Roadways and Infrastructure	*3.65*	*2.91*
Seasonal Wetland	1.39	1.05
Vernal Pools and Swales	1.84	1.87
Channels and Streams	0.42	0.00
Regional Sports Park	*6.11*	*0.01*
Seasonal Wetland	5.63	0.01
Vernal Pools and Swales	0.20	0.00
Channels and Streams	0.28	0.00
University Village/Residential	*15.88*	*0.00*
Seasonal Wetland	6.11	0.00
Vernal Pools and Swales	9.58	0.00
Channels and Streams	0.19	0.00
Total	40.68 [1]	4.26 [1]

1. Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013

Alternative A proposes to protect in perpetuity suitable habitat for vernal pool species, including approximately 65.30 acres of waters within an on-site Preserve and 3.58 acres within Riparian Buffer areas. When combined, this represents a preservation ratio of approximately 1.5:1 for every acre of habitat directly and indirectly affected by proposed activities. As described in **Chapter 2.0**, wetlands within the proposed Preserve would be preserved and managed in accordance with the Wetland Management Plan that is subject to final approval by the United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW) and Environmental Protection Agency (EPA). The goals described in the plan include enhancing wetland habitat functions and services. These efforts could include restoring vernal pools that have been damaged by prior activities. Nevertheless, without additional compensation and mitigation, the onsite loss of habitat for vernal pool species is considered significant and adverse. With recommended mitigation, impacts would be reduced to a less-than-significant level.



SOURCE: NAIP, 2009; Sacramento County, 2013; and ESA, 2013

Figure 4.5-1
Potential Effect to Habitat for Vernal Pool Species - Alternative A

This page intentionally left blank

Mitigation Measures

Implement Measure 3.3: Comprehensive Drainage Plan.

Measure 5.1a: Compensate for the Loss of Habitat for Vernal Pool Species. The project proponent proposes on-site habitat preservation in perpetuity and purchase of habitat creation credits at an USACE and USFWS approved mitigation bank and/or to restore/enhance habitat within the designated Preserve areas upon USFWS approval to fully compensate for direct and indirect effects to habitat for federally listed vernal pool species. While final ratios would be determined in consultation with USFWS, it is estimated that compensation would be at a minimum 2:1 preservation ratio and 1:1 creation/restoration/rehabilitation ratio for direct effects to habitat for vernal pool species (40.68 acres of direct effects), and a 2:1 preservation ratio for indirect effects to habitat for vernal pool species (4.26 acres of indirect effects).

Alternative A would include 68.88 acres of on-site habitat for vernal pool species preservation and enhancement. Thus, Alternative A proposes on-site preservation for direct and indirect effects at a 1.5:1 ratio. The level of on-site creation, restoration and/or, rehabilitation activities proposed by the Wetland Management Plan has not yet been quantified.

To fully compensate for the direct loss of habitat for federally listed vernal pool species, the project proponent proposes to purchase habitat creation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval at a minimum 1:1 ratio for direct effects to habitat for vernal pool species. In addition, the project proponent would purchase habitat preservation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval for the direct and indirect effects to habitat for vernal pool species. Combined with the on-site preservation, this is expected to result in a 2:1 preservation component for direct and indirect effects.

Habitat compensation for each development area must occur prior to or concurrent with development of that area which is within 250 feet of suitable habitat for vernal pool species. Programmatic compensation requirements for each land use are summarized in **Table 4.5-2**. Compensation for each land use must be approved by the USACE and USFWS prior to the initiation of construction activities within 250 feet of suitable habitat for vernal pool species.

Options for habitat compensation are described below. These options may be combined to meet the overall compensation needs for each land use.

Option 1: Purchase Vernal Pool Habitat Credits.

Prior to the initiation of construction within each development area, the project proponent would purchase the required acreage of vernal pool creation and preservation credits at a USACE and USFWS-approved mitigation bank. The project proponent would provide the USACE proof of the purchase prior to construction of that development area.

TABLE 4.5-2
HABITAT COMPENSATION REQUIREMENTS BY LAND USE TYPE – ALTERNATIVE A

Land Use	Habitat for Vernal Pool Species Compensation: 1:1 Creation (Acres)	Habitat for Vernal Pool Species Compensation: 0.5:1 Preservation (Acres)
Airport Commercial	6.62	3.48
Commercial Development	6.50	3.04
Economic Development	0.00	0.00
Parks Recreation	1.92	1.14
Roadways and Infrastructure	3.65	3.07
Regional Sports Park	6.11	2.86
University Village/Residential	15.88	7.42
Total	**40.68**	**21.00**

SOURCE: ESA, 2013; Sacramento County, 2013

Option 2: Implement On Site Creation/Restoration/Rehabilitation.

Prior to construction within each development area, direct effects to habitat for vernal pool species would be compensated through the restoration and/or enhancement of habitat for vernal pool species within on-site Preserve areas. The restoration goal would be to restore and enhance habitat for vernal pool species such that their ultimate functions and services are equal to or greater than the wetland features affected by the implementation of Alternative A. This effort could include restoring vernal pools and/or other suitable aquatic features that have been damaged by prior activities. The plan would include monitoring requirements to ensure the long term success of restored and enhanced habitats.

Measure 5.1b: Use Best Management Practices (BMPs) to Provide Effective Erosion and Sediment Control. Use of BMPs for stormwater control is expected to reduce the potential for preserved and avoided habitat for vernal pool species to be indirectly affected by sediment-laden discharges from construction sites. The performance and effectiveness of these BMPs would be determined either by visual means, where applicable (i.e., observation of above-normal sediment release), or by actual water sampling in cases where the verification of containment reduction or elimination is required to determine the adequacy of the measures. BMPs to be implemented would include, but are not limited to, the following:

- All disturbed surfaces or stockpile areas would be protected with erosion control measures in place during the period of October 1 through April 30, or as appropriate based on weather conditions.
- BMPs for temporary erosion control (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) would be employed per the product specifications for disturbed areas, stockpiled soil, and along culverts and drainage ditches on active construction sites and in downstream areas that may be affected by construction activities. Requirements for the placement and monitoring of the BMPs would be part of the contractor's project specifications. Performance and adequacy of the measures would be determined visually by site construction

management and verified by the County Department of Water Resources and Central Valley Regional Water Quality Control Board as appropriate.

- Dirt and debris would be swept from paved areas in construction zones on a daily basis as necessary to remove excessive accumulations of silt, mud or other debris. Sweeping and dust removal would be implemented by the contractor and oversight of these operations the responsibility of the construction site superintendent.
- All exposed/disturbed areas, left barren of vegetation due to project related activities, would be seeded, mulched and fertilized with a blend of native and/or naturalized grass and forb species. Locally obtained native wildflower seeds may be included in the seed mix. Planted areas must achieve an 80% acreage coverage rate to be considered successful. All exposed areas where seeding is considered unsuccessful after 90 days, would received appropriate soil preparation and a second application of seed/mulch/fertilizer. Quarterly monitoring would be conducted for a period of one year or until the target goal is met. The application, schedule, and maintenance of the vegetative cover would be the responsibility of the contractor and requirements to establish a vegetative cover would be included in the construction contractor's project specifications.
- If discharges of sediment or hazardous substances to drainage ways are observed, construction would be halted until the source of contamination is identified and remediated. Visual indications of such contamination include an oily sheen or coating on water, and noticeable turbidity (lack of clarity) in the water.

Measure 5.1c: Conduct Worker Environmental Awareness Training (WEAP). A Worker Environmental Awareness Program (WEAP) training for construction crews and construction forepersons would be conducted before any construction activities begin. The WEAP training would be conducted by a qualified wildlife biologist. The training would include a brief review of the special status species and other sensitive resources that could occur in the project area and their legal status and protection. The program would also cover all relevant mitigation measures, permit conditions and BMP plans, such as the Stormwater Pollution Prevention Plan (SWPPP) and/or erosion control and sediment plan. During WEAP training, construction personnel would be informed of the importance of avoiding ground-disturbing activities outside of the designated work area. A designated environmental inspector would be responsible for ensuring that construction personnel adhere to the guidelines and restrictions and that all persons working on site have attended a WEAP training session. WEAP training sessions would be conducted as needed for new personnel brought onto the job throughout the duration of construction.

Measure 5.1d: Limit Project Access Routes/Staging Areas. The total number of access routes, number and size of staging areas, and the total area of construction activity would be limited to those areas identified in the approved construction drawings and/or plans or as otherwise approved per permit conditions. Access routes and project boundaries would be clearly marked at all times. Access routes for heavy equipment to and from the project site would be restricted to established roadways to minimize habitat disturbance. The storing of construction equipment, vehicles, and supplies would be restricted to the designated construction staging areas outside of proposed Preserve(s), designated avoided, and riparian buffer areas. All fueling, cleaning and maintenance activities of vehicles and other equipment would be performed only in designated areas and at least 250 feet away from avoided/preserved habitats. As part of WEAP training, all workers would be informed of the importance of

preventing spills and appropriate measures to take in the event of a spill. All spills would be cleaned up immediately.

Measure 5.1e: Protect Preserved and Avoided Habitats. Avoided and preserved habitat, including habitat within designated Preserve and Riparian Buffer areas, would be protected at all times from construction activities. Habitat protection measures would include the following:

- A USFWS-approved biologist (monitor) would inspect all construction-related activities at the project site to ensure that no unauthorized take of listed species or destruction of their habitat occurs. The biologist would have the authority to stop any activities that may result in such take or destruction until appropriate corrective measures have been completed. The biologist also would be required to report immediately any unauthorized impacts to the USFWS and the CDFW.
- Adequate fencing would be placed and maintained around all avoided (preserved) habitat for vernal pool species to prevent direct impacts from construction.

Impact 5.2: Potential to Conflict with provisions of the USFWS Vernal Pool Recovery Plan

As discussed in **Section 3.5**, the project site is located within the Mather Core Area of the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005), which is a Zone 1 core area having the highest priority for recovery. As stated in the Recovery Plan, the Mather Core Area has specific conservation goals, including protecting 95 percent of suitable habitat for vernal pool tadpole shrimp, slender Orcutt grass, and Sacramento Orcutt grass, and protecting 85 percent of suitable habitat for vernal pool fairy shrimp. Approximately 57.42 acres of suitable habitat for vernal pool species occurs within the area where the Mather Core Area overlaps the project site. These protection goals therefore correspond to preservation of approximately 48.81 acres (85 percent) and 54.55 acres (95 percent) of suitable habitat for vernal pool species where the Mather Core Area overlaps the project site.

Alternative A includes a large preservation component for habitat for vernal pool species. Approximately 52.44 acres of suitable habitat for vernal pool species within the Mather Core Area would be protected in perpetuity within the action area (**Figure 4.5-1**). This corresponds to 91 percent of the suitable habitat for vernal pool species within the Mather Core Area of the project site. However, some of this habitat may be indirectly affected by construction on and/or operation of adjacent proposed land use areas. **Table 4.5-3** summarizes the effects of Alternative A on suitable habitat for vernal pool species within the Mather Core Area of the project site.

As shown in **Table 4.5-3**, Alternative A would protect suitable habitat for those species targeted for protection within the Mather Core Area, with the majority of that being high quality habitat for vernal pool species. Furthermore, some of this habitat is expected to be restored and/or enhanced, thereby increasing habitat suitability for these species. Alternative A would be consistent with the goals of the USFWS recovery plan for vernal pool species as it protects at least 85% of the habitat for vernal pool species within the Mather Core Area. Thus, this impact is considered less-than-significant.

TABLE 4.5-3
EFFECTS TO MATHER RECOVERY AREA HABITAT – ALTERNATIVE A

Habitat Type	Total Acreage in Mather Recovery Area	Directly Affected (Acres)	Potentially Indirectly Affected (Acres)	Preserved/ Avoided Habitat (Acres) / Percent[1]		Preserved/ Avoided Habitat which is not Indirectly Impacted (Acres) / Percent[2]	
Vernal Pools and Swales	41.96	2.86	2.01	39.10	93%	37.09	88%
Seasonal Wetlands	9.94	1.95	0.88	7.99	80%	7.11	72%
Ephemeral and Intermittent Channels	5.52	0.18	0.00	5.34	97%	5.34	97%
Total[3]	**57.42**	**4.98**	**2.89**	**52.44**	**91%**	**49.54**	**86%**

1 Habitat within the Mather Core Area that is not directly impacted.
2 Habitat within the Mather Core Area that is 1) not directly impacted and 2) not indirectly affected (i.e. for vernal pools, vernal swales and seasonal wetlands at least 250 feet from proposed land disturbance..
3 Totals subject to rounding
SOURCE: ESA, 2013; Sacramento County, 2013

Impact 5.3: Effects to Valley Elderberry Longhorn Beetle

Reconnaissance-level surveys of the project site identified the presence of elderberry shrubs that provide suitable habitat for valley elderberry longhorn beetle (VELB). These shrubs are located in areas proposed for the Regional Sports Park and the University Village. Implementation of Alternative A has the potential to adversely affect this species by adversely impacting suitable elderberry shrubs. While no exit holes were documented by these surveys, the shrubs represent potential habitat for all stages of the VELB's life cycle (Wetlands Research Associates, 2004c). Therefore, removal or degradation of elderberry shrubs may adversely affect VELB and limit management opportunities for its recovery. This is considered a significant, adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

Measure 5.3: Mitigate for Impacts to VELB and its Habitat. Prior to construction within a development area, the development area and a 100-foot buffer would be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist in accordance with USFWS protocols. If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground surface level occur on or adjacent to the construction site, or are otherwise located where they may be directly or indirectly affected by Alternative A, minimization and compensation measures, which include transplanting existing shrubs and planting replacement habitat (conservation plantings), would be undertaken (see below). Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to provide habitat for the beetle because of their small size and/or immaturity. Therefore, no minimization measures are required for removal of elderberry plants with all stems measuring 1.0 inch or less in diameter at ground level.

For shrubs with stems measuring 1.0 inch or greater, the project proponent would ensure that elderberry shrubs within 100 feet of proposed construction be protected and/or compensated for in accordance with the *U.S. Fish and Wildlife Services' (USFWS) Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS, 1999) and the *Programmatic Formal*

Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office (USFWS, 1996b). A summary of the required mitigation measures is provided in **Appendix G.**

Impact 5.4: Effects to Golden Eagle

As described in **Section 3.5**, the golden eagle is protected under the Bald Eagle Protection Act. The Bald Eagle Protection Act protects the "take" of this species, as well as active nest sites. However, because the project site does not contain suitable nesting habitat for this species, effects related to the take of individual golden eagles or their nests are not anticipated.

As noted previously, there are observations of golden eagles foraging within project site grasslands in the winter. Therefore, this species may be affected by the loss of suitable wintering foraging habitat. Potential effects to grassland vegetation, as well as other habitat types present within the project site, are summarized in **Table 4.5-4**. This evaluation indicates that approximately 1,327 acres of suitable foraging habitat (annual grasslands) may be affected by proposed development. Neighboring habitat types, such as seasonal wetlands and vernal pools, may also contribute towards seasonal foraging opportunities for this species.

TABLE 4.5-4
EFFECTS TO VEGETATION AND HABITATS – ALTERNATIVE A

Habitat Type	Existing (Acres)	Affected (Acres)	Percent Affected
Annual Grassland	2775.8	1,327.1	47.8%
Cottonwood Woodland	72.7	72.7	100.0%
Disturbed / Ruderal	87.3	53.3	61.1%
Drainage Ditch (Riverine)	2.5	1.4	56.0%
Lake / Pond (Lacustrine)	40.9	0.0	0.0%
Recreation / Landscaped	216.7	2.9	1.3%
Seasonal Wetland	61.53	21.1	34.3%
Stream Channel (Riverine)	29.9	8.3	27.8%
Urban/Developed	2,373.6	410.5	17.3%
Valley Foothill Riparian	14.4	0.0	0.0%
Vernal Pool and Vernal Swale	73.9	17.5	23.7%
Total	**5,749.4**	**1,914.9**	**33.3%**

SOURCE: ESA, 2013; Sacramento County, 2013

Under Alternative A, approximately 1,160 acres of annual grassland habitat would be preserved within the proposed Preserve and Riparian Buffer areas. This represents a grassland preservation ratio of 0.87:1. These areas contain the highest quality grasslands within the project site, would be preserved in perpetuity, and would be managed under a Wetlands Management Plan with goals to protect and enhance habitat conditions.

Because no suitable nesting habitat would be affected and the project site would provide high quality foraging habitat opportunities for this species in the proposed Preserve in perpetuity under Alternative A, a less-than-significant impact would result.

Impact 5.5: Effects to Western Spadefoot

Implementation of Alternative A would directly affect approximately 38.6 acres of seasonal wetland and vernal pool habitat, which may provide suitable breeding habitat for western spadefoot. This species has been recorded on the project site, including within vernal pools near Eagles Nest Road. Filling and grading suitable aquatic habitat could affect individuals if they are present. In addition, loss of suitable breeding habitat may limit breeding opportunities for this species within the action area. This is considered a significant, adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> **Measure 5.5: Perform Pre-construction Surveys for Western Spadefoot.** Prior to the fill of any seasonal wetlands or vernal pools for each development area, a qualified biologist would conduct a survey for western spadefoot. The survey would include transecting all suitable habitat that may be affected by proposed activities and identifying suitable burrows that may be used for aestivation. Suitable burrows would be excavated using hand tools. If a spadefoot is found in a construction area, the biologist would move the spadefoot from the area to suitable habitat within the proposed Preserve.

Impact 5.6: Effects to Western Pond Turtle

Implementation of Alternative A would include the filling of approximately 9.7 acres of seasonal stream channels and drainage ditches, which may provide suitable aquatic habitat for western pond turtle. Draining and grading of suitable habitat during construction could directly affect western pond turtle individuals if they are present. This is considered a significant, adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> **Measure 5.6: Perform Pre-construction Surveys for Western Pond Turtle.** Prior to construction within each development area, a qualified biologist would conduct a survey for western pond turtles within 24 hours of the start of construction activities within 500 feet of streams, ditches, and other watercourses located within the proposed construction areas. If no individuals are identified then no additional measures are required. If a turtle is found in a proposed construction area, the biologist would move the turtle from the area to suitable habitat within the proposed Preserve. If a turtle becomes trapped during construction activities, a biologist would remove the turtle from the work area and place it in a suitable area of the proposed Preserve.

Impact 5.7: Effects to Nesting Special-Status Birds Species and Migratory Birds

As noted in **Section 3.5**, several species of state and local concern may nest in habitats that may be directly or indirectly affected by site development. Swainson's hawk, tri-colored blackbird, burrowing owls, white-tailed kites, short-eared owls and loggerhead shrike may be adversely affected if active nest sites are either removed or exposed to a substantial increase in noise or human presence during construction or use of the action area. Most birds are also protected by the Migratory Bird Treaty Act, and tri-colored blackbird, short-eared owl, western burrowing owl, northern harrier, and loggerhead shrike are considered species of special concern by the CDFW,

while white-tailed kite are a fully protected species under CESA. Disturbance associated with the proposed development and resulting in the loss or abandonment of an active nest would be considered a significant, adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

Measure 5.7a: Avoid Active Nesting Season. To avoid and minimize impacts to tree and shrub nesting species, the following measures would be implemented;

- If feasible, conduct all tree and shrub removal and grading activities during the non-breeding season (generally September 1 through January 31).
- If grading and tree removal activities are scheduled to occur during the breeding and nesting season (February 1 through August 31), pre-construction surveys would be performed prior to the start of proposed activities (refer to Measure 5.7b).

Measure 5.7b: Conduct Pre-construction Nesting Bird Surveys. If construction, grading or other project-related activities are schedule during the nesting season (February 1 to August 31), pre-construction surveys would be conducted by a qualified wildlife biologist to identify active Swainson's hawk nests within ½-mile of proposed construction activities and nests of other species within 250 feet of proposed construction activities. The surveys would be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. The results of the survey would be emailed to CDFW at least three days prior to construction. Surveys would be conducted by a qualified biologist.

If the pre-construction surveys do not identify any nesting raptors or other nesting migratory bird species within areas potentially affected by construction activities, no further mitigation would be required. If the pre-construction surveys do identify nesting raptors or other nesting bird species within areas that may be affected by site construction, Measure 5.7c would be implemented.

Measure 5.7c: Avoid Active Bird Nest Sites. Should active nest sites be discovered within areas that may be affected by construction activities, additional measures would be implemented as described below.

- **Swainson's Hawk:** If active nests are found, CDFW would be notified and project-related construction impacts would be avoided by establishment of appropriate no-work buffers to limit project-related construction activities near the nest site. The size of the no-work buffer zone would be determined in consultation with the CDFW, although a ¼ mile buffer would be used when possible. In consultation with CDFW, monitoring of nest activity by a qualified biologist may be required if the project-related construction activity has potential to adversely affect the nest or nesting behavior of the bird(s).
- **Burrowing Owls:** If actively nesting burrowing owls are discovered in the action area during the breeding or nesting season (February 1 to August 31), CDFW would be notified. Where construction activities could directly affect burrowing owl survival or reproductive behavior, or where maintenance of a minimum 250-foot buffer zone around active burrowing owls is not practical, a qualified biologist would recommend site specific mitigation measures.

- If proposed development would result in direct impacts to active burrows, passive relocation/exclusion would be allowed during the non-breeding season (September 1 to January 31). The CDFW would be consulted on current passive relocation methodology before relocation of owls is attempted.
- **Tricolored Blackbird:** If a colony is identified within 500 feet of construction, the project proponent would consult with CDFW regarding suitable measures to avoid impacting breeding effort.
- **Short-eared Owl, Northern Harrier, White-Tailed Kite, Loggerhead Shrike, and other Migratory Birds:** If active nests are found, construction impacts would be avoided by establishment of appropriate no-work buffers to limit project-related construction activities near the nest site. The size of the no-work buffer zone would be determined in consultation with the CDFW although a 500-foot would be used when possible.

Impact 5.8: Effects to Special-Status Wildlife Associated with Annual Grasslands

Construction activities under Alternative A would result in the loss of approximately 1,327 acres of annual grassland. These areas provide habitat for several special-status wildlife species, including American badger, burrowing owl, northern harrier, short-eared owl, white-tailed kite, and Swainson's hawk. Although grassland habitats are regionally abundant in central California, this portion of Sacramento County has experienced substantial losses of grassland habitat due to residential and commercial development. This project, when combined with adjacent existing and proposed development, has the potential to contribute to the fragmentation and loss of large tracts of grassland habitat.

CDFW and the County have developed mitigation guidance and programs to compensate for the loss of Swainson's hawk foraging habitat. The County's Swainson's Hawk Ordinance focuses on the loss of lands zoned for agricultural use, while CDFW guidance recommends a foraging habitat mitigation ratio that is dependent upon the development's distance to the nearest known Swainson's hawk nest site. Because the project site is not zoned for agricultural use, the CDFW guidance was evaluated to determine potential foraging habitat mitigation needs. Based upon this guidance and the nearest recorded nest site (CDFW, 2010), a mitigation ratio of 0.75:1 is recommended to reduce potential effects related to foraging habitat loss.

As noted in Impact 5.4, Alternative A includes the preservation of approximately 1,160 acres of annual grassland habitat. This amounts to a preservation ratio of 0.87:1, which exceeds CDFW mitigation guidance. The proposed Preserve is located adjacent to other areas of grassland habitat to the south of the project site, thereby reducing potential fragmentation effects. Based upon these factors, Alternative A would result in a less-than-significant impact related to the loss of annual grassland habitat for these species.

Impact 5.9: Effects to Special-Status Plants

Implementation of Alternative A would result in the direct loss of approximately 38.6 acres of suitable habitat for special-status plants associated with vernal pools. Three special-status plant species, Bogg's Lake hedge-hyssop, Ahart's dwarf rush, and legenere, have been identified in the action

area during previous surveys (WRA, 2004). Under Alternative A, the vernal pools containing Bogg's Lake hedge-hyssop, Ahart's dwarf rush, and two of the four legenere populations would be preserved within the proposed Preserve. The remaining two known populations of legenere are found in pools that would be directly affected by the proposed University Village / Residential land use. Additional special-status species associated with seasonal wetlands, vernal pool, and emergent marsh habitats that may be affected by Alternative A include slender Orcutt grass, Sacramento Orcutt grass, and Sanford's arrowhead. Although these plant species were not identified during previous surveys performed within the project site, suitable habitat is present and the lack of recent surveys warrants the completion of additional surveys prior to the start of construction. The potential loss of special-status plant populations is considered a significant, adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

Measure 5.9a: Perform Pre-construction Surveys for Special-Status Plants. Prior to disturbance of any vernal pools or swale within each development area, that development area shall be surveyed by a qualified botanist for special status plants following established CDFW *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (CDFW, 2009), which calls for protocol-level surveys during the appropriate flowering/identification period for each potentially affected species. If the pre-construction surveys do identify special-status plant species within areas that may be affected by site construction, Measure 5.9b would be implemented.

Measure 5.9b: Compensate for the Loss of Special-Status Plant Populations. Known populations of Bogg's Lake hedge-hyssop, Ahart's dwarf rush, and legenere would be protected within the Preserve. Alternative A would also directly affect two known populations of legenere, and may affect additional, undocumented populations of special-status plants. Measures to compensate for the loss of special status species include:

- Prepare a Mitigation and Monitoring Plan that will be approved by the USFWS and CDFW to relocate plants and/or seed banks or reintroduce new populations in suitable habitat and soil types within the on-site Preserve or at a CDFW or USFWS-approved off-site location;
- Restore or enhance suitable habitat within the Preserve under a plan approved by the USACE, USFWS and CDFW.

Impact 5.10: Loss of Native Oaks and Other Protected Trees

Development activities under Alternative A may occur within the dripline of native oak trees or landmark trees, or may result in the direct removal of native oak trees or landmark trees. Work within the dripline of trees may cause permanent damage to the root system and the subsequent loss of the tree. The Sacramento County Tree Ordinance calls for avoidance of native oaks six-inches or greater in diameter at breast height (dbh), multi-trunk native oaks of 10-inches or greater dbh, or landmark trees. Impacts to protected oak or landmark trees are considered significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

Measure 5.10: Protect Sensitive Tree Resources Adjacent to Construction Activities. Sensitive tree resources adjacent to construction activities may require additional protection. Where feasible, buffer zones should include a minimum one-foot-wide buffer zone outside the dripline for oaks and landmark trees. Grading within the driplines of oak trees would not be permitted unless specifically authorized by a Certified Arborist.

4.5.2 Alternative B – 2006 Conceptual Land Use Plan Alternative

Impact 5.1: Effects to Federally Listed Vernal Pool Species and Critical Habitat

Potential direct and indirect effects to suitable habitat for vernal pool species as a result of Alternative B development are summarized in **Figure 4.5-2** and **Table 4.5-5**.

TABLE 4.5-5
EFFECTS TO HABITAT FOR VERNAL POOL SPECIES – ALTERNATIVE B

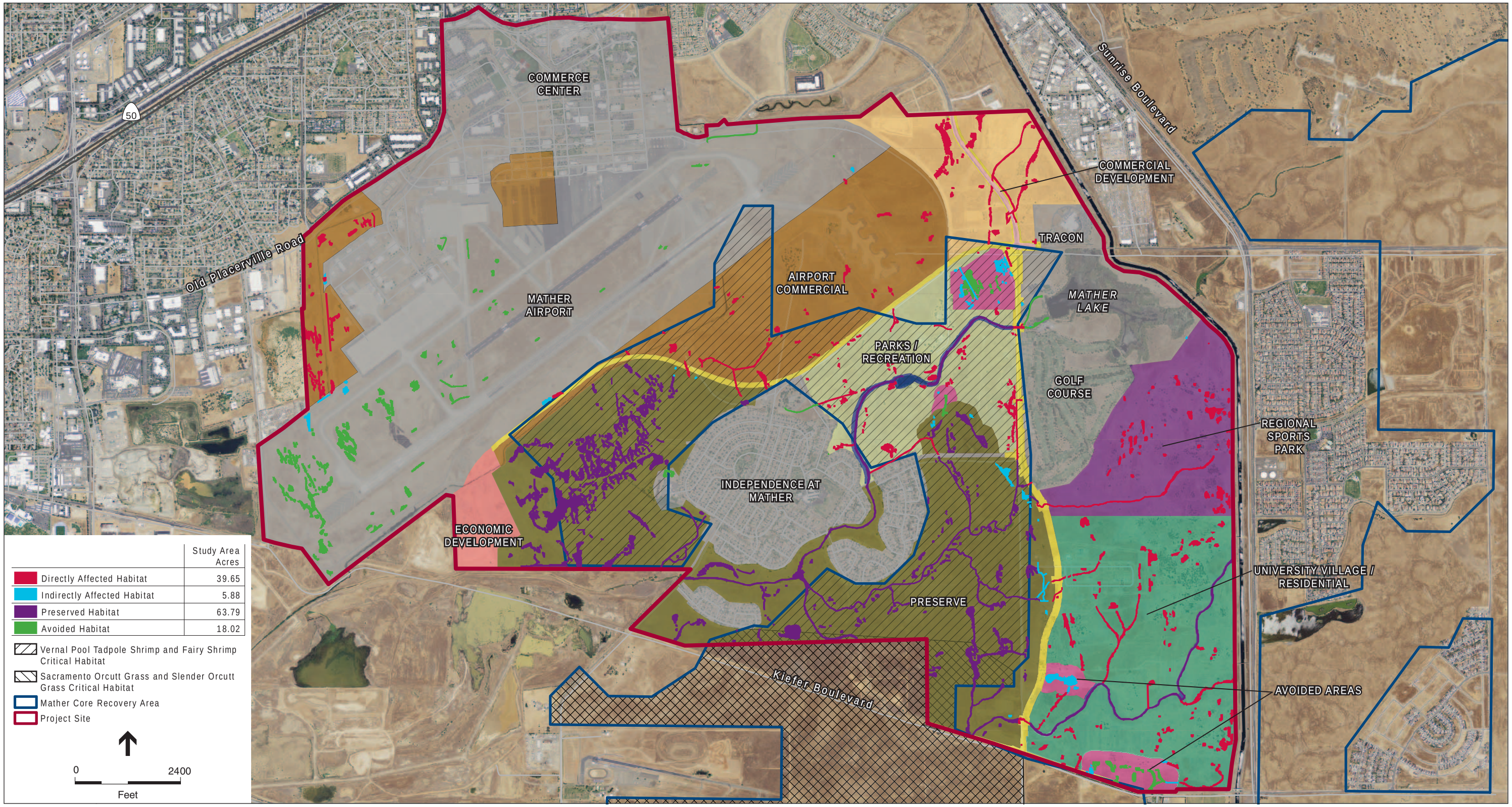
Land Use	Direct Effects (Acres)	Indirect Effects (Acres)
Airport Commercial	*6.62*	*0.82*
Seasonal Wetland	4.11	0.20
Vernal Pools and Swales	2.52	0.62
Commercial Development	*6.50*	0.00
Seasonal Wetland	3.64	0.00
Vernal Pools and Swales	2.86	0.00
Economic Development	*0.00*	*0.00*
Parks Recreation	*4.85*	*0.61*
Seasonal Wetland	1.58	0.23
Vernal Pools and Swales	3.27	0.39
Roadways and Infrastructure	*3.65*	*4.06*
Seasonal Wetland	1.39	0.77
Vernal Pools and Swales	1.84	3.29
Channels and Streams	0.42	0.00
Regional Sports Park	*6.11*	*0.01*
Seasonal Wetland	5.63	0.01
Vernal Pools and Swales	0.20	0.00
Channels and Streams	0.28	0.00
University Village/Residential	*11.91*	*0.38*
Seasonal Wetland	5.82	0.15
Vernal Pools and Swales	5.90	0.23
Channels and Streams	0.19	0.00
Total	**39.65**[1]	**5.88**[1]

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013

Development under Alternative B would result in the direct loss of approximately 39.65 acres of suitable habitat for vernal pool species. Of these acres, approximately 16.59 acres are classified as vernal pools or swales, with the remainder (23.06 acres) classified as seasonal wetlands and

channels. Furthermore, development under Alternative B would also indirectly affect approximately 5.88 acres of habitat for vernal pool species located in the proposed Preserve, avoided areas and at Mather Airport.

In addition to the these effects, up to 7.62 acres of critical habitat for vernal pool tadpole shrimp and fairy shrimp would be directly affected and up to 2.44 acres of critical habitat would be indirectly affected, as discussed under Impact 5.2, below. No critical habitat for slender Orcutt grass and Sacramento Orcutt grass would be affected by Alternative B.



SOURCE: NAIP, 2009; Sacramento County, 2013; and ESA, 2013

Mather Specific Plan Project Supplemental Draft EIS . 209259

Figure 4.5-2

Potential Effect to Habitat for Vernal Pool Species - Alternative B

This page intentionally left blank

The direct loss of suitable habitat for these species, including the direct take of species, represents a significant, adverse impact. In addition, the proximity of proposed activities to habitat for vernal pool species presents the possibility of secondary effects as described for Alternative A. Therefore, potential indirect effects to suitable habitat are also considered a significant, adverse impact.

Alternative B also proposes on-site preservation of habitat for vernal pool species, including 57.10 acres within an on-site Preserve and 6.69 acres within Riparian Buffer areas. This habitat would be protected in perpetuity. When combined, this represents a preservation ratio of 1.4:1 for every acre directly and indirectly affected by activities associated with this alternative. As described previously, wetlands within the proposed Preserve would be preserved and managed in accordance with the Wetland Management Plan that is subject to final approval by the USACE, USFWS, CDFW and EPA. Nevertheless, without additional compensation and mitigation, the onsite loss of habitat for vernal pool species is considered significant and adverse. Even with recommended mitigation, impacts would remain significant and adverse.

Mitigation Measures

Implement Mitigation Measures 5.1b: Use Best Management Practices (BMPs) to Provide Effective Erosion and Sediment Control, 5.1c: Conduct Worker Awareness Training (WEAP), 5.1d: Limit Project Access Routes/Staging Areas, and 5.1e: Protect Preserved and Avoided Habitats.

Measure 5.1a: Compensate for the Loss of Habitat for Vernal Pool Species. The project proponent would provide on-site habitat preservation in perpetuity and purchase habitat creation credits at an USACE and USFWS approved mitigation bank and/or restore/enhance habitat within the designated Preserve area upon USFWS approval to fully compensate for direct and indirect effects to habitat for federally listed vernal pool species. While final ratios would be determined in consultation with USFWS, it is estimated that compensation would be at a minimum 2:1 preservation ratio and 1:1 creation/restoration/rehabilitation ratio for direct effects to habitat for vernal pool species (39.65acres) and a 2:1 preservation ratio for indirect effects to habitat for vernal pool species (5.88acres).

Alternative B would include 63.79 acres of on-site habitat for vernal pool species preservation and enhancement. Thus, Alternative B would provide on-site preservation for direct and indirect effects at a 1.4:1 ratio.

To fully compensate for the direct loss of habitat for federally listed vernal pool species, the project proponent would purchase habitat creation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval at a minimum 1:1 ratio for direct effects to habitat for vernal pool species. In addition, the project proponent would purchase habitat preservation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval for the direct and indirect effects to habitat for vernal pool species. Combined with the on-site preservation, this is expected to result in a 2:1 preservation component for direct and indirect effects.

Habitat compensation for each development area must occur prior to or concurrent with development of that area which is within 250 feet of suitable habitat for vernal pool species. Programmatic compensation requirements for each land use are summarized in **Table 4.5-6**. As noted below, compensation for each land use must be approved by the USACE and USFWS prior to the initiation of construction activities within 250 feet of suitable habitat for vernal pool species.

Options for habitat compensation are described under Section 4.5.1, Measure 5.1a.

TABLE 4.5-6
HABITAT COMPENSATION REQUIREMENTS BY LAND USE TYPE – ALTERNATIVE B

Land Use	Habitat for Vernal Pool Species Compensation: 1:1 Creation (Acres)	Habitat for Vernal Pool Species Compensation: 0.6:1 Preservation (Acres)
Airport Commercial	6.62	4.46
Commercial Development	6.50	3.90
Economic Development	0.00	0.00
Parks Recreation	4.85	3.27
Roadways and Infrastructure	3.65	4.62
Regional Sports Park	6.11	3.66
University Village/Residential	11.91	7.36
Total	**39.65**	**27.27**

SOURCE: ESA, 2013; Sacramento County, 2013

Impact 5.2: Potential to Conflict with provisions of the USFWS Vernal Pool Recovery Plan

As discussed previously, the project site is located within the Mather Core Area of the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005) which is a Zone 1 core area having the highest priority for recovery. See Section 4.5.1, Impact Discussion 5.2 for details on the specific conservation goals of the Recovery Plan.

Alternative B includes substantial preservation of habitat for vernal pool species. Approximately 44.55 acres of suitable habitat for vernal pool species within the Mather Core Area would be protected in perpetuity within the action area (**Figure 4.5-2**) under this alternative. An additional 2.81 acres would be avoided by Alternative B through designation of “Avoided areas”. Avoided areas would not be disturbed during construction but no active management is currently proposed. Combined, there would be 49.80 acres that would be preserved or avoided within the Mather Core Area. This corresponds to 87 percent of the suitable habitat for vernal pool species within the Mather Core Area. However, some of this habitat may be affected by adjacent proposed land uses. **Table 4.5-7** summarizes the effects of Alternative B on suitable habitat for vernal pool species within the Mather Core Area.

TABLE 4.5-7
EFFECTS TO MATHER RECOVERY AREA HABITAT – ALTERNATIVE B

Habitat Type	Total in Mather Recovery Area (Acres)	Directly Affected (Acres)	Potentially Indirectly Affected (Acres)	Preserved/ Avoided Habitat (Acres) / Percent[1]	Preserved/ Avoided Habitat which is not Indirectly Impacted (Acres) / Percent[2]
Vernal Pools and Swales	41.96	4.87	1.75	37.08 / 88%	35.33 / 84%
Seasonal Wetlands	9.94	2.57	0.69	7.37 / 74%	6.68 / 67%
Ephemeral and Intermittent Channels	5.52	0.18	0.00	5.34 / 97%	5.34 / 97%
Total	**57.42**	**7.62**	**2.44**	**49.80 / 87%**	**47.36 / 82%**

1 Habitat within the Mather Core Area that is not directly impacted.
2 Habitat within the Mather Core Area that is 1) not directly impacted and 2) not indirectly affected (i.e. for vernal pools, vernal swales and seasonal wetlands at least 250 feet from proposed land disturbance..
3 Totals subject to rounding
SOURCE: ESA, 2013; Sacramento County, 2013

Alternative B would preserve suitable habitat for those species targeted for protection within the Mather Core Area, with the majority of that being high functioning habitat for vernal pool species. Furthermore, some of this habitat is expected to be restored and/or enhanced, thereby increasing habitat suitability for these species. Nevertheless, without mitigation, Alternative B would conflict with the goals of the recovery plan, as it would fail to protect at least 85 percent of the existing habitat for vernal pool species within the Mather Core Area. Approximately 1.45 acres of additional habitat would need to be preserved within the Mather Core Area to meet the goals of the recovery plan. This is a significant and adverse impact. In addition, while mitigation is recommended to compensate for this impact (see below), the feasibility of this measure cannot be demonstrated at this time as there are no USACE or USFWS approved mitigation banks within the Mather Core Area at this time. Therefore, this impact would remain significant and adverse.

Mitigation Measures

Measure 5.2: Preserve, Restore or Enhance Additional Habitat for Vernal Pool Species. Additional habitat for vernal pool species (approximately 1.45 acres) would be preserved or restored within the Mather Core Area to meet the 85% minimum goals of the recovery plan. Preservation or restoration may occur within or outside of the project site, but must occur within the designated boundaries of the Mather Core Area. Preservation would take the form of either purchasing mitigation credits from a USACE and USFWS approved mitigation bank or through conservation easements and an endowment of preservation lands within the Mather Core Area. As noted above, there are no USFWS and USACE approved mitigation banks that have available credits within the Mather Core Area. Proposed restoration plans, including associated land use restrictions, would require approval from the USFWS and USACE. Proof of preservation, restoration or enhancement must be provided to the USACE and USFWS prior to project construction.

Impact 5.3: Effects to Valley Elderberry Longhorn Beetle (VELB)

Implementation of Alternative B has the potential to adversely affect this species by adversely affecting suitable elderberry shrubs. Because these shrubs represent potential habitat for all stages of VELB's life cycle, the removal or degradation of elderberry shrubs may adversely affect VELB and limit management opportunities for their recovery. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

Implement Mitigation Measure 5.3: Mitigate for Impacts to VELB and its Habitat.

Impact 5.4: Effects to Golden Eagle

This species may be affected by the loss of suitable wintering foraging habitat. Potential effects to grassland vegetation, as well as all other habitat types present within the project site, are summarized in **Table 4.5-8**. This evaluation indicates that approximately 1,429 acres of suitable foraging habitat (annual grasslands) would be affected by proposed development. Neighboring habitat types, such as seasonal wetlands and vernal pools, may also contribute towards seasonal foraging opportunities for this species.

TABLE 4.5-8
EFFECTS TO VEGETATION AND HABITATS – ALTERNATIVE B

Habitat Type	Existing (Acres)	Affected (Acres)	Percent Affected
Annual Grassland	2775.8	1,429.0	51.5%
Cottonwood Woodland	72.7	72.7	100.0%
Disturbed / Ruderal	87.3	53.3	61.1%
Drainage Ditch (Riverine)	2.5	1.4	56.0%
Lake / Pond (Lacustrine)	40.9	0.0	0.0%
Recreation / Landscaped	216.7	2.9	1.3%
Seasonal Wetland	61.53	21.6	35.1%
Stream Channel (Riverine)	29.9	8.4	28.1%
Urban/Developed	2,373.6	411.0	17.3 %
Valley Foothill Riparian	14.4	0.0	0.0%
Vernal Pool and Vernal Swale	73.9	16.3	22.1%
Total	**5,749.4**	**2,016.6**	**35.1%**

SOURCE: ESA, 2013; Sacramento County, 2013

Under Alternative B, approximately 975 acres of annual grassland habitat would be preserved within the proposed Preserve and Riparian Buffer areas. It further avoids another 83 acres of grasslands within designated Avoided areas. This amounts to a preservation ratio of 0.74:1. These areas contain the highest quality grasslands within the project site, would be preserved in

perpetuity, and would be managed under a Wetlands Management Plan with goals to enhance habitat conditions.

Because no suitable nesting habitat would be affected and the project site would provide high quality foraging habitat opportunities for this species in perpetuity under Alternative B, a less-than-significant impact would result.

Impact 5.5: Effects to Western Spadefoot

Implementation of Alternative B would include filling approximately 37.9 acres of seasonal wetland and vernal pool habitat, which may provide suitable breeding habitat for this species. Filling and grading suitable aquatic habitat during construction could affect individuals if they are present. In addition, loss of suitable breeding may limit breeding opportunities for this species within the action area. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> Implement Mitigation Measure 5.5: Perform Pre-construction Surveys for Western Spadefoot.

Impact 5.6: Effects to Western Pond Turtle

Implementation of Alternative B would include filling approximately 9.8 acres of seasonal stream channels and drainage ditches, which may provide suitable nesting habitat for western pond turtle. Draining and grading of suitable habitat during construction directly affect western pond turtle individuals if they are present. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> Implement Mitigation Measure 5.6: Perform Pre-construction Surveys for Western Pond Turtle.

Impact 5.7: Effects to Nesting Special-Status Birds Species and Migratory Birds

Alternative B may impact nesting birds, including Swainson’s hawk, tri-colored blackbird, burrowing owl, white-tailed kite, short-eared owl and loggerhead shrike. These species may be adversely affected if active nest sites are either directly removed or exposed to a substantial increase in noise or human presence during construction or use of the action area. Disturbance associated with the proposed development and resulting in the loss or abandonment of an active nest would be considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

> Implement Mitigation Measures 5.7a: Avoid Active Nesting Season, 5.7b: Conduct Pre-construction Nesting Bird Surveys, and 5.7c: Avoid Active Bird Nest Sites.

Impact 5.8: Effects to Special-Status Wildlife Associated with Annual Grasslands

Construction activities under Alternative B would result in the loss of approximately 1,429 acres of annual grassland. These areas provide habitat for several special-status wildlife species, including American badger, burrowing owl, northern harrier, short-eared owl, white-tailed kite, and Swainson's hawk.

As noted in Impact 5.4, Alternative B includes the preservation of approximately 975 acres of annual grassland habitat. It further avoids another 83 acres of grasslands within designated Avoided areas. This amounts to a preservation ratio of 0.74:1, which is substantially similar to the State recommended mitigation ratio of 0.75:1. The Preserve and Avoided areas also contain high-quality habitat and are located adjacent to other areas of grassland habitat to the south of the project site, thereby reducing potential fragmentation effects. Based upon these factors, Alternative B would result in a less-than-significant impact for these species.

Impact 5.9: Effects to Special-Status Plants

Implementation of Alternative B would result in the direct loss of approximately 37.9 acres of suitable habitat for special-status plants associated with vernal pools. Please see Section 4.5.1, Impact Discussion 5.9 for details on plant species populations. The potential loss of special-status plant populations is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

> Implement Mitigation Measures 5.9a: Perform Pre-construction Surveys for Special-Status Plants and 5.9b: Compensate for the Loss of Special-Status Plant Populations.

Impact 5.10: Loss of Native Oaks and Other Protected Trees

Please see Section 4.5.1, Impact Discussion 5.10 for details on potential impacts to native oaks and other protected trees. The impact to protected oaks or landmark trees is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> Implement Mitigation Measure 5.10: Protect Sensitive Tree Resources Adjacent to Construction Activities.

4.5.3 Alternative C – Multiple Preserves Alternative

Impact 5.1: Effects to Federally Listed Vernal Pool Species and Critical Habitat

Alternative C would result in direct and indirect effects to suitable habitat for these species as well as the known populations. Potential direct and indirect effects to suitable habitat for vernal pool species as a result of Alternative C development are summarized in **Table 4.5-9** and **Figure 4.5-3**.

Development under Alternative C would result in the direct loss of approximately 33.59 acres of suitable habitat for vernal pool species. Of these acres, approximately 11.85 acres are classified as vernal pools or swales, with the remainder (21.74 acres) classified as seasonal wetlands and channels. Furthermore, development under Alternative C would also indirectly affect approximately 8.80 acres of habitat for vernal pool species located in the proposed Preserves and at Mather Airport.

TABLE 4.5-9
EFFECTS TO HABITAT FOR VERNAL POOL SPECIES – ALTERNATIVE C

Land Use	Direct Effects (Acres)	Indirect Effects (Acres)
Airport Commercial	*6.62*	*0.82*
Seasonal Wetland	4.11	0.20
Vernal Pools and Swales	2.52	0.62
Commercial Development	*3.38*	*0.00*
Seasonal Wetland	3.11	0.00
Vernal Pools and Swales	0.27	0.00
Economic Development	*0.00*	*0.00*
Parks Recreation	*1.92*	*0.52*
Seasonal Wetland	0.79	0.14
Vernal Pools and Swales	1.13	0.38
Roadways and Infrastructure	*3.65*	*7.08*
Seasonal Wetland	1.39	1.11
Vernal Pools and Swales	1.84	5.96
Channels and Streams	0.42	0.00
Regional Sports Park	*6.11*	*0.01*
Seasonal Wetland	5.63	0.01
Vernal Pools and Swales	0.20	0.00
Channels and Streams	0.28	0.00
University Village/Residential	*11.91*	*0.38*
Seasonal Wetland	5.82	0.15
Vernal Pools and Swales	5.90	0.23
Channels and Streams	0.19	0.00
Total	**33.59**[1]	**8.80**[1]

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013

In addition to the these effects, up to 4.98 acres of critical habitat for vernal pool tadpole shrimp and fairy shrimp would be directly affected and up to 2.89 acres of critical habitat would be indirectly affected. No critical habitat for slender Orcutt grass and Sacramento Orcutt grass would be affected by Alternative C.

As with Alternatives A and B, the direct loss of suitable habitat for these species, including the direct take of species, represents a significant, adverse impact. In addition, the proximity of proposed activities to habitat for vernal pool species presents the possibility of secondary effects as described for Alternatives A and B. Therefore, potential indirect effects to suitable habitat are also considered a significant, adverse impact.

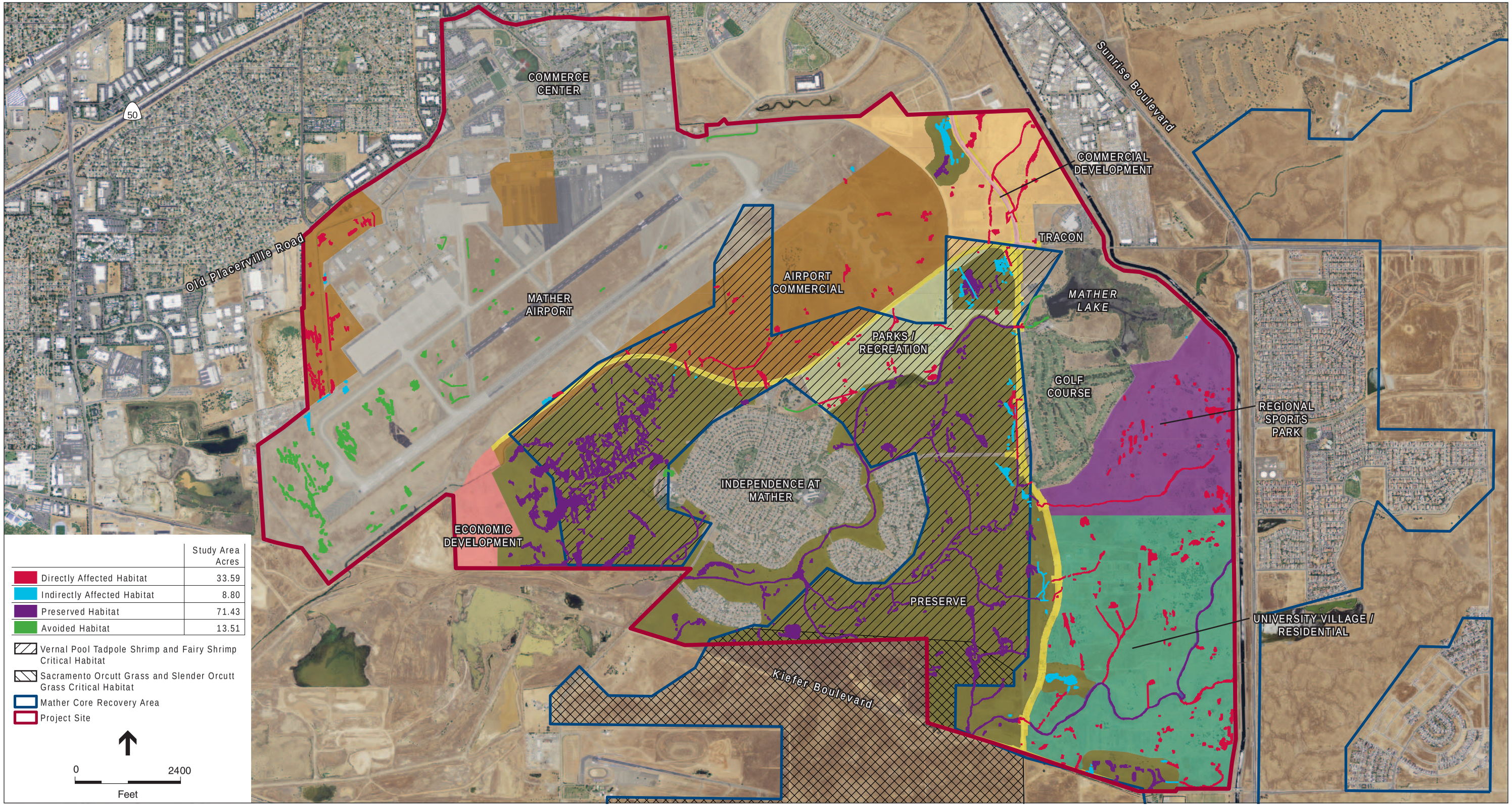
Alternative C also proposes on-site preservation of habitat for vernal pool species, including 67.85 acres within on-site Preserves and 3.58 acres within Riparian Buffer areas. This habitat would be protected in perpetuity. When combined, this represents a preservation ratio of 1.7:1 for every acre directly and indirectly affected by activities associated with this alternative. As described previously, wetlands within the proposed Preserves would be preserved and managed in accordance with the Wetland Management Plan that is subject to final approval by the USACE, USFWS, CDFW and EPA. Nevertheless, without additional compensation and mitigation, the onsite loss of habitat for vernal pool species is considered significant and adverse. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

Implement Mitigation Measures 5.1b: Use Best Management Practices (BMPs) to Provide Effective Erosion and Sediment Control, 5.1c: Conduct Worker Awareness Training (WEAP), 5.1d: Limit Project Access Routes/Staging Areas, and 5.1e: Protect Preserved and Avoided Habitats.

Measure 5.1a: Compensate for the Loss of Habitat for Vernal Pool Species. The project proponent would provide on-site habitat preservation in perpetuity and purchase habitat creation credits at an USACE and USFWS approved mitigation bank and/or restore/enhance habitat within the designated Preserve areas upon USFWS approval to fully compensate for direct and indirect effects to habitat for federally listed vernal pool species. While final ratios would be determined in consultation with USFWS, it is estimated that compensation would be at a minimum 2:1 preservation ratio and 1:1 creation ratio for direct effects to habitat for vernal pool species (33.59 acres) and a 2:1 preservation ratio for indirect effects to habitat for vernal pool species (8.80 acres).

Alternative C would include 71.43 acres of on-site habitat for vernal pool species preservation and enhancement. Thus, Alternative C would provide on-site preservation for direct and indirect effects at a 1.7:1 ratio. The level of on-site creation, restoration and/or rehabilitation proposed by the Wetland Management Plan has not yet been quantified.



SOURCE: NAIP, 2009; Sacramento County, 2013; and ESA, 2013

Figure 4.5-3
Potential Effect to Habitat for Vernal Pool Species - Alternative C

This page intentionally left blank

To fully compensate for the direct loss of habitat for federally listed vernal pool species, the project proponent would purchase habitat creation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval at a minimum 1:1 ratio for direct effects to habitat for vernal pool species. In addition, the project proponent would purchase habitat preservation credits at an USACE and USFWS approved mitigation bank and/or create/restore/rehabilitate habitat within the designated Preserve areas upon USFWS approval for the direct and indirect effects to habitat for vernal pool species. Combined with the on-site preservation, this is expected to result in a 2:1 preservation component for direct and indirect effects.

Habitat compensation for each development area must occur prior to or concurrent with development of that area within 250 feet of suitable habitat for vernal pool species. Programmatic compensation requirements for each land use are summarized in **Table 4.5-10**. As noted below, compensation for each land use must be approved by the USACE and USFWS prior to the initiation of construction activities within 250 feet of suitable habitat for vernal pool species.

Options for habitat compensation are described under Section 4.5.1, Measure 5.1a.

TABLE 4.5-10
HABITAT COMPENSATION REQUIREMENTS BY LAND USE TYPE – ALTERNATIVE C

Land Use	Habitat for Vernal Pool Species Compensation: 1:1 Creation (Acres)	Habitat for Vernal Pool Species Compensation: 0.3:1 Preservation (Acres)
Airport Commercial	6.62	2.35
Commercial Development	3.38	1.07
Economic Development	0.00	0.00
Parks Recreation	1.92	0.77
Roadways and Infrastructure	3.65	3.38
Regional Sports Park	6.11	1.93
University Village/Residential	11.91	3.87
Total	**33.59**	**13.37**

SOURCE: ESA, 2013; Sacramento County, 2013

Impact 5.2: Potential to Conflict with provisions of the USFWS Vernal Pool Recovery Plan

As discussed previously, the project site is located within the Mather Core Area of the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005), which is a Zone 1 core area having the highest priority for recovery.

Approximately 52.44 acres of suitable habitat for vernal pool species within the Mather Core Area would be protected in perpetuity within the project site under Alternative C (**Figure 4.5-3**). This corresponds to 91 percent of the suitable habitat for vernal pool species within the Mather Core Area. However, some of this habitat may be indirectly affected by construction and/or operation of adjacent proposed land uses. **Table 4.5-11** summarizes the effects of Alternative C on suitable habitat for vernal pool species within the Mather Core Area.

TABLE 4.5-11
EFFECTS TO MATHER RECOVERY AREA HABITAT – ALTERNATIVE C

Habitat Type	Total in Mather Recovery Area (Acres)	Directly Affected (Acres)	Potentially Indirectly Affected (Acres)	Preserved/ Avoided Habitat (Acres) / Percent[1]	Preserved/ Avoided Habitat which is not Indirectly Impacted (Acres) / Percent[2]
Vernal Pools and Swales	41.96	2.86	2.01	39.10 / 93%	37.09/ 88%
Seasonal Wetlands	9.94	1.95	0.88	7.99 / 80%	7.11 / 72%
Ephemeral and Intermittent Channels	5.52	0.18	0	5.34/ 97%	5.34 / 97%
Total	**57.42**	**4.98**	**2.89**	**52.44/ 91%**	**49.54 / 86%**

1 Habitat within the Mather Core Area that is not directly impacted.
2 Habitat within the Mather Core Area that is 1) not directly impacted and 2) not indirectly affected (i.e. for vernal pools, vernal swales and seasonal wetlands at least 250 feet from proposed land disturbance.
3 Totals subject to rounding
SOURCE: ESA, 2013; Sacramento County, 2013

As shown in **Table 4.5-11**, Alternative C would protect suitable habitat for those species targeted for protection within the Mather Core Area, with the majority of that being high quality habitat for vernal pool species. Furthermore, some of this habitat is expected to be restored and/or enhanced, thereby increasing habitat suitability for these species. Based on this evaluation, Alternative C would be consistent with the goals of the USFWS recovery plan for vernal pool species as it protects at least 85% of the habitat for vernal pool species within the Mather Core Area. Thus, this impact is considered less-than-significant.

Impact 5.3: Effects to Valley Elderberry Longhorn Beetle

Implementation of Alternative C has the potential to adversely affect this species by adversely affecting suitable elderberry shrubs. Because these shrubs represent potential habitat for all stages of VELB's life cycle, the removal or degradation of elderberry shrubs may adversely affect VELB and limit management opportunities for their recovery. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

Implement Mitigation Measure 5.3: Mitigate for Impacts to VELB and its Habitat.

Impact 5.4: Effects to Golden Eagle

This species may be affected by the loss of suitable wintering foraging habitat. Potential effects to grassland vegetation, as well as all other habitat types present within the project site, are summarized in **Table 4.5-12**. This evaluation indicates that approximately 1,262 acres of suitable foraging habitat (annual grasslands) would be affected by activities associated with this alternative. Neighboring habitat types, such as seasonal wetlands and vernal pools, may also contribute towards seasonal foraging opportunities for this species.

TABLE 4.5-12
EFFECTS TO VEGETATION AND HABITATS – ALTERNATIVE C

Habitat Type	Existing (Acres)	Affected (Acres)	Percent Affected
Annual Grassland	2,784.6	1,262.0	45.3%
Cottonwood Woodland	73.3	72.7	99.2%
Disturbed / Ruderal	87.3	53.3	61.1%
Drainage Ditch (Riverine)	2.5	1.4	56.0%
Lake / Pond (Lacustrine)	46.3	0.0	0.0%
Recreation / Landscaped	216.7	2.9	1.3%
Seasonal Wetland	52.6	20.2	38.4%
Stream Channel (Riverine)	24.5	8.3	33.9%
Urban/Developed	2,374.6	410.3	17.3%
Valley Foothill Riparian	14.4	0.0	0.0%
Vernal Pool and Vernal Swale	72.6	11.2	15.4%
Total	**5,749.4**	**1842.4**	**32.0%**

SOURCE: ESA, 2012; Sacramento County, 2013

Under Alternative C, approximately 1,225 acres of annual grassland habitat would be preserved within the proposed Preserves and Riparian Buffer areas. This represents a grassland preservation ratio of 0.97:1. These areas contain the highest quality grasslands within the project site, would be preserved in perpetuity, and would be managed under a Wetlands Management Plan with goals to enhance habitat conditions.

Because no suitable nesting habitat would be affected and the project site would provide high quality foraging habitat opportunities for this species in perpetuity under Alternative C, a less-than-significant impact would result.

Impact 5.5: Effects to Western Spadefoot

Implementation of Alternative C would include filling approximately 31.4 acres of seasonal wetland and vernal pool habitat, which may provide suitable breeding habitat for this species. Filling and grading suitable aquatic habitat during construction could affect individuals if they are present. In addition, loss of suitable breeding may limit breeding opportunities for this species within the action area. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> Implement Mitigation Measure 5.5: Perform Pre-construction Surveys for Western Spadefoot.

Impact 5.6: Effects to Western Pond Turtle

Implementation of Alternative C would include filling approximately 9.7 acres of seasonal stream channels and drainage ditches, which may provide suitable nesting habitat for western pond turtle. Draining and grading of suitable habitat during construction directly affect western pond turtle individuals if they are present. This is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

> Implement Mitigation Measure 5.6: Perform Pre-construction Surveys for Western Pond Turtle.

Impact 5.7: Effects to Nesting Special-Status Birds Species and Migratory Birds

Alternative C may impact nesting birds, including Swainson's hawk, tri-colored blackbird, burrowing owl, white-tailed kite, short-eared owl and loggerhead shrike. These species may be adversely affected if active nest sites are either directly removed or exposed to a substantial increase in noise or human presence during construction or use of the action area. Disturbance associated with the proposed development and resulting in the loss or abandonment of an active nest would be considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

> Implement Mitigation Measures 5.7a: Avoid Active Nesting Season, 5.7b: Conduct Pre-construction Nesting Bird Surveys, and 5.7c: Avoid Active Bird Nest Sites.

Impact 5.8: Effects to Special-Status Wildlife Associated with Annual Grasslands

Construction activities under Alternative C would result in the loss of approximately 1,262 acres of annual grassland. These areas provide habitat for several special-status wildlife species, including American badger, burrowing owl, northern harrier, short-eared owl, white-tailed kite, and Swainson's hawk.

As noted in Impact 5.4, Alternative C includes the preservation of approximately 1,225 acres of annual grassland habitat. This amounts to a preservation ratio of 0.97:1, which exceeds CDFW mitigation guidance for Swainson's hawk foraging habitat. Based upon these factors, Alternative C would result in a less-than-significant impact for these species.

Impact 5.9: Effects to Special-Status Plants

Implementation of Alternative C would result in the direct loss of approximately 31.4 acres of suitable habitat for special-status plants associated with vernal pools. Please see Section 4.5.1, Impact Discussion 5.9 for details on plant species populations. The potential loss of special-status plant populations is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measures

Implement Mitigation Measures 5.9a: Perform Pre-construction Surveys for Special-Status Plants and 5.9b: Compensate for the Loss of Special-Status Plant Populations.

Impact 5.10: Loss of Native Oaks and Other Protected Trees

Please see Section 4.5.1, Impact Discussion 5.10 for details on potential impacts to native oaks and other protected trees. The impact to protected oaks or landmark trees is considered a significant and adverse impact. With recommended mitigation, impacts would be reduced to a less-than-significant level.

Mitigation Measure

Implement Mitigation Measure 5.10: Protect Sensitive Tree Resources Adjacent to Construction Activities.

4.5.4 Alternative D – No Permit Alternative

Impact 5.1: Effects to Federally Listed Vernal Pool Species and Critical Habitat

Alternative D would not directly affect suitable habitat for these species. Proposed aggregate mining has the potential to indirectly affect habitat for federally listed vernal pool species. Any mining in the project site would require permits from Sacramento County (including compliance with the California Environmental Quality Act [CEQA]) and may require permits from USFWS under Section 10 of the Endangered Species Act for indirect impacts. This may include preparation of a Habitat Conservation Plan to address the incidental take of listed species.

While no fill of wetlands would occur under this alternative, vernal pools would continue to be subject to encroachment by invasive weed species and illegal activities such as dumping and off-road vehicle use. While these activities are detrimental to the long term success and recovery of these species, it is anticipated that habitat conditions within the project site would largely remain unchanged from current conditions and thus impacts would be less than significant.

Impact 5.2: Potential to Conflict with provisions of the USFWS Vernal Pool Recovery Plan

Because Alternative D would not result in the direct loss of any habitat within the Mather Core Area, no impact would result.

Impact 5.3: Effects to Valley Elderberry Longhorn Beetle and Golden Eagle

As described previously, future development under Alternative D may include infill development and aggregate mining. These activities would not result in any direct or indirect effects to VELB or golden eagle. No impact would result.

Impacts 5.4 to 5.8: Effects to Special-Status Species and Migratory Birds

As described previously, future development under Alternative D may include infill development and aggregate extraction. These activities would not result in any direct effects to western spadefoot, western pond turtle, American badger, northern harrier, Swainson's hawk, tri-colored blackbird, burrowing owl, white-tailed kite, short-eared owl, loggerhead shrike, or migratory birds. While aggregate mining may indirectly affect habitat for vernal pool species in the project site, any future mining activities would require permits from Sacramento County, and subsequent analysis and mitigation under CEQA. A less-than-significant impact would result.

Impact 5.9: Effects to Special-Status Plants

As described previously, future development under Alternative D may include infill development and aggregate mining. These activities would not result in any direct effects to Bogg's Lake hedge-hyssop, Ahart's dwarf rush, legenere, slender Orcutt grass, Sacramento Orcutt grass, and Sanford's arrowhead. While aggregate mining may indirectly affect habitat for vernal pool species in the project site, any future mining activities would require permits from Sacramento County, and subsequent analysis and mitigation under CEQA. A less-than-significant impact would result.

Impact 5.10: Loss of Native Oaks and Other Protected Trees

Future development under Alternative D, including infill development and aggregate mining, are unlikely to directly impacted protected tree resources. Furthermore, any effects to protected tree resources would be subject to protection per local ordinances, and a less-than-significant impact would result.

References

California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game or CDFG). 2009. Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities. Sacramento, CA. November 24, 2009.

California Department of Fish and Wildlife (CDFW). 2010. California Natural Diversity Database (CNDDB) Rarefind computer program (Version 3.1.0). California Department of Fish and Game, Biogeographic Data Branch. Sacramento, CA. Commercial Version dated: May 1, 2010. Data will expire on November 1, 2010. Accessed September 8, 2010.

Sacramento County, 2013. Mather Field Wetland Delineation Re-Verification 2012 and associated GIS data files. Department of Planning and Environmental Review. Sacramento, CA. January 2013.

U.S. Fish and Wildlife Service (USFWS) 1996a. Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California. Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 1996b. Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle within the Jurisdiction of the Sacramento Field Office. Sacramento, CA. September 19, 1996.

U.S. Fish and Wildlife Service (USFWS). 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento, CA. Available online at: http://www.fws.gov/sacramento/es/documents/velb_conservation.htm

U.S. Fish and Wildlife Service (USFWS). 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1. Portland, Oregon.

Wetlands Research Associates, Inc. (WRA), 2004. Mather Field Natural Resource Assessment: Phases I and II. San Rafael, California. Prepared for Sacramento County.

This page intentionally left blank

4.6 Aquatic Resources

4.6.1 Alternative A – Applicant's Preferred Alternative

Impact 6.1: Effects to Wetlands and Other Waters of the U.S.

Approximately 48.28 acres of jurisdictional waters of the U.S. within the project site would be filled under Alternative A. Impacted features would include approximately 17.47 acres of vernal pools and swales, 21.15 acres of seasonal wetland, 1.37 acres of drainage ditches, and 8.29 acres of ephemeral and intermittent stream channels. Unlike impacts calculated for vernal pool habitats (see Section 4.5), only those jurisdictional areas that are proposed for fill under Alternative A are included in these values. Indirect impacts to jurisdictional waters of the U.S. are discussed in detail in Section 4.3 (Hydrology, Water Quality, and Flooding) and Section 4.5 (Biological Resources), as well as Mitigation Measures 5.1b and 5.1c. Potential effects associated with each land use under Alternative A are summarized in **Table 4.6-1** and **Figure 4.6-1**.

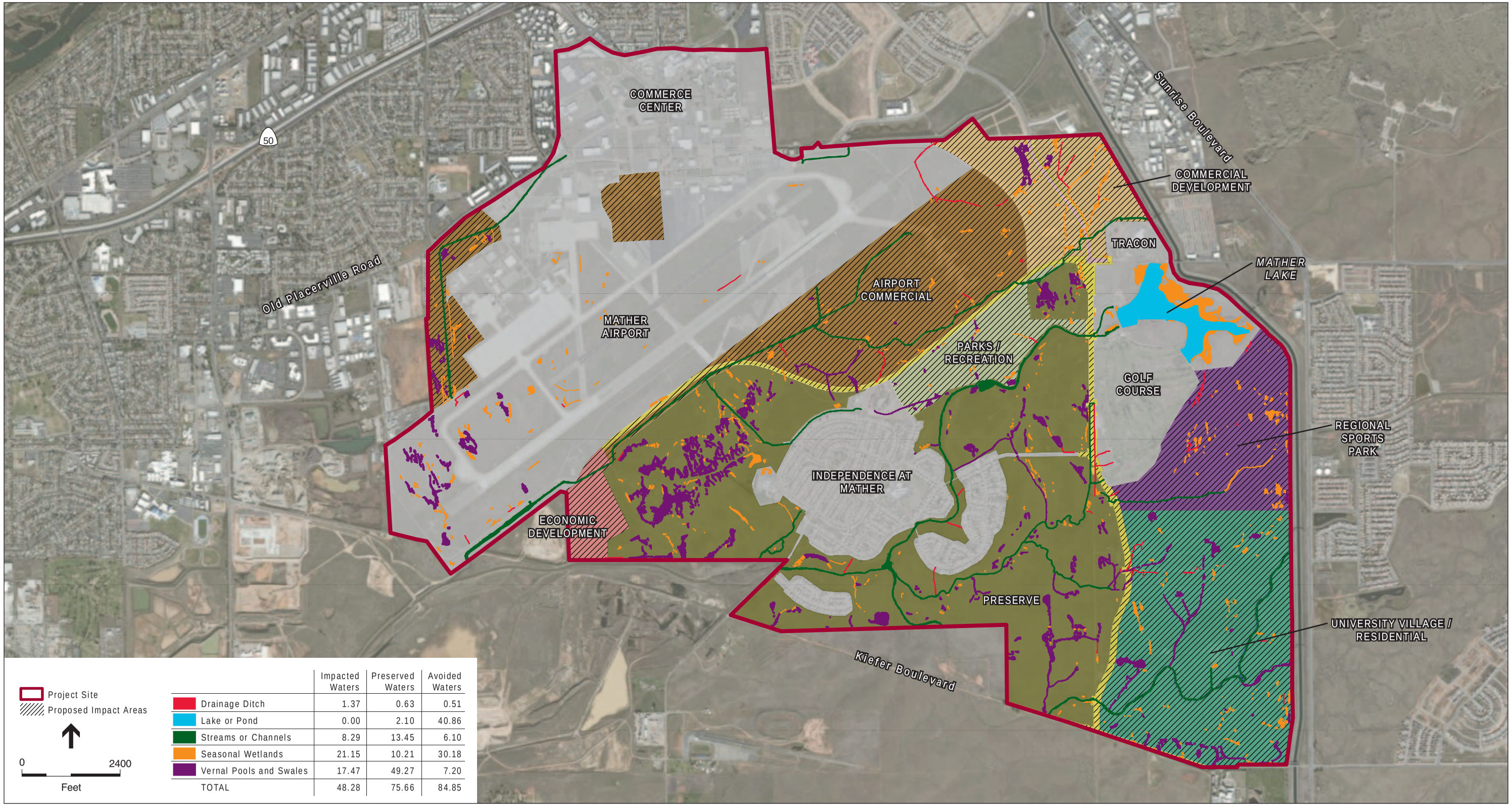
The U.S. Army Corps of Engineers (USACE) considers the functions and services of the wetlands and other waters that would be eliminated or degraded, the functions and services of waters on proposed mitigation sites, and the likelihood of success of proposed mitigation when considering compensatory mitigation for impacts. The purpose of compensatory mitigation is to develop long-term self-sustaining waters that are not dependent on human intervention after the establishment period. In general, the required compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services. Compensatory mitigation may be achieved through restoration, enhancement, establishment, and in certain circumstances preservation. Restoration is generally favored because the likelihood of success is greater, the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation (33 CFR §332.3).

The amount of required compensatory mitigation must be, to the extent practical, sufficient to replace lost aquatic resource functions. In cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio is used. A mitigation ratio greater than one-to-one may be necessary to account for the method of compensatory mitigation (e.g., preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resource and the compensation site (33 CFR §332.3). Alternative A includes on-site preservation of approximately 75.66 acres of wetlands and other waters of the U.S. within on-site Preserve and Riparian Buffer areas. On site preservation is summarized in **Table 4.6-2**, while **Table 4.6-3** summarizes the preservation ratio for each impacted water type.

TABLE 4.6-1
PROPOSED EFFECTS TO WATERS OF THE U.S. - ALTERNATIVE A

Proposed Land Use	Type Affected	Acres Affected[1]
Airport Commercial	Drainage Ditch	0.31
	Channels and Streams	5.67
	Seasonal Wetland	4.02
	Vernal Pools and Swales	3.33
Subtotal		**13.33**
Commercial Development	Drainage Ditch	0.22
	Channels and Streams	0.62
	Seasonal Wetland	4.17
	Vernal Pools and Swales	3.06
Subtotal		**8.06**
Economic Development	Drainage Ditch	0.01
	Channels and Streams	0.37
Subtotal		**0.37**
Parks Recreation	Drainage Ditch	0.01
	Channels and Streams	0.54
	Seasonal Wetland	0.79
	Vernal Pools and Swales	1.13
Subtotal		**2.47**
Roadways/Infrastructure	Drainage Ditch	0.33
	Channels and Streams	0.53
	Seasonal Wetland	0.53
	Vernal Pools and Swales	0.20
Subtotal		**1.58**
Regional Sports Park	Drainage Ditch	0.27
	Channels and Streams	0.28
	Seasonal Wetland	5.63
	Vernal Pools and Swales	0.20
Subtotal		**6.38**
University Village/ Residential	Drainage Ditch	0.24
	Channels and Streams	0.30
	Seasonal Wetland	6.01
	Vernal Pools and Swales	9.56
Subtotal		**16.10**
TOTAL		**48.28**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.



	Impacted Waters	Preserved Waters	Avoided Waters
Drainage Ditch	1.37	0.63	0.51
Lake or Pond	0.00	2.10	40.86
Streams or Channels	8.29	13.45	6.10
Seasonal Wetlands	21.15	10.21	30.18
Vernal Pools and Swales	17.47	49.27	7.20
TOTAL	48.28	75.66	84.85

SOURCE: NAIP, 2012; Sacramento County, 2013; and ESA, 2013

Figure 4.6-1
Potentially Affected Waters of the U.S. – Alternative A

This page intentionally left blank

TABLE 4.6-2
PROPOSED ON-SITE PRESERVATION - ALTERNATIVE A

Proposed Land Use	Type Preserved	Acres Preserved[1]
Preserve	Drainage Ditch	0.63
	Open Water	2.10
	Channels and Streams	9.99
	Seasonal Wetland	10.21
	Vernal Pools and Swales	49.25
Subtotal		**72.18**
Riparian Buffer	Channels and Streams	3.46
	Seasonal Wetland	0.001
	Vernal Pools and Swales	0.01
Subtotal		**3.48**
TOTAL:		**75.66**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

TABLE 4.6-3
PROPOSED PRESERVATION TO IMPACT RATIO - ALTERNATIVE A

Impacted Waters	Acres[1]	Preserved Waters	Acres[1]	Preservation to Impact Ratio
Drainage Ditch	1.37	Drainage Ditch	0.63	0.5:1
Channels and Streams	8.29	Channels and Streams	13.45	1.6:1
Seasonal Wetland	21.15	Seasonal Wetland	10.21	0.5:1
Vernal Pools and Swales	17.47	Vernal Pools and Swales	49.27	2.8:1
Open Water	0.00	Open Water	2.10	n/a
TOTAL:	**48.28**		**75.66**	**1.6:1**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

Based upon the calculations summarized in **Table 4.6-3**, Alternative A would include on-site preservation of 1.6 times the acreage impacted by site development. Furthermore, it would preserve the highest functioning waters on the project site according to the results of the Natural Resource Assessment described in **Section 3.5**. This includes the preservation of most Rank 4 and 5 features, and a 2.8:1 preservation of vernal pool and swale features, which typically have the highest functions and services.

As described in **Chapter 2.0**, wetlands within the on-site Preserve would be actively managed in accordance with a Wetland Management Plan that is subject to final approval by the USACE, United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG) and Environmental Protection Agency (EPA). Nevertheless, without additional compensation, the on-site loss of 48.28 acres of wetlands and other waters of the U.S. is considered a significant, adverse impact.

Mitigation Measures

Implement Mitigation Measures 5.1a: Compensate for Loss of Vernal Pool Habitat, 5.1b: Use Best Management Practices (BMPs) to Provide Effective Erosion and Sediment Control, 5.1c: Conduct Worker Environmental Awareness Training (WEAP), 5.1d: Limit Project Access Routes/Staging Areas and 5.1e: Protect Preserved and Avoided Habitats. As Mitigation Measure 5.1a addresses only aquatic resources which contain habitat suitable for vernal pool species, the following mitigation is necessary to ensure no net loss overall of jurisdictional waters of the U.S.

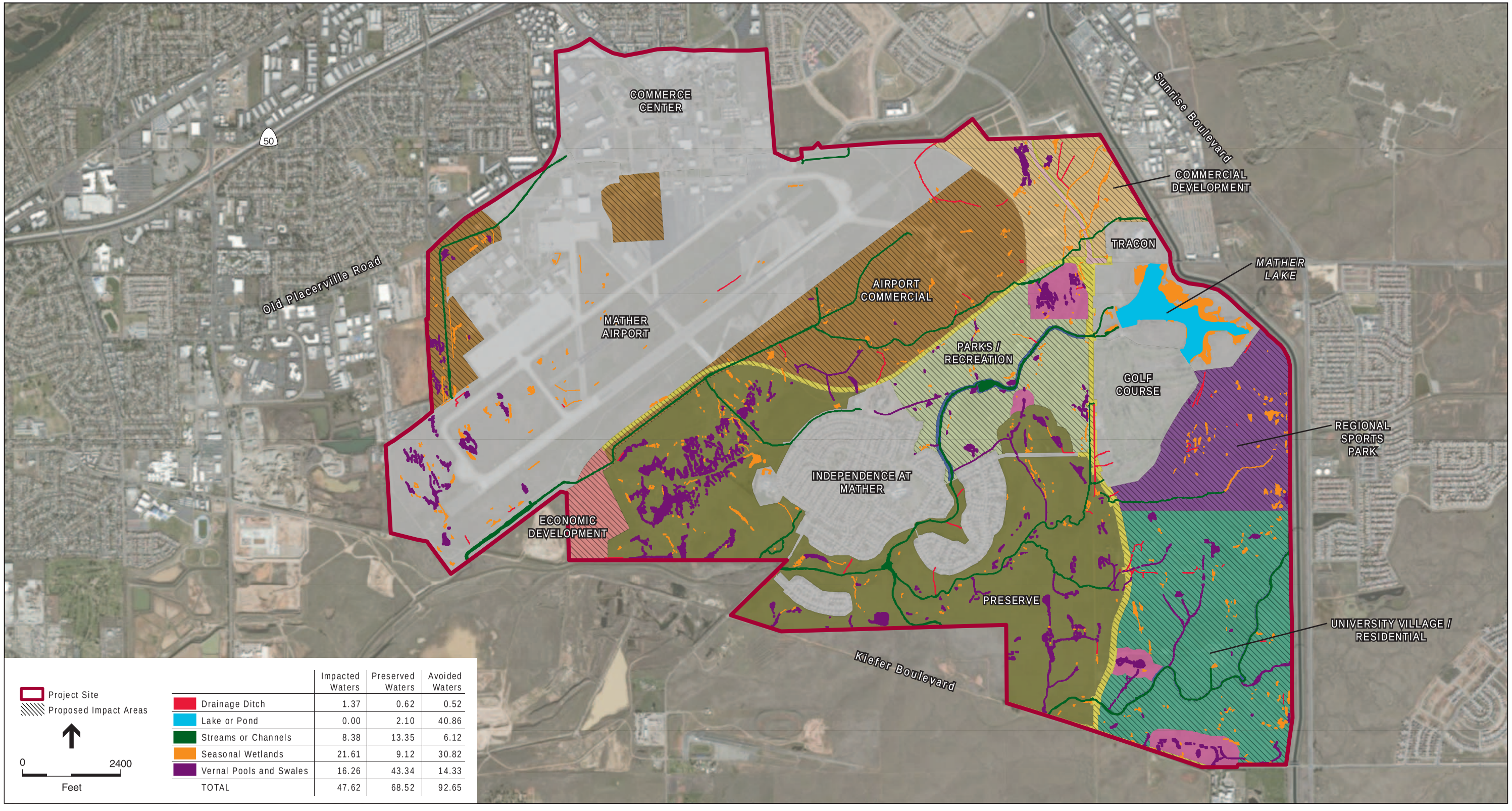
Measure 6.1: Fully Compensate for the Loss of Waters of the U.S.: The project proponent would ensure that any loss of waters of the U.S. would be compensated for by restoration or creation of waters at a ratio no less than 1:1, prior to the filling of any jurisdictional waters of the U.S within that phase of the project. Compensation may include on or off site creation, restoration, or enhancement, or purchase of appropriate credits from a Corps-approved mitigation bank. On-site or off-site creation/restoration plans would be prepared by a qualified biologist prior to the filling of any jurisdictional waters of the U.S and approved by the Corps. On- or off-site creation/restoration sites would be monitored for at least five years to ensure their success.

4.6.2 Alternative B – 2006 Conceptual Land Use Plan Alternative

Impact 6.1: Effects to Wetlands and Other Waters of the U.S.

Approximately 47.62 acres of jurisdictional waters of the U.S. within the project site would be filled under Alternative B. Impacted features would include approximately 16.26 acres of vernal pools and swales, 21.61 acres of seasonal wetland, 1.37 acres of drainage ditches, and 8.38 acres of ephemeral and intermittent stream channels. Potential effects associated with each land use under Alternative B are summarized in **Table 4.6-4** and **Figure 4.6-2**.

Alternative B includes on-site preservation of approximately 68.52 acres of wetlands and other waters of the U.S. within on-site Preserve and Riparian Buffer areas. Approximately 7.80 acres of wetlands and other waters of the U.S. would also be located in avoided areas. Avoided areas would not be disturbed during construction but no active management is proposed. On site preservation is summarized in **Table 4.6-5**, while **Table 4.6-6** summarizes the preservation ratio for each impacted water type. Based upon the calculations summarized in **Table 4.6-6**, Alternative B would include an overall on-site preservation ratio of 1.4:1. Furthermore, it would preserve some of the highest functioning waters on the project site according to the Natural Resource Assessment described in **Section 3.5**. Wetlands within an on-site Preserve would be actively managed in accordance with a Wetland Management Plan that is



	Impacted Waters	Preserved Waters	Avoided Waters
Drainage Ditch	1.37	0.62	0.52
Lake or Pond	0.00	2.10	40.86
Streams or Channels	8.38	13.35	6.12
Seasonal Wetlands	21.61	9.12	30.82
Vernal Pools and Swales	16.26	43.34	14.33
TOTAL	47.62	68.52	92.65

SOURCE: NAIP, 2012; Sacramento County, 2013; and ESA, 2013

Figure 4.6-2
Potentially Affected Waters of the U.S. – Alternative B

This page intentionally left blank

subject to final approval by the USACE, USFWS, CDFG and EPA. Nevertheless, without additional compensation, the on-site loss of 47.62 acres of wetlands and other waters of the U.S. is considered a significant, adverse impact.

TABLE 4.6-4
EFFECTS TO WATERS OF THE U.S. – ALTERNATIVE B

Proposed Land Use	Type Affected	Acres Affected[1]
Airport Commercial	Drainage Ditch	0.31
	Channels and Streams	5.67
	Seasonal Wetland	4.02
	Vernal Pools and Swales	3.33
Subtotal		**13.33**
Commercial Development	Drainage Ditch	0.22
	Channels and Streams	0.62
	Seasonal Wetland	4.17
	Vernal Pools and Swales	3.06
Subtotal		**8.06**
Economic Development	Drainage Ditch	0.01
	Channels and Streams	0.37
Subtotal		**0.37**
Parks Recreation	Drainage Ditch	0.01
	Channels and Streams	0.62
	Seasonal Wetland	1.58
	Vernal Pools and Swales	3.60
Subtotal		**5.81**
Roadways/Infrastructure	Drainage Ditch	0.33
	Channels and Streams	0.53
	Seasonal Wetland	0.53
	Vernal Pools and Swales	0.20
Subtotal		**1.58**
Regional Sports Park	Drainage Ditch	0.27
	Channels and Streams	0.29
	Seasonal Wetland	5.63
	Vernal Pools and Swales	0.20
Subtotal		**6.38**
University Village/ Residential	Drainage Ditch	0.24
	Channels and Streams	0.30
	Seasonal Wetland	5.68
	Vernal Pools and Swales	5.88
Subtotal		**12.09**
TOTAL:		**47.62**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

TABLE 4.6-5
ON-SITE PRESERVATION – ALTERNATIVE B

Proposed Land Use	Type Preserved	Acres Preserved[1]
Preserve	Drainage Ditch	0.61
	Channels and Streams	7.01
	Seasonal Wetland	9.11
	Vernal Pools and Swales	43.31
Subtotal		**60.05**
Riparian Buffer	Open Water	2.10
	Drainage Ditch	0.002
	Channels and Streams	6.33
	Seasonal Wetland	0.001
	Vernal Pools and Swales	0.04
Subtotal		**8.47**
TOTAL:		**68.52**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

TABLE 4.6-6
PRESERVATION TO IMPACT RATIO – ALTERNATIVE B

Impacted Waters	Acres[1]	Preserved Waters	Acres[1]	Preservation to Impact Ratio
Drainage Ditch	1.37	Drainage Ditch	0.62	0.5:1
Channels and Streams	8.38	Channels and Streams	13.35	1.6:1
Seasonal Wetland	21.61	Seasonal Wetland	9.12	0.4:1
Vernal Pools and Swales	16.26	Vernal Pools and Swales	43.34	2.7:1
Open Water	0.00	Open Water	2.10	n/a
TOTAL:	**47.62**		**68.52**	**1.4:1**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

Mitigation Measures

Implement Mitigation Measures 5.1a: Compensate for Loss of Vernal Pool Habitat, 5.1b: Use BMPs to Provide Effective Erosion and Sediment Control, 5.1c: Conduct WEAP, 5.1d: Limit Project Access Routes/Staging Areas, 5.1e: Protect Preserved and Avoided Habitats, and 6.1: Fully Compensate for Loss of Waters of the U.S.

4.6.3 Alternative C – Multiple Preserves Alternative

Impact 6.1: Effects to Wetlands and Other Waters of the U.S.

Approximately 41.11 acres of jurisdictional waters of the U.S. within the project site would be filled under Alternative C. Impacted features would include approximately 11.20 acres of vernal pools and swales, 20.25 acres of seasonal wetland, 1.37 acres of drainage ditches, and 8.29 acres

of ephemeral and intermittent stream channels. Potential effects associated with each land use under Alternative C are summarized in **Table 4.6-7** and **Figure 4.6-3**.

TABLE 4.6-7
EFFECTS TO WATERS OF THE U.S. – ALTERNATIVE C

Proposed Land Use	Type Affected	Acres Affected[1]
Airport Commercial	Drainage Ditch	0.31
	Channels and Streams	5.67
	Seasonal Wetland	4.02
	Vernal Pools and Swales	3.33
Subtotal		**13.33**
Commercial Development	Drainage Ditch	0.22
	Channels and Streams	0.62
	Seasonal Wetland	3.64
	Vernal Pools and Swales	0.46
Subtotal		**4.9**
Economic Development	Drainage Ditch	0.01
	Channels and Streams	0.37
Subtotal		**0.37**
Parks Recreation	Drainage Ditch	0.01
	Channels and Streams	0.54
	Seasonal Wetland	0.79
	Vernal Pools and Swales	1.13
Subtotal		**2.47**
Roadways/Infrastructure	Drainage Ditch	0.33
	Channels and Streams	0.53
	Seasonal Wetland	0.53
	Vernal Pools and Swales	0.20
Subtotal		**1.58**
Regional Sports Park	Drainage Ditch	0.27
	Channels and Streams	0.28
	Seasonal Wetland	5.63
	Vernal Pools and Swales	0.20
Subtotal		**6.38**
University Village/ Residential	Drainage Ditch	0.24
	Channels and Streams	0.30
	Seasonal Wetland	5.64
	Vernal Pools and Swales	5.88
Subtotal		**12.05**
TOTAL:		**41.11**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

Alternative C includes on-site preservation of approximately 82.83 acres of wetlands and other waters of the U.S. within on-site Preserves and Riparian Buffer areas. On site preservation is summarized in **Table 4.6-8**, while **Table 4.6-9** summarizes the preservation ratio for each impacted water type.

TABLE 4.6-8
ON-SITE PRESERVATION - ALTERNATIVE C

Proposed Land Use	Type Preserved	Acres Preserved[1]
Preserves	Drainage Ditch	0.63
	Open Water	2.10
	Channels and Streams	9.99
	Seasonal Wetland	11.11
	Vernal Pools and Swales	55.53
Subtotal		**79.36**
Riparian Buffer	Channels and Streams	3.46
	Seasonal Wetland	0.001
	Vernal Pools and Swales	0.01
Subtotal		**3.48**
TOTAL:		**82.83**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

TABLE 4.6-9
PRESERVATION TO IMPACT RATIO - ALTERNATIVE C

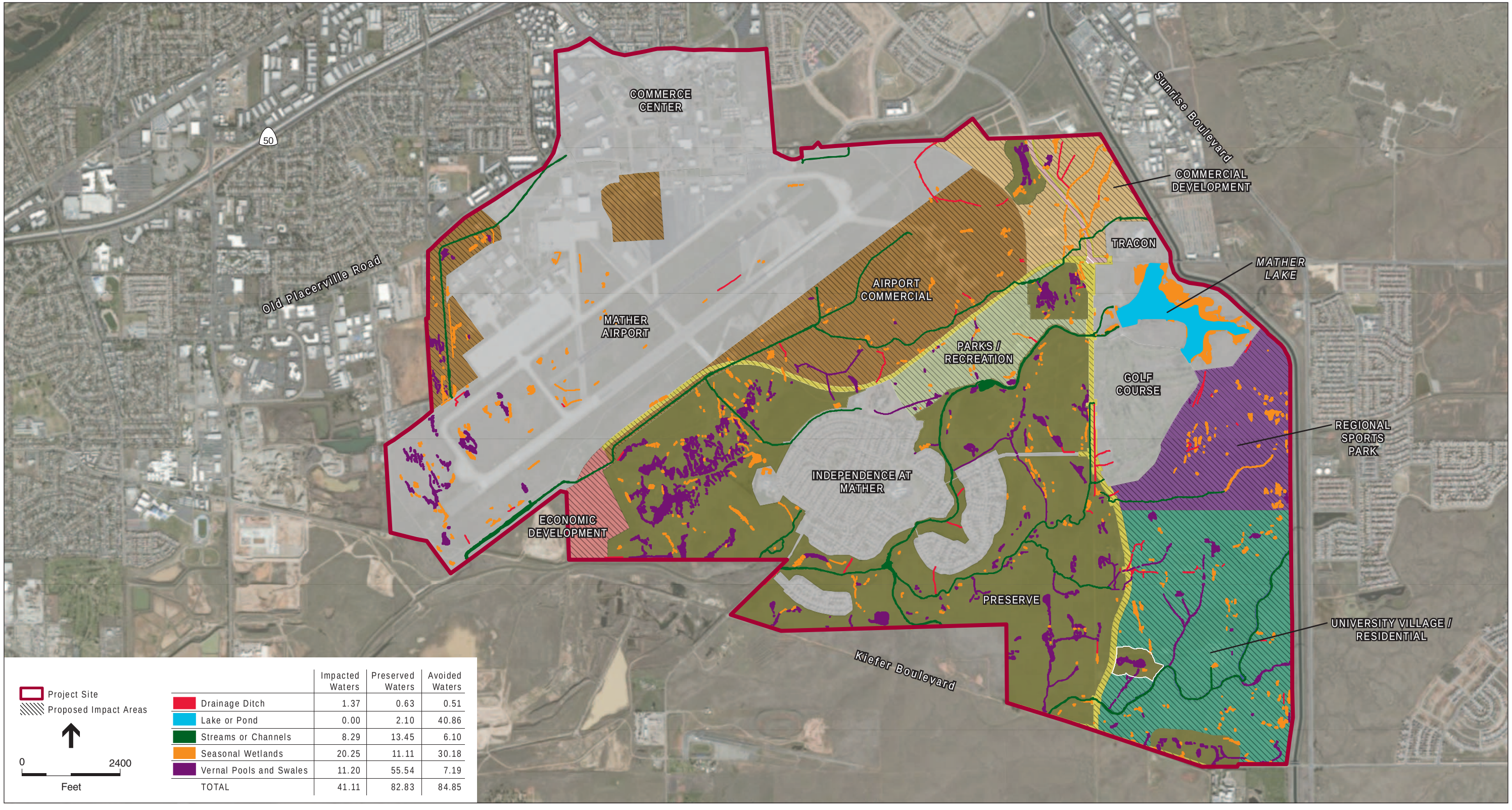
Impacted Waters	Acres[1]	Preserved Waters	Acres[1]	Preservation to Impact Ratio
Drainage Ditch	1.37	Drainage Ditch	0.63	0.5:1
Channels and Streams	8.29	Channels and Streams	13.45	1.6:1
Seasonal Wetland	20.25	Seasonal Wetland	11.11	0.5:1
Vernal Pools and Swales	11.20	Vernal Pools and Swales	55.54	5.0:1
Open Water	0.00	Open Water	2.10	n/a
TOTAL:	**41.11**		**82.83**	**2.0:1**

1 Totals are approximate and subject to rounding.
SOURCE: ESA, 2013; Sacramento County, 2013.

Based upon the calculations summarized in **Table 4.6-9**, Alternative C would include an overall on-site preservation ratio of 2.0:1. Furthermore, it would preserve some of the highest functioning waters on the project site according to the Natural Resource Assessment described in **Section 3.5**. As described in **Chapter 2.0**, wetlands within the on-site Preserves would be actively managed in accordance with a Wetland Management Plan that is subject to final approval by the USACE, USFWS, CDFG and EPA. Nevertheless, without additional compensation, the on-site loss of 41.11 acres of wetlands and other waters of the U.S. is considered a significant, adverse impact.

Mitigation Measures

Implement Mitigation Measures 5.1a: Compensate for Loss of Vernal Pool Habitat, 5.1b: Use BMPs to Provide Effective Erosion and Sediment Control, 5.1c: Conduct WEAP, 5.1d: Limit Project Access Routes/Staging Areas, 5.1e: Protect Preserved and Avoided Habitats, and 6.1: Fully Compensate for Loss of Waters of the U.S.



	Impacted Waters	Preserved Waters	Avoided Waters
Drainage Ditch	1.37	0.63	0.51
Lake or Pond	0.00	2.10	40.86
Streams or Channels	8.29	13.45	6.10
Seasonal Wetlands	20.25	11.11	30.18
Vernal Pools and Swales	11.20	55.54	7.19
TOTAL	41.11	82.83	84.85

SOURCE: NAIP, 2012; Sacramento County, 2013; and ESA, 2013

Figure 4.6-3
Potentially Affected Waters of the U.S. – Alternative C

This page intentionally left blank

4.6.4 Alternative D – No Permit Alternative

Impact 6.1: Effects to Wetlands and Other Waters of the U.S.

No wetlands or other waters of the U.S. would be filled under Alternative D. Potential development under this alternative could include infill development within the Mather Airport Commerce Center and aggregate mining near the southwest corner of the project site. Neither of these land uses would require the fill of jurisdictional features based upon the current wetland delineation. Thus impacts would be less than significant.

Alternative D would include a wetland preserve, but because this alternative does not include substantial economic development and related revenue to fund management of a preserve, the level of active management of preserve areas, including the restoration or enhancement of existing wetland resources, is unknown.

References

Sacramento County, 2013. Mather Field Wetland Delineation Re-Verification 2012 and associated GIS data files. Department of Planning and Environmental Review. Sacramento, CA. January 2013.

This page intentionally left blank

CHAPTER 5.0
Consultation, Coordination and List of Preparers

Lead Agency

U.S. Army Corps of Engineers

Kathleen Dadey; Chief, California South Branch
Michael Jewell, Regulatory Division Chief

Cooperating Agencies

Environmental Protection Agency, Region IX

Paul Jones, Biologist
Tom Kelly, Environmental Protection Specialist

Sacramento Metropolitan Air Quality Management District

Rachel DuBose, Air Quality Planner/Analyst

U.S. Air Force

Philip Mook, Senior Representative for Air Force Real Property Agency

U.S. Fish and Wildlife Service

Kenneth Sanchez, Assistant Field Supervisor
Lisa Ellis, Senior Biologist

EIS Consultants

Environmental Science Associates

Erich Fischer, Project Director
Jennifer Wade, Project Manager
Brad Allen, GIS

This page intentionally left blank

Appendix H

Mather Air Force Base Transfer Biological Opinion

ESA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In reply refer to:
81420-2008-F-1567-3

24 January 2012

Mr. Philip Mook
Air Force Real Property Agency
Mather Air Force Base
3411 Olsen Street
McClellan, California 95652-1003

Subject: Biological Opinion for the Disposal of the former Mather Air Force Base, Sacramento County, California

Dear Mr. Mook:

The Department of Defense, U.S. Air Force (Air Force) requested formal consultation with the U.S. Fish and Wildlife Service (Service) on June 10, 2008, for the Disposal of the Former Mather Air Force Base (Mather Field) project (proposed project), Sacramento County, California. Your request was received by the Service on June 11, 2008, followed by an email clarifying the request on January 4, 2010. As requested, a draft biological opinion was provided to the Air Force on January 21, 2010 (Service File 81420-2008-TA-1567-2). This is the Service's response to your February 24, 2011, request that the Service issue the final biological opinion. The Air Force proposes to transfer Mather Field to Sacramento County (County) for continued operation of the commercial airport, biological resource preservation, and future development. The Service has reviewed the information submitted by your office describing the effects of the proposed project on the federally listed as threatened vernal pool fairy shrimp *(Branchinecta lynchi)*, endangered vernal pool tadpole shrimp *(Lepidurus packardi)*, (collectively, vernal pool crustaceans), endangered Sacramento Orcutt grass (*Orcuttia viscida*), and threatened slender Orcutt grass (*Orcuttia tenuis*) (collectively, vernal pool grasses). The proposed project is within critical habitat unit 13 for vernal pool fairy shrimp, unit 8 for vernal pool tadpole shrimp, unit 2 for Sacramento Orcutt grass, and unit 6 for slender Orcutt grass (71 FR 7117). A portion of the project area overlaps with the Mather core area as designated by the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005) (Recovery Plan). You requested concurrence with your determination that the proposed project is likely to adversely affect the vernal pool crustaceans and their designated critical habitat. You also requested concurrence with your determination that the proposed project is likely to adversely affect the vernal pool grasses, but not likely to adversely affect their designated critical habitat. Our primary concern and mandate is the protection of federally listed species and this biological opinion is issued in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

Concurrent with the proposed property transfer, which by itself will have no adverse effects to listed species or critical habitat, a wetlands preserve (Preserve) will be established and managed for the benefit of the vernal pool crustaceans and grasses. Although the Air Force's proposal is limited to the property transfer of Mather Field and Preserve establishment, the County has submitted Clean Water Act Section 404 pre-application materials to the Corps for proposed development in areas of Mather Field outside the proposed Preserve.

The County's development is reasonably certain to occur following transfer and will result in adverse effects to the vernal pool crustaceans and grasses, and designated critical habitat. These adverse effects were considered during consultation, as indirect effects of the action, for the purposes of conducting our jeopardy / adverse modification analyses, as they will only occur as a result of the proposed property transfer. However, while we determined that the take resulting from these adverse effects will be incidental to implementation of the proposed project, this biological opinion does not provide an Incidental Take Statement exempting it from the prohibitions of section 9 of the Act. Once the County finalizes and moves forward with its development plans, these future actions can be more fully evaluated. Each subsequent action that will adversely affect listed species or critical habitat will then be required to obtain incidental take coverage through either section 7 or section 10 of the Act.

The proposed future development of Mather Field by the County constitutes an indirect effect of the proposed project. Therefore, the Service concurs with the Air Force that the vernal pool crustaceans and vernal pool grasses are likely to be adversely affected as a result of the proposed project. A portion of critical habitat unit 13 for vernal pool fairy shrimp and a portion of critical habitat unit 8 for vernal pool tadpole shrimp occurring on Mather Field will not be part of the Preserve; therefore, the Service concurs that these critical habitat units for the vernal pool crustaceans are likely to be adversely affected by the project. All of the portions of critical habitat unit 2 for Sacramento Orcutt grass and unit 6 for slender Orcutt grass that occur on Mather Field will be part of the Preserve; therefore, the Service concurs that critical habitat units for the vernal pool grasses are not likely to be adversely affected by the proposed project. This document represents the Service's biological opinion on the effects of the proposed project on the vernal pool crustaceans, vernal pool grasses, and their respective designated critical habitat in accordance with the Act.

Our review of the proposed project included the following: (1) your letter and project description dated June 10, 2008; (2) various emails, phone calls, and meetings held between the Service, the Air Force, the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (Corps), the California Department of Fish and Game (CDFG), and the County to discuss project details pertaining to the base disposal; and (3) other information available to the Service.

Consultation History

March 31, 1993 The *Final Record of Decision (ROD) for Disposal and Reuse of Mather Air Force Base* was issued by the Air Force Base Conversion Agency

(AFBCA 1993). The ROD designated certain areas of the former base for preservation and stated that the recipients of the parcels would become responsible for the proposed endangered species at the time of disposal, including actions required under the Act.

July 27, 1994 — The Service issued a conference opinion on the vernal pool fairy shrimp, vernal pool tadpole shrimp, and California linderiella (*Linderiella occidentalis*). The conference opinion did not address critical habitat as it was not proposed for designation at the time.

November 21, 1994 — A *Supplemental Record of Decision (SROD) for Disposal and Reuse of Mather Air Force Base* was issued by the AFBCA (AFBCA 1994) in response to comments on the Final Environmental Impact Statement.

October 16, 1995 — A *Revised Supplemental Record of Decision (SROD) for Disposal and Reuse Mather Air Force Base* was issued by the AFBCA (AFBCA 1995). In the SROD, the Air Force proposed to attach restrictions to the deeds for certain parcels requiring that these parcels be managed consistent with a management plan approved by appropriate federal and state regulatory agencies, including but not limited to the Service, EPA Region IX, CDFG, and the Corps, to protect vernal pools, wetlands, and endangered species.

Spring, 1997 — Sacramento County Board of Supervisors (Board) adopted the *Mather Field Specific Plan* (Sacramento County 1997). The Specific Plan specified policies, permitted uses, development standards and design guidelines and established (1) the location, intensity, and character of land uses; (2) circulation patterns and necessary infrastructure improvements to support development; (3) the location and general configuration of parks and open space; (4) community facilities necessary to support new development and contribute to the quality and livability of the region as a whole; and (5) implementing actions required to realize the objectives. The Specific Plan included a policy (M-EM-2) to conserve and enhance habitat for sensitive species consistent with state, federal, and local regulations and agreements. It also included a policy (M-EM-5) to provide permanent mitigation for wetlands lost at Mather due to development or aggregate resource extraction.

March 10, 1999 — The Service issued a biological opinion on water service contracts to deliver water from the American River to the Sacramento County Water Agency's (SCWA) Zone 40 Service Area, which includes Mather Field (Service File No. 1-1-97-F-0161). Term and condition 2B of the biological opinion required that, upon transfer of the Base, the County preserve the vernal pool habitat on the airport and park properties at the Base under perpetual conservation easement. Additionally, the County was required to develop a vernal pool management plan consistent with

	that required under the SROD within 18 months of execution of the SCWA water contract. The Board of Supervisors approved the SCWA Water Contract, thereby agreeing to the conditions of the biological opinion.
August, 2001	The County completed the *Final Report for Mather Field Vernal Pool Study* (Jones & Stokes 2001). This report evaluated the significance of vernal pools and adjacent uplands at Mather Field.
December 10, 2004	The Service issued a biological opinion on the Freeport Regional Water Project (Service File No. 1-1-04-0224). This biological opinion incorporated the terms and conditions of the SCWA Zone 40 BO (Service File No. 1-1-97-F-0161) on water service contracts.
February, 2004	The County completed a *Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act: Mather Field Study Area* (WRA 2004a). The deliniation identified several different types of wetlands, including vernal pools, vernal swales, vernal marshes, and seasonal wetlands.
April, 2004	The Board conceptually endorsed creation of a wetlands preserve at Mather Field. The Board directed staff to work with stakeholders to develop a plan for creating a preserve and for addressing other uses, including roadways, economic development, parks, and easement restrictions for conservation and resource protection.
May, 2004	The County completed the *Mather Field Natural Resources Assessment*, which documented the occurrences of special-status species in the Mather Field Study Area (WRA 2004b).
June, 2005	The County began a series of meetings of key stakeholders (e.g., California Native Plant Society, Mather Independence Home Owners Association, SPLASH, and State, Federal, and local agencies) interested in the future of Mather Field. The stakeholders group developed alternatives for the boundaries of the preserve, identified other vernal pools to be protected, and discussed the alignments of Eagle's Nest and Douglas Roads.
November 29, 2005	Air Force, County, and Service representatives met to discuss the section 7 responsibility associated with transferring Mather Field from the Air Force to Sacramento County.
January 12, 2006	Air Force, County, and Service representatives met to discuss principles and guidelines for compensation and alternatives for minimizing adverse impacts to vernal pool resources associated with implementing the *Mather*

	Field Specific Plan.
February 10, 2006	The final rule designating critical habitat for vernal pool species was published (71 FR 7117). This included critical habitat being designated for the vernal pool fairy shrimp, vernal pool tadpole shrimp, slender Orcutt grass, and Sacramento Orcutt grass on Mather Field.
September, 2007	The County completed a *Draft South Mather Wetlands Management Plan* (Management Plan) (EDAW 2007). This plan provides guidance for management, maintenance, and public use of Mather Field.
June 10, 2008	The Air Force submitted a biological assessment and requested formal consultation on the vernal pool crustaceans and grasses.
September 3, 2008	The Service provided comments on the draft Management Plan (81420-2008-TA-1801-1).
September 23, 2008	Air Force, County, Corps, and Service representatives met to discuss revisions to the conservation area boundaries based on a map prepared by the Service.
Spring, 2009	Air Force, County, and Service representatives met several times to review comments on the draft Management Plan and discuss information requirements for section 7 consultation on the land transfer.
March 16, 2009	Air Force, County, Corps, and Service representatives met to review a revised conservation area map prepared by the County and discuss future development plans, endangered species compensation, and Corps permitting and mitigation requirements.
April 8, 2009	Air Force, County, Corps, EPA, and Service representatives met to discuss indirect impacts of the County's future development plans and Section 404 requirements and endangered species compensation for adverse affects to listed species.
May 26, 2009	Air Force, County, Corps, EPA, and Service representatives met to discuss property use restrictions for the conservation area.
July 15, 2009	Air Force, County, Corps, EPA, and Service representatives met to discuss endangered species habitat compensation for proposed future County development plans.
September 3, 2009	Air Force, County, and Service representatives met to discuss the proposed terms and conditions of the section 7 consultation on the land transfer.

January 4, 2010	The Air Force initiated formal consultation on critical habitat and specified effects determinations for all species and critical habitat.
January 21, 2010	The Service issued the draft *Biological Opinion for the Disposal of the former Mather Air Force Base, Sacramento County, California* to the Air Force and the County.
March 8, 2010	The Service received comments of the draft biological opinion from the Air Force.
April 12, 2010	The Air Force and Service met to discuss the draft biological opinion comments provided to the Air Force by the County.
June 3, 2010	Air Force, County, Corps, EPA, and Service representatives met to discuss the draft biological opinion.
September 9, 2010	Air Force, County, Corps, EPA, and Service representatives met to discuss the draft biological opinion.
February 24, 2011	The Air Force emailed the Service requesting the biological opinion to be issued with the addition of allowing 90 days post-land transfer for the County to place the conservation easement upon the proposed Preserve.

BIOLOGICAL OPINION

Description of the Proposed Action

The Air Force proposes to transfer ownership of the former Mather Air Force Base, now called Mather Field, to Sacramento County. The proposed action includes establishment of the on-site Preserve to protect, in perpetuity, sensitive and high value vernal pool habitat and associated listed species (Figure 1). The Preserve will include all of the vernal pool grass critical habitat occurring at Mather Field, a significant portion of the vernal pool crustacean critical habitat occurring at Mather Field, and a significant portion of the Mather core area occurring at Mather Field (71 FR 7117, Service 2005).

Mather Field is located in Sacramento County and partially overlaps with the boundaries of the City of Rancho Cordova, 12 miles east of downtown Sacramento. It was used as an airport, pilot training school, and military air base from 1918 until 1993 when it was closed by the Air Force. In total, the former Mather Air Force Base occupied approximately 5,718 acres. Developed areas within the installation occupy less than 10 percent of the total area, and as a result, an extensive undeveloped landscape remains. The undeveloped areas at Mather Field are characterized by valley grasslands that include vernal pools, vernal swales, and seasonal wetlands.

Of the 5,718 acres at Mather Field, 162 acres have already been transferred to other entities; these 162 acres were already developed and do not have habitat for listed species. The remaining 5,556 acres will be transferred to the County. Of the 5,556 acres (including 108.42 acres of wetland vernal pool habitat) included in the property transfer, 1,272 acres (64.57 acres of wetland vernal pool habitat) will be included in the Preserve; 1,912 acres (34.40 acres of wetland vernal pool habitat) are included in current County development proposals; 851 acres have already been developed and are not proposed for further development (no wetland vernal pool habitat); and 95 acres are associated with Mather Lake and are not proposed for further development (no wetland vernal pool habitat). The remaining 1,426 acres are associated with the existing Mather Airport, of which 90 acres (6.95 acres of wetland vernal pool habitat) are designated for protection and 1,336 acres (2.50 acres of wetland vernal pool habitat) are not currently proposed for development or protection (Figure 1).

Upon transfer, the 1,272-acre Preserve will be established to protect resources, including vernal pool habitat, in perpetuity. The Preserve encompasses a total of 1,272 acres (64.57 acres of wetland vernal pool habitat). Of that, 951 acres (51.29 acres of wetland vernal pool habitat) are within the vernal pool crustaceans' critical habitat (Figure 2). All of the vernal pool grasses' critical habitats that are in the action area are included in the proposed Preserve (Figure 2). The Preserve includes an additional 321 acres (13.28 acres of wetland vernal pool habitat) outside of the core area and critical habitat, which add to the conservation value of the Preserve by providing connectivity and buffer areas. Additionally, on the north side of Morrison Creek a 50-foot buffer from the centerline of the creek is included in the Preserve (buffer not depicted in Figure 1); a bike path may be approved within this buffer in the future. The Conservation Measures below outline the requirements and timing of the conservation easement, management plan, funding, and preserve management for the Preserve.

The 90 acres (6.95 acres of wetland vernal pool habitat) of protected areas within Mather Airport will continue to be managed as they have been in the past, with appropriate vegetation and wildlife management strategies implemented as needed to comply with Federal Aviation Administration (FAA) mandates to control wildlife hazards at Mather Airport and promote the conservation of federally listed species. This property will be transferred from the Air Force to the County with deed notification regarding the County's responsibility to comply with the Conservation Measures of this biological opinion, to comply with the Act, and to consult with the Service regarding vernal pool species prior to any change of land use in these areas. The County has designated these lands as Protected Areas (Figure 1).

The additional 1,336 acres (2.50 acres of wetland vernal pool habitat) associated with the existing Mather Airport and not currently proposed for development or protection will continue to be managed in a manner that complies with the Act and FAA mandates.

The remaining 1,912 acres (34.40 acres of wetland vernal pool habitat) included in the property transfer are proposed for development by the County. Although the proposed property transfer does not directly adversely affect federally listed species, the transfer will result in indirect adverse effects to federally listed species and designated critical habitat by facilitating the County's proposed development, which is reasonably certain to occur and will result in direct

and indirect effects to the vernal pool crustaceans and grasses and designated critical habitat. Future land uses at Mather Field will be under Sacramento County Board of Supervisors authority and will be based primarily on the planning proposals included in the *Mather Field Specific Plan* (Sacramento County 1997). Future projects that have been proposed include additional recreational and commercial development, construction of a new County park, construction of a municipal sports complex, re-alignment of existing roads, construction of new roads and infrastructure, and construction of a new university. The ultimate land use for those areas outside the Preserve and not under FAA purview as part of continued airport operation is not precisely known at the time of this consultation. However, these areas have been included in development proposals submitted to the Corps by the County for permitting of wetland fill; therefore the effects to listed species and critical habitat from this reasonably foreseeable future habitat loss resulting from the County's development have been included as indirect effects of the proposed action in the analysis for this consultation.

Proposed Conservation Measures

The conservation measures as proposed below are considered part of the proposed action evaluated by the Service in this biological opinion.

1. The protected status of the Preserve shall run with the land and be binding on all heirs, successors, assigns, lessees, owners, or other occupiers and users. The Air Force will transfer the property encompassing the Preserve and the County will be required to record a Service-approved conservation easement for the 1,272-acre Preserve on Mather Field within 90 days of conveyance (Figure 1). The conservation easement will prohibit any use of, or activity on, the Preserve which is inconsistent with the protection of federally listed species, without prior written concurrence from the Service. The conservation easement must be approved by the Service prior the County taking title to the property encompassing the Preserve; therefore, the County should submit a conservation easement to the Service for review well in advance of the transfer date. The Service agrees to provide a review of the conservation easement within 30 days. The Service recommends using the Service template; an electronic version is available upon request. Prior to the end of 90 days from property transfer, the County shall record the conservation easement with the County Recorder and provide the Service with a copy of the recorded conservation easement. The Preserve will be managed in accordance with a Service-approved management plan, will be funded by a non-wasting endowment, and will be managed by a natural resource manager in perpetuity, as outlined below in "a" through "c".

    a) As a transfer requirement, the County will complete the Mather Wetlands Management Plan, which includes a Preliminary Work Plan, and manage the Preserve according to the plan. The Preliminary Work Plan will describe the first 5 to 10 years of management of the Preserve and will be designed to help to determine the best approach for long-term management of the Preserve. The Air Force will require that the Mather Wetlands Management Plan, including the Preliminary Work Plan, be completed and approved by the Service, Corps, EPA, and CDFG prior to transfer of the Preserve property. The Preliminary Work Plan

will be implemented at the time of recordation of the conservation easement. Once the Preliminary Work Plan is complete (between 5 and 10 years), the Mather Wetlands Management Plan will be updated based on results of the Preliminary Work Plan and submitted to the Service for review no later 10 years after taking title to the Preserve property. Once approved by the Service, it will be finalized and implemented.

b) Concurrent with the Wetlands Management Plan, the County will submit for Service approval a Property Analysis Record (PAR) or PAR-like analysis for the Preliminary Work Plan. The County will be responsible for the annual Initial and Capital funds, as determined by the PAR, for the Preliminary Work Plan. A draft PAR or PAR-like analysis for the full Mather Wetlands Management Plan and a proposed schedule for funding an endowment for Preserve management in perpetuity will also be included in the submittal for Service approval. Upon completion of the Preliminary Work Plan and the finalization of the Mather Wetlands Management Plan, this PAR will be updated and finalized. A sufficient funding level with acceptable guarantees (i.e., cash endowment) will be provided to fully ensure the ongoing maintenance and stewardship of the Preserve. The endowment will generate sufficient revenue annually to manage the Preserve and may be funded by the County through development fees collected from developers at Mather Field that are affecting vernal pool species. Funding of the endowment must be concurrent with the collection of development fees and must be fully funded within 5 years of completing the work outlined in the Preliminary Work Plan. Until the endowment is fully funded, the County will be responsible for the annual Initial and Capital funds determined by the final PAR.

c) Land management responsibilities for the Preserve will reside with a natural resource management agency or qualified non-profit organization, and will be subject to Service approval. The County shall retain a qualified Service-approved Preserve manager to manage the Preserve in a manner consistent with the Mather Wetlands Management Plan. The Preserve manager shall be selected within 90 days of transfer or prior to recordation of the Conservation Easement, whichever comes first.

Future Activities not Covered by this Opinion

Future Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Military Munitions Cleanup activities, including site cleanup, restoration, monitoring, and corrective actions, are not fully defined at this time, and therefore are not included in this biological opinion. Future consultation with the Service will occur during preparation of the CERCLA Feasibility Study and Proposed Plan or other appropriate documentation for each action that may affect a federally listed species or designated critical habitat. Furthermore, as previously stated, this biological opinion does not include incidental take authorization for

adverse affects to federally listed species or designated critical habitat associated with future development activities on transferred lands.

Action Area

The action area is defined in 50 CFR §402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the proposed action, the Service considers the action area to be the portion of Mather Field being transferred from the Air Force to the County (Figure 1). The action area is located within the City of Rancho Cordova, 12 miles east of downtown Sacramento and one mile south of U.S. Highway 50. The action area is bounded by Mather Road to the north, the Folsom South Canal to the east, Kiefer Boulevard to the south, and Old Placerville Road/Happy Lane to the west.

Analytical Framework for the Jeopardy Analysis and Adverse Modification Analyses

Jeopardy

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the vernal pool crustaceans' and the vernal pool grasses' range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the vernal pool species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the vernal pool crustaceans and the vernal pool grasses (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the vernal pool crustaceans and the vernal pool grasses; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the vernal pool crustaceans and the vernal pool grasses.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the vernal pool crustaceans' and the vernal pool grasses' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the vernal pool crustaceans and the vernal pool grasses in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the vernal pool crustaceans and the vernal pool grasses and the role of the action area in the survival and recovery of the vernal pool crustaceans and the vernal pool grasses as the context for evaluating the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in the biological opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the range-wide condition of designated critical habitat for the vernal pool crustaceans in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the vernal pool crustaceans' critical habitat are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve the intended recovery role for the vernal pool crustaceans.

The analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of the vernal pool crustacean critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the adverse modification.

Status of the Species and Critical Habitat

Vernal Pool Fairy Shrimp

Species Description – The vernal pool fairy shrimp was listed as threatened in 1994 (Service, 1994) (59 FR 48153). Further details on the life history and ecology of the vernal pool fairy shrimp may be found in the final listing rule, Eng *et al.* (1990), Helm (1998), Simovich et al. (1992), and Volmar (2002).

Vernal pool fairy shrimp have delicate elongate bodies; large, stalked, compound eyes; no hard shell (i.e., no carapace); and 11 pairs of swimming legs. Typically less than one inch long, fairy shrimp swim or glide upside-down using complex, beating movements of the legs. They are restricted to vernal pools (and swales), an ephemeral freshwater habitat that forms in areas with Mediterranean climates where slight depressions become seasonally saturated or inundated following fall and winter rains. Vernal pool fairy shrimp inhabit alkaline pools, ephemeral drainages, rock outcrop pools, vernal pools, and vernal swales (Eriksen and Belk 1999; Helm

1998). Occupied habitats range in size from rock outcrop pools as small as one square meter to large vernal pools up to 12 acres; the potential ponding depth of occupied habitat ranges from 1.2 inches to 48 inches (in southern California).

The geographic range of this species encompasses most of the Central Valley from Shasta County to Tulare County and the central coast range from northern Solano County to Santa Barbara County, California. Additional occurrences have been identified in western Riverside County, California, and in Jackson County, Oregon near the city of Medford (California Natural Diversity Database [CNDDB] 2008; Helm 1998; Eriksen and Belk 1999; Volmar 2002; Service 1994, 2003). The vernal pool fairy shrimp are currently known from 32 presumed populations. The number of recorded sightings of individuals has increased from 178 to over 550 (CNDDB 2008). Records include old museum records and site duplication, so the number of occurrences that are currently extant is unknown. The distribution of the shrimp remains essentially unchanged since listing. Known records suggest that in most locations the shrimp is frequently present only in low numbers or only present in a small percentage of the pools at a site.

Due to local topography and geology, vernal pools are usually clustered into pool complexes (Holland and Jain 1988). The genetic characteristics of the species, as well as ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. The pools and, in some cases, pool complexes supporting these species are usually small.

Life History – Female vernal pool fairy shrimp carry eggs in a pear-shaped, ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools fill with rainwater. Vernal pool fairy shrimp develop rapidly, feeding on algae, bacteria, protozoa, rotifers, and bits of detritus, and may become sexually mature within two weeks after hatching (Gallagher 1996; Helm 1998). The adults of the vernal pool fairy shrimp have been collected from early December to early May, depending on annual weather conditions. However, these non-dormant populations often disappear early in the season long before the vernal pools dry up. Such quick maturation permits vernal pool fairy shrimp populations to persist in relatively short-lived, shallow bodies of water (Simovich et al. 1992).

Vernal pool fairy shrimp have passive dispersal. Large-scale flooding resulting from winter and spring rains may have played an important role in dispersal of the species, allowing the animals to colonize different individual vernal pools and other vernal pool complexes within a watershed. This dispersal means has been altered due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds likely are now the primary dispersal agents for fairy shrimp (Simovich *et al.* 1992) even at a relatively local scale, and likely have always been important to

long-distance dispersal. The eggs of the crustaceans are either ingested (Krapu 1974, Swanson et al. 1974, Driver 1981, Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

Vernal Pool Tadpole Shrimp

Species Description – A final rule was published on September 19, 1994 (Service 1994), to list the vernal pool tadpole shrimp as endangered under the Act. Further information on the life history and ecology of the vernal pool tadpole shrimp may be found in Eng *et al.* (1990), Helm (1998), Simovich *et al.* (1992), and Volmar (2002).

Vernal pool tadpole shrimp have large, shield-like carapaces approximately one inch long that cover most of their body; dorsal, compound eyes; and a pair of long cercopods, one on each side of a flat caudal plate, at the end of their last abdominal segment. Like vernal pool fairy shrimp, vernal pool tadpole shrimp are restricted to vernal pools (and swales), an ephemeral freshwater habitat that forms in areas with Mediterranean climates where slight depressions become seasonally saturated or inundated following fall and winter rains. They have been found in vernal pools containing clear to highly turbid water and ranging in size from 5 square meters (54 square feet) in the Mather Air Force Base area of Sacramento County, to the 36-hectare (89-acre) Olcott Lake at Jepson Prairie in Solano County; the potential ponding depth of occupied habitat ranges from 1.5 inches to 59 inches. Vernal pools at Jepson Prairie and Vina Plains (Tehama Co.) have a neutral pH, and very low conductivity, total dissolved solids, and alkalinity (Barclay and Knight 1984, Eng *et al.* 1990). These pools are located most commonly in grass-bottomed swales of grasslands in old alluvial soils underlain by hardpan or in mud-bottomed claypan pools containing highly turbid water.

The vernal pool tadpole shrimp is known from 19 populations in the Central Valley, ranging from east of Redding in Shasta County south to Fresno County, and from a single vernal pool complex located on the San Francisco Bay National Wildlife Refuge in Alameda County. As with vernal pool fairy shrimp, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes.

Life History – Females deposit cysts (partially developed embryos encased in an egg-like structure) which settle on the pool bottom. Although some cysts may hatch quickly, others remain dormant to hatch during later rainy seasons (Ahl 1991). Tadpole shrimp may become sexually mature within three to four weeks after hatching (Ahl 1991; Helm 1998). Reproductively mature adults may be present in pools until the habitats dry up in the spring (Ahl 1991; Simovich *et al.* 1992; Gallagher 1996). Vernal pool tadpole shrimp are primarily bottom-dwelling animals that move with legs down while feeding on detritus and living organisms, including fairy shrimp and other invertebrates (Pennak 1989). Vernal pool tadpole shrimp have similar dispersal methods as discussed above for vernal pool fairy shrimp.

Status and Distribution of the Vernal Pool Crustaceans – Both vernal pool crustaceans are imperiled by a variety of human-caused activities, primarily the loss and modification of habitat due to urban development, agricultural conversion, and infrastructure construction, especially

along the periphery of urban areas (Service 2007a, 2007b). Habitat loss occurs from direct destruction and modification (e.g., to the hydrology) of pools due to filling, grading, disking, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a determination that a historic loss between 60 and 85 percent may be more accurate. Coe (1988) estimated that within 20 years, 60 to 70 percent of the habitat would be destroyed by human activities. The rate of loss of vernal pool habitat in the state has been estimated at 2 to 3 percent per year (Holland and Jain 1988).

Between 1994 and 2005, the Service's Sacramento Fish and Wildlife Office engaged in section 7 consultations for projects with impacts to approximately 50,000 acres of vernal pool habitat, which includes both the vernal pools (wetland acres) and the surrounding uplands (Service 2007a). This total includes the loss of 25,000 acres of vernal pool habitat to residential, commercial, and industrial development (Service 2005).

In addition to direct habitat loss, the vernal pool habitat also has been and continues to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986, Goodman 1987a, b). Should an extirpation event occur in a population that has been fragmented, the opportunities for re-colonization would be greatly reduced due to physical (geographical) isolation from other (source) populations. Only a small proportion of the habitat of these species is protected from these threats.

The Recovery Plan (plan) provides a recovery strategy for 20 federally-listed species: 10 endangered plants, 5 threatened plants, 3 endangered animals, and 2 threatened animals. The vernal pool fairy shrimp and the vernal pool tadpole shrimp are included in the plan. The Recovery Plan presents an ecosystem-level strategy for recovery and conservation focused on habitat protection and management. As a basis, the plan uses the 17 vernal pool regions in the State of California as defined by the California Department of Fish and Game in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998). The plan further designates core areas that are distinct areas in each vernal pool region that provide the features, populations, and distinct geographic and/or genetic diversity necessary for recovery of the species. Five year reviews were completed for both vernal pool fairy shrimp and vernal pool tadpole shrimp in 2007 (Service 2007a, 2007b). No change in status was recommended for both species.

Sacramento Orcutt Grass

Species Description and Life History – Sacramento Orcutt grass was listed as endangered on March 26, 1997 (62 FR 14338). Sacramento Orcutt Grass is a densely tufted annual in the grass family (Poaceae) that reaches 2 to 10 centimeters (1 to 4 inches) in height. The stems are generally erect and terminate in spike-like inflorescences. Flowering occurs from May to June. The plants are viscid when young and when mature are covered with a sticky exudate producing the characteristic sweet odor of this genus. Sacramento Orcutt grass closely resembles San Joaquin Valley Orcutt grass; however, the two species are geographically separated (Stone *et al.*, 1988). The germination of Sacramento Orcutt grass may be dependent on a symbiotic relationship with an aquatic fungus. When the fungus grows abundantly, which occurs only after heavy winter rains, Orcutt grass germination can occur (Stone *et al.* 1988).

Status and Distribution – Sacramento Orcutt grass has the narrowest habitat requirements of all the *Orcuttia* species found in the Central Valley. This species occurs only in natural vernal pools within a 350 square-km (135 square-mile) area in eastern Sacramento County. The range of the species lies in a narrow zone of remnant depositional stream terraces at the base of the Sierran foothills (Stone *et al.* 1988) in Northern Hardpan and Northern Volcanic Mudflow vernal pools. Occurrences are at an elevation of 46 to 82 meters (150 to 270 feet) on high-terrace vernal pools that range in area from 0.1 hectare (0.25 acre) to 0.28 hectare (2.03 acres). The species is known from nine occurrences. The two occurrences that have been extirpated were lost to urban development and conversion of the vernal pool habitat to a stockpond. Most known occurrences are protected; however, urban development remains a threat to other occurrences (Service 2008).

Sacramento Orcutt grass is included in the ecosystem-level strategy for recovery and conservation presented in the Recovery Plan as discussed above in the vernal pool crustacean section. A 5-year review was completed for Sacramento Orcutt grass in 2008 (Service 2008). No change in status was recommended.

Slender Orcutt Grass

Species Description and Life History – Slender Orcutt grass was listed as threatened on March 26, 1997 (62 FR 14338). Slender Orcutt grass is a small, weakly tufted annual in the grass family (Poaceae). The plant has several stems 2-6 inches tall, terminating in an elongate inflorescence of scattered spikelets. The lemmas are deeply cleft into fine, equal-length, prominent teeth that are sharp-pointed or short-awned. The foliage is grayish, with sparse hairs. The erect stems often branch from the upper nodes.

Status and Distribution – Slender Orcutt grass occurs across a wide range of elevations (90 – 5,761 feet), but is associated primarily with vernal pool habitat on Northern Volcanic Ashflow and Northern Volcanic Mudflow substrates. The species is typically associated with larger and/or deeper vernal pools (typically deeper than 11.8 inches) that have relatively long periods of inundation. The plant is also restricted to the deepest portion of the pools. The main habitat requirement for this species appears to be inundation of sufficient duration and quantity to eliminate most competition and to meet the plant's physiological requirements for prolonged

inundation, followed by gradual desiccation (Griggs and Jain 1983; Corbin and Schoolcraft 1990). Slender Orcutt grass is restricted to northern California with scattered, disjunct populations occurring in the Sacramento Valley from Siskiyou County to Sacramento County.

Most of the 59 native extant populations are in Shasta County (19 populations, including one translocated) and Tehama County (32 populations). The species is also found in Lake, Lassen, Plumas, Sacramento, and Siskiyou counties. Only two extant occurrences are found in Sacramento County (Stone *et al.* 1988). Several historically known populations have been eliminated by agricultural conversion, airport construction, and wetland draining for mosquito abatement. Current threats include land use conversion and urban development along the periphery of urban areas (Service 2005). The species is vulnerable to indirect impacts from developments due to the changes in hydrology and increases in sedimentation.

Slender Orcutt grass is included in the ecosystem-level strategy for recovery and conservation presented in the Recovery Plan as discussed above in the vernal pool crustacean section. A 5-year review is currently being drafted for slender Orcutt grass.

Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp Critical Habitat

Critical habitat for the vernal pool tadpole shrimp and vernal pool fairy shrimp was designated in the *Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon* (71 FR 7117). The designated critical habitat units constitute the Service's best assessment of areas determined to be occupied by the species at the time of listing, areas that contain the PCEs essential to the conservation of the species, and additional areas essential to the conservation of the federally listed vernal pool species.

There are 35 critical habitat units designated for the vernal pool fairy shrimp, totaling 597,821 acres. There are 18 critical habitat units designated for the vernal pool tadpole shrimp, totaling 228,785 acres (Service 2006). The PCEs of critical habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp are: 1) topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools, providing for dispersal and promoting hydroperiods of adequate length in the pools; 2) depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days for vernal pool fairy shrimp and 41 days for vernal pool tadpole shrimp, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction; 3) sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and 4) structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

The reduction and fragmentation of habitat due to urban development, flood control projects, highway development, and agricultural land conversion threaten many of the vernal pool crustacean critical habitat units. Critical habitat units near areas that are rapidly developing are under the greatest degree of risk. Critical habitat for the vernal pool fairy shrimp is the most threatened by development activities in the following counties: Butte (units 7 and 9); Merced (units 21 to 23); Placer (unit 12); and Sacramento (units 13 and 14). Critical habitat for the vernal pool tadpole shrimp is the most threatened by development in the following counties: Butte (unit 3); Merced (unit 16); and Sacramento (units 8 and 9). The amount of destroyed suitable vernal pool crustacean habitat within these critical habitat units has not been quantified; however, the Service has issued biological opinions for many projects within these counties that have, cumulatively, contributed to a local and range-wide trend of habitat loss and degradation of suitable vernal pool crustacean habitat within designated critical habitat.

Environmental Baseline

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated effects of all proposed federal projects in the action area that have undergone section 7 consultation and the effects of State and private actions that are contemporaneous with the consultation in progress.

Vernal pool fairy shrimp and vernal pool tadpole shrimp

Status of the species within the action area - The action area is located in the Southeastern Sacramento Valley Vernal Pool Region, which contains almost 15 percent of the remaining vernal pool grasslands in the State of California (Keeler-Wolf et al. 1998). The action area is also within the Mather core area as designated in the Recovery Plan (Service 2005). An "occurrence", which may represent a documented collection, observation, or museum specimen, is defined by the CNDDB as a location occupied by a species separated from other locations by at least 0.25 miles, and may contain multiple records. There are 106 occurrences of vernal pool fairy shrimp in the Southeastern Sacramento Valley Vernal Pool Region and ten occurrences of vernal pool fairy shrimp within the Mather core area (Service 2007a). There are 79 occurrences of vernal pool tadpole shrimp in the Southeastern Sacramento Valley Vernal Pool Region and 58 occurrences of vernal pool tadpole shrimp within the Mather core area (Service 2007b). The high number of occurrences of the vernal pool crustaceans in this vernal pool region makes conservation and management of the habitat essential to the conservation and recovery of the species, especially in light of rapid increases in development in the Mather core area (Service 2007a). The Recovery Plan recommends protecting 85 percent of suitable habitat and 80 percent of occurrences within the Mather core area for vernal pool fairy shrimp. For vernal pool tadpole shrimp, the Recovery Plan recommends protecting 95 percent of suitable habitat and 80 percent of occurrences within the Mather core area.

Numerous surveys have been conducted in the action area and there are multiple records of vernal pool crustaceans on Mather Field, including in the proposed Preserve and the area proposed for development by the County. Vernal pool fairy shrimp were observed within a

vernal pool located among the High Terrace pools in the Preserve, along the eastern edge of Independence at Mather, and in pools in the southwestern corner of Mather Field. The species is likely to be distributed in vernal pools throughout the area. Vernal pool tadpole shrimp were found in more than 60 locations within all areas of Mather Field. Vernal pool habitat is present throughout the undeveloped portions of Mather Field; however, the proposed Preserve supports the highest density and in general the highest quality of habitat.

Factors affecting the vernal pool fairy shrimp and vernal pool tadpole shrimp within the action area – There are no known concurrent actions from State, local, private, and unrelated federal actions within the action area affecting the environmental baseline of the two species. A related activity, as part of the base closure, is the Air Force conducting work under CERCLA at Mather Field that may adversely affect the vernal pool crustaceans (Service File No. 81420-2009-0845-1). Mather Field occasionally experiences trespassing that damages pools (e.g., off-road vehicles driving through pools) and Sacramento County is actively working to reduce harmful effects.

During the time that Mather Air Force base was an active military base, the action area was used extensively by the military. Vernal pool habitats at Mather have been impacted to varying degrees by historical use of the property as a former military installation. Aerials during that period show an extensive road network throughout much of the area, many of which bisect wetland features. Construction of the base and supporting facilities, including housing, schools, hospital, and commercial and recreational facilities, are the primary source of historical impacts. Most of the base development took place in the 1940s through 1960s, and many of the original buildings are still in place. Throughout Mather Field, vernal pool habitats were adversely affected by road and utility construction, off-road vehicle use, firebreak construction, soil and rubble stockpiling, and spills or releases of hazardous materials. Additionally, adverse affects in the areas proposed for development by the County resulted from the construction of: two landfills in the northeastern corner of the base; a practice grenade field in the eastern portion of the base; an open burn/open detonation pit in the eastern portion of the base; a small arms firing range in the eastern portion of the base; a trap and skeet range north of Morrison Creek; and a second small arms firing range and a second trap and skeet range southeast of the east half of the runway. The construction of these facilities and activities by the Air Force likely resulted in adverse affects to the listed species. In addition, construction of the Folsom South Canal by the U.S. Bureau of Reclamation in the 1970s resulted in the spreading of a large quantity of surplus soil over the southeastern portion of the base. The upper foot or more of surface soils at this area were excavated in 1996 (approximately 8,680 cubic yards, an average of about 16 inches depth over the site) by the Air Force as part of an unrelated soil remediation project. Thus, some listed species in this part of the project site were likely buried as part of the canal construction or removed during the site remediation. Although the area was intensively used and modified by the military, it has remained largely undisturbed since base closure in 1993 and is still suitable habitat. In particular, the area where the Preserve is proposed has been allowed to return to a more natural state, but is in need of active management.

<u>Sacramento Orcutt grass and slender Orcutt grass</u>

Status of the species within the action area – The action area is located in the Southeastern Sacramento Valley Vernal Pool Region and the Mather core area as designated in the Recovery Plan (Service 2005). Historically, Sacramento Orcutt grass has only occurred in Sacramento County and six of the nine known extant occurrences of Sacramento Orcutt grass occur within the Mather core area (Service 2008). Slender Orcutt grass is known from three extant occurrences within the Mather core area (CNDDB 2008). The Recovery Plan recommends protecting 95 percent of suitable habitat and 100 percent of occurrences within the Mather core area for Sacramento Orcutt grass. For slender Orcutt grass, the Recovery Plan recommends protecting 95 percent of suitable habitat and 80 percent of occurrences within the Mather core area.

Vernal pool habitat is present throughout the undeveloped portions of Mather Field; however, the Preserve supports the highest density and in general the highest quality of habitat. Although suitable habitat exists at Mather Field, multiple surveys conducted within the action area over the last 15 years have not located either species (e.g., Wetlands Research Associates Inc. 2004, Jones & Stokes Associates Inc. 1997, Carol Witham, pers. comm.). Both species occur approximately one half mile from the project area at the Sunrise-Douglas Preserve. It is possible that seed banks for these species exist at Mather Field and populations may appear during optimal years of precipitation and ponding duration.

Factors affecting the Sacramento Orcutt grass and the slender Orcutt grass within the action area – There are no known concurrent actions from State, local, private, and unrelated federal actions within the action area affecting the environmental baseline of the two species. The CERCLA action mentioned above is being conducted in the area previously affected by the construction of the Folsom South Canal and the soil remediation project. Mather Field occasionally experiences trespassing that damages pools (e.g., off-road vehicles driving through pools) and Sacramento County is actively working to reduce harmful effects.

During the time that Mather Air Force base was an active military base, the action area was used extensively by the military. See the vernal pool fairy shrimp and vernal pool tadpole shrimp baseline for a complete discussion. Air Force activities during the time the base was active likely resulted in adverse affects to vernal pool crustaceans and grasses. Although the area was intensively used and modified by the military, it has remained largely undisturbed since base closure in 1993 and is still suitable habitat. In particular, the area where the Preserve is proposed has been allowed to return to a more natural state, but is in need of active management.

<u>Vernal pool fairy shrimp critical habitat and vernal pool tadpole shrimp critical habitat</u>

Status of the vernal pool fairy shrimp and vernal pool tadpole shrimp critical habitat within the action area – Mather Field is located in critical habitat unit 8 for vernal pool tadpole shrimp and unit 13 for vernal pool fairy shrimp. These units have the same boundaries and are approximately 2,450 acres located north of State Route 16 and west of Sunrise Boulevard along Mather Boulevard in Sacramento County. Approximately 1,440 acres of these critical habitats are located within the boundaries of Mather Field with the remaining 1,010 acres of the units located south of Mather Field. These units contain all PCEs for the vernal pool crustaceans that

are essential for the conservation of the species. The units also contain numerous vernal pool crustacean occurrences. Vernal pool crustaceans have been documented in a variety of vernal pool habitats, including geologically young, low terrace vernal pools on the Riverbank Formation, older, high terrace vernal pools on the Laguna and Arroyo Seco geologic formations, and Northern Volcanic Mudflow vernal pools on the Mehrten and Valley Springs geologic formations.

Factors affecting vernal pool crustacean critical habitat within the action area - There are no known concurrent actions from State, local, private, and unrelated federal actions within the action area affecting the environmental baseline of the critical habitat for these two species within the action area.

During the time that Mather Air Force base was an active military base, the action area, including the portion designated as critical habitat, was used extensively by the military. Vernal pool habitats at Mather have been impacted to varying degrees by historical use of the property as a former military installation. Aerials during that period show an extensive road network throughout much of the area, many of which bisect wetland features. Construction of the base and supporting facilities are the primary source of historical impacts, however little construction has been done in critical habitat. Other activities that adversely affected vernal pool critical habitat at Mather Field include road and utility construction, off-road vehicle use, firebreak construction, soil and rubble stockpiling, and spills or releases of hazardous materials. Approximately 100 acres of roads, structures, parking lots, part of Mather Regional Park, and part of the airport flightline are within the critical habitat boundary, but will not be part of the Preserve. Although the area was intensively used and modified by the military, it has remained largely undisturbed since base closure in 1993 and is still suitable habitat. The area where the Preserve is proposed has been allowed to return to a more natural state, but is in need of active management.

Effects of the Proposed Action

Vernal Pool Crustaceans and Grass Species

The 1,272-acre Preserve will be established upon transfer of ownership of the property. The Preserve targets preservation of the highest functioning and most biologically healthy wetland habitats at Mather Field within a large, contiguous area that includes the associated uplands, buffers, and contributing local watersheds. The Preserve contains a total of 64.57 acres of wetland vernal pool habitat. As described under the Proposed Conservation Measures, the Air Force will require, as a condition of property transfer, that Sacramento County record a Service-approved conservation easement on the Preserve. The protection provided by the conservation easement will ensure that the property remain in its natural condition forever, and will prohibit any use of, or activity on, the protected property which is inconsistent with the protection of federally listed species, without prior written concurrence from the Service. A Service-approved wetland management plan will be developed and implemented to ensure adequate protection and functionality of the habitat for the vernal pool crustaceans and grasses.

The Preserve includes 51.29 acres of wetland vernal pool habitat within the Mather core area, approximately 95 percent of all habitat within the core area that is contained on Mather Field, which is consistent with the recommendations of the Recovery Plan for the vernal pool crustaceans and grasses. Additionally, the Preserve includes 13.28 acres of wetland vernal pool habitat that were not designated as critical habitat or part of the core area. These areas, along with the associated uplands, provide important connectivity, watersheds, and added buffers, which benefit the functioning of the Preserve greatly and contribute to species conservation and recovery. Contributing to the long-term preservation and management of the vernal pool habitat is critical for the species' survival and recovery, and the Preserve will accomplish this by encompassing a large contiguous area of high quality vernal pool habitat in the Mather core area containing numerous species occurrences.

The 90 acres of protected areas at Mather Airport contain an additional 6.98 acres of wetland vernal pool habitat. These areas are proposed to be retained as open space with appropriate vegetation and wildlife management strategies implemented as needed to comply with FAA mandates to control wildlife hazards at Mather Airport. If land uses in these areas ever change, effects to vernal pool species would be subject to consultation under the Act.

The additional 1,336 acres (2.50 acres of wetland vernal pool habitat) that are associated with the existing Mather Airport and not currently proposed for development or protection will continue to be managed in a manner similar to the protected areas. Although this area is not currently under proposal for development, it may be in the future and would be subject to consultation under the Act.

The disposal of the Base will not result in direct effects to the vernal pool crustaceans and grasses. However, the transfer will facilitate an indirect adverse effect to federally listed species because the County's proposed development is reasonably certain to occur and will result in direct and indirect effects to vernal pool habitats and the listed species. The County has submitted development proposals to the Corps for environmental review for 1,912 acres on Mather Field. This includes direct fill of 34.40 acres and potential indirect effects (ground disturbing activities within 250 feet of pools) to 7.54 acres wetland vernal pool habitat. These numbers represent the worst case scenario and actual habitat affected may decrease as plans for development projects are refined and avoidance and minimization measures are developed.

Although details of the development proposals for future development by the County have not been finalized, future development projects at Mather Field will be required to demonstrate compliance with the Act. Incidental take and proposed minimization measures associated with future projects at Mather Field will be authorized individually or as a group via section 7 or section 10 of the Act, at the time a final project proposal is submitted for agency review. The future development project may affect the vernal pool crustaceans and grasses due to direct fill, increased sedimentation, changes in hydrologic regime (e.g., change in rates of surface flow, reducing subsurface volumes), alteration of the hardpan, and changing the slope or groundcover of the surrounding landscape. Survival of aquatic organisms like the vernal pool fairy shrimp and vernal pool tadpole shrimp are directly linked to the water regime of their habitat (Zelder 1987). Therefore, construction near vernal pool habitat is likely to result in take of the vernal

pool crustaceans. This loss or disturbance of vernal pool habitats could result in the taking of an unknown number of vernal pool fairy shrimp and vernal pool tadpole shrimp in the 34.40 acres directly affected and the 7.54 acres indirectly affected by the County's future development. If seed banks for Sacramento Orcutt grass or slender Orcutt grass are present, the County's development plans could impact the populations of these species in the 34.40 acres directly affected and the 7.54 acres indirectly affected by the County's future development.

Incidental take resulting from the development of Mather Field will occur within the Mather core area, an area under much development pressure making preservation of habitat important for the species' survival and recovery. Areas proposed for development at Mather Field are the areas that have been affected by construction of the Folsom Canal, the soil remediation project, the two landfills, the practice grenade range, the open burn/open detonation pit, the two trap and skeet ranges, and the two small arms firing ranges. The Preserve, although adversely affected by previous military activities such as roads and stockpiling, contains the highest quality habitat at Mather Field and is a large, contiguous area that will contribute to the long-term preservation and management of vernal pool habitat in an area that is critical for the species' survival and recovery.

Vernal Pool Crustacean Critical Habitat

Approximately 1,440 acres of critical habitat are located within the boundaries of Mather Field with the remaining 1,010 acres of the units are located south of the Mather Field. The Preserve on Mather Field will permanently protect approximately 951 acres of critical habitat, which is approximately 39 percent of critical habitat unit 13 for vernal pool fairy shrimp and unit 8 for vernal pool tadpole shrimp, and approximately 66 percent of these units that are on Mather Field. Critical habitat units are evaluated in the context of the range-wide condition of the critical habitat to determine if the critical habitat range-wide would remain functional. Range-wide, 0.16 percent of vernal pool fairy shrimp critical habitat will be preserved and 0.08 percent will be adversely affected. Range-wide, 4.2 percent of vernal pool tadpole shrimp critical habitat will be preserved and 0.2 percent will be adversely affected. The Preserve includes an additional 321 acres of lands contiguous to the critical habitat units that serve to provide connectivity between portions of the critical habitat, which will increase the function of the landscape by providing connectivity and buffer areas. Further, the Preserve will be managed to the benefit of the vernal pool crustaceans and their habitat. Because of the protection of these critical habitat units as part of the Preserve, these units should play a strong role in the conservation of the species and the proposed project should not irreparably damage the functioning of the range-wide critical habitat.

Based on the PCEs previously described in the *Status of the Critical Habitat* section, any construction that occurs in or near vernal pool habitat has the potential to disrupt vernal pool crustacean critical habitat through direct and indirect effects. These effects include direct fill of habitat and altered hydrologic regimes that affect the surrounding upland areas, vernal pools, and swale complexes such that they fail to function properly due to changes in water availability, changes in inundation periods and depths, altered water quality or temperature, and changes in soil moisture content.

The proposed project would facilitate the County's future development of the approximately 489 acres of critical habitat not included in the Preserve. Approximately 100 acres of the 489 acres are occupied by roads, structures, parking lots, part of Mather Regional Park, and part of the airport flightline so these acres do not contain any of the PCEs. The remaining 389 acres of vernal pool crustacean critical habitat have one or more of the PCEs, including 2.68 acres of wetland vernal pool habitat, and are likely to be adversely affected in the future by the County's development plan. However, much of the critical habitat that is proposed for development is degraded due to previous impacts and is fragmented by roads and other structures. Details of the development are not known at this time, but part of the area may be developed by the County's Parks and Recreation (e.g., soccer fields, parking lot) and part of the area may be used by the airport for commercial development (e.g., air cargo, aircraft maintenance).

Cumulative Effects

Cumulative effects are those impacts of future State, Tribal, county, local agency, and private actions that are reasonably certain to occur. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. On the Preserve section of the action area, no impacts are expected except the management of the Preserve and potentially restoration of vernal pool habitat. Due to the high concentration of wetlands on Mather Field, most projects that could affect listed vernal pool species are expected to require a Clean Water Act permit and the Corps would undergo section 7 consultation with the Service.

Conclusion

After reviewing the current status of the vernal pool fairy shrimp, vernal pool tadpole shrimp, Sacramento Orcutt grass, slender Orcutt grass, vernal pool fairy shrimp critical habitat, and vernal pool tadpole shrimp critical habitat, the environmental baseline for the area covered by this biological opinion, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that disposal of the former Mather Air Force Base is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. The Service reached this conclusion because the project-related effects to these species, when added to the environmental baseline and analyzed in consideration of anticipated cumulative effects, would not rise to the level of precluding recovery of the species or reducing the likelihood of survival of the species. Although the future development by the County will likely adversely affect the species and designated critical habitat, the proposed project establishes a Preserve that protects, in perpetuity, a large, contiguous portion of the highest quality habitat on Mather Field which will contribute to the long-term preservation and management of vernal pool habitat in an area that is critical for the species' survival and recovery, and includes a large portion of the Mather critical habitat units and the Mather core area.

This biological opinion acknowledges that the proposed property transfer facilitates an indirect adverse effect to listed species and designated critical habitat because of the County's proposed

development, which is reasonably certain to occur, and will result in direct and indirect effects to vernal pool crustacean and grass species. The Service does not anticipate the proposed land transfer will incidentally take any vernal pool tadpole shrimp or vernal pool fairy shrimp; therefore, the Service is not providing an incidental take statement with this biological opinion.

Future development proposed at Mather Field that may incidentally take federally listed species or adversely affect critical habitat are required to be in compliance with either section 7 or section 10 of the Act, as appropriate. In the case of section 7 consultation, an Incidental Take Statement with Reasonable and Prudent Measures and Terms and Conditions to minimize take will be issued with the biological opinion. Section 10 will require development of an HCP and issuance of an incidental take permit. The conclusion that the effects to vernal pool crustaceans in the form of direct effects to 34.40 acres and indirect effects to 7.54 acres of vernal pool wetland habitat are not likely to jeopardize the continued existence of these species, and that the effects to vernal pool critical habitat are not likely to cause adverse modification to the critical habitat, will apply to future development at Mather Field by the County. However, these conclusions may need to be re-assessed in future section 7 consultation or section 10 permit process if it is determined that significant changes have occurred in the baseline of the species or critical habitat that may influence the jeopardy or adverse modification analysis.

CONSERVATION RECOMMENDATIONS

Conservation recommendations are suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of new information. These measures may serve to further minimize or avoid the adverse effects of a proposed action on listed, proposed, or candidate species, or on designated critical habitat. They may also serve as suggestions on how action agencies can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act, or recommend studies improving an understanding of a species' biology or ecology. Wherever possible, conservation recommendations should be tied to tasks identified in recovery plans. The Service is providing you with the following conservation recommendation:

1. The Air Force and the County should work with the Service to implement the recovery actions to achieve recovery criteria of the Recovery Plan, including but not limited to species and habitat status surveys and species-related research.

2. The Air Force and the County should utilize their authority and resources to increase public awareness of vernal pool species.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Please contact Ken Sanchez, Assistant Field Supervisor, at (916) 414-6600 if you have questions regarding this biological opinion.

Sincerely,

Susan K. Moore

Susan K. Moore
Field Supervisor

cc:
Katherine Dadey, U.S. Army Corps of Engineers, Sacramento, California
Paul Jones, U.S. Environmental Protection Agency, San Francisco, California
Todd Gardner, California Department of Fish and Game, Rancho Cordova, California
Molly Enloe, U.S. Air Force, McClellan, California
Clark Whitten, Sacramento County, Sacramento, California
Rick Balaz, Sacramento County, Sacramento, California

LITERATURE CITED

Ahl, J.S.B. 1991. Factors affecting contributions of the tadpole shrimp, *Lepidurus packardi*, to its oversummering egg reserves. Hydrobiologia 212:137-143.

Air Force Base Conversion Agency. 1993. Record of Decision, Disposal and Reuse of Mather Air Force Base. March 31.

Air Force Base Conversion Agency. 1994. Supplemental Record of Decision, Disposal and Reuse of Mather Air Force Base. November 21.

Air Force Base Conversion Agency. 1995. Supplemental Record of Decision, Disposal and Reuse of Mather Air Force Base. October 16.

Barclay, W.R. and A.W. Knight. 1984. Physio-chemical processes affecting production in a turbid vernal pool. Pages 126-142 IN S. Jain and P. Moyle, eds. Vernal pools and intermittent streams. Inst. Ecol. Pub. 28. Univ. Calif. Davis, California.

California Natural Diversity Data Base (CNDDB). 2008. Rarefind. Natural Heritage Division, California Fish and Game, Sacramento, California.

Coe, T. 1988. The application of Section 404 of the Clean Water Act to Vernal Pools. Pages 356-358. IN J.A. Kusler, S. Daly, and G. Brooks, eds. Urban Wetlands. Proceedings of the National Wetland Symposium. Oakland, California.

Corbin, B. and G. Schoolcraft 1990. *Orcuttia tenuis* Species management Guide. Lassen National Forest and Susanville District of the Bureau of Land Management. 1989.

Donald, D.B. 1983. Erratic occurrence of anostracans in a temporary pond: colonization and extinction or adaptation to variations in annual weather. Canadian Journal of Zoology 61:1492-1498.

Driver, E.A. 1981. Caloric value of pond invertebrates eaten by ducks. Freshwater Biology 11:579-581.

EDAW. 2007. Draft South Mather Wetlands Management Plan. Prepared for County of Sacramento, May 2007.

Eng, L.L., D. Belk, and C.H. Erickson. 1990. California Anostraca: Distribution, habitat, and status. J. Crustacean Biology. 10(2):247-277.

Eriksen, C. H. and D. Belk. 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press, Eureka, California. 196 pages.

Fugate, M.L. 1992. Speciation in the fairy shrimp genus *Branchinecta* (Crustacea: Anostraca) from North America. Ph.D. dissertation. Department of Biology, University of California, Riverside, California.

Gilpin, M.E. and M.E. Soule. 1986. Minimum viable populations: processes of species extinction. Pages 18-34 IN M.E. Soule, ed. Conservation biology: the science of scarcity and diversity. Sinauer Associates, Inc.; Sunderland, Massachusetts.

Goodman, D. 1987a. The demography of chance extinction. Pages 11-19 IN M.E. Soule, ed. Conservation biology: the science of scarcity and diversity. Sinauer Associates, Inc.; Sunderland, Massachusetts.

_____ 1987b. How do any species persist? Lessons for conservation biology. Conservation Biology 1: 59-62.

Griggs, F.T. and S.K. Jain. 1983. Conservation of vernal pool plants in California, II. Population biology of a rare and unique grass. Biological Conservation **27**: 171 – 193.

Helm, B. 1998. Biogeography of eight large branchiopods endemic to California. Pages 124 - 139 *in*: C. W. Witham, E.T. Bauder, D. Belk, W.R. Ferren, Jr., and R. Ornduff (eds.).Ecology, conservation, and management of vernal pool ecosystems - proceedings from a 1996 conference, California Native Plant Society, Sacramento, California. 285 pages.

Holland, R.F. 1978. The geographic and edaphic distribution of vernal pools in the Great Central Valley, California. California Native Plant Society, Special Publ. 4:1-12.

Holland, R. F. and S. Jain. 1988. Vernal Pools. Pages 515-533 *in* M. E. Barbour and J. Major, (eds.). Terrestrial Vegetation of California. California Native Plant Society. Sacramento, California.

Jones & Stokes, Associates, Inc. 2001. Final Report for Mather Field Vernal Pool Study. Sacramento, CA. Prepared for County of Sacramento.

Keeler-Wolf, T., D.R. Elam, K. Lewis, and S.A. Flint. 1998. California vernal pool assessment preliminary report. California Department of Fish and Game, Sacramento, California.

Krapu, G.L. 1974. Foods of breeding pintails in North Dakota. J. Wild. Manag. 38(3):408-417.

Pennak, R.W. 1989. Freshwater invertebrates of the United States. Wiley & Sons. New York, New York.

Sacramento County. 1997. Mather Field Specific Plan. Sacramento, California. May.

Simovich, M.A., R.C. Brusca and J.L. King. 1992. Invertebrate survey, PGT-PG&E/Bechtel Pipeline Expansion Project. University of San Diego, San Diego, California.

Stone, R.D., W.B. Davilla, D.W. Taylor, G.L. Clifton, L. Stebbins. 1988. Status survey of the grass tribe Orcuttieae and Chamaesyce hooveri in the Central Valley of California. U.S. Fish and Wildlife Service, Sacramento, CA. 124 p.

Swanson, G.A., M.I. Meyer and J.R. Serie. 1974. Feeding ecology of breeding blue-winged teals. J. Wild. Mang. 38:396-407.

U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of endangered status for the conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool tadpole shrimp; and threatened status for the vernal pool fairy shrimp. Federal Register 59:48136-48153.

_____. 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Four Endangered Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Oregon. Federal Register Vol. 68: 46684-46857.

_____. 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1. Portland, Oregon.

_____. 2006. Endangered and Threatened Wildlife and Plants; Critical Habitat Designation for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Final Rule. Federal Register Vol. 71: 7117-7315.

_____. 2007a. Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) 5-year Review: Summery and Evaluation. September 2007.

_____. 2007b. Vernal Pool Tadpole Shrimp (*Lepidurus packardi*) 5-year Review: Summery and Evaluation. September 2007.

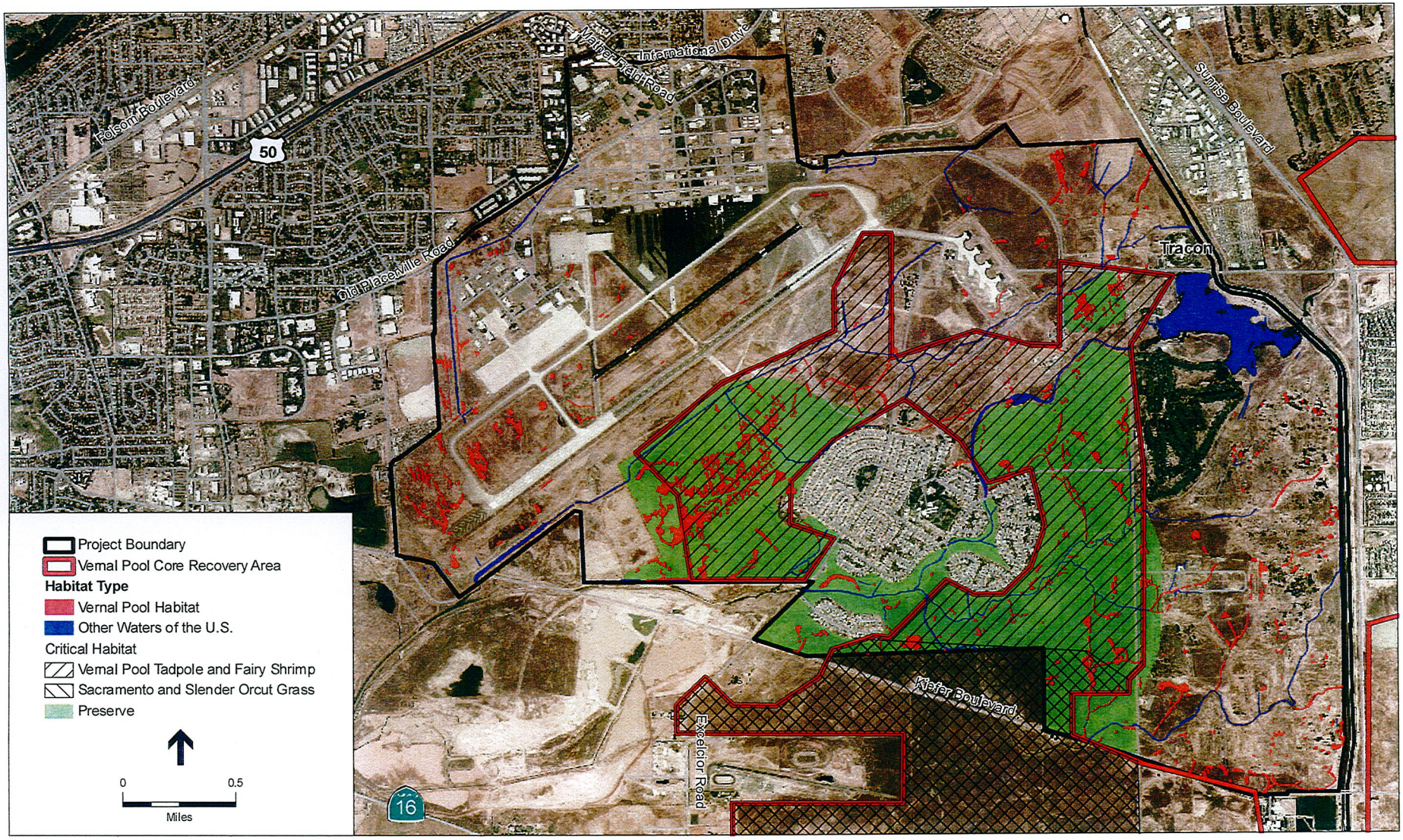
_____. 2008. *Orcuttia viscida* (Sacramento Orcutt Grass) 5-year Review: Summery and Evaluation. June 2008.

Volmar, J. 2002. Wildlife and Rare Plant Ecology of Eastern Merced County's Vernal Pool Grasslands. Vollmar Consulting. Berkeley, California. 446 pp.

Wetlands Research Associates, Inc. 2004a. Delineation of Potential Jurisdictional Wetlands and Waters of the U.S. under Section 404 of the Clean Water Act: Mather Field Study Area, Sacramento County, California. San Rafael, California. Prepared for County of Sacramento. Originally published October 2002. Revised February 3, 2004.

Wetlands Research Associates, Inc. 2004b. Mather Field Natural Resource Assessment: Phase I and II. San Rafael, California. Prepared for County of Sacramento.

Zelder, P. H. 1985. The Ecology of Southern California Vernal Pools: A community Profile. U.S. Fish & Wildlife Service Biological Report 85(7.11). 136 pp.

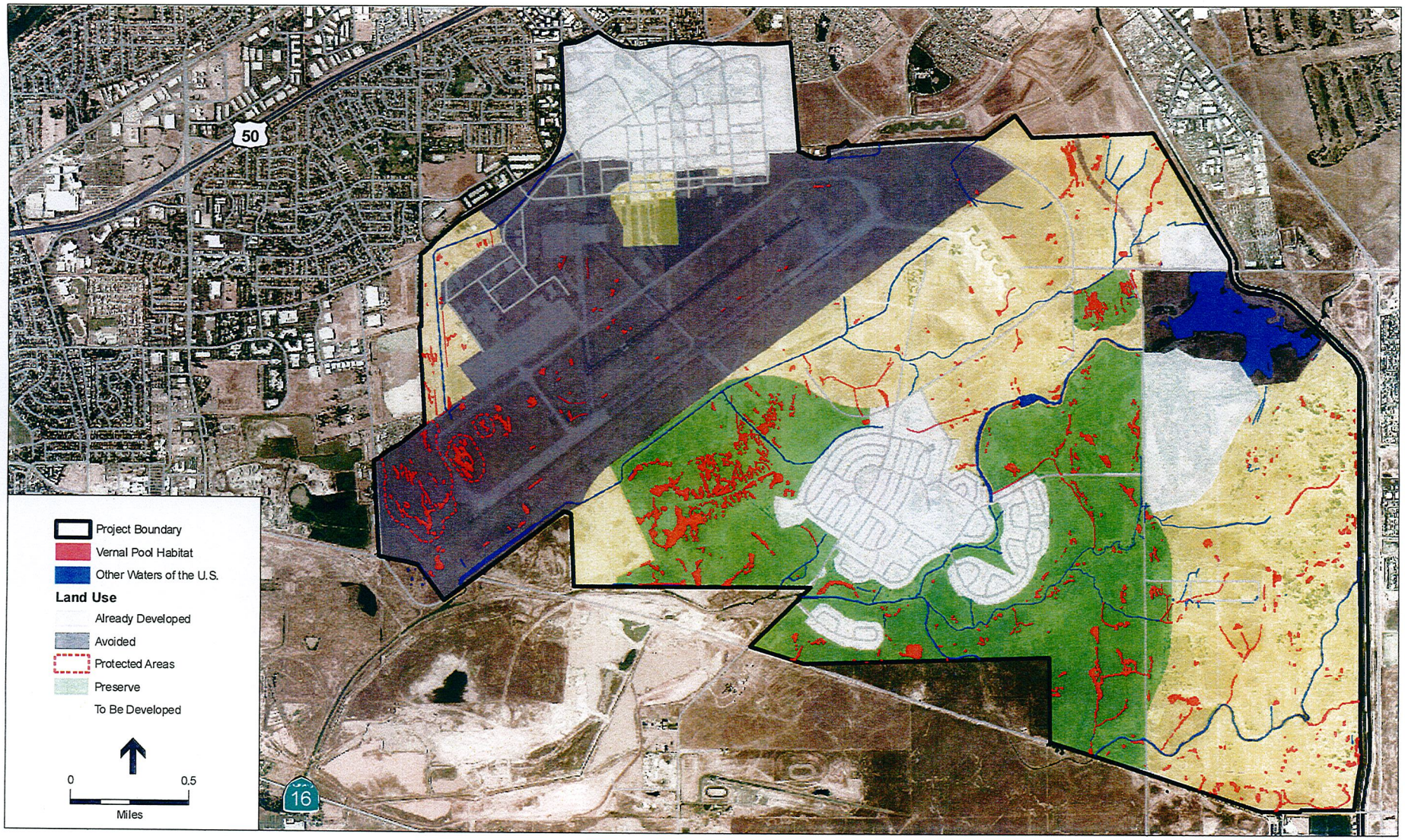


SOURCE: NAIP, 2009; and ESA, 2009

South Mather Draft Master Plan . 209295

Figure 2

Critical Habitat and Recovery Areas



SOURCE: NAIP, 2009; and ESA, 2009

South Mather Draft Master Plan . 209295

Figure 1
Proposed Land Uses