

# APPENDIX H

## BIOTIC RESOURCES

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# **BIOLOGICAL RESOURCES REPORT**

**CHARLES M. SCHULZ SONOMA COUNTY AIRPORT  
MASTER PLAN UPDATE IMPLEMENTATION PROJECT**

**SONOMA COUNTY, CALIFORNIA**

LSA

July 22, 2011

# **BIOLOGICAL RESOURCES REPORT**

**CHARLES M. SCHULZ SONOMA COUNTY AIRPORT  
MASTER PLAN UPDATE IMPLEMENTATION PROJECT**

**SONOMA COUNTY, CALIFORNIA**

Submitted to:

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LSA Project No. RSQ0901

**LSA**

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## EXECUTIVE SUMMARY

### PURPOSE OF THIS REPORT

This report describes and analyzes the potential impacts of the Charles M. Schulz Sonoma County Airport Master Plan Update Implementation Project on biological resources, including federal and state-listed special-status plant and animal species. This report is intended as a technical document in support of the draft Environmental Impact Report (EIR) being prepared for the Master Plan Update Implementation Project, pursuant to the California Environmental Quality Act (CEQA).

### PROJECT DESCRIPTION

**Location.** The Master Plan Update Implementation Project is located at the Charles M. Schulz Sonoma County Airport (Airport) northwest of the City of Santa Rosa, California, approximately two miles west of U.S. Highway 101 and just south of the Town of Windsor. The project site is located in the Santa Rosa Plain region of Sonoma County<sup>1</sup> (see Figures 1 and 2 – Appendix A).

**Background.** The Master Plan Update Implementation Project implements elements of the Charles M. Schulz Sonoma County Airport Master Plan (AMP), a long-range plan to guide future development and improvement of the Airport. The AMP contains “short-term” elements expected to be constructed within the next 5 years, and “long-range” elements that may be proposed 5 to 20 years in the future. The Sonoma County Transportation and Public Works Department – Airport Division (hereinafter referred to as the “County”) is proposing to implement all the various short-term elements of the AMP by 2015, and has prepared preliminary designs for these elements.

Many of the AMP short-term elements are associated with improvements to the Runway Safety Areas (RSAs) at the Airport. These RSA improvements are needed to bring the Airport into compliance with Federal Aviation Administration (FAA) design standards; the County as the project sponsor is requesting FAA unconditional approval for these improvements. The FAA is the federal lead agency for the evaluation of the RSA improvements in compliance with the National Environmental Policy Act (NEPA), and for consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) in compliance with the Endangered Species Act.<sup>2</sup>

**Proposed Project Description.** The Proposed Project entails grading work for the construction of runway extensions, blast pads, aprons, taxiways, access roads, and associated RSAs in accordance with FAA requirements (see Figure 3 in Appendix A, see also Appendix B). The Proposed Project would occur within the active operational area of a regional commercial aviation facility. Virtually all of the lands that would be affected by the Proposed Project are subject to regular or occasional

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<sup>1</sup> See Section 1.2 for a definition of “Santa Rosa Plain.”

<sup>2</sup> A separate Biological Assessment (BRR) that addresses only federally-listed species is being prepared for the Proposed Project, for the purposes of consultation with the USFWS and NMFS under Section 7 of the federal Endangered Species Act.

management activities needed to ensure safe flight operations, maintain aircraft and facilities, and protect the public safety.

The long-term elements of the Proposed Project are not currently proposed to be constructed and no designs have been or are being prepared for these elements. Consequently, the long-term elements are being treated programmatically in the draft EIR, and under this BRR. These elements (see Figure 3 in Appendix A; see also Appendix B) include construction of a replacement airline passenger terminal, new taxi lanes, an air cargo facility, acquisition of additional private properties, construction of runway run-up aprons, and relocation and/or construction of miscellaneous aviation support facilities, including replacement of landing aids and construction of individual hangars as in-fill projects.

## IMPACTS OF THE PROPOSED PROJECT

The Proposed Project would result in temporary grading and/or permanent impacts to a range special-status species and habitat types, including vernal pools and other wetlands, ponds, riparian woodlands, oak woodlands, annual grasslands, and ruderal areas (see Figure 3). These impacts are summarized below:

### Impacts to Special-status Plants:

**Burke's Goldfields (*Lasthenia burkei*).** The Proposed Project would not affect any wetlands containing existing populations of this federal and state-listed species occurs, or where historic populations occurred. However, the Proposed Project would result in the loss of 4.4 acres of vernal pools and other seasonal wetlands that are suitable habitat for Burke's goldfields. Under the *Final Santa Rosa Plain Conservation Strategy* (Conservation Strategy Team 2005) and the USFWS *Programmatic Biological Opinion* (hereinafter referred to as the "Conservation Strategy" and the "PBO" respectively), loss of such habitat is considered an adverse impact to Burke's goldfields because the habitat may retain a remnant seedbank for this species.<sup>3</sup> Therefore, the Proposed Project would adversely affect Burke's goldfields.

**Pappose Tarplant (*Centromadia parryi* ssp. *parryi*).** Two populations of this California Rare Plant Rank (CRPR) 1B<sup>4</sup> species occur at the Airport. Runway safety area grading for the Proposed Project would potentially disturb or eliminate one of the two populations of this species. Therefore, the Proposed Project would adversely affect pappose tarplant.

**Sebastopol Meadowfoam (*Limnanthes vinculans*).** This federal and state-listed Endangered plant species does not occur at the Airport, however a historic population occurred in one location. The Proposed Project would not affect the location of the historic population, but would result in the loss of 4.4 acres of vernal pools and other seasonal wetlands that are suitable habitat for this plant species. Under the Conservation Strategy and PBO, loss of such habitat is considered an adverse impact to Sebastopol meadowfoam because the habitat may retain a remnant seedbank for this species. Therefore, the Proposed Project would adversely affect Sebastopol meadowfoam.

<sup>3</sup> Many of the wetlands that would be affected by the Proposed Project occur within parts of the Airport that were previously graded and/or regularly irrigated. Therefore, the potential for these wetlands to have retained a remnant seedbank for federally-listed vernal pool plants is doubtful. Nevertheless, consistent with the Conservation Strategy and PBO, this BRR assumes that a remnant seedbank could potentially exist.

<sup>4</sup> See Section 1.5 for definition of the CRPR system.

**Sonoma Sunshine (*Blennosperma bakeri*).** This federal and state-listed Endangered plant species does not occur at the Airport, nor were there any known historic occurrences. However, the Proposed Project would result in the loss of 4.4 acres of vernal pools and other seasonal wetlands that are suitable habitat for Sonoma sunshine. Under the Conservation Strategy and PBO, loss of such habitat is considered an adverse impact to Sonoma sunshine because the habitat may retain a remnant seedbank for this species. Therefore, the Proposed Project would adversely affect Sonoma sunshine.

### **Impacts to Special-status Animals:**

**American Badger (*Taxidea taxus*).** This California Species of Special Concern<sup>5</sup> has not been observed at the Airport and is rare on the Santa Rosa Plain. Nevertheless, this species has the potential to occur in grasslands and open woodland areas at the Airport which provide suitable foraging and burrowing habitat for this species. Earthmoving and grading activities for the Proposed Project in grasslands and open woodlands have the potential to destroy American badger dens. Therefore, the Proposed Project would have the potential to adversely affect American badgers.

**Burrowing Owl (*Athene cunicularia*).** This California Species of Special Concern occurs as a transient species on the Santa Rosa Plain, and is unlikely to occur as nesting species (in burrows) at the Airport. Nevertheless, the potential for this species to be present in occupied burrows cannot be ruled out. Earthmoving and general construction work for the Proposed Project in grasslands and ruderal areas would have the potential to destroy burrowing owl burrows and/or disturb breeding owls. Therefore, the Proposed Project would have the potential to adversely affect burrowing owls.

**California Tiger Salamander (*Ambystoma californiense*).** The Airport is within the presumed historic geographic range of Distinct Population Segment (DPS) of California tiger salamander, a federally-listed Endangered Species and state-listed Threatened species. However, there is no evidence of occurrence of this species at the Airport, nor in the Airport Vicinity.<sup>6</sup> Also, the Airport is well outside the migratory range of the nearest known occurrence of this species, and is also separated from this occurrence by several significant movement barriers. Nevertheless, the Conservation Strategy and PBO consider Airport lands that are not covered by hardscape (e.g., asphalt, concrete, compacted gravel areas) to be suitable upland habitat for California tiger salamander, based on the presumed historic range of this species. Consequently, the Proposed Project would result in 91.6 acres of temporary adverse impacts and 38.9 acres of permanent impacts to suitable habitat for this species.

**Proposed Critical Habitat for the Sonoma County Distinct Population Segment of California Tiger salamander.** The Airport lies within the boundaries of the USFWS-proposed Critical Habitat for the Sonoma County Distinct Population Segment of this species. The Proposed Project would temporarily affect 91.6 acres and permanently affect 38.9 acres of this proposed Critical Habitat. Therefore, the Proposed Project would destroy or adversely modify proposed Critical Habitat for the Sonoma County Distinct Population Segment of California tiger salamander.

**Loggerhead Shrike (*Lanius ludovicianus*).** This California Species of Special Concern has not been observed at the Airport, nor are there documented breeding occurrences within the Airport Vicinity. Nevertheless, this species has the potential to use the Airport's grasslands and woodlands as foraging

<sup>5</sup> See Section 1.5 for definition of "California Species of Special Concern."

<sup>6</sup> See Section 1.2 for a definition of "Airport Vicinity."

habitat, and to nest in trees, large shrubs and possibly debris piles at the Airport. Earthmoving and general construction work for the Proposed Project in grasslands and woodlands would have the potential to destroy or disturb occupied loggerhead shrike nesting sites. Therefore, the Proposed Project would have the potential to adversely affect loggerhead shrikes.

**Northern Harrier (*Circus cyaneus*).** This California Species of Special Concern occurs in grasslands at the Airport and may also nest in the grasslands, however no nests have been observed. Nevertheless, earthmoving and general construction work for the Proposed Project in grasslands would have the potential to destroy or disturb occupied northern harrier nesting sites. Therefore, the Proposed Project would have the potential to adversely affect northern harriers.

**Tricolored Blackbird (*Agelaius tricolor*).** Although not observed at the Airport, this California Species of Special Concern could nest in stands of emergent marsh vegetation at the Airport. It is also known to historically occur as a nesting species in the Airport Vicinity. Earthmoving and general construction work within and in the vicinity of marsh habitat at the Airport would have the potential to destroy or disturb tricolored occupied blackbird nesting sites. Therefore, the Proposed Project would have the potential to adversely affect tricolored blackbirds.

**Western Pond Turtle (*Actinemys marmorata*).** This California Species of Special Concern occurs within one pond and along a creek at the Airport, and may occur in other ponds and creeks there. It may also utilize adjacent upland areas as nesting, hibernation and dispersal habitat. The Proposed Project would adversely affect western pond turtle by removing the occupied pond and by filling one other pond and a segment of the occupied creek, as well as grading adjacent upland habitat. Therefore, the Proposed Project would adversely affect western pond turtles.

**White-tailed Kite (*Elanus leucurus*).** This species is designated by CDFG as a Fully Protected Species.<sup>7</sup> It occurs at the Airport and could nest in scrub willow stands or in the riparian woodlands along creek corridors. Earthmoving and general construction work for the Proposed Project in the willow and riparian habitats would have the potential to destroy or disturb occupied nesting sites for this species. Therefore, the Proposed Project would have the potential to adversely affect white-tailed kites.

**Yellow Warbler (*Dendroica petechia*).** This California Species of Special Concern occurs within riparian and willow scrub woodlands along creek corridors at the Airport and may nest in these habitats. Earthmoving, general construction and tree removal work for the Proposed Project within and in the vicinity of riparian and willow scrub woodlands would have the potential to destroy or disturb occupied nesting sites for this species. Therefore, the Proposed Project would have the potential to adversely affect yellow warblers.

**Yellow-Breasted Chat (*Icteria virens*).** This California Species of Special Concern has not been observed at the Airport, but could nest in riparian woodlands and willow scrub habitats along creek corridors. Earthmoving, general construction and tree removal work for the Proposed Project within and in the vicinity of riparian and willow scrub woodlands would have the potential to destroy or

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<sup>7</sup> See Section 1.5 for definition of “Fully Protected Species.”

disturb occupied nesting sites for this species. Therefore, the Proposed Project would have the potential to adversely affect yellow-breasted chats.

**Other Nesting Birds.** Under the Migratory Bird Treaty Act and various sections of the CDFG Code, nearly all nesting bird species are protected. Earthmoving and general construction work for the Proposed Project in grassland/ruderal habitats and the open areas of oak woodlands would have the potential to destroy or disturb occupied nesting sites for ground-nesting birds. Tree removal work in all habitat types for the Proposed Project could destroy occupied nests. Earthmoving and general construction work in the vicinity of occupied nests anywhere within the Airport could disturb nesting species. Therefore, the Proposed Project would have the potential to adversely affect nesting birds.

### Impacts to Other Biological Resources:

**Wetlands and Other Jurisdictional Waters of the United States and State of California.** The Proposed Project would result in the filling of the wetlands and other waters listed below.<sup>8</sup>

<u>Wetland/Other Water Type</u>	<u>Fill Area</u>
vernal pools and other seasonal wetlands	4.4 acres
perennial and intermittent streams (creeks)	0.5 acre (1,486 l.f.)
ponds and marshes	2.1 acres
willow scrub	0.2 acre
Total Fill	= 7.2 acres

Therefore, the Proposed Project would adversely affect wetlands and other jurisdictional waters.

**Loss of Riparian Woodland and Non-jurisdictional Willow Scrub.** The Proposed Project would remove 3.7 acres of riparian woodland and 1.0 acre of non-jurisdictional willow scrub habitat. Approximately 3.4 acres of this impact would occur as a result of the filling of an approximately 1,500-linear foot reach of Airport Creek and re-routing of the filled reach into a new 850-linear foot channel and a 650-linear foot underground culvert for the purposes of meeting RSA specifications. The remainder of the impact would be from removal of riparian vegetation along an approximately 565-linear foot segment of Airport Creek in order to provide airspace clearance for approaches to Runway 14. Therefore, the Proposed Project would adversely affect riparian woodland and non-jurisdictional willow scrub habitat.

**Loss of Oak Woodland and Individual Native Trees.** The Proposed Project would remove 0.8 acre of oak woodland, primarily in the vicinity of the Airport Creek channel relocation area northeast of Runway 14. Additionally, various individual oak trees and other native trees would be removed by the Proposed Project. Therefore, the Proposed Project would adversely affect oak woodland and individual native trees.

**Disturbance of Avoided Sensitive Habitats during Construction.** Earthmoving and other construction work would have the potential to disturb sensitive habitats (i.e., wetlands, ponds, marshes, woodlands, and willow scrub) located outside the actual project development area. Such

<sup>8</sup> Appendix C provides a copy of the Corps-verified jurisdictional map.

disturbance could occur as a result of: (1) vehicular and construction equipment operation and movement, (2) material and equipment storage, (3) discharges/runoff of sediment and debris, and (4) unauthorized intrusions by construction personnel. Therefore, the Proposed Project would have the potential to adversely affect sensitive habitats located outside the development area.

**Loss of Airport Creek Wildlife Movement Corridor.** The Proposed Project would eliminate a suitable corridor for the passage of wildlife across the site provided by riparian vegetation along Airport Creek. The corridor's dense vegetative cover, mesic-shaded conditions and aquatic habitat facilitate movement by fish and other aquatic and terrestrial fauna. This existing corridor would be replaced by a lightly vegetated 850-linear foot channel and a 650-linear foot underground culvert beneath the graded RSA zone. Therefore, the Proposed Project would adversely affect the Airport Creek wildlife movement corridor.

**Impacts of Long-term Project Elements.** Depending on their locations and designs, the various long-term project elements would have the potential to cause the following effects: (1) loss of occupied and/or suitable habitat for Burke's goldfields, and suitable habitat for Sonoma sunshine and Sebastopol meadowfoam; (2) loss of suitable habitat and Proposed Critical Habitat for CTS; (3) potential disturbance of occupied burrowing owl burrows and other special status bird nests during earthmoving and other construction activities; (4) potential disturbance of other nesting birds protected under the Migratory Bird Treaty Act and under the CDFG Code; (5) potential destruction or disturbance of American badger dens from earthmoving and construction activities; (6) potential mortality or injury to western pond turtles from earthmoving and construction activities; (7) potential loss of jurisdictional wetlands and other waters of the United States and State of California; and (8) potential disturbance of sensitive habitats located outside the long-term project element construction areas.

## **SANTA ROSA PLAIN CONSERVATION STRATEGY; PROGRAMMATIC BIOLOGICAL OPINION**

This BRR provides an analysis of the Proposed Project's compliance with both the Conservation Strategy and the PBO. The Conservation Strategy provides guidance to USFWS and CDFG policies for reviewing projects that affect CTS, Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam on the Santa Rosa Plain; it also provides the biological framework upon which the PBO is based. The PBO provides avoidance/minimization measures and mitigation ratios for these species.

## **MINIMIZATION, AVOIDANCE, AND COMPENSATORY MITIGATION MEASURES**

Sections 3.0 and 4.0 of this BRR provide a range of species-specific measures to avoid, minimize and mitigate potential impacts to special-status plant and animal species and sensitive habitats.

## 1.0 INTRODUCTION

This Biological Resources Report (BRR) describes and analyzes the potential impacts of the Charles M. Schulz Sonoma County Airport Master Plan Update Implementation Project on biological resources, including federal and state-listed special-status plant and animal species, at the Sonoma County Airport (see Figures 1 – 2 in Appendix A). This report is intended as a technical document in support of the draft Environmental Impact Report (EIR) being prepared for the Master Plan Update Implementation Project, pursuant to the California Environmental Quality Act (CEQA).

### 1.1 RESPONSIBLE PARTIES

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### 1.2 KEY TERMS USED IN THIS REPORT

Several important terms are used throughout this BRR, as follows:

- **“Airport Study Area”** refers to the Airport property and adjacent parcels designated for future acquisition, an area of approximately 1,180 acres in size (see Figure 4 in Appendix A). The Airport Study Area contains the Airport’s two runways (Runway 14-32 and Runway 1-19) as well as all Airport infrastructure and facilities. The Airport Study Area also includes the proposed extension areas of the two runways and all other non-developed areas of the Airport within which the Proposed Project would take place.
- **“Airport Vicinity”** contains the Airport Study Area (see below) as well as surrounding lands within the Santa Rosa Plain within an approximate 5-mile radius of the Airport perimeter (see Figure 5 in Appendix A). The Airport Vicinity includes lands that may provide suitable habitat for listed species that could also access Airport lands.

- **“Goldfields Preserve”** (also called the “Wildflower Preserve”) - Consisting of approximately 10.5 acres of land situated along Taxiway A to the west of Runway 1-19 (see Figure 3 in Appendix A). This area contains 0.6 acre of vernal pools that support a large subpopulation of Burke’s goldfields, a federally-listed plant species.
- **“Runway 14-32 Preserve”** – Consisting of approximately 16 acres of land situated between Runway 14-32 and the adjacent Taxiway Y, and between Aprons A and C (see Figure 3 in Appendix A). The preserve was established to protect part of an existing large subpopulation of Burke’s goldfields growing within several shallow vernal pool/seasonal wetlands in this area.
- **“SACMA”** refers to the Sonoma County Airport Consolidated Mitigation Area, an approximately 14.5-acre area north of Taxiway A, bordered by Upper Ordinance Creek (see Figure 3 in Appendix A). This area contains approximately 4.4 acres of vernal pools and supports a small population of Burke’s goldfields.
- **“SACMA-2”** refers to the second phase of the Sonoma County Airport Consolidated Mitigation Area, consisting of 8.5 acres of land south of the intersection of Windsor Road and Sanders Road (see Figure 3 in Appendix A). This area contains 3.3 acres of vernal pools.
- **“Santa Rosa Plain”** is defined as that portion of central Sonoma County, bordered on the south and west by the Laguna de Santa Rosa, on the east by the foothills of Sonoma Mountain and the Mayacamas Mountains, and on the north by the Russian River.

### 1.3 DESCRIPTION OF THE PROJECT

**Project Location.** The Airport Study Area is located northwest of Santa Rosa, California; approximately two miles west of Highway 101 and just south of the City of Windsor (see Figures 1 - 2 in Appendix A). The Airport Study Area is located in the Santa Rosa Plain region of Sonoma County (the Plain), in the Healdsburg, California 7.5-minute USGS quadrangle. Access is via Airport Boulevard off U.S. Highway 101 (see Figure 2 in Appendix A).

The majority of the Airport Study Area is bounded on the east by North Laughlin Road; on the south by Laughlin Road; on the west by Slusser Road, Mark West Station Road, and Windsor Road; and on the north by Windsor Road and Sanders and Shiloh Road (see Figure 3 in Appendix A). Surrounding land uses include commercial and light industrial to the east, ranchette residential and grazing to the north and west, and vineyards to the south (see Figure 3 in Appendix A).

**General Site Conditions.** The Airport Study Area is generally flat with variously-sized seasonal wetlands, swales, ditches, and perennial ponds. A large portion of the Airport Study Area is irrigated with treated wastewater and mowed throughout the year. The northern portion of the Airport Study Area, especially the area between Sanders Road and the northern ends of the runways, generally supports less disturbed habitat than the remainder of the Airport. Reaches of Redwood Creek, Airport Creek, and Ordinance Creek are located in the northern portion of the Airport Study Area; a small reach of Mark West Creek is located immediately southeast of the Airport Study Area. Pool Creek borders the northern boundary. Habitats and vegetation communities are described in more detail in Section 2.2.

The Airport Study Area occurs within the active operational area of the Airport, a regional commercial aviation facility. Virtually all of the Airport Study Area is subject to regular or occasional management activity needed to ensure safe flight operations, maintain aircraft and facilities, and protect the public safety.

The Plain is a distinctive geographic feature in central Sonoma County. It is a generally flat landscape that historically supported valley oak (*Quercus lobata*) woodlands and grasslands (savannah). This landscape is crossed by several prominent creeks that flow to the west into the Laguna de Santa Rosa (Laguna) along the western edge of the Plain. Historically, much of the Plain supported extensive vernal pool-swale complexes that drained to the Laguna. Extensive stands of riparian woodland historically occurred along the Laguna which flows to the north, and eventually drains to the Russian River via Mark West Creek. Much of the Plain's vernal pool and riparian habitat has been lost to development over the past century.

**Project Background.** The Proposed Project implements elements of the Charles M. Schulz Sonoma County Airport Master Plan (AMP), a long-range plan to guide future development and improvement of the Airport. The AMP contains "short-term" elements expected to be constructed within the next 5 years, and "long-range" elements that may be proposed 5 to 20 years in the future. The Sonoma County Transportation and Public Works Department – Airport Division (hereinafter referred to as the "County") is proposing to implement the various short-term elements of the AMP by 2015, and has prepared preliminary designs for these elements.

Many of the AMP short-term elements are associated with improvements to the Runway Safety Areas (RSAs) at the Airport. An RSA is a defined surface surrounding a runway that enhances the safety of and reduces the risk of damage to airplanes in the event of an undershoot (aircraft landing short of the runway), an overshoot (aircraft landing on the runway but not able to stop on the runway), or an excursion from the runway (aircraft moving off the runway to the right or left). RSAs provide accessibility for firefighting and rescue equipment responding to such incidents.

The proposed RSA improvements are needed to bring the Airport into compliance with Public Law 109-115 which requires owners or operators of commercial service airports with scheduled passenger service (i.e., airports certified under Part 139 of Title 14 of the Code of Federal Regulations) to be brought into conformance with FAA standards for Runway Safety Areas (RSAs) by 2015. FAA standards and requirements are contained in FAA Advisory Circular (AC) 150/5300-13, Airport Design. Paragraph 305(a) of AC 150/5300-13 states that RSAs shall be:

- cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
- drained by grading or storm sewers to prevent water accumulation;
- capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
- free of objects, except for objects that need to be located in the RSA because of their function. Objects higher than three inches (7.6 centimeters [cm]) above grade should be constructed, to the extent practicable, on low-impact resistant (easily broken) supports (frangible mounted

structures) of the lowest practicable height, with the frangible point no higher than three inches (7.6 cm) above grade. In no case should their height exceed three inches (7.6 cm) above grade.

In addition, the ends of Runways 14 and 19 are co-located and are not in compliance with FAA design standards regarding runway ends. The FAA's Runway Safety Project Team (RSAT), which is a multi-disciplinary group that is charged with identifying means of improving safety at airports, prepared a Runway Safety Project Plan that was issued on March 12, 2010. Project Item Number STS-2010-008 in the RSAT Runway Safety Project Plan indicates that the co-location of the ends of Runways 19 and 14 has caused and continues to cause a high frequency of pilot confusion involving departures on the wrong runway. The Project Item identifies Airport risk associated with this problem, and recommends that the Airport eliminate the present condition by decoupling the runway ends.

The County, as the project sponsor, is requesting FAA unconditional approval of the runway and taxiway modifications and associated changes within the Airport Layout Plan (ALP). The FAA is the federal lead agency for the evaluation of the project in compliance with NEPA, and for consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in compliance with the Endangered Species Act.<sup>9</sup>

**Proposed Project Description.** The Proposed Project (see Figure 3 in Appendix A) consists of the following short-term elements that would affect undeveloped areas of the Airport and would have the potential to affect listed species:

- Extension of Runway 14-32 from 5,115 feet to 6,000 feet in length (an 885-foot extension); extension of Runway 1-19 from 5,002 feet to 5,202 feet (a 200-foot extension).
- Construction of 200-foot-long blast pads off the ends of Runways 14 and 19.
- Construction of paved run-up aprons and taxiways associated with the two runways; removal of existing taxiways and aprons.
- Filling of an approximately 1,500-linear foot reach of Airport Creek; re-routing of the filled reach into a new 850-linear foot channel and a 650-linear foot underground culvert for the purposes of meeting FAA Runway Safety Area (RSA) specifications for Runway 14.
- Placement of a 395-linear foot high-water ditch connected to Airport Creek into a culvert for meeting RSA specifications.
- Construction of a standard (1,000-foot long by 500-foot wide) graded RSA beyond the end of Runway 14, requiring the filling of approximately 2.1 acres of vernal pools and other seasonal wetlands, and filling of an approximately 0.5-acre man-made pond to eliminate a wildlife attractant hazard to aircraft using the runway. The RSA is designed to meet FAA standards as specified in FAA Advisory Circular 150/5300-13, *Airport Design*, Chapter 5. Beginning at the new runway end, the first 200 feet of the RSA would have a slope of 3.0%. From this point until about the midpoint of the RSA, the slope would be about 2.7%. Near the midpoint of the RSA, the area of fill would meet the existing ground level. The final northern segment of the RSA would be created by rough grading the existing ground to a consistent 0.2% slope. The cross slope of the RSA would be 1.0% or less.

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<sup>9</sup> Consultation for the Proposed Project under Section 7 of the Endangered Species Act will be supported by a separate Biological Assessment document (under preparation) that addresses only federally-listed species.

- Construction of paved access (service) roads along the outside perimeters of the new Runway 14 RSA and the Runway 32 RSA. The roads would be at the same elevation as the RSA. Outside the service road, the area of fill would have a 25% slope until it meets existing ground level.
- Removal of riparian vegetation along an approximately 565-linear foot segment of Airport Creek in order to provide airspace clearance for approaches to Runway 14, as required under FAA regulations.
- Filling or permanent draining of an existing 1.2-acre man-made pond that lies immediately south of Runway 32 in order to eliminate a wildlife attractant hazard to aircraft using this runway.
- Temporary disturbance of approximately 91.6 acres of upland areas for temporary haul roads, staging and spoil areas during construction.
- Creation of two storm water basins within uplands north of Taxiway A and north of Runway 1-19.
- Relocation of the localizer antenna and equipment building to the north of the Runway 14 RSA.

The Proposed Project also includes various long-term elements that are not currently proposed to be constructed and are being treated programmatically in the draft EIR, and under this BRR. These elements consist of the following:

- Construction of a replacement airline passenger terminal.
- Construction of new taxi lanes to provide access to new private-use hangars.
- Designation of a site for an air cargo facility to serve small-package shipping.
- Acquisition of additional private properties for approach protection.
- Construction of new runway run-up aprons.
- Relocation and/or construction of miscellaneous aviation support facilities, including replacement of landing aids and construction of individual hangars as in-fill projects.

**Storm Water Pollution Protection Plan (SWPPP).** The Proposed Project would include a SWPPP prepared in full accordance with the State Water Resources Control Board, National Pollution Discharge Elimination System (NPDES) Construction General Permit. The SWPPP would include Best Management Practices (BMPs) for controlling sediment, turbidity, and the release of other pollutants into Airport Creek during construction. The SWPPP would also include a rainy season erosion prevention and monitoring plan to ensure that surface runoff from the construction site meets Regional Water Quality Control Board (RWQCB) water quality standards and objectives for the Russian River Hydrologic Unit and the Mark West Hydrologic Subunit, as promulgated in the North Coast Regional Water Quality Control Board (RWQCB) Basin Plan (RWQCB 2007). The SWPPP would be subject to the approval of the RWQCB prior to the start of work.

**Standard Urban Storm Water Mitigation Plan (SUSMP).** The Proposed Project would also be required to include a SUSMP prepared in accordance with Sonoma County and RWQCB standards. The SUSMP would include provisions for on-site treatment and detention of storm water runoff during storm event to avoid water quality changes and hydro-modification of downstream receiving waters.

## 1.4 METHODS

This BRR was prepared using available scientific and commercial information sources and data. Background information sources for the Airport Study Area and Airport Vicinity were combined with site specific field surveys, as summarized below:

**General Background Research.** Federally-listed species that potentially occur in the Airport Study Area and Airport Vicinity were identified based on the USFWS official list of threatened and endangered species for the USGS 7.5 minute quadrangles that cover the Plain (see Appendix D; also Figure 5 in Appendix A). The California Natural Diversity Data Base (CNDDDB) (CNDDDB 2011) was also consulted for all known records in the following U.S. Geological Survey 7.5 minute quadrangles: Healdsburg, Mark West Springs, Sebastopol, and Santa Rosa (see Figure 6 in Appendix A). Information on listed plant species was extracted from the following sources: California Native Plant Society's on-line database (CNPS 2011), *The Jepson Manual* (Hickman 1993), *A Flora of Sonoma County* (Best et. al. 1996), the *Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan* (CH2M Hill 1995), *Final Santa Rosa Plain Conservation Strategy* (Conservation Strategy Team 2005), and *Programmatic Biological Opinion (Programmatic) for U.S. Army Corps of Engineers (Corps) Permitted Projects that May Affect California Tiger Salamander and Three Endangered Plant Species on the Santa Rosa Plain, California (Corps File Number 223420N)* (USFWS 2007).

**Site-Specific Background Research.** In addition to the information sources cited above, various studies and surveys conducted in the Airport Study Area and Airport Vicinity were consulted. These included the following studies: WESCO (1988); Patterson (1987); Patterson, Goggolz and Waaland (1994); Cook and Northern (2001); Cook (2002); LSA Associates (2003, 2004, 2005a, 2005b, 2006a, 2006b, 2006c, 2007) and Rana Resources/CH2MHill (2008). Also consulted were the unpublished results of monthly surveys of birds and other wildlife conducted within the Airport Study Area in 2005-2006 and 2009-2010 in support of an on-going wildlife hazard assessment (LSA 2006c, 2010a).

Additional field studies were conducted in direct support of this BRR, as follows:

- **Habitat mapping and assessments.** A wildlife biologist and botanist conducted general habitat type mapping of the Airport Study Area in August and September 2009 (see Figure 7 in Appendix A). Vegetation community types were mapped in accordance with the *Manual of California Vegetation* (Sawyer, et al. 2009) using a sub-meter accurate GPS receiver. A vegetation species list, including dominant/characteristic plant species was compiled by community type. Wildlife observations, wildlife habitat characteristics and special habitat features (e.g., nesting sites, burrows, and dens) were also noted.
- **Wetland delineation.** A wetland delineation specialist conducted mapping of all wetlands and other jurisdictional waters of the U.S. and State of California within the Airport Study Area between July and November 2009 (LSA 2010b). The delineation map was field verified by the U.S. Army Corps of Engineers (Corps) between March 11 and July 8, 2010, and is provided herein as Appendix C.
- **Botanical surveys.** Botanists updated the results of the 2003-2004 botanical surveys (LSA 2005b) with additional botanical surveys conducted in 2009 and 2010 (LSA 2011a). The surveys covered all suitable habitats for special status plants species within the Airport Study Area

including additional parcels of land acquired by the Airport since the time of the last surveys (see Figure 4 in Appendix A).

- **California red-legged frog and CTS habitat assessment and surveys.** A wildlife biologist conducted habitat assessments of pond and creek habitats on February 23 and July 6, 2011. Additionally, on May 16, 2011 seine net aquatic surveys were conducted in Ponds 4 and 6, both of which would be filled by the Proposed Project (LSA 2011b).
- **Salmonid survey.** At the request of the NMFS, fisheries biologists conducted creek habitat evaluations and seine net surveys for salmonids on July 6, 2011 along Airport and Redwood Creek (LSA 2011c).

## 1.5 BIOLOGICAL RESOURCES ADDRESSED

### Special-status Species

This BRR cover all plant and animal species within the following categories:

- **Federally-listed Species.** All species formally listed or proposed for listing under the federal ESA, based on the USFWS official list of species for the Airport (i.e. species occurring within the Sebastopol, Healdsburg, Santa Rosa, and Mark West Springs USGS 7.5 minute quadrangles; and/or species that may be affected by projects in these quadrangles – see Appendix D). Figure 5 (see Appendix A) shows the CNDDDB records of federally-listed plants and animals and critical habitat in the Airport Vicinity and in surrounding lands.
- **State of California Listed Species.** All species in CNDDDB records for the selected quadrangles that are listed as endangered, threatened, or rare (plants only); or proposed for such listing, under the California Endangered Species Act (CESA).
- **California Fully Protected and Protected Species.** All species in CNDDDB records for the selected quadrangles that are listed by the State of California as “fully protected” and “protected” under Section 2081 for the CESA, with the potential to occur in the Airport Vicinity.
- **California Species of Special Concern.** All species in CNDDDB records for the selected quadrangles that are classified by the California Department of Fish and Game (CDFG) as “California Species of Special Concern.” These species are broadly defined as plants and animals that are of concern to CDFG because of a decline in population, restricted distribution, and/or a decline of habitat with which they are associated. Project-related impacts to species of special concern are considered “significant” under *CEQA Guidelines*.
- **California Rare Plants.** All plant species in CNDDDB records for the selected quadrangles that are ranked by CDFG and the CNPS as California Rare Plants, based on the evaluations of the Rare Plant Status Review Group (a group of 300+ botanical experts from government, academia, non-government organizations, and the private sector). All such rare plant species are identified on CDFG’s *Special Vascular Plant, Bryophyte, and Lichens* list. The California Rare Plant Rankings (CRPR) are as follows:
  - 1A - Plants Presumed Extinct in California
  - 1B - Plants Rare, Threatened, or Endangered in California and elsewhere
  - 2 - Plants Rare, Threatened, or Endangered in California, but more common elsewhere

- 3 - Plants for which we need more information – a review list
- 4 - Plants of limited distribution – a watch list
- **Other Bird Species.** All nesting birds covered under the federal Migratory Bird Treaty Act (16 USC 703) and under CDFG Code, Sections 3503, 3503.5, and 3513. Nearly all bird species that have the potential to nest in the Airport Vicinity are protected under these regulations.

### **Sensitive Habitats and Other Biological Resources**

This BRR addresses all sensitive habitat types that occur within the Airport Study Area, as follows:

- **Jurisdictional Wetlands and Other Water of the U.S. and State of California.** All wetlands and other waters that are subject to regulation under Sections 401 and 404 of the Federal Clean Water Act and under the State of California Porter-Cologne Act.
- **Streams and Associated Riparian Vegetation.** All stream corridors, including the stream beds and banks, and associated riparian vegetation stands extending beyond the tops of banks, as regulated under CDFG Code Section 1600.
- **Biological Resources under the Sonoma County General Plan 2020.** All habitats addressed under Sonoma County General Plan (Sonoma County 2008) policies, as follows:

**Policies OSRC-7a and 7b: Biotic Habitat Areas in the Open Space and Resource Conservation Element.** The Airport is located within Open Space Plan Map 5E and is designated on the map as containing wetland, stream, special-status plant, and CTS biotic resources that require site assessment and adequate mitigation. The policy requires that the following priority for mitigation approaches be used: (1) avoidance; (2) on-site mitigation to achieve “no net loss”; (3) off-site mitigation to achieve no net loss; and (4) off-site habitat creation to achieve no net loss. Policy OSRC-7b also includes the following measures relevant to the Proposed Project:

- a) To the extent feasible, mitigation should be consistent with permit requirements of Federal and State regulatory agencies.
- b) Acreage required for adequate mitigation and replacement habitat should be at least two times the acreage affected unless a lower level is acceptable to the applicable State and Federal agencies, with the amount depending on the habitat affected and the applicable mitigation priority value.

**Policy OSRC-7k:** This policy requires that native trees and woodlands be identified and preserved to the maximum extent practicable, and that the fragmentation of woodlands be minimized. The policy also requires replacement plantings, preferably on the site, for any native trees that are removed; and call for the permanent protection of other existing woodlands where full replacement plantings are not possible.

**Policy OSRC-7t:** This policy requires Sonoma County (the County) to continue to actively participate in the FishNet4C program and work cooperatively with participating agencies to implement recommendations to improve and restore aquatic habitat for listed anadromous fish species and other fishery resources (Fishnet 4C et al. 2004).

**Policy OSRC-8b:** This policy requires that 50-foot wide streamside conservation areas be established along riparian corridors.

**Policy OSRC-8e:** This policy prohibits grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots within any streamside conservation area. However, allows an exception to be considered if the land use involves minor expansion of an existing structure where it is demonstrated that the expansion would be accomplished with minimum damage to riparian functions.

**Policy OSRC-8m:** This policy requires the application of Sonoma County Water Agency Flood Control Design Criteria creek setbacks where necessary to protect against streambank erosion.

## 2.0 ENVIRONMENTAL SETTING

### 2.1 PHYSICAL SETTING

**Topography.** The Airport Study Area is located within the northern portion of the Plain, a region typified by gently rolling to relatively level topography. Most of the surfaces in the Airport Study Area have been graded for runways, buildings, irrigated hay growing, and drainage, so the original surface topography has been largely muted or removed; surfaces are generally flat. However, variously sized depressions, swales, and ditches remain and/or have been constructed, some of which pond water during the rainy season. Elevations range from approximately 100 to 140 feet above mean sea level.

**Soils.** The Airport Study Area is largely mapped as containing Huichica Series soils, which are moderately well-drained to somewhat poorly drained loams on hummocky plains and terraces (USDA 1972). Huichica soils have a clay or cemented hard pan horizon that results in very low permeability and the potential for surface ponding. Most of the Huichica soil types found in the Airport Study Area are classified as hydric soils. The soils along Pool Creek in the northwest corner of the Airport Study Area are mapped as clayey alluvial lands. Soils along and adjacent to Airport Creek are mapped as Riverwash and Zamora silty clay loam. The soils in the extreme southwest corner of the Airport Study Area are mapped as Pajaro gravelly loam. The Alluvial land, clayey, and Riverwash are listed as partially hydric from floodplain flooding. All of the Airport Study Area's soils may contain inclusions of soils with hydric properties in wetlands or stream channels.

**Hydrology.** Most of the Airport Study Area has been graded and natural drainage patterns have been altered with ditches and underground storm drains. Much of the area surrounding the runways was cultivated for irrigated hay production, which was discontinued in approximately 2005. Portions of the formerly cultivated land have natural appearing vernal pool basins and swales, but no observed mound and swale micro-topography. The site receives an average annual rainfall of approximately 31 inches (Cal. Weather Database <http://ipm.ucdavis.edu/WEATHER/wxretrieve.html>).

The northern and northeastern portions of the Airport Study Area drain to Airport Creek, which flows westward through the northern part of the site (see Figure 7 in Appendix A). The extreme northern portion of the Airport Study Area drains northwestward to Pool Creek. Airport and Pool Creeks are tributaries to Windsor Creek, which is located approximately 0.7 mile downstream of the Airport (see Figure 5 in Appendix A). The central and southern portions of the site drain southward to Mark West Creek, which is located immediately south of the Airport. The western portion of the site drains westward to Windsor Creek. Windsor Creek is tributary to Mark West Creek which flows to the Russian River; approximately 4 miles west of the Airport (see Figure 5 in Appendix A).

### 2.2 VEGETATION TYPES AND ASSOCIATED HABITATS

This section describes vegetation communities, habitats, and associated wildlife in the Airport Study Area. A list of all plant species observed within the Airport Study Area is provided in Appendix E; a

list of all observed animal species is provided in Appendix F. The scientific and common names for the plant and animal species used in this report are from the following sources: common plants (Hickman 1993, Jepson Herbarium 2010); federally-listed plants (CNPS 2011); fishes (Nelson et al. 2004); amphibians and reptiles (Crother 2008); birds (American Ornithologist's Union 1998 and supplements), bird subspecies names (Shuford and Gardali 2008); and mammals (Baker et al. 2003). For animals, subspecies names are used only when a specific subspecies is listed by the USFWS. Vegetation Community types are in accordance with the *Manual of California Vegetation* (Sawyer, et al. 2009).

Approximately 237.5 acres of the Airport Study Area are developed, containing paved and graded areas that support Airport infrastructure and facilities (see Figure 7 in Appendix A). Most of the non-developed areas consist of non-native grasslands and ruderal vegetation types, and include many areas that are regularly or occasionally irrigated with treated wastewater and mowed throughout the year. The Airport Study Area contains several biological preserves that support vernal pools and other seasonal wetland habitats as well as stands of riparian and oak woodlands (see Figure 7 in Appendix A). The northern portion of the Airport Study Area, especially the north of the runway ends, generally provides higher quality, less disturbed habitat than the central and southern portions. Riparian corridors of Redwood Creek, Airport Creek, and Ordinance Creek are located in the northern portion of the Airport Study Area and a small reach of Mark West Creek is located immediately to the southeast. Pool Creek borders the northern boundary of the Airport Study Area.

**Non-native Grassland/Ruderal.** Non-native annual grassland and ruderal vegetation types (784.4 acres) occur throughout the Airport Study Area, and include areas that are mowed and irrigated with treated wastewater (see Figure 7 in Appendix A). Much of the area between the runways and west of Runway 1-19 was formerly used to grow hay irrigated with treated municipal wastewater, however this practice was discontinued in approximately 2005. Depending on localized dominance, the non-native grasslands consist of the following vegetation alliances under Sawyer, et al. (2009):

- Wild oats grasslands (*Avena fatua* Semi-natural Herbaceous Stands) – dominated by wild oats (*Avena fatua*). Other grass species commonly present are: soft chess (*Bromus hordeaceus*), foxtail fescue (*Vulpia myuros*), Harding grass (*Phalaris aquatica*), hare barley (*Hordeum murinum* ssp. *leporinum*), medusahead (*Taeniatherum caput-medusae*), ripgut brome (*Bromus diandrus*), orchard grass (*Dactylus glomeratus*), sweet vernal grass (*Anthoxanthum aristulatum*), and Bermuda grass (*Cynodon dactylon*). Other common forb species include English plantain (*Plantago lanceolata*), chicory (*Cichorium intybus*), knotweed (*Polygonum arenastrum*), wild radish (*Raphanus sativus*), bindweed (*Convolvulus arvensis*), common vetch (*Vicia sativa*), mustards (*Brassica* spp.), and yellow star thistle (*Centaurea solstitialis*).
- Annual brome grasslands (*Bromus diandrus*, *hordeaceus* Semi-natural Herbaceous Stands) – Similar composition as the wild oat grasslands except dominated by soft chess and/or ripgut brome.
- Annual rye grass fields (*Lolium multiflorum* Semi-natural Herbaceous Stands) – Where moister conditions prevail due to topography or in areas that are regularly irrigated, Italian ryegrass

*Lolium multiflorum*) dominates.<sup>10</sup> Other common species include umbrella sedge (*Cyperus eragrostis*), velvet grass (*Holcus lanatus*), and Harding grass.

Native forbs occur in non-native grasslands in the Airport Study Area, primarily where irrigation is not conducted, especially in the parcels north of the two runways (see Figure 7 in Appendix A). Native forbs include sky lupine (*Lupinus nanus*), miniature lupine (*Lupinus bicolor*), California milkmaids (*Cardamine californica*), white brodiaea (*Triteleia hyacinthina*), Ithuriel's spear (*Triteleia laxa*), California poppy (*Eschscholzia californica*), valley tassels (*Castilleja attenuata*), harvest brodiaea (*Brodiaea elegans*), suncup (*Camissonia ovata*), small owl's-clover (*Triphysaria pusilla*), fringedpod (*Thysanocarpus radians*), blue-eyed grass (*Sisyrinchium bellum*), and purple sanicle (*Sanicula bipinnatifida*).

Patches of native grasses are found in the Airport Study Area. Uplands support patches of purple needlegrass (*Nassella pulchra*) and California brome (*Bromus carinatus*). Moister grasslands support small stands of California oatgrass (*Danthonia californica*), meadow barley (*Hordeum brachyantherum*), and short-awn foxtail (*Alopecurus aequalis* var. *aequalis*).

Non-native grasslands and areas supporting ruderal vegetation within the Airport Study Area are likely to support populations of various small mammal species. Grassland-associated mammal species observed within the Airport Study Area include California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), and black-tailed jackrabbits (*Lepus californicus*). Predators that forage for small mammals in grasslands that have been observed in the Airport Study Area include gopher snake (*Pituophis catenifer*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), and coyote (*Canus latrans*).

Great egrets (*Ardea alba*) and great blue herons (*Ardea herodias*), more typically associated with wetland habitats, have been commonly observed hunting voles and gophers in grasslands at the Airport during the winter and spring, when the grasslands are still green. Smaller birds typically associated with grasslands that occur commonly at the Airport include savannah sparrows (*Passerculus sandwichensis*) and western meadowlark (*Sturnella neglecta*). Areas of mowed grass such as the strips along and at the ends of the Airport runways are attractive to birds such as the Canada goose (*Branta canadensis*), killdeer (*Charadrius vociferous*), and American pipit (*Anthus rubescens*).

**Seasonal Wetlands.** Seasonal wetlands (44.7 acres) occur throughout the Airport Study Area and include vernal pools, swales, ditches, drainages, and depressions with wetland vegetation (see Figure 7 in Appendix A). Appendix C provides a copy of the Corps verified wetland delineation map.<sup>11</sup> The seasonal wetlands are generally consistent with the following vegetation alliances under Sawyer, et al. (2009):

- Smooth goldfields - vernal pools (*Lasthenia glaberrima* Herbaceous Alliance) – Consisting of the following dominant or characteristic native vernal pool species: smooth goldfields (*Lasthenia*

<sup>10</sup> Sawyer, et al. (2009) does not consider *L. multiflorum* and *L. perenne* as distinguishable species in the field and considers all vegetation types dominated by *Lolium* to be "Perennial rye grass field."

<sup>11</sup> The Corps only verified wetlands and other waters within the Airport Study Area where physical access to the site was possible. Wetlands on several off-site parcels within the Airport Study Area were mapped based on aerial photographic interpretation only; these were not verified by the Corps. The delineation map provided in Appendix C shows only Corps verified wetlands and other waters.

*glaberrima*), slender popcorn-flower (*Plagiobothrys stipitatus*), Douglas meadowfoam (*Limnanthes douglasii*), maroon-spot downingia (*Downingia concolor* var. *concolor*), winged water starwort (*Callitriche marginata*), yellow-ray goldfields (*Lasthenia glaberrima*), blennosperma (*Blennosperma nanum* var. *nanum*), semaphore grass (*Pleuropogon californicus*), annual hairgrass (*Deschampsia danthonioides*), and coyote thistle (*Eryngium armatum*).

The deeper pools in the Airport Study Area also support stands of creeping spikerush (*Eleocharis macrostachya*), woolly-marbles (*Psilocarphus brevissimus*), and vernal pool buttercup (*Ranunculus bonariensis*). Some vernal pools in the Airport Study Area, primarily at preserves, support the federal and state endangered Burke's goldfields (see Figure 7 in Appendix A).

Based on their vegetation and distribution patterns, the vernal pools within the Airport Study Area appear to be remnants of the historic pool systems that once encompassed much of the Plain. However, some pools and swales along berms and embankments in the vicinity of the runways appear to have been created inadvertently when some of the Airport features were constructed and currently contain plant species more typical of disturbed vernal pools. Additionally vernal pools and swales, encompassing more than 7 acres, were established between 1988 and 2002 in the SACMA, SACMA-II (Duran) and Goldfields Preserve sites at the north end of the Airport Study Area (see Figure 7 in Appendix A).

- **Other Seasonal Wetlands.** Disturbed pools and swales and other seasonal wetland areas, including those that are irrigated, tend to be dominated by non-native species such as Italian ryegrass, Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), curly dock (*Rumex crispus*), pennyroyal (*Mentha pulegium*), rabbit's-foot grass (*Polypogon monspeliensis*), spiny-fruit buttercup (*Ranunculus muricatus*), and Bermuda grass (*Cynodon dactylon*).

Many drainages and ditches in the Airport Study Area also support seasonal wetland vegetation. Most of these features were constructed to drain runoff away from the Airport facilities to creek channels or off-site. These features generally lack an Ordinary High Water Mark (OHWM) and bank. Some of these drainages are linear and constructed in uplands and some of them were constructed or augmented within a pre-existing drainage. In addition to drainages that have wetlands characteristics, there are several unvegetated ditches in the Airport Study Area.

Vernal pools and seasonal wetlands in the Airport Study Area provide suitable breeding habitat for amphibians such as Pacific treefrog (*Pseudacris regilla*), and western toad (*Bufo boreas*); only the treefrog has been observed within the Airport Study Area. Various species of water birds are attracted to seasonal wetlands and vernal pools including mallards (*Anas platyrhynchos*), greater yellowlegs (*Tringa melanoleuca*), Wilson's snipe (*Gallinago delicata*), great egret, and great blue heron. Birds typical of freshwater marsh habitats observed or likely to occur in the seasonal wetlands include Virginia rail (*Rallus limicola*), song sparrow (*Melospiza melodia*), and red-winged blackbird (*Agelaius phoeniceus*).

**Streams.** The Airport Study Area supports approximately 3.3 acres (10,830 linear feet) of stream channels along various segments of Redwood Creek, Airport Creek, Pool Creek, Upper Ordinance Creek, and Lower Ordinance Creek (see Figure 7 in Appendix A). The Airport Study Area also contains approximately 0.2 acre of non-wetland ditches, swales and associated culverts that were constructed as part of the overall Airport surface drainage system, and constitute ephemeral tributaries to the various creeks.

Redwood Creek originates approximately a quarter of a mile to the west of Highway 101 and flows westward across the northern portion of the Airport Study Area for slightly more than a mile until it converges with Airport Creek (see Figure 7 in Appendix A). Airport Creek continues across the northern edge of the Airport, eventually joining Windsor Creek approximately 1.2 miles west of the Redwood Creek/Airport Creek confluence. Windsor Creek, in turn, flows into Mark West Creek southwest of the Airport.

The lower reaches of Airport Creek within the Airport Vicinity are in a natural channel, while the upper reaches appear to have been partially channelized. The creek channel is typically incised from 2 to 4 feet and has a width between 8 and 15 feet. The upper reaches appear to be perennial, probably from landscape irrigation runoff, and the lower reaches appear to be perennial to seasonally intermittent.

Upper Ordinance Creek is a tributary of Airport Creek northeast of the Airport runways (see Figure 7 in Appendix A). It was formerly a natural channel that was straightened. Lower Ordinance Creek is a short tributary to Airport Creek; the confluence lies just outside the western Airport boundary (see Figure 7 in Appendix A). The lower reaches of Lower Ordinance Creek have a natural appearing channel, while the upper reach near the northern end of the runways has been truncated and re-routed by grading. The channel in the upper reach is slightly incised and varies in width from 5 to 10 feet. Both Upper and Lower Ordinance Creeks are seasonally intermittent.

Although the various creek channels are largely unvegetated, some reaches have bands of wetland vegetation along the banks, such as water plantain (*Alisma plantago-aquatica*), cattails (*Typha* spp.) slough sedge (*Carex obnupta*), water parsley (*Oenanthe sarmentosa*), pennyroyal (*Mentha pulegium*), spreading rush (*Juncus patens*), umbrella sedge, and smartweed (*Polygonum* sp.).

Various species of warm water native and introduced freshwater fish typical of low gradient creeks on the Plain occur or are likely to occur in creeks within the Airport Study Area. Native species include the California roach (*Lavinia symmertricus*) and threespine stickleback (*Gasterosteus aculeatus*). Non-native fish common in the creeks of the Plain include the common carp (*Cyprinus carpio*), western mosquitofish (*Gambusia affinis*), largemouth bass (*Micropterus salmoides*), and bluegill (*Lepomis macrochirus*). Both threespine stickleback and western mosquitofish were observed in Airport and Redwood Creeks. Also observed in the creeks were American bullfrog (*Rana catesbeiana*) and red swamp crayfish (*Procambarus clarkii*), both non-native aquatic predators.

The creeks of the Plain are generally not suitable as breeding sites for native amphibians due to the presence of predatory fishes including both native and non-native species. The western pond turtle (*Actinemys marmorata*) occurs in perennial aquatic habitats on the Plain and is found in Airport Creek. It is also likely to occur in Redwood and Ordinance Creeks.

A wide variety of water birds have been observed in creeks in the Airport Study Area. Examples include Canada goose, mallard, American widgeon (*Anas americana*), green-winged teal (*Anas crecca*), bufflehead (*Bucephala albeola*), pied-billed grebe (*Podilymbus podiceps*), great blue heron, great egret, green heron (*Butorides virescens*), and black-crowned night heron (*Nycticorax nycticorax*).

**Ponds.** There are seven ponds in the Airport Study Area encompassing 10.3 acres (see Figure 7 in Appendix A). A series of four constructed ponds occur in a natural swale/drainage on recently acquired parcels and parcels proposed for acquisition at the northern end of the Airport Study Area, just south of Sanders Road (Ponds 1 through 4 - see Figure 7 in Appendix A). The ponds are fed by seasonal runoff from the local watershed which includes two upstream swales to the east. These ponds have edges of willow scrub/woodland habitat, as well as seasonal wetland fringes, and contain deep water through most of the year. The two easternmost ponds appear connected and may have the same water surface elevation. Overflow from these two ponds may drain partially southward across a dam via a swale to Airport Creek, and partially westward across a dam to the two westernmost ponds. The two westernmost ponds may also be connected; overflow from these two ponds drains westward across a dam and then through partially channelized swales and seasonal wetlands to Airport Creek.

Two inter-connected ponds are located in the southeast corner of the Airport Study Area north of Laughlin Road (Ponds 5 and 6 - see Figure 7 in Appendix A). The upstream, northeastern pond (Pond 5) appears to be a dammed natural swale that receives local runoff, is relatively shallow, and may dry during the summer. The lower, southwestern pond (Pond 6) appears to be an excavated and dammed basin which receives overflow from the northeastern pond, is relatively deeper, and contains deep water through most of the year. Pond 6 drains southward toward Mark West Creek. Both ponds have willow scrub/woodland habitat along their edges and the Pond 6 supports an area of freshwater marsh.

A reservoir pond (Pond 7) is located in the vineyard southeast of the intersection of Laughlin Road and Slusser Road (see Figure 7 in Appendix A). This steep-sided reservoir is a dammed natural drainage that receives runoff from its local watershed, and appears to contain deep water through most of the year. Overflow from this reservoir drains westward via a drainage to Mark West Creek.

The ponds are generally not suitable as breeding sites for native amphibians due to the observed or likely presence of American bullfrogs and predatory fishes, including both native and non-native species. A large population of bullfrogs was observed in Pond 4. Largemouth bass, blue gill, and bullfrogs were observed in Pond 5. A population of western pond turtles was also observed in Pond 6.

A wide variety of water birds has been observed in ponds in the Airport Study Area. Examples include Canada goose, mallard, American widgeon, green-winged teal, bufflehead, pied-billed grebe, great blue heron, great egret, green heron, and black-crowned night heron.

**Freshwater Marsh.** Patches of freshwater marsh vegetation (0.5 acre) occur in the Airport Study Area adjacent to some seasonal wetlands, swales and ponds, and along stream channels. The marshes are generally consistent with the following vegetation alliance under Sawyer, et al. (2009):

- Cattail marshes (*Typha* spp. Herbaceous Alliance) – Dominated by tall perennial marsh plants (up to 10 feet), primarily cattails and bulrushes (*Scirpus acutus* and *S. microcarpus*) in areas where water seldom exceeds three feet in depth. Along the upper marsh edges, dense stands of shorter-statured marsh plants are found, such as sedges, creeping spikerush, and rushes. Woody species such as willows and Himalayan blackberry (*Rubus discolor*) are also sometimes associated with freshwater marsh habitats in the Airport Study Area. The interiors may be broken by open patches of water that often are choked with smartweed (*Polygonum* sp.).

Most freshwater marsh habitats in the Airport Study Area are relatively small and are not mapped separately from adjacent wetland and aquatic habitats. One area that was mapped as freshwater marsh occurs along the northern portion of the Pond 6 (see Figure 7 in Appendix A). Freshwater marsh also occurs in small stands within wetlands in the infield area between the two runways and at the south end of Runway 1-19. There are also small patches of bulrush along the margins of the vineyard pond (Pond 7) in the southwestern corner of the Airport Study Area.

Freshwater marshes in the Airport Study Area provide suitable habitat for a variety of wildlife species including Pacific treefrog, western pond turtle, and a variety of bird species such as Virginia rail (*Rallus limicola*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), and red-winged blackbird (*Agelaius phoeniceus*). Mammals such as the common muskrat (*Ondatra zibethicus*) also occupy freshwater marshes on the Plain and may occur in the Airport Study Area.

**Willow Scrub/Woodland.** Willow scrub/woodland (9.5 acres) occurs in the Airport Study Area along the perimeters of ponds, along a drainage near the western boundary, and along reaches of Airport Creek (see Figure 7 in Appendix A). This vegetation type is generally consistent with the following vegetation alliance under Sawyer, et al. (2009):

- Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) – Dominated by arroyo willows with red willow (*S. laevigata*) as a subdominant; includes other aquatic and hydrophytic vegetation such as mosquito fern (*Azolla filiculoides*), floating seedbox (*Ludwigia* sp.), and creeping spikerush (*Eleocharis macrostachya*). All the ponds in the Airport Study Area support willow scrub/woodland habitat. Pond 7 in the southwestern corner of the Airport Study Area is dominated by willows, Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), oaks (*Quercus* spp.) and non-native trees. An approximately 350-linear foot reach of willow scrub occurs along Airport Creek. This reach is regularly trimmed by the Airport for runway safety purposes, probably maintaining the willow scrub stand rather than allowing maturation to riparian woodland. This willow scrub area has patches of cattail (*Typha* sp.) adjacent to and within the channel and Himalayan blackberry on the upper edges.
- Red willow thickets (*Salix laevigata* Woodland Alliance) – Containing essentially the same species mix as arroyo willow thickets but with red willow as the sole or dominant tree/shrub species.

Willow scrub/woodland in the Airport Study Area provides habitat for a variety of wildlife species, especially songbirds such as Bewick's wren (*Thryomanes bewickii*), Wilson's warbler (*Wilsonia pusilla*), and American goldfinch (*Spinus tristis*). Other birds found in this habitat include common yellowthroat and song sparrow. A variety of other migratory and wintering birds such as yellow-rumped warbler (*Dendroica coronata*) use willow scrub/woodland for foraging and shelter. Larger willows provide nesting and roosting habitat for large water birds such as the black-crowned night heron.

**Riparian Woodland.** Riparian woodlands in the Airport Study Area occur along Redwood Creek, Airport Creek, Ordinance Creek, Pool Creek, and Mark West Creek (see Figure 7 in Appendix A). Depending on the dominant canopy tree, this vegetation type is generally consistent with one of the following vegetation alliances under Sawyer, et al. (2009):

- Valley oak woodland (*Quercus lobata* Woodland Alliance) - Supporting a fairly dense canopy of mature valley oak (*Quercus lobata*); other trees and shrub species include red willow, arroyo

willow, coast live oak (*Quercus agrifolia*), Oregon ash (*Fraxinus latifolia*), sandbar willow (*Salix exigua*), white alder (*Alnus rhombifolia*), non-native fruit trees (*Prunus* sp.), Siberian elm (*Ulmus pumila*), and walnut (probably a hybrid between northern California black walnut - *Juglans californica* var. *hindsii* and English walnut - *J. regia*).<sup>12</sup> Understory vegetation includes poison oak (*Toxicodendron diversilobum*), Himalayan blackberry, California blackberry (*Rubus ursinus*), wild grape (*Vitis californica*), blue elderberry (*Sambucus mexicana*), and sedge (*Carex* sp.).

- Oregon ash groves (*Fraxinus latifolia* Forest Alliance) – Essentially the same species mix as the valley oak woodland alliance, but dominated by Oregon ash trees.

Riparian woodlands in the Airport Study Area support a wide diversity of native wildlife; the species composition varies depending on the dominant tree cover. The riparian woodlands along Redwood and Airport Creeks are dominated by valley oaks and have a large component of coast live oaks, and therefore tend to support oak woodland associated wildlife species. Examples of birds that breed in oak dominated riparian woodlands, and have been observed in the Airport Study Area, include Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), oak titmouse (*Baeolophus inornatus*), and white-breasted nuthatch (*Sitta carolinensis*). Riparian woodland areas that have a significant willow component are likely to support willow-associated bird species, such as Bewick's wren, Wilson's warbler, American goldfinch, and common yellowthroat. Mammals such as mule deer (*Odocoileus hemionus*) and northern raccoon (*Procyon lotor*) use the riparian woodlands within the Airport Study Area for shelter and foraging habitat.

**Oak Woodlands and Oak Trees.** This vegetation type consists of small stands of valley oak trees and scattered individual valley oak trees that are not associated with riparian corridors (30.4 acres). This vegetation type is generally consistent with the following vegetation alliances under Sawyer, et al. (2009):

- Valley oak woodland (*Quercus lobata* Woodland Alliance) – This vegetation type is distinguished from the riparian woodland by the presence of occasional coast live oak trees, and an herbaceous understory dominated by non-native grasses and forbs of the same species as described under the non-native grassland/ruderal habitat. The understory also contains poison oak and Himalayan blackberry as common shrub species. The oak woodland stands in the Airport Study Area probably constitute remnants of historic oak woodlands and savannas that occurred throughout the Plain. Two of the largest oak woodland areas in the Airport Study Area are adjacent to the riparian woodlands along Ordinance Creek and Airport Creek and in the northwestern area of the Airport. The oak woodland area north of Airport Creek consists of a mix of valley oak trees and non-native fruit trees, primarily pears (*Pyrus* sp.) and plums (*Prunus* sp.), that are remnants of an old orchard.

The oak woodlands within the Airport Study Area support the same mix of wildlife species associated with the riparian woodlands (see above). Amphibians and reptiles that commonly occur in oak woodlands and are likely to occur in the Airport Study Area include the California slender

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<sup>12</sup> The walnut species that occurs in the Airport Creek riparian corridor along the airport's northern boundary have the morphological characteristics of northern California black walnut (var. *hindsii*), however the trees may in fact be a hybrid with the cultivated variety, *J. regia*, with which the native species readily hybridizes. Alternatively, the tree may indeed be the native variety but may have been introduced by humans since the only known occurrences of this species in Sonoma County may have been a result of the spread of nuts traded by Native American tribes from the Central Valley.

salamanders (*Batrachoseps attenuatus*), arboreal salamander (*Aneides lugubris*), southern alligator lizard (*Elgaria multicarinata*), and ring-neck snake (*Diadophis punctatus*).

**Developed.** Developed areas (237.5 acres) occur throughout the Airport Study Area and include runways, taxiways, Airport facilities, paved roads, houses, buildings, and ornamental landscaping and trees.

**Rural Residential.** Some of the northern and southern off-site parcels include residential areas with houses and other buildings and ornamental trees and landscaping (15.3 acres) (see Figure 7 in Appendix A). Some of these sites also contain native valley oak trees. Rural residential areas generally have less hardscape features than developed habitats and contain more ornamental trees.

**Ornamental Landscaping.** Ornamental landscaping (8.5 acres) in the Airport Study Area generally occur adjacent to buildings, developed areas, and former farm homesteads on the off-site parcels in the northern, western, and southwestern portions of the Airport Study Area. Small ornamental trees and small clumps of ornamental trees were not mapped in this category and were combined with other habitats such as developed and non-native grassland/ruderal. Ornamental trees include pines (*Pinus* sp.), acacia (*Acacia* sp.), sweetgum (*Liquidambar styraciflua*), lemon-scented gum (*Eucalyptus citriodora*), blue gum (*Eucalyptus globulus*), apple trees (*Malus domestica*), fig tree (*Ficus carica*), agave (*Agave* sp.), and Indian fig (*Opuntia ficus-indica*). Native valley oaks and occasionally other native trees are mixed in with the ornamental trees. Ornamental trees also include redwood (*Sequoia sempervirens*), which is a native tree but is not local to the Airport Vicinity. Two large stands of blue gum (*Eucalyptus globulus*) occur in the southern portion of the Airport Study Area, encompassing 1.8 acres (see Figure 7 in Appendix A).

**Cultivated Lands.** A vegetable garden and plant nursery for the adjacent Sonoma County correctional facility occurs in the eastern portion of the Airport Study Area. A vineyard occurs in the southwestern corner of the Airport Study Area, surrounding Pond 7 and within a private parcel in the southeast corner of the Airport Study Area. Together these two cultivated lands encompass 45.4 acres.

## 2.3 SANTA ROSA PLAIN CONSERVATION STRATEGY AND PROGRAMMATIC BIOLOGICAL OPINION

The Conservation Strategy was developed to create a long-term conservation plan to mitigate for the potential adverse impacts of future development on federally-listed plants and animals in the Plain (Conservation Strategy Team 2005). The Conservation Strategy protects and contributes to the recovery of Burke's goldfields, Sonoma sunshine, Sebastopol meadowfoam, and CTS; and provides the biological framework upon which the PBO is based (USFWS 2007).

Under the Conservation Strategy and PBO, vernal pools and most other seasonal wetlands on the Plain are considered to be suitable habitat for Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam. Loss of such habitat is considered an adverse impact to all 3 species, regardless of

whether or not the species are actually present, because the habitat may retain a remnant seed bank for the species.<sup>13</sup>

Projects that require Corps permit approval (such as the Proposed Project) can be appended to the PBO, and thereby provided individual take authorization, if the projects apply the PBO's mitigation ratios and adhere to all applicable avoidance and minimization measures in the PBO. The PBO potentially allows appendage of all projects on the Plain, regardless of size or extent of impact, with the exception of projects that would affect occupied Burke's goldfields or Sonoma sunshine habitat with populations of 2,000 or greater plants. However, the final decision to allow appendage rests with the USFWS which reserves the right to require a separate Section 7 consultation for any project based on the level of impacts, avoidance, and minimization or mitigation measures. The Corps and USFWS have followed also a policy to apply the PBO only to those projects with 3.0 acres or less of impacts to seasonal wetlands; larger projects typically require individual consultations with the USFWS.

The Conservation Strategy identifies eight conservation areas for listed plants and CTS, one listed plant and CTS preserve system, and one listed plant conservation area. Conservation areas are lands where recovery and mitigation efforts should be directed to best protect and expand populations of the listed species. The Conservation Strategy also encourages the establishment of preserves within these areas; translocation of listed species; habitat improvement through wetland creation, restoration and enhancement; and mitigation measures to reduce and compensate for impacts. Projects on the Plain that potentially affect these federally-listed species should evaluate those impacts and implement mitigation measures based on recommendations in the Conservation Strategy.

Under the Conservation Strategy, a large portion of the undeveloped parts of the Airport Study Area falls within the "Windsor Listed Plant Conservation Area." All of the Airport Study Area is located within an area described as "Potential for Presence of California Tiger Salamander and Listed Plants" (see Figure 8 in Appendix A). The Conservation Strategy and the associated PBO contain various guidelines and objectives applicable to these two areas. Section 3.12 below provides a detailed discussion of the Proposed Project's compliance with these guidelines and objectives.

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<sup>13</sup> Many of the wetlands that would be affected by the Proposed Project occur within parts of the Airport that were previously graded and/or regularly irrigated. Therefore, the potential for these wetlands to have retained a remnant seedbank for federally-listed vernal pool plants is doubtful. Nevertheless, consistent with the Conservation Strategy and PBO, this BRR assumes that a remnant seedbank could potentially exist.

### 3.0 SPECIAL-STATUS SPECIES ACCOUNTS, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section addresses special-status plant and animal species analyzed under this BRR. This section also provides avoidance, minimization and mitigation measures for those species that would be affected by the Proposed Project. The species accounts provided in this section include the species' status, description, general distribution, occurrence in the Airport Study Area and Airport Vicinity, and the potential impacts of the Proposed Project on the species.

#### 3.1 SPECIAL-STATUS PLANT SPECIES ABSENT FROM THE AIRPORT STUDY AREA

Table A summarizes all plant species analyzed using the data sources and selection criteria described in Section 2.4 and 2.5. The table contains all species listed by the USFWS for the Sebastopol, Healdsburg, Santa Rosa and Mark West Springs USGS 7.5-minute quadrangles, regardless of whether there are occurrences or suitable habitat for these species in the Project Vicinity. The table also contains all species in the CNDDDB for the four USGS quadrangles cited above that occur in the Airport Vicinity, or have a reasonable potential to occur based on their distribution and habitat requirements.

The Airport Study Area contains suitable habitat for the following special-status plant species listed in Table A. However, these species are absent from the Airport Study Area based on the results of protocol-level botanical surveys (LSA 2011b). Therefore the Proposed Project would not affect these species:

**Baker's Navarretia** (*Navarretia leucocephala* ssp. *bakeri*) is a CRPR 1B species in the phlox family (Polemoniaceae). It is an annual plant that grows in vernal pools and other wet depressions in cismontane woodland, lower montane coniferous forest, meadows, and valley and foothill grassland; it prefers adobe or alkaline soils (CNDDDB 2011, CNPS 2011). This species grows in association with other rare plants, such as Gairdner's yampah, Sebastopol meadowfoam, Burke's goldfields, broad leaved navarretia (*Navarretia cotulifolia*), and Lobb's buttercup. Suitable habitat for this species is present in vernal pools and other seasonal wetlands in the Airport Study Area

Baker's navarretia is found in northern San Francisco Bay and Sacramento Valley counties, including Colusa, Glenn, Lake, Marin, Mendocino, Napa, Sebastopol, Solano, Sonoma, Sutter, Tehama, and Yolo counties. The center of its distribution appears to be Sonoma and Mendocino counties (CNDDDB 2011, CNPS 2011). The closest known CNDDDB occurrence is approximately 0.1 mile northeast of the Airport Study Area near Sanders Road; last observed in 1993 (see Figure 6 in Appendix A). There are nine other CNDDDB occurrences within 5 miles of the Airport Study Area and some of them are presumed extant.

**Table A: Special-status Plants that Occur or Potentially Occur within the Airport Vicinity**

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Alopecurus aequalis</i> var. <i>sonomensis</i>	Sonoma alopecurus	FE/-/1B	Freshwater marshes and swamps; riparian scrub in Sonoma and Marin Counties. Known from fewer than 6 extant occurrences, two of which may be extirpated. Threatened by cattle trampling and non-native plants. Elevation Range: 15-690 feet Nearest Extant Occurrence: 10 miles (may be extirpated)	May-July	Suitable habitat in marshes and willow scrub, however the habitat is marginal for this species due to dominance by invasive emergent marsh plants. This species was not observed in the Airport Study Area during protocol level surveys.
<i>Amsinckia lunaris</i>	Bent-flowered fiddleneck	-/-/1B	Coastal bluff scrub; valley and foothill woodlands and grasslands in numerous northern California counties. Elevation Range: 10-1640 feet Nearest Extant Occurrence: 5.7 miles	March-June	Potentially suitable habitat in grasslands in the Airport Study Area. Potential for occurrence very low due to the generally disturbed nature of grasslands within the Airport Study Area (e.g. regularly mowed, irrigated, many are previously graded). This species was not observed in the Airport Study Area during protocol level surveys.
<i>Astragalus clarianus</i>	Clara Hunt's milk-vetch	FE, ST/1B	Chaparral, serpentinite grasslands and woodlands in Sonoma, Solano, Napa Counties. Known from only 4 occurrences. Elevation Range: 255-900 feet Nearest Extant Occurrence: 8.5 miles	March-May	No suitable habitat in the Airport Study Area.
<i>Blennosperma bakeri</i>	Sonoma sunshine	FE/SE/1B	Vernal pools and mesic grasslands. Endemic to the Santa Rosa Plain. Elevation Range: 30-360 feet Nearest Extant Occurrence: 0.2 miles (introduced at this location)	March-May	Potentially suitable habitat in vernal pools, swales, and seasonal wetlands in Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Brodiaea californica</i> var. <i>leptandra</i>	Narrow-anthered California brodiaea	-/-/1B	Open broad-leaved upland forests and chaparral, usually with serpentinite soils. Occurs in several northern California counties, including Sonoma, Lake and Napa Counties. Elevation range: 360-3,000 feet Nearest Extant Occurrence: 1.4 miles	May-July	No suitable habitat in the Airport Study Area.

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Carex albida</i>	White sedge	FE/SE/1B	Freshwater marshes; bogs and seeps. Only extant occurrence is the Pitkin marsh in Sonoma County (USFWS 2009a). A historic occurrence along Santa Rosa Creek is presumed extirpated due to altered hydrology and other disturbances including invasive exotic species. Elevation Range: 115-180 feet Nearest Extant Occurrence: 3.5 miles	May-July	Potentially suitable habitat in freshwater marshes. The potential for occurrence of this species is very low due to the disturbed, hydrologically altered nature of the Airport's marshes and the presence of extensive wastewater irrigation. This species was not observed in the Airport Study Area during protocol level surveys.
<i>Carex comosa</i>	Bristly sedge	-/-/2	Marshes and swamps; valley and seasonal wetlands; foothill grasslands. Occurs in numerous northern California and Bay Delta counties, as well as San Bernardino County. Threatened by alterations of marsh hydrology due to drainage. Elevation Range: 0-1,395 feet Nearest Extant Occurrence: 8.2 miles	May-Sept.	Potentially suitable habitat in freshwater marshes in Airport Study Area. The potential for occurrence of this species is very low due to the disturbed, hydrologically altered nature of the Airport's marshes. This species was not observed in the Airport Study Area during protocol level surveys.
<i>Ceanothus confusus</i>	Rincon ridge ceanothus	-/-/1B	Closed-cone coniferous forests, chaparral, and cismontane woodlands; volcanic or serpentine soils on dry shrubby slopes in Sonoma, Mendocino, Napa and Lake Counties. Elevation Range: 245-3,490 feet Nearest Extant Occurrence: 1.9 miles	Feb.-April	No suitable habitat in the Airport Study Area.
<i>Ceanothus foliosus</i> var. <i>vineatus</i>	Vine Hill ceanothus	-/-/1B	Sandy, acidic soil in chaparral in Mendocino and Sonoma Counties. Elevation Range: 150-1,000 feet Nearest Extant Occurrence: 2.0 miles	March-May	No suitable habitat in the Airport Study Area.

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Centromadia parryi</i> ssp. <i>parryi</i>	Pappose tarplant	-/-1B	Meadows and seeps; chaparral; coastal prairie; coastal salt marshes; vernal mesic valley and foothill grasslands. Found in several northern and central Bay-Delta counties, as well as Sonoma, San Mateo, Monterey, San Luis Obispo and Los Angeles Counties. Threatened by overgrazing and ground disturbance activities associated with development and road maintenance. Elevation Range: 70-380 feet Nearest Extant Occurrence: on-site	May-Nov.	Potentially suitable habitat in seasonal wetlands and grasslands in Airport Study Area. However, unlikely to occur in grasslands that are regularly mowed such as in the Airport infield area due to sensitivity to disturbance. As shown in Figure 9 in Appendix A, this species is known to occur in the SACMA Preserve and in the Sanders Road parcel situated north of Runway 14-32 (neither of which are mowed). Not observed elsewhere during protocol level surveys.
<i>Clarkia imbricata</i>	Vine Hill clarkia	FE/SE/1B	Chaparral, grasslands on acidic soils in Sonoma County. Known from only 2 extant occurrences, one of which is introduced. Elevation range: 160-245 feet Nearest Extant Occurrence: 2.5 miles	June-Aug.	No suitable habitat in the Airport Study Area.
<i>Downingia pusilla</i>	Dwarf downingia	-/-2	Mesic valley and foothill grasslands; vernal pools in Sonoma, Napa and Solano Counties, as well as numerous Central Valley counties. Occurs almost always under natural conditions. Elevation Range: 3-1,460 feet Nearest Extant Occurrence: 0.1 miles (Introduced at this location)	March-May	Potentially suitable habitat in vernal pools, swales, and seasonal wetlands in Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Hemizonia congesta</i> ssp. <i>congesta</i>	Seaside tarplant	-/-1B	Northern coastal scrub; valley and foothill grasslands, sometimes along roads. Occurs in numerous northern California counties as well as Monterey and Eldorado County. Threatened by agriculture, development, road construction and possibly by over-grazing. Elevation Range: 65-1,840 feet Nearest Extant Occurrence: 0.5 miles	April-Nov.	Potentially suitable habitat in grasslands in the Airport Study Area. However, unlikely to occur in grasslands that are regularly mowed such as in the Airport infield area due to sensitivity to disturbance. This species was not observed in the Airport Study Area during protocol level surveys.

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Juglans californica</i> var. <i>hindsii</i>	Northern California black walnut	-/-1B	Riparian woodlands and riparian scrub in Contra Costa, Napa, Sacramento, Solano and Yolo Counties. Occurs in plantings and as a naturalized plant throughout California; however only one confirmed native stand exists (in Napa County). Readily hybridizes with the English walnut ( <i>J. regia</i> ). Elevation Range: 0-1,445 feet Nearest Extant Occurrence: >18 miles (Only verified natural occurrence)	April-May	Potentially suitable habitat occurs along Redwood & Airport Creek riparian corridors. This species was not observed in the Airport Study Area during protocol level surveys. (A species of <i>Juglans</i> occurs in these riparian areas, but is likely to be the introduced hybrid.)
<i>Lasthenia burkei</i>	Burke's goldfield	FE/SE/1B	Mesic meadows and vernal pools in Sonoma, Lake and Mendocino Counties. Twenty-five of the known 31 occurrences are on the Santa Rosa Plain. Elevation Range: 50-1,970 feet Nearest Extant Occurrence: on-site	April-June	Potentially suitable habitat in vernal pools and seasonal wetlands in Airport Study Area. Species occurs on Airport property in the Goldfield Preserve, SACMA Preserve and in the vicinity of the Runway 14-32 Preserve (see Figure 9 in Appendix A).
<i>Legenere limosa</i>	Legenere	-/-1B	Vernal pools in numerous northern and Central Valley counties in California. Occurs almost always under natural conditions. Elevation Range: 3-2,890 feet Nearest Extant Occurrence: 6.6 miles	April-June	Potentially suitable habitat in vernal pools, and seasonal wetlands in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Leptosiphon jepsonii</i>	Jepson's leptosiphon	-/-1B	Chaparral and cismontane woodlands usually with volcanic soils in Colusa, Lake, Napa, Sonoma and Yolo Counties. Elevation Range: 330-1,640 feet Nearest Extant Occurrence: 4.2 miles	March-May	No suitable habitat in the Airport Study Area.
<i>Lilium pardalinum</i> ssp. <i>pitkinense</i>	Pitkin Marsh lily	FE/SE/1B	Freshwater marshes with sandy soils. Only known extant populations occur at the Pitkin Marsh and one other marsh (location suppressed by the CNDDDB) in Sonoma County (CNDDDB 2011; USFWS 2009a). Elevation Range: 115-215 feet Nearest Extant Occurrence: unknown	June-July	No suitable habitat in the Airport Study Area.

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Limnanthes vincularis</i>	Sebastopol meadowfoam	FE/SE/1B	Vernal pools; mesic valley and foothill grasslands and meadows. This species is endemic to central and southern Santa Rosa Plain, with the exception of one population (likely introduced) at the Yountville Ecological Preserve in Napa County. Elevation Range: 50-4,000 feet Nearest Extant Occurrence: 0.2 miles (Introduced at this location)	April-May	Potentially suitable habitat in vernal pools and seasonal wetlands in Airport Study Area. One historic occurrence (now extirpated) in the location shown on Figure 9 in Appendix A. Species not observed in the Airport Study Area during protocol level surveys.
<i>Microseris paludosa</i>	Marsh microseris	-/-/1B	Cismontane woodlands; coniferous forests; coastal scrub; mesic valley and foothill grasslands. Occurs in numerous northern California counties from Monterey County northward. Elevation Range: 15-985 feet Nearest Extant Occurrence: 5.5 miles	April-June	Potentially suitable habitat in seasonal wetlands in Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Navarretia leucocephala</i> ssp. <i>plieantha</i>	Many-flowered navarretia	FE/SE/1B	Vernal pools with volcanic ash flow soils in Lake and Sonoma Counties. Only 7 known occurrences, 5 of which are in Lake County. Only occurrence on the Santa Rosa Plain is immediately northeast of the Airport Elevation Range: 100-3,120 feet Nearest Extant Occurrence: 0.3 miles	May-June	Potentially suitable habitat in vernal pools in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	Baker's navarretia	-/-/1B	Vernal pools; cismontane woodlands, lower montane coniferous forests, mesic valley and foothill grasslands. Occurs in Colusa, Lake, Mendocino, Marin, Napa, Solano, Sonoma and Tehama Counties. Elevation Range: 50-5,710 feet Nearest Extant Occurrence: 0.1 mile	May-July	Potentially suitable habitat in vernal pools and seasonal wetlands in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	Gairdner's yampah	-/-/4	Vernal pools, other seasonal wetlands and moist grasslands in numerous counties throughout California. Elevation Range: 0-1,200 feet Nearest Extant Occurrence: on-site	June-Oct.	Suitable habitat in vernal pools and other seasonal wetlands; occurs in one location in the Airport Study Area – the SACMA Preserve (see Figure 9 in Appendix A).

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Ranunculus lobbii</i>	Lobb's aquatic buttercup	-/-/4	Vernal pools and other seasonal wetlands and ponds in numerous counties from Monterey northward. Elevation Range: 50-1,545 feet Nearest Extant Occurrence: on-site	Feb.-May	Suitable habitat in vernal pools and seasonal wetlands; occurs in two locations within the Airport Study Area (see Figure 9 in Appendix A).
<i>Rhynchospora alba</i>	White beaked-rush	-/-/2	Freshwater marshes, bogs, seeps, wet meadows in numerous northern California counties. Threatened by hydrological alterations. Elevation Range: 200-6,690 feet Nearest Extant Occurrence: 3 miles	July-Aug.	Potentially suitable habitat in freshwater marshes, and seasonal wetlands in Airport Study Area. The potential for occurrence of this species is very low due to the disturbed, hydrologically altered nature of the Airport's marshes. This species was not observed in the Airport Study Area during protocol level surveys.
<i>Rhynchospora californica</i>	California beaked-rush	-/-/1B	Freshwater marshes and swamps; coniferous forests; meadows and seeps. Occurs in Butte, Mariposa, Marin and Sonoma Counties. Elevation Range: 150-3,315 feet Nearest Occurrence: 3.5 miles	May-July	Potentially suitable habitat in freshwater marshes/seasonal wetlands in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Rhynchospora globularis</i> var. <i>globularis</i>	Round-headed beaked-rush	-/-/2	Freshwater marshes and swamps in Sonoma County. Elevation Range: 150-200 feet Nearest Extant Occurrence: 3 miles	July-August	Potentially suitable habitat in freshwater marshes in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys.
<i>Trifolium amoenum</i>	Showy rancheria clover (a.k.a. Showy Indian clover)	FE/-/1B	Coastal bluff scrub; valley and foothill grasslands in Alameda, Mendocino, Marin, Napa, Santa Clara, Solano and Sonoma Counties. Believed extirpated from all historic occurrences. One verified extant occurrence in Marin County. Elevation Range: 15-1,360 feet Nearest Extant Occurrence: 13 miles	April-June	Marginally suitable habitat in grassland in the Airport Study Area. Potential for occurrence very low due to the disturbed nature of the Airport's grasslands, on-going wastewater irrigation and mowing. This species was not observed in the Airport Study Area during protocol level surveys.

Scientific Name	Common Name	Status (Fed/State/CRPR)	Habitat/Nearest Occurrence	Blooming Period	Potential to Occur in the Airport Study Area
<i>Trifolium hydrophilum</i>	Saline clover	-/-1B	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. In numerous northern California counties. Elevation Range: 0-985 feet Nearest Extant Occurrence: 13 miles	April-June	Potentially suitable habitat in freshwater marshes and seasonal wetlands in the Airport Study Area; however this species was not observed in the Airport Study Area during protocol level surveys. (A closely related clover species ( <i>Trifolium depauperatum</i> var. <i>depauperatum</i> ) was observed on Airport property at the south of infield, Executive Hangar taxiway, and at the SACMA Preserve.)

<sup>1</sup> FE - Federally-listed as endangered.

SE - State-listed as endangered.

CRPR (California Rare Plant Rank):

1B - Plants considered rare, threatened, or endangered in California and elsewhere.

2 - Plants considered rare, threatened, or endangered in California but more common elsewhere.

4 - Plants of limited distribution in California; a “watch” list.

**Bent-flowered fiddleneck** (*Amsinckia lunaris*) is a CRPR 1B species in the borage family (Boraginaceae) that is found in numerous northern California counties and is endemic to California. It is an annual plant that grows in coastal scrub, annual grasslands and woodlands. It is generally found along sheltered or shaded slopes within the openings and edges of oak woodlands and at the edges of poison oak thickets (Hayes and Taylor 2006). The nearest recorded occurrence in the CNDDDB is approximately 5.7 miles from the Airport (CNDDDB 2011). Potentially suitable habitat for this species is present in annual grasslands and woodlands in the Airport Study Area; however, there are no known occurrences on the Plain.

**Bristly Sedge** (*Carex comosa*) is a perennial, rhizomatous herb in the sedge family (Cyperaceae) that grows primarily in marshes and swamps, and along lake margins. It is a CRPR 2 species. Potentially suitable habitat for this species is found in freshwater marshes and possibly along the edges of ponds and creeks in the Airport Study Area; however, there are no known occurrences of the species on the Plain. This species is associated almost always with undisturbed marshes (CNPS 2011). Since marshes at the Airport are largely associated with previously graded areas and along constructed ponds, the potential for occurrence of this species is low. The nearest recorded occurrence is an 1896 record along the Russian River, approximately 8.2 miles from the Airport Study Area CNDDDB (2011). It is not known if this occurrence is extant.

**California Beaked-rush** (*Rhynchospora californica*) is a perennial herb that occurs in freshwater marshes, swamps and wet meadows. It is a CRPR 1B species in the sedge family (Cyperaceae) that is endemic to California. It occurs in freshwater marshes, swamps and wet meadows. Potentially suitable habitat for this species is found in freshwater marshes and possibly along the edges of ponds and creeks in the Airport Study Area; however, it is not known to occur on the Plain. Since marshes at the Airport are largely associated with previously graded areas and along constructed ponds, the potential for occurrence of this species is low. The nearest recorded occurrence is approximately 3 miles from the Airport Study Area outside of the Plain (CNDDDB 2011).

**Dwarf Downingia** (*Downingia pusilla*) is an annual herb in the bellflower family (Campanulaceae) that grows in vernal pools, playa pools, on margins of vernal lakes and other mesic areas within valley and foothill grassland, and grows in both alkaline (saline) and non-alkaline soils. It is CRPR 2 species that has a California range extending from Merced and Mariposa counties in the south to Tehama County in the north, and includes Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba Counties. Sonoma County is the only coastal county known to support this species (CNPS 2011).

This species often occurs with other rare wetland and vernal pool species such as alkali milkvetch (*Astragalus tener* var. *tener*), legenere (*Legenere limosa*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), Heckard's peppergrass (*Lepidium latipes* var. *heckardii*), and little mouse-tail (*Myosurus minimus* ssp. *apus*) (CNDDDB 2011). It blooms from March through May. There are eight CNDDDB occurrences of dwarf downingia within 5 miles of the Airport Study Area (see Figure 6 in Appendix A). The closest occurrence is approximately 0.1 mile from the Airport Study Area at constructed wetlands where this species was inoculated. The next closest occurrence is 0.4 mile from the Airport Study Area and this occurrence is extirpated (CNDDDB 2011). Another occurrence, which is presumed extant, is 1.5 miles from the Airport Study Area.

**Legenere** (*Legenere limosa*) is an annual herb in the bellflower family (Campanulaceae) that is endemic to California, and occurs almost exclusively in vernal pools. It is a CRPR 1B species that is highly susceptible to over-grazing and other human caused disturbances and occurs almost exclusively in vernal pools. The species is known to occur on the Plain; potentially suitable habitat is found in vernal pools in the Airport Study Area. This species is associated almost always with undisturbed wetlands and is threatened by the presence of non-native plants (CNPS 2011). Since wetlands at the Airport are largely associated with previously graded and/or regularly irrigated areas, and generally have a large component of non-native plant species, the potential for occurrence of this species is low. The nearest CNDDDB occurrence is approximately 6.6 miles from the Airport Study Area (CNDDDB 2011). Potentially suitable habitat for this species is found in vernal pools in Airport Study Area.

**Lobb's Aquatic Buttercup** (*Ranunculus lobbii*) is a CRPR 4 species in the buttercup family (Ranunculaceae). It is an annual herb that occurs in vernal pools and other seasonal wetlands and ponds. It is endemic to California and occurs commonly in vernal pools in Sonoma County and the Santa Rosa Plain. There are numerous occurrences of this species within the Airport Vicinity. Potentially suitable habitat occurs in vernal pools and other seasonal wetlands in the Airport Study Area. Two populations of this plant species occur in the Airport Study Area (see Figure 9 in Appendix A); both are within seasonal wetlands not located within the project disturbance area.

**Many-flowered Navarretia** (*Navarretia leucocephala* ssp. *plieantha*) is a federal and state-listed Endangered species. It is an annual species of the phlox family (Polemoniaceae) that occupies vernal pools situated on volcanic ash flows. Many-flowered navarretia is endemic to Lake and Sonoma counties. It is known from seven locations and all are presumed extant; five populations are in Lake County and two in Sonoma County (CNDDDB 2011). The closest known CNDDDB population (Occurrence No. 9) to the Airport Vicinity is located near Sanders Road approximately 0.3 mile northeast of the Airport Study Area (see Figure 5 in Appendix A). This occurrence is the only recorded occurrence of this species on the Plain; it was last observed in 1998 and is presumed extant. There are no other CNDDDB occurrences located in the Airport Vicinity. .

Suitable habitat may occur in vernal pools in the Airport Study Area containing volcanic ash flow derived soils. It should be noted that the Huichica Series soils that occur within the Airport's vernal pools may contain inclusions of volcanic ash flow soils; however in general ash flow derived soils are not the predominant pool soil type (USDA Soil Conservation Service 1972).

**Marsh Microseris** (*Microseris paludosa*) is a perennial herb in the sunflower family (Asteraceae) that inhabits mesic grasslands, seasonal wetlands, and coastal scrub habitats. It is a CRPR 1B species that is known to occur in Mendocino, Monterey, Marin, San Benito, Santa Cruz, San Luis Obispo, and Sonoma counties. The closest known CNDDDB occurrence is approximately 2.8 miles north of the Airport near old Redwood Highway, but it was last observed in 1949, and may be extirpated (see Figure 6 in Appendix A). The next nearest occurrence (apparently extant) is in the Sebastopol vicinity, approximately 5.5 miles to the southwest. Suitable habitat is present in vernal pools and other seasonal wetlands and grasslands in the Airport Study Area.

**Northern California Black Walnut** (*Juglans californica* var. *hindsii*) is a CRPR 1B species; it has no federal listing status. It is a tree in the walnut family (Juglandaceae) that occurs in deep alluvial soil associated with a creek or stream in riparian forest and riparian woodland (LSA 2011b). Few

extant native stands of Northern California black walnut remain, however this species is widely naturalized and/or planted. According to CNPS (2011) there is only one viable natural occurrence as of 2003 (in Napa County); natural occurrences in other counties are extirpated or questionable. It is not reported in Sonoma County but is questionably reported in surrounding counties. There are no CNDDDB occurrences of this species within 5 miles of the Airport Study Area.

Walnut trees with the morphological characteristics of var. *hindsii* were observed in the Airport Study Area along Airport Creek, Redwood Creek and Lower Ordinance Creek; however, these trees are unlikely to be the special status species. The trees may have been introduced by humans since the only known occurrences of this species in Sonoma County may have been a result of the spread of nuts traded by Native Americans tribes from the Central Valley (Best et al. 1996). More likely, the trees within the Airport Study Area are a hybrid with the cultivated variety, *J. regia*, with which the native species readily hybridizes (CNPS 2011).

**Round-headed Beaked-rush (*Rhynchospora globularis* var. *globularis*)** is a perennial rhizomatous herb in the sedge family (Cyperaceae) that occurs in freshwater marshes and swamps. It is a CRPR 2 species that is known to occur only in Sonoma County. This species is associated almost always with undisturbed marshes (CNPS 2011). Since marshes at the Airport are largely associated with previously graded areas and along constructed ponds, the potential for occurrence of this species is low. The nearest recorded occurrence is approximately 3 miles from the Airport, outside of the Plain. Potentially suitable habitat for this species is found in freshwater marshes in the Airport Study Area.

**Saline Clover (*Trifolium depauperatum* var. *hydrophilum*)** is an annual herb in the pea family (Fabaceae) that grows in salt marshes and in alkaline soils in moist valley and foothill grasslands, and vernal pools. It is a CRPR 1B species that is found in all central coast counties, from San Luis Obispo County to Sonoma County, except in San Francisco County. It has been observed growing at the margins of vernal pools and along swales with saltgrass (*Distichlis spicata*), and brass buttons (*Cotula coronopifolia*) (CNDDDB 2011). Saline clover has been observed growing with the rare plant species dwarf downingia (*Downingia pusilla*) and Contra Costa goldfields (*Lasthenia conjugens*) (CNDDDB 2011). The closest known occurrence is extirpated one located approximately 4.4 miles southeast of the Airport (see Figure 6 in Appendix A). A closely related clover species (*Trifolium depauperatum* var. *depauperatum*) was observed on Airport property at the south of infield, Executive Hangar taxiway, and at the SACMA Preserve.

**Showy Rancheria Clover (*Trifolium amoenum*)** is an annual plant in the pea family (Fabaceae) that is a federally-listed Endangered species and a CRPR 1B species. It occurs along coastal bluffs and in grassland habitats. There are 23 CNDDDB historical occurrences of showy rancheria clover in 5 Bay Area counties (CNDDDB 2011). However, most if not all the historical populations are believed to have been extirpated by the late-1980s due to urbanization, land conversion to agriculture, and competition from non-native plant species. In 1993, a single plant was found near Occidental but was not observed again in later years. In 1996, a small population was observed in a Marin County grassland in the Valley Ford 7.5 minute quadrangle.

The closest historical CNDDDB occurrence of showy rancheria clover to the Airport Study Area is approximately 4.8 miles south of the Airport Study Area (see Figure 5 in Appendix A). This record was observed in 1945 near Wrights School, 4 miles west of Santa Rosa, and is likely to be extirpated. There are no other CNDDDB records in the Airport Vicinity. The single confirmed population of this

species is in the Valley Ford region, located approximately 13 miles from the Airport Study Area. The grasslands within the Airport Study Area may provide suitable habitat for showy rancheria clover. However, the suitability is marginal due to the highly disturbed nature of the Airport's grasslands, on-going wastewater irrigation and mowing.

**Sonoma alopecurus** (*Alopecurus aequalis* var. *Sonomensis*) is a perennial plant in the grass family (Poaceae) that is a federal Endangered species and a CRPR 1B species. It occurs in freshwater marshes and riparian scrub habitats. There are 27 CNDDDB historical occurrences of Sonoma alopecurus in Sonoma and Marin Counties; many of these occurrences are historic records that may no longer be extant (CNDDDB 2011). Only six occurrences that are likely to be extant (CNPS 2011). The closest CNDDDB occurrence of Sonoma alopecurus to the Airport Study Area is approximately 10 miles to the south. This occurrence was last seen in 1974 and may no longer be extant.

Sonoma alopecurus is highly susceptible to over-grazing and also appears to be vulnerable to completion from invasive emergent marsh plants including nutsedges and rushes (USFWS 1997). The marshes within the Airport Study Area are not grazed, however they are largely dominated by invasive emergent marsh plants, primarily cattails and rushes, and therefore provide only marginally suitable habitat for this species.

**White Beaked-rush** (*Rhynchospora alba*) is a rhizomatous perennial herb in the sedge family (Cyperaceae) that occurs in freshwater marshes, bogs, and wet meadows. It is a CRPR 2 species that is not known to occur on the Plain; the nearest recorded occurrence is approximately 3.5 miles from the Airport Study Area to the southwest (CNDDDB 2011). Potentially suitable habitat for this species is found in freshwater marshes and possibly along the edges of ponds and creeks in the Airport Study Area.

**White Sedge** (*Carex albida*) is a perennial herb in the sedge family (Cyperaceae) that is a federally-listed Endangered species and CRPR 1B species. It occurs in freshwater marshes, swamps, and bogs. The species was historically known to occur in four populations, all in Sonoma County (CNDDDB 2011). It is presumed extant at two locations (upper and lower Pitkin Marsh), possibly extirpated from Santa Rosa Creek, and extirpated at the Perry Marsh due to loss of its habitat (USFWS 2009a). The closest CNDDDB occurrence (Occurrence No. 2) of this species is along Santa Rosa Creek approximately 3.0 miles south of the Airport Study Area (see Figure 5 in Appendix A). This record was observed in 1977 and is possibly extirpated due to the loss of freshwater marsh habitat on this creek. There are no other CNDDDB occurrences in the Airport Vicinity or in the northern Plain. The Airport Study Area contains approximately 0.5 acre of marsh habitat that may be marginally suitable for white sedge. This species is associated almost always with undisturbed marshes (CNPS 2011). Since marshes at the Airport are largely associated with previously graded areas and along constructed ponds, the potential for occurrence of this species is low.

### **3.2 SPECIAL-STATUS PLANT SPECIES PRESENT IN THE AIRPORT STUDY AREA; LISTED PLANT SPECIES COVERED UNDER THE CONSERVATION STRATEGY AND PBO**

This section addresses the following two categories of special-status plants listed in Table A: (1) special-status plant species that occur in the Airport Study Area; and (2) the three federally-listed

plant species covered under the Conservation Strategy and PBO (Burke's goldfields, Sonoma sunshine, and Sebastopol meadowfoam).

### 3.2.1 Burke's Goldfields (*Lasthenia Burkei*)

**Description.** Burke's goldfields is a federal and state-listed Endangered species. It is an annual plant in the sunflower family (Asteraceae) that occupies vernal pools, swales, wet meadows, and seeps. A more detailed description of this species and its life history is found in the botanical surveys report (LSA 2011b).

**Distribution.** Burke's goldfield is endemic to the Central Coastal Ranges and has historically been reported from Mendocino, Lake, and Sonoma counties. There are 31 recorded occurrences of this species. A single, possibly extirpated occurrence is in Mendocino County; four occurrences are in Lake County, and one occurrence is in Napa County (CNDDDB 2011). The remaining 25 occurrences are from Sonoma County, with the center of distribution in the northwestern and central areas of the Plain. Three of the 25 occurrences in Sonoma County are known to be extirpated (CNDDDB 2011).

**Occurrence in the Airport Vicinity.** Occurrences in the Airport Vicinity are located both north and south of the Airport Study Area (see Figure 5 in Appendix A). There are twenty-one CNDDDB occurrences within 5 miles of the Airport Study Area (see Figure 5 in Appendix A). Occurrences in the Airport Vicinity include colonies mapped between Sonoma County Airport and Shiloh, at the junction of Highway 101 and Shiloh Road, northwest of Windsor along Starr Road, on the east side of Redwood Highway north of Arata Lane, southwest of the Windsor Road/Arata Lane intersection, and in the Wikiup wetlands mitigation bank east of the Airport, between Highway 101 and Redwood Highway.

**Occurrence within the Airport Study Area.** The Airport Study Area contains both historic and extant occurrences of Burke's goldfields. The historic occurrences are based on pre-1988 observations by Patterson (1987) and others and are also recorded as CNDDDB Occurrence No. 7 (CNDDDB 2011) (see Figure 9 in Appendix A). The locations of the historic sub-populations are non-specifically mapped by the CNDDDB; they are depicted as broad circles or polygons within which the much smaller actual sub-populations were recorded. More precise locations of the historic subpopulations were mapped by Patterson (1987) as shown on Figure 9 in Appendix A. The historic sub-populations of Burke's goldfields have largely been extirpated from the Airport, with the exception of those described in the next paragraph. The extirpation of these historic sub-populations has been due to past Airport development and operational activities or possibly other unknown causes.

The extant occurrences are based on the surveys conducted from 2002 through 2010 and correspond roughly to CNDDDB occurrence record No. 7 (see Figure 9 in Appendix A). Current sub-populations of Burke's goldfields occur in three locations at the Airport, some of which are within areas designated as protected preserves: the SACMA Preserve, Goldfields Preserve, and the Runway 14-32 Wetland Preserve (see Figure 9 in Appendix A). The SACMA Preserve sub-population (approximately 2,700 individuals) was derived from CDFG-salvaged soil that contained seeds of Burke's goldfields; the salvaged soil was introduced into constructed vernal pools at the SACMA site in 1999. The source of the salvaged soil was a vernal pool impacted during construction of a project

in the industrial park immediately to the east of the Airport. The Goldfields Preserve site consists of an estimated >100,000 individuals in a dense cover (LSA 2011b). This sub-population consists of naturally occurring plants and seeded plants introduced into two constructed pools in 1988. Colonies of Burke's goldfields were observed in several pools in the vicinity of the Runway 14-32 Preserve in the late 1980s, and were confirmed by botanists in the spring of 2005 and again in 2009-2010 (Patterson 1987, LSA 2011b). Botanists estimated the total individual plants within the vicinity of the Runway 14-32 Preserve to be approximately 81,000 in 2009, and 156,000 in 2010 (LSA 2011b).

**Impacts of the Proposed Project – Short-term Elements.** None of the short-term elements of the Proposed Project would affect any existing sub-populations of this species, nor would they affect any wetlands within which historic sub-populations of this plant species were recorded. However, under the Conservation Strategy and PBO, all of the Airport's vernal pools and other seasonal wetlands are considered to be suitable habitat for Burke's goldfields. Loss of such habitat is considered an impact to Burke's goldfields because the habitat may retain a remnant seed bank.<sup>14</sup> The Proposed Project would result in the loss of 4.4 acres of suitable Burke's goldfields habitat. Therefore, the Proposed Project would adversely affect Burke's goldfields.

**Impact 3.2.1:** Loss of 4.4 acres of suitable habitat for Burke's goldfields.

**Mitigation Measure 3.2.1:** The County shall implement either of the following mitigation measures in accordance with the interim mitigation guidelines of the Conservation Strategy and the requirements of the PBO:

- 1. Mitigation Credit Purchase.** The County shall acquire 6.8 acres of plant preservation mitigation credits from a USFWS approved off-site mitigation or conservation bank on the Plain. The acquired credits shall consist of at least 2.2 acres of established habitat and 4.4 acres of occupied or established habitat for Burke's goldfields and/or Sonoma sunshine, resulting in an overall mitigation ratio of 1.5:1 for suitable habitat.<sup>15, 16</sup>
- 2. Dedicated Mitigation Site.** The County shall acquire at least 2.2 acres of established habitat and 4.4 acres of occupied or established habitat for Burke's goldfields and/or Sonoma sunshine at an off-site mitigation area on the Plain. The off-site mitigation area shall be approved by the USFWS and shall be managed in perpetuity under a USFWS approved conservation easement, management plan, and non-wasting endowment.<sup>17</sup> A 5-year mitigation and monitoring plan for verifying compliance with this mitigation measure shall

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<sup>14</sup> Many of the wetlands that would be affected by the Proposed Project occur within parts of the Airport that were previously graded and/or regularly irrigated. Therefore, the potential for these wetlands to have retained a remnant seedbank for federally-listed vernal pool plants is doubtful. Nevertheless, consistent with the Conservation Strategy and PBO, this BRR assumes that a remnant seedbank could potentially exist.

<sup>15</sup> Under the PBO, "occupied" habitat supports listed plant populations that existed prior to the establishment of a mitigation bank. "Established" habitat supports new or expanded plant populations that resulted from active seeding and management efforts conducted after a mitigation bank has been established.

<sup>16</sup> The Conservation Strategy and PBO require that mitigation for impacts to suitable habitat for these 3 species within sites north of Santa Rosa Creek (where the Airport occurs) mitigate within occupied or suitable habitat for Burke's goldfields and/or Sonoma sunshine, in recognition of the fact that Sebastopol meadowfoam generally occurs south of Santa Rosa Creek.

<sup>17</sup> A "non-wasting" endowment has sufficient principal so the interest income is enough to fund annual maintenance and management costs.

be prepared by the Project Biologist.<sup>18</sup> The plan shall include detailed monitoring protocols, performance goals, reporting requirements, and potential remedial measures, and shall be subject to the review and approval of the USFWS prior to the start of work. The plan shall be prepared as part of the detailed Mitigation and Monitoring Plan that would be required by these agencies under their respective regulatory approval processes.

**Impacts of the Proposed Project – Long-term Elements.** Implementation of the following long-term elements would have the potential to affect occupied and/or suitable Burke's goldfields habitat, depending on the future proposed locations of these elements and their specific designs: new air traffic control tower, new taxi lanes for private use hangers, air cargo facility, and replacement run-up apron for Runway 32.

### **3.2.2 Gairdner's Yampah (*Perideridia Gairdneri* ssp. *gairdneri*)**

**Description.** Gairdner's yampah is a CRPR 4 species; it has no federal listing status. It is a perennial herb in the carrot family (Apiaceae) that occurs in vernal pools, other seasonal wetlands, and moist grasslands (LSA 2011b).

**Distribution.** This species is endemic to California and occurs in many counties throughout the state. However it is rare on the Plain, known from only two confirmed occurrences on the Plain, one in an unknown location in the Windsor vicinity and one in the Todd Road Preserve (Patterson et. al. 1994).

**Occurrence in Airport Vicinity.** The nearest recorded occurrence of this species is assumed to be between 1 and 1.5 of the Airport Study Area in the Windsor vicinity.

**Occurrence within the Airport Study Area.** Potentially suitable habitat occurs in vernal pools and other seasonal wetlands. One population of this plant species occurs in the Airport Study Area within the SACMA Preserve (see Figure 9 in Appendix A).

**Impacts of the Proposed Project – Short-term Elements.** Short-term elements of the Proposed Project would not affect this species.

**Impacts of the Proposed Project – Long-term Elements.** Long-term elements of the Proposed Project would not affect this species.

### **3.2.3 Lobb's Aquatic Buttercup (*Ranunculus Lobbii*)**

**Description.** Lobb's aquatic buttercup is a CRPR 4 species; it has no federal listing status. It is an annual herb in the buttercup family (Ranunculaceae) that occurs in vernal pools and other seasonal wetlands and ponds (LSA 2011b).

**Distribution.** This species is endemic to California. It occurs commonly in vernal pools in Sonoma County and on the Plain.

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<sup>18</sup> A designated Project Biologist, subject to the approval of CDFG and USFWS shall be responsible for supervising and verifying compliance with all mitigation measures contained herein.

**Occurrence in Airport Vicinity.** There are numerous occurrences of this species within 5 miles of the Airport Study Area.

**Occurrence within the Airport Study Area.** Potentially suitable habitat occurs in vernal pools and other seasonal wetlands in the Airport Study Area. Two populations of this plant species occur in the Airport Study Area – both within seasonal wetlands within the area between the two runways (see Figure 9 in Appendix A).

**Impacts of the Proposed Project – Short-term Elements.** Short-term elements of the Proposed Project would not affect this species.

**Impacts of the Proposed Project – Long-term Elements.** Long-term elements of the Proposed Project would not affect this species.

### **3.2.4 Pappose Tarplant (*Centromadia Parryi* ssp. *parryi*)**

**Description.** Pappose tarplant is a CRPR 1B species; it has no federal listing status. It is an annual herb in the aster family (Asteraceae) that occurs in wet meadows, seeps, and mesic grasslands, usually with alkaline soils (Best et. al. 1996).

**Distribution.** Pappose tarplant occurs in numerous coastal and bay-delta counties including nine locations in Sonoma County.

**Occurrence in Airport Vicinity.** The nearest off-site occurrence to the Airport is approximately 4.5 miles to the south, in the central area of the Plain (see Figure 6 in Appendix A).

**Occurrence within the Airport Study Area.** Potentially suitable habitat occurs in seasonal wetlands and grasslands in the Airport Study Area. Two populations of this plant species occur in the Airport Study Area - one at the SACMA Preserve and one at the recently-acquired parcel north of Airport Creek south of Sanders Road (see Figure 9 in Appendix A). The SACMA population was observed to have approximately 300 plants; the population at the Sander Road parcel had approximately 200 plants.

**Impacts of the Proposed Project – Short-term Elements.** Grading for the Runway 14 RSA would occur within an area that supports one the Airport's two populations of pappose tarplant (see Figure 10 in Appendix A). Therefore, the Proposed Project would adversely affect pappose tarplant.

**Impact 3.2.4:** Loss or disturbance of a pappose tarplant population.

**Mitigation Measure 3.2.4:** The County shall implement the following mitigation measures for potential impacts to pappose tarplant:

Following seed-set in the late summer/early fall (September - November), prior to the year in which construction is scheduled, seeds shall be collected from stands of pappose tarplant within the Airport Study Area. The harvested seeds shall be properly stored and shall be used to re-establish one or more new stands of tarplant within the Airport Study Area, following completion

of grading. The Project Biologist shall supervise and document compliance with the mitigation measure and shall subsequently prepare a report summarizing compliance.

**Impacts of the Proposed Project – Long-term Elements.** Long-term elements of the Proposed Project would not affect this species.

### **3.2.5 Sebastopol Meadowfoam (*Limnanthes Vinculans*)**

**Description.** Sebastopol meadowfoam is a federal and state-listed Endangered species. It is an annual herb in the meadowfoam family (Limnanthaceae). Sebastopol meadowfoam occupies vernal pools/swales and wet grasslands and meadows, commonly in valley oak savanna on poorly drained soils of clay and sandy loam. A more detailed description of this species and its life history is found in the botanical surveys report (LSA 2011b).

**Distribution.** Sebastopol meadowfoam is endemic to the vicinity of the Plain, with the exception of one population (likely introduced) at the Yountville Ecological Preserve in Napa County. There are 40 recorded occurrences of Sebastopol meadowfoam, 33 of which are presumed extant (CNDDDB 2011). The distribution of the meadowfoam occurs mainly in the central and southern portions of the Plain, south of Santa Rosa Creek. Two occurrences are outside of the Plain but in the nearby vicinity, one at Atascadero Creek Marsh, west of Sebastopol, the other in the region of Knights Valley, northeast of Windsor.

**Occurrence in Airport Vicinity.** The closest known occurrence of Sebastopol meadowfoam in the Airport Vicinity is a transplanted population located at the Airport Business Center mitigation site, approximately 0.2 mile to the northeast (Occurrence No. 50 - see Figure 5 in Appendix A). The next closest occurrence is approximately 0.8 mile southeast of the Airport Study Area in the Wood Road-Woolsey Road vicinity (Occurrence No. 28 - see Figure 5 in Appendix A). This occurrence was originally observed in 1976, but was not observed during a subsequent survey in 1983 and may be extirpated (CNDDDB 2011). Occurrence No. 21 is located at the Alton Lane Preserve approximately 2.2 miles southeast of the Airport Study Area (see Figure 5 in Appendix A). This record was observed in 1998 and was verified by botanists in 2009 (LSA 2011b). This occurrence is also presumed to be an introduced population. Occurrence No. 18 (approximately 3.0 miles south of the Airport Study Area) is presumed to be extirpated based on surveys in 1983 and 1990, and may in fact have been confused with a record for Sonoma sunshine (CNDDDB 2011). Occurrence No. 47 (approximately 3.6 miles southeast of the Airport Study Area) is an extant population that was observed in 2002 (CNDDDB 2011).

**Occurrence within the Airport Study Area.** The CNDDDB maps one historic occurrence of Sebastopol meadowfoam in a swale near the area that is presently the Sonoma County Airport's Goldfields Preserve (see Figure 9 in Appendix A). This occurrence is extirpated; it was not observed by botanists in the Goldfields Preserve during repeated surveys between 2002 and 2010 (LSA 2011b). The apparent reason for the loss of this occurrence is that the swale no longer provides suitable habitat for this species; the swale is now dominated by freshwater marsh perennials (Pavlik, et al. 1998, as cited in CNDDDB 2011). During 2003-2004 and again in 2009-2010, botanists paid particular attention to vernal pools and seasonal wetlands in the southern portion of the Airport Study Area, due to the presence of dense cover by Douglas' meadowfoam (*Limnanthes douglasii*), a meadowfoam

also associated with vernal pools and other mesic areas. Sebastopol meadowfoam was not observed in these locations or elsewhere in the Airport Study Area during these surveys.

**Impacts of the Proposed Project.** Sebastopol meadowfoam does not occur within the Airport Study Area and therefore no populations of this plant species would be affected by the Proposed Project. Additionally, the Proposed Project would not affect the single wetland within which this species historically occurred. However, under the Conservation Strategy and PBO, all of the Airport's vernal pools and other seasonal wetlands are considered to be suitable habitat for Sebastopol meadowfoam. Loss of such habitat is considered an adverse impact to Sebastopol meadowfoam because the habitat may retain a remnant seed bank for this species. The Proposed Project would result in the loss of 4.4 acres of suitable Sebastopol meadowfoam habitat. Therefore, the Proposed Project would adversely affect Sebastopol meadowfoam.

**Impact 3.2.5:** Loss of 4.4 acres of suitable habitat for Sebastopol meadowfoam.

**Mitigation Measure:** The County shall implement Mitigation Measure 3.2.1, as described above for Burke's goldfields.

**Impacts of the Proposed Project – Long-term Elements.** Implementation of the following long-term elements would have the potential to affect suitable Sebastopol meadowfoam habitat depending on the future proposed locations of these elements and their specific designs: new air traffic control tower, new taxi lanes for private use hangars, air cargo facility, and replacement run-up apron for Runway 32.

### **3.2.6 Sonoma Sunshine (*Blennosperma Bakeri*)**

**Description.** Sebastopol meadowfoam is a federal and state-listed Endangered species. It is an annual species in the sunflower family (Asteraceae) that occupies vernal pools, swales, and mesic grasslands. A more detailed description of this species and its life history is found in the botanical surveys report (LSA 2011b).

**Distribution.** Sonoma sunshine is endemic to Sonoma County. The CNDDDB (2011) records 27 populations, 22 of which are presumed extant. Five occurrences, two of which are extirpated, are outside the Plain in Sonoma Valley. The remaining populations (two of which are considered extirpated) are found on the Plain, predominantly to the west and northwest of Santa Rosa.

**Occurrence in Airport Vicinity.** The closest known occurrence of Sonoma sunshine in the Airport Vicinity is a transplanted population located at the Airport Business Center mitigation site, approximately 0.2 mile to the northeast (see Figure 5 in Appendix A). The next closest occurrence is 1.6 miles to the southeast (Occurrence No. 6) in the vicinity of Wood Road. This occurrence was recorded in 1993 and was verified in 2007-2008 by botanists (LSA 2008). In addition, there are nine other CNDDDB occurrences, most of which are presumed extant, within 5 miles of the Airport Study Area (see Figure 5 in Appendix A).

**Occurrence within the Airport Study Area.** Sonoma sunshine is not known to occur in the Airport Study Area and was not observed by botanists during appropriately timed surveys in 2003 and 2004

and again in 2009 and 2010 (LSA 2011b). There are no known historic occurrences in the Airport Study Area.

**Impacts of the Proposed Project.** Sonoma sunshine does not occur within the Airport Study Area, nor have any historic sub-populations of this plant species been recorded. Therefore, no populations of this plant species would be affected by the Proposed Project. However, under the Conservation Strategy and PBO, all of the Airport's vernal pools and other seasonal wetlands are considered to be suitable habitat for Sonoma sunshine. Loss of such habitat is considered an adverse impact to Sonoma sunshine because the habitat may retain a remnant seed bank. The Proposed Project would result in the loss of 4.4 acres of suitable Sonoma sunshine habitat. Therefore the Proposed Project would adversely affect Sonoma sunshine.

**Impact 3.2.6:** Loss of 4.4 acres of suitable habitat for Sonoma sunshine.

**Mitigation Measure:** The County shall implement Mitigation Measure 3.2.1, as described above for Burke's goldfields.

**Impacts of the Proposed Project – Long-term Elements.** Implementation of the following long-term elements would have the potential to affect suitable Sonoma sunshine habitat depending on the future proposed locations of these elements and their specific designs: new air traffic control tower, new taxi lanes for private use hangers, air cargo facility, and replacement run-up apron for Runway 32.

### 3.3 SPECIAL-STATUS ANIMAL SPECIES ABSENT FROM THE AIRPORT STUDY AREA

Table B summarizes all animal species analyzed using the data sources and selection criteria described in Section 2.4 and 2.5. The table contains all species listed by the USFWS for the Sebastopol, Healdsburg, Santa Rosa and Mark West Springs USGS 7.5-minute quadrangles, regardless of whether there are occurrences or suitable habitat for these species in the Airport Vicinity. The table also contains all species in the CNDDDB for the four USGS quadrangles cited above that occur in the Airport Vicinity or have a reasonable potential to occur based on their distribution and habitat requirements.

Suitable habitat occurs in the Airport Vicinity for the following terrestrial special-status animal species listed in Table B. Suitable habitat also occurs in the Airport Vicinity, downstream of the Airport Study Area, for the following salmonid species in Table A. However, all the species discussed in this Section are assumed to be absent from the Airport Study Area for the reasons described below; therefore, the Proposed Project would not affect these species:

#### 3.3.1 California Freshwater Shrimp (*Syncaris Pacifica*)

**Description.** California freshwater shrimp is a federal and state-listed Endangered species. It is a year-round residents of low elevation (less than 380 feet) perennial creeks with a low gradient (generally less than one percent) in Marin, Sonoma, and Napa counties. The only other species in the

genus, *Syncaris pasadenae*, occurred in streams in the Los Angeles Basin in southern California; it was last collected in 1933 and is now almost certainly extinct (Martin and Wicksten 2004).

As described in the *California Freshwater Shrimp Recovery Plan* (USFWS 1998b) and Martin and Wicksten (2004), optimal habitat for California freshwater shrimp includes creeks that are 12-36 inches deep, with exposed live roots of trees, such as alder (*Alnus* sp.) and willow (*Salix* sp.), along completely submerged undercut banks (horizontal depth greater than 6 inches), with overhanging vegetation and vines. During the winter, shrimp are found beneath the undercut banks among the fine roots or overhanging vegetation. These areas provide shelter from high water velocities. During the summer, shrimp may become restricted to deeper pools as the creeks begin to dry. These pools also generally have overhanging vegetation on which the shrimp forage for fine particulate matter. Shrimp are not typically found in creek reaches with boulder and bedrock bottoms.

California freshwater shrimp are likely prey for a wide variety of predaceous and opportunist vertebrates and invertebrates including California roach, three-spine stickleback, steelhead, western pond turtle, California newt (*Taricha torosa*), California giant salamander (*Dicamptodon ensatus*), water scorpions (*Ranatra* spp.), predaceous diving beetles and dragonfly, and damselfly nymphs. Introduced fish species such as common carp, and western mosquitofish all prey on this species.

**Distribution.** California freshwater shrimp is currently known from 17 creek segments in Marin, Napa, and Sonoma counties (Martin and Wicksten 2004, USFWS 1998b). The distribution of shrimp can be separated into four drainage units: (1) tributary streams in the lower Russian River drainage which flow westward to the Pacific Ocean, (2) coastal streams flowing westward directly into the Pacific Ocean, (3) streams draining into Tomales Bay, and (4) streams flowing southward into northern San Pablo Bay. Many of the shrimp populations are now isolated from one another in disjunct drainage units. In Sonoma County, California freshwater shrimp are known to have occurred or currently occur in 11 creeks.

**Occurrence in Airport Vicinity.** There are no creeks in the Airport Vicinity that are known to support California freshwater shrimp. The three closest creeks known to support California freshwater shrimp are Blucher Creek (a tributary to the Laguna de Santa Rosa), Jonive Creek, and Green Valley Creek (both of which flow directly into the Russian River near Rio Dell). All these creeks are over five miles from the Airport Study Area. Mark West Creek, located just south of the Airport Study Area may also provide suitable habitat for California freshwater shrimp, based on the prevalence of exposed roots and vegetation extending into the water, and the creek's historic perennial flows. Nonetheless, this species has not been observed in the creek.

**Occurrence within the Airport Study Area.** There are no records of California freshwater shrimp within the Airport Study Area, and the species is assumed to be absent from the Airport Study Area. Based on a habitat assessment conducted within Redwood Creek and Airport Creek (LSA 2006b), neither creek provides suitable habitat for California freshwater shrimp due to a lack of undercut banks that are needed to provide refuge during high flows, and due to a paucity of exposed roots and vegetation extending into the water on which the shrimp can move and forage. Neither creek historically provided suitable shrimp habitat because of their original ephemeral conditions. Both creeks originate in small drainage basins that would not have provided adequate runoff for perennial

**Table B: Special Status Animal Species Potentially Occurring at the Charles M. Schulz Sonoma County Airport**

Species	Status	Habitat	Occurrence or Potential for Occurrence in Airport Study Area
American Badger <i>Taxidea taxus</i>	SSC	Open country, grasslands, pasture, and open woodlands with friable soils and abundant small mammal populations.	Potentially suitable habitat in grasslands in the Airport Study Area, but is generally rare on the Plain. No potential dens observed within the Airport Study Area.
Burrowing owl <i>Athene cucicularia</i>	SSC	Open habitat; nests and roosts primarily in ground squirrel burrows, but will use other natural or artificial underground retreats. Ground squirrel burrow complexes provide the most important source of shelter and nesting sites.	Observed within the Airport Study Area in 2003 just west of Taxiway Y (see Figure 9 in Appendix A). Is likely to occur occasionally in the Airport Study Area as a winter visitor or migrant; not known to nest there. The absence of ground squirrels in the Study Area greatly reduces habitat suitability for burrowing owl nesting.
California coastal chinook salmon ESU <i>Oncorhynchus tshawytscha</i>	FT	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Does not occur in creeks in the vicinity of the Airport but does occur in the Russian River and in Santa Rosa Creek.	Not likely to occur in the Airport Study Area due to lack of suitable habitat. Creeks within the Airport Study Area (Redwood and Airport Creeks) are warm water creeks with muddy bottoms that do not provide suitable spawning or rearing habitat.
California freshwater shrimp <i>Syncaris pacifica</i>	FE, SE	Perennial creeks with pools (12-36 inches deep) and undercut banks with exposed live root tangles. Species requires non-degraded creeks without introduced aquatic predators. Not known to occur in creeks in the vicinity of the Airport, however Mark West Creek may provide suitable habitat for this species.	Not likely to occur in the Airport Study Area due to lack of suitable habitat; Redwood and Airport Creeks do not provide suitable habitat conditions for this species due to degraded conditions and lack of undercut banks.
California red-legged frog <i>Rana draytonii</i>	FT, SSC	Freshwater marshes, streams, ponds, and other semi-permanent water sources. Suitable breeding ponds and pools usually have a minimum depth of 20 inches, and must contain water during the entire development period for eggs and tadpoles (typically March through August). No records of occurrence in the Airport Vicinity or anywhere on the Plain.	Not likely to occur in the Airport Study Area due to lack of suitable habitat. Aquatic habitat areas in the Airport Study Area are not suitable for breeding due to an abundance of bullfrogs and predatory fishes.

Species	Status	Habitat	Occurrence or Potential for Occurrence in Airport Study Area
California tiger salamander <i>Ambystoma californiense</i>	FE, ST	Vernal pools or other fish-free ephemeral water bodies with sufficient hydroperiods for larval development; adjacent uplands with an abundance of small mammal burrows as non-breeding season habitat. Occurs on the Plain – this population is considered genetically distinct from other populations in the State (“Distinct Population Segment” - DPS). The Airport is within the USFWS proposed Critical Habitat area for this DPS.	Airport Study Area contains suitable movement and dispersal habitat. However, this species is unlikely to occur in the Airport Study Area due to distance from the nearest known breeding site (3.2 miles – see Figure 10 in Appendix A) and lack of suitable breeding habitat.
Central California Coast coho salmon ESU <i>Oncorhynchus kisutch</i>	FE, SE	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Present in the Russian River, Mark West Creek and some associated tributaries. Windsor, Pool and Mark West Creeks are NMFS Critical Habitat for this species. Other tributaries of these creeks are potential Critical Habitat if the tributaries are accessible to salmonids. These creeks and tributaries may also be Essential Fish Habitat for this species.	Not likely to occur in the Airport Study Area due to lack of suitable habitat. Creeks within the Airport Study Area (Redwood and Airport Creeks) are warm water creeks with muddy bottoms that do not provide suitable spawning or rearing habitat.
Central California Coast steelhead ESU <i>Oncorhynchus mykiss</i>	FT	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Present in the Russian River, Mark West Creek and some associated tributaries, including Windsor Creek, downstream of Redwood and Airport Creeks, as well as Pool Creek. Windsor, Pool and Mark West Creeks are NMFS Critical Habitat for this species. These creeks and tributaries may also be Essential Fish Habitat for this species.	Not likely to occur in the Airport Study Area due to lack of suitable habitat. Creeks within the Airport Study Area (Redwood and Airport Creeks) are warm water creeks with muddy bottoms that do not provide suitable spawning or rearing habitat.
Central Valley steelhead ESU <i>Oncorhynchus mykiss</i>	FT	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Does not occur in creeks in the vicinity of the Airport, nor on the Plain.	Does not occur within the Airport Study Area.

Species	Status	Habitat	Occurrence or Potential for Occurrence in Airport Study Area
Central Valley spring-run chinook salmon ESU <i>Oncorhynchus tshawytscha</i>	FT, ST	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Does not occur in creeks in the vicinity of the Airport, nor on the Plain.	Does not occur within the Airport Study Area.
Loggerhead shrike <i>Lanius ludovicianus</i>	SSC (nesting)	Open habitat, such as grasslands and ranchlands with scattered trees or shrubs for nesting; uses fences or other elevated perch sites.	Not observed within the Airport Study Area, however the Airport Study Area provides suitable nesting and foraging habitat.
Northern harrier <i>Circus cyaneus</i>	SSC (nesting)	Forages over open habitats, such as grasslands, pastures, marshes, and fields with large populations of voles and other small rodents. Nests on the ground in similar habitat. This species is a fairly common resident in Sonoma County with an increase in numbers as migrants arrive as winter visitors.	Observed within the Airport Study Area. Suitable nesting habitat is present within the Airport Study Area's grasslands.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT, SSC	Old-growth forests with tree canopies that are high and open enough for the owls to fly between and underneath the trees. Preferred areas have large trees with broken tops, deformed limbs or large holes used as nesting sites.	Does not occur in the Airport Study Area due to lack of suitable habitat.
Pallid bat <i>Antrozous pallidus</i>	SSC	Roosts in crevices in rock outcrops; in expansion joints under bridges; in hollows in large old trees, and occasionally in old buildings. Forages on large terrestrial insects in open habitats.	Could forage within the Airport Study Area, but suitable roosting habitat is minimal. There are no rocky outcrops or large trees with suitable cavities for roosting, but old out-buildings in the southeastern corner of the Study Area and the abandoned bunker near Taxiway B may have roosting potential.
Sacramento River winter-run chinook salmon ESU <i>Oncorhynchus tshawytscha</i>	FE, SE	Clear cool riffles with gravel or cobble substrate for spawning; clear, cool riffles and pools as rearing habitat. Does not occur in creeks in the vicinity of the Airport, nor on the Plain.	Does not occur within the Airport Study Area.
Tri-colored blackbird <i>Agelaius tricolor</i>	SSC (nesting colonies)	Nests in colonies of large stands of freshwater marsh vegetation, has nested in large patches of thistle and other rank green weedy growth.	A nesting colony occurred historically in the Airport Vicinity. Suitable habitat present in marsh areas but not observed within the Airport Study Area. Unlikely to occur as a nesting species due to the small extent of freshwater marshes.

Species	Status	Habitat	Occurrence or Potential for Occurrence in Airport Study Area
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SSC	Roosts in old buildings, mines, and caves; forages over a variety of habitat types.	Could forage within the Study Area, but suitable roosting habitat is minimal. There are no rocky outcrops, but old out-buildings in the southeastern corner of the Study Area and the abandoned bunker near Taxiway B may have some roosting potential.
Western pond turtle <i>Actinemys marmorata</i>	SSC	Ponds, marshes, and streams with deep pools with basking sites and suitable upland areas outside the flood zone with friable soils for egg laying.	Observed in Pond 6 and Airport Creek (see Figure 9 in Appendix A). May also occur in other ponds in the Airport Study Area and in deep pools in Redwood, Creek and Ordinance Creeks.
White-tailed kite <i>Elanus leucurus</i>	CFP	Forages over open habitats, such as grasslands, pastures, and fields with large populations of voles and other small rodents. Nests in isolated trees and along the edges or woodlands near open areas.	Observed within the Airport Study Area and may nest in isolated willow stands or in the riparian woodlands along Redwood, and Airport Creeks.
Yellow warbler <i>Dendroica petechia</i>	SSC (nesting)	Nests in large stands of willow riparian woodlands.	Observed within the Airport Creek riparian corridor in the Airport Study Area. Could nest within willow scrub and riparian woodland areas.
Yellow-breasted chat <i>Icteria virens</i>	SSC (nesting)	Nests in large stands of willow riparian woodlands with dense understory.	Not observed within the Airport Study Area. Willow scrub habitat area may provide suitable nesting habitat; nesting could also occur in willow stands within riparian woodland areas.

FE – Listed as Endangered under the federal Endangered Species Act

TE – Listed as Threatened under the federal Endangered Species Act

SE – Listed as Endangered under the State of California Endangered Species Act

ST – Listed as Threatened under the State of California Endangered Species Act

CFP – State of California Fully Protected Species

SSC – California Department of Fish and Game Species of Special Concern

SSC (nesting) - California Department of Fish and Game Species of Special Concern when nesting.

flows. Their current more perennial hydrology appears to be associated primarily with urban runoff from the extensive developed and landscaped areas upstream of the Airport Study Area and winter storm flows. Given these past and present conditions, it is unlikely that California freshwater shrimp ever occurred in Redwood or Airport Creeks.

Martin and Wicksten (2004) emphasize that California freshwater shrimp are highly vulnerable to habitat degradation and introduced aquatic predators. All of the creek segments assessed in the Airport Study Area are degraded to varying degrees by upstream uses (agriculture, urban and road drainage, and flood control activities), increased sedimentation, pollution from highway runoff, and/or the presence of non-native aquatic predators.

**Impacts of the Proposed Project.** Based on the foregoing analysis, the short-term and long-term elements of the Proposed Project would not adversely affect California freshwater shrimp.

### 3.3.2 California Red-Legged Frog (*Rana Draytonii*)

**Description.** CRLF is a federally-listed Threatened species and is a California Species Special Concern that occurs in and along freshwater marshes, streams, ponds, and other semi-permanent water sources. Optimal habitat contains dense emergent or shoreline riparian vegetation closely associated with deep (i.e., greater than 2.3 ft), still, or slow-moving water (Jennings and Hayes 1994). Although CRLF can occur in intermittent streams and ponds, they are unlikely to persist in streams in which all surface water disappears annually (Jennings and Hayes 1994). Suitable breeding ponds and pools usually have a minimum depth of 20 inches, but CRLF sometimes breed successfully in pools as shallow as 10 inches (Fellers 2005). Regardless of water depth, suitable breeding habitat must contain water during the entire development period for eggs and tadpoles (typically March through August).

Adult CRLF are primarily aquatic, although adjacent upland habitats are also important since they are used by adult and juvenile CRLF while escaping high water during flood events, estivating, and dispersing to other aquatic habitats. During times of dispersal, CRLF are known to relocate more than one mile away from breeding sites through upland habitat to reach other sources of water (USFWS 2002).

**Distribution.** The historic range of CRLF extended southward along the coast from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding in Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985). California Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central Coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges.

CRLF occurring west and north of San Francisco Bay drainages and the Walker Creek Drainage in Marin County were not included in listing rule of May 23, 1996 (USFWS 1996). However, the recent final Critical Habitat rule for CRLF failed to exclude these populations, specifically stating that the species is listed wherever found (USFWS 2010). The USFWS also advised the authors of this BRR that they believe CRLF to be absent from most of the Plain, except in the southwestern corner of the Plain (south of Highway 116) and the area north of Mark West Creek (which includes the Airport)

where the USFWS does not feel enough survey data currently exists (Ben Solvesky, USFWS pers. com.).

**Occurrence in Airport Vicinity.** There are no recorded occurrences of CRLF in the Airport Vicinity, nor anywhere on the Plain. The nearest known occurrence is approximately 12.7 miles southeast of the Airport Study Area in Ledson Marsh in Annadale State Park (CNDDDB 2011). A detailed study of the potential for CRLF to occur in lands to the west of the Airport (including a portion of lands within the Airport Vicinity) was conducted for the nearby Town of Windsor's Eastside Road Storage Project (Rana Resources/CH2MHill 2008). This study included analysis of aquatic habitats in the region, and summarized the results from other protocol-level surveys of nearby aquatic habitats, including protocol surveys previously conducted by PRMD at the Airport for another project. The study found that all survey results in the region were negative and all surveyed aquatic features were determined to be poor habitat for CRLF, largely due to the presence of bullfrogs, western mosquito fish (*Gambusia affinis*), largemouth bass and other aquatic predators (Rana Resources/CH2MHill 2008). Additionally, the study states that CRLF habitat assessments conducted by Biologist David Cook in 2006 along Airport and Redwood Creeks did not find any potential CLF habitat.

**Occurrence within the Airport Study Area.** CRLF is assumed to be absent from the Airport Study Area based their lack of occurrence on the Plain, and based on the results of a site assessment and aquatic surveys conducted by wildlife biologists for the Proposed Project (LSA 2011c). The assessment and surveys included seine net sampling of Ponds 4 and 6, and sein net/dip net sampling of nine reaches of Airport and Redwood Creeks (in association with salmonid surveys). All sampling results were negative with respect to CRLF. Results indicated the following: (1) the ponds in the Airport Study Area are unlikely to provide suitable habitat for CRLF breeding and rearing due to their perennial to near perennial nature and the associated presence of populations of non-native aquatic species such as American bullfrogs, largemouth bass, and bluegill; (2) Airport and Redwood Creeks are also unlikely to provide suitable habitat for CRLF due to an abundance of non-native aquatic species such as red swamp crayfish (*Procambarus clarkii*), western mosquito fish (*Gambusia affinis*), and American bullfrogs.

**Impacts of the Proposed Project.** Based on the foregoing analysis, the short-term and long-term elements of the Proposed Project would not adversely affect CRLF.

### **3.3.3 Central California Coast Evolutionary Significant Unit (ESU) of Steelhead (*Oncorhynchus Mykiss*)**

**Description.** The following discussion of this species is based on Moyle (2002) and NMFS (1996, 1998, 2005). Central California Coast steelhead is a federally-listed Threatened species and is a California Species Special Concern. It is a native salmonid of the North Pacific Ocean and the associated fresh water drainages of western North America and northeast Asia. Steelhead have a complex life cycle, with some fish exhibiting anadromy (spawning in freshwater, juveniles migrating to the ocean, then adults returning to spawn in their natal freshwater rivers and creeks) and others being freshwater residents, spending their entire lives in freshwater.

In the Russian River system (including the Windsor and Mark West Creek tributaries), steelhead spawning runs generally occur between December and the end of April. Steelhead movements are

determined by the breeding condition of the fish and winter rainfall patterns. Most steelhead enter the Russian River from December to February, but often remain in the main river for some time and do not enter smaller tributary streams, such as Windsor and Mark West Creeks, until runoff events occur. Rainstorms cause the water to rise and turbidity to increase. Shortly thereafter, as flow and turbidity in the swollen creeks begin to decrease, the fish typically move upstream. This pattern may be considerably modified, for example, by lack of rainfall at the appropriate time, in which case fish may take advantage of any rise in stream flow, however minor, that might occur.

Steelhead require specific types of habitat for nest-building (nests are referred to as redds) and spawning, for successful incubation of the eggs, and for feeding and rearing of the young fish prior to their becoming smolts and making their downstream migration to the sea. Steelhead spawn in areas where water depth ranges from 4 to 28 inches. The general requirements for this species include coarse, clean, well-oxygenated gravel for making redds, where the embryos will be allowed to develop undisturbed, at appropriate temperatures and with ample water movement to supply oxygen and remove metabolic wastes. The optimal temperature range for spawning in northern California is approximately 39-57°F. Incubation time decreases with increasing temperature, but higher temperatures also increase the virulence of pathogens and the toxicity of any harmful contaminants in the water. Water temperatures above 64°F are generally unfavorable, and sustained temperatures above 72-77°F are lethal to embryos and juveniles.

Developing embryos require high dissolved oxygen levels (near saturation) within the redd. Maintenance of high oxygen levels depends on a continuous flow of well-oxygenated water through the gravel; thus, the gravel must be fairly coarse (usually 0.8-4.0 inches diameter); stream velocity above the gravel should be in the range of 0.7-2.9 feet/second; and the gravel must be free from excessive quantities of suspended or deposited sediment. Accumulations of fine sediment (< 0.08 inches particle size) resulting from erosion, logging, poor agricultural practices, reduced stream velocity, etc., directly affect viability of embryos, emerging fry, and juveniles. In addition, sedimentation reduces the carrying capacity of the stream by reducing invertebrate food production and available shelter in crevices beneath cobble and boulders.

After emerging from the gravel, juvenile (often referred to as parr) steelhead continue to require well-aerated, cool, clean water free from excessive loads of sediment, as well as a supply of invertebrate food and shelter for resting and protection from predators. Steelhead fry are inclined to occupy riffles; however, in small California streams such as Windsor Creek, riffle surface areas greatly diminish during the dry season relative to pools, and steelhead occur mainly in pools in these instances. Steelhead eggs hatch in three to four weeks. Juvenile steelhead typically spend one to two years rearing in freshwater before migrating to estuarine areas as smolts and then into the ocean to feed and mature. Steelhead can then remain at sea for up to three years before returning to fresh water to spawn.

**Distribution.** Steelhead were historically distributed throughout the North Pacific Ocean from the Kamchatka Peninsula in Asia to the northern Baja Peninsula. Currently, this species occurs from the Kamchatka Peninsula, east and south, along the western coast of North America to at least San Mateo Creek in San Diego County. This species occurs in both coastal streams and inland waters (usually referred to as redband trout in inland streams).

**Occurrence in the Airport Vicinity.** Steelhead occur in suitable habitat throughout the Russian River drainage; however, spawning areas are concentrated in the middle and upper reaches of its tributary streams. Although suitable spawning habitat is present mainly in the tributary streams (e.g., Mark West Creek), the river and its major tributaries are essential movement corridors for fish migrating up and downstream to and from the spawning areas. In the Airport Vicinity, steelhead occur (depending on the season) in the Laguna de Santa Rosa, Mark West Creek, Pool Creek, and Windsor Creek (see Figure 5 in Appendix A).

Pool Creek (immediately northeast of the Airport Study Area), Windsor Creek (to which Airport Creek flows approximately 0.7 mile downstream of the Airport Study Area), and Mark West Creek (immediately south of the Airport Study Area) are all designated as Critical Habitat for steelhead (see Figure 5 in Appendix A). These creeks may also qualify as Essential Fish Habitat (EFH) for salmonids under the Magnuson-Stevens Act (see letters from the NMFS – Appendix G).

**Occurrence within the Airport Study Area.** There are no records of steelhead from Redwood or Airport Creeks. These creeks do not contain suitable spawning, rearing, or migration habitat for steelhead; it is therefore unlikely that steelhead could occur in the creeks. As noted in Section 3.3.1, both creeks are warm water bodies that were probably ephemeral before upstream development and associated landscaping provided a perennial water source through urban runoff. The tributaries have relatively small watersheds not typically associated with perennial or long-intermittent streams; they do not extend east of U.S. Highway 101 and do not receive runoff from the foothills to the east. During summer low flows, the creeks tend to be turbid from local runoff.

The unsuitability of Redwood and Airport Creeks as habitat for steelhead or other salmonids was ascertained by biologists who conducted a steelhead habitat assessment and sampling within the Airport Study Area (LSA 2006b, 2011c). Field observations verified that both creeks are slow flowing with mud banks and bottoms. Suitable spawning, rearing, or migration habitat for steelhead was not found; there were no observed riffle areas with suitable coarse gravelly spawning beds. A more detailed analysis of the suitability of the two creeks for salmonids was conducted in 2011 by biologists Eric Lichtwardt and Michael H. Fawcett, Ph.D., who characterized and sampled nine reaches of Redwood and Airport Creeks upstream, downstream and within the Airport Study Area (LSA 2011c). None of the stream reaches had habitat conditions suitable for salmonid spawning or rearing. Stream reaches were generally characterized by slow moving, turbid or muddy waters with muddy streambeds with moderately high water temperatures. Water temperatures (64° – 69° F) were well above the range suitable for spawning or juvenile rearing. No salmonids were captured during the surveys; all fish captured were warm water fish species, as follows: threespine stickleback (*Gasterosteus aculeatus*), fathead minnows (*Pimephales promelas*), western mosquito fish (*Gambusia affinis*), California roach (*Hesperoleucus symmetricus*), and several prickly sculpin (*Cottus asper*). Additionally, bullfrog tadpoles and red swamp crayfish (*Procambarus clarkii*) were found.

**Impacts of the Proposed Project.** The Proposed Project would not cause direct impacts to steelhead since suitable habitat does not occur within the Airport Study Area. The Proposed Project would also not cause indirect impacts to steelhead occurring 0.7 mile downstream in Windsor Creek because the Proposed Project would include a range of water quality and hydro-modification management measures that would protect downstream waters.

Water Quality protection would be implemented under the Proposed Project's SWPPP, and would include the following standard measures: (1) limiting in-stream work in Airport Creek to a single dry season under low flow conditions; (2) the use of temporary cofferdams upstream and downstream of all in-stream work areas in Airport Creek to isolate the work areas from the stream and prevent sediment discharges downstream; (3) the use of desilting basins for all dewatering from isolated stream reaches between cofferdams; (4) restoration of stream beds and banks following grading work and pre-rainy season hydroseeding of banks with a suitable erosion control seed mix; (5) prohibiting discharges into Airport Creek or its tributaries of substances toxic to aquatic life; (6) prohibiting discharges of fill material, including asphalt or concrete, soil, or other materials into the creek downstream of the construction area; (7) restricting stream water contact with wet concrete; (9) placing equipment maintenance and fueling areas well away from the creek bank; and (10) preparation of an emergency response and cleanup plan.

Post-project water quality protection impacts in downstream waters would be avoided under the Proposed Project's SUSMP (Tyson Robertson, P.E., Brelje & Race Consulting Engineers, pers. com.). Under the SUSMP, new pavement areas would be designed to avoid direct drainage to Airport Creek. Rainfall would drain towards the pavement edges and sheet flow through the adjacent vegetated buffer areas, similar to the pre-project drainage conditions. The natural vegetated buffer areas would provide initial infiltration and treatment prior to being discharged into the existing creek systems.

Post-project hydro-modification of downstream waters in Airport and Windsor Creeks would also be avoided through the Proposed Project's SUSMP, which would require limitation on total impervious area (TIA) and on-site detention of stormwater. Under post-project conditions, the TIA within the 1,060-acre Airport would increase from approximately 215 acres to 240 acres (a 2 percent increase in the percentage of Airport impervious area). A new detention basin would be provided to accommodate the 100-year storm event; a separate new retention basin would be sized to retain the volume increase from the 2-year, 24-hour storm event. The new basins would accommodate the runoff from all impervious surfaces to be implemented on the northern portion of site that drains to Airport Creek (a tributary area of approximately 310 acres). The runoff volume generated from the 2-year, 24-hour storm would increase slightly from approximately 57 acre-feet in the existing condition to approximately 60 acre-feet for the project (an increase of 3 acre-feet over existing conditions). The basins would retain the volume and detain the peak flow from at least the 2-year, 24-hour storm event to pre-project conditions, which is the currently accepted criterion in Sonoma County for mitigation of the potential for downstream impacts as a result of hydro-modification for a given project. Therefore, impacts to Windsor Creek from hydro-modification (virtually absent for 2-year events or less) of its local tributary, Airport Creek, would not be significant.<sup>19</sup>

Under post-project conditions, the Proposed Project would not significantly increase water temperatures in steelhead habitat downstream in Windsor Creek. The Proposed Project would result in an increase in unshaded or poorly shaded creek channel in Airport Creek from 350 linear feet

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<sup>19</sup> The south portion of the Airport eventually drains to Mark West Creek. There are three distinct locations where the airport drainage leaves the site to the south. At each of these locations, existing natural basin features currently provide detention and retention of most runoff from the southern portion of the project and will continue to do so post-construction. Therefore, the Proposed Project would not cause hydro-modification of Mark West Creek.

under current conditions to 1,415 linear feet, resulting in summertime water temperature increases in stream waters. However, these temperature increases would be mitigated by two factors: (1) the 650 linear feet of Airport Creek that would be confined to an underground culvert which would serve to permanently cool stream water temperatures; and (2) the remaining approximately 3,400 linear feet of shaded stream channel downstream of the Airport that would also cool summertime flows. Moreover, the entire Redwood/Airport Creek system is a relatively small flow contributor to Windsor Creek (approximately 10 percent of the total watershed); the volume of flow contribution in the summer is much smaller when flow in Airport Creek is minimal.

Based on the foregoing analysis, the short-term and long-term elements of the Proposed Project would not adversely affect Central California Coast steelhead ESU.

**Impacts on Critical Habitat.** Critical Habitat for Central California coast steelhead ESU is found within the Airport Vicinity (but not within the Airport Study Area) along segments of Pool Creek, Windsor Creek, and Mark West Creek (see Figure 5 in Appendix A). The short-term and long-term elements of the Proposed Project would not destroy or adversely modify Critical Habitat for Central California Coast steelhead ESU for the reasons cited above.

### **3.3.4 Central California Coast Evolutionary Significant Unit (ESU) Of Coho Salmon (*Oncorhynchus Kisutch*)**

**Description.** The following discussion of this species is based on Moyle (2002) and NMFS (2009). Central California Coastal coho salmon is a federal and State Endangered species. The coho salmon is an anadromous salmonid species. In contrast to the life history patterns of other anadromous salmonids, coho salmon on the west coast of North America generally exhibit a relatively simple 3-year life cycle. Adults typically begin their freshwater spawning migration in the late summer and fall, spawn by mid-winter, and then die. Run and spawn timing of adult coho salmon vary between and within coastal and Columbia River Basin populations. Depending on river temperatures, eggs incubate in “redds” (gravel nests excavated by spawning females) for 1.5 to 4 months before hatching as “alevins” (a larval life stage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles, or “fry,” and begin actively feeding. Juveniles rear in fresh water for up to 15 months, then migrate to the ocean as “smolts” in the spring. Coho salmon typically spend two growing seasons in the ocean before returning to their natal streams to spawn as 3 year-olds. Some precocious males, called “jacks,” return to spawn after only 6 months at sea.

In the 1940s, the estimated abundance of coho salmon in this ESU ranged from 50,000 to 125,000 natural spawning adults. Today, it is estimated that there are probably less than 6,000 naturally reproducing coho salmon, and the vast majority of these fish are considered to be of non-native origin (either hatchery fish or from streams stocked with hatchery fish). Sufficient quantities of good quality water are essential for coho survival, growth, reproduction, and migration. Important elements of water quality include the following: (1) water temperatures within the range that corresponds with migration; (2) rearing and emergence needs of fish; and (3) the aquatic organisms upon which they depend. Desired conditions for coho salmon include an abundance of cool, well-oxygenated water that is present year round, free of excessive suspended sediments and other pollutants.

**Distribution.** Coho salmon were historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, and from the Anadyr River, Russia, south to Hokkaido, Japan. Historically, this species probably inhabited most coastal streams in Washington, Oregon, and northern and central California. Some populations, now considered extinct, are believed to have migrated hundreds of miles inland to spawn in tributaries of the upper Columbia River in Washington, and the Snake River in Idaho.

**Occurrence in the Airport Vicinity.** Coho salmon occur in suitable habitat in the Russian River drainage, including the main stem of the Russian River and in Mark West Creek where their numbers appear to have been enhanced by a local captive broodstock program (University of California 2011). They may also occur in Windsor Creek. Coho salmon migrate up the Russian River from mid-November to January and spawn primarily in December through January (SCWA 2004). Smolts emigrate downstream March through May. Although suitable spawning habitat is present mainly in the smaller tributary streams (e.g., the upper Mark West Creek watershed), the river and its major tributaries are essential movement corridors for fish migrating up and downstream to and from the spawning areas.

**Occurrence within the Airport Study Area.** There are no records of coho salmon from Redwood or Airport Creeks. These creeks do not contain suitable spawning, rearing, or migration habitat for coho and they are unlikely to support this species. As noted in Section 3.3.2, both creeks are warm water bodies that were probably ephemeral before upstream development and associated landscaping provided a perennial water source through urban runoff. The tributaries have relatively small watersheds not typically associated with perennial or long-intermittent streams; they do not extend east of U.S. Highway 101 and do not receive runoff from the foothills to the east. During summer low flows, the creeks tend to be turbid from local runoff.

The unsuitability of Redwood and Airport Creeks as habitat for salmonids was ascertained by biologists who conducted salmonid habitat assessment and sampling of both creeks within and near the Airport Study Area (LSA 2006b, 2011c). Field observations verified that both creeks are slow flowing with mud banks and bottoms. Suitable spawning, rearing, or migration habitat for salmonids was not found; there were no observed riffle areas with suitable coarse gravelly spawning beds. As described above for steelhead, no salmonids were collected during stream sampling of these two creeks (LSA 2011c).

**Impacts of the Proposed Project.** The short-term and long-term elements of Proposed Project would not cause direct impacts to coho salmon since suitable habitat does not occur within the Airport Study Area. The Proposed Project would also not cause indirect impacts to coho salmon potentially occurring 0.7 mile downstream in Windsor Creek because the Proposed Project would include a range of water quality and hydro-modification management measures that would protect downstream waters, as described above in Section 3.3.3. Based on the foregoing analysis, the Proposed Project would not adversely affect Central California Coast coho salmon ESU.

**Impacts on Critical Habitat.** Under federal regulations (50CFR Part 226), Critical Habitat for Central California coast coho salmon ESU occurs within all accessible creeks in the Mark West Creek watershed, provided that the creeks are capable of supporting coho salmon. Therefore Pool Creek, Windsor Creek, and Mark West Creek would all qualify as Critical Habitat. Redwood and Airport Creeks would be unlikely to qualify as Critical Habitat because habitat conditions are unsuited for

supporting salmonids. Therefore, the short-term and long-term elements of the Proposed Project would not destroy or adversely modify Critical Habitat for Central California Coast coho salmon ESU for the reasons cited above.

### **3.4 SPECIAL-STATUS ANIMAL SPECIES PRESENT OR POTENTIALLY PRESENT IN THE AIRPORT STUDY AREA**

The following species listed in Table A occur within the Airport Study Area or have suitable habitat in the study area:

#### **3.4.1 American Badger (*Taxidea Taxus*)**

**Description.** The American badger is a California Species Special Concern; it has no federal listing status. It is a carnivorous mammal that forages and digs burrows in grassland, scrub, and woodland habitats. Badgers eat ground squirrels, pocket gophers, and other small prey such as mice, reptiles, insects, earthworms, and birds. Badgers are solitary, nocturnal creatures, foraging at night and then remaining underground during the daylight hours. They dig burrows with 8-12 inch elliptical (wider than tall) entrances in friable soils for cover. This animal frequently reuses old burrows, although some have been known to dig a new den each night, especially in summer. They are most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas. Cultivated lands have been reported to provide little usable habitat for this species (Williams 1986).

**Distribution.** This species was once fairly widespread throughout the open grassland habitats of California. Badgers are now an uncommon, permanent resident found throughout most of the state, with the exception of the northern North Coast area (Zeiner et. al. 1990).

**Occurrence in Airport Vicinity.** The closest occurrence of American badger is approximately 4.4 miles to the south of the Airport (see Figure 6 in Appendix A) (CNDDDB 2011). American badgers have an average home range of 2,100 acres (U.S. Forest Service 2011). Consequently, the Airport Study Area is likely to be outside the range of the CNDDDB occurrence. However, undocumented occurrences of badgers could occur closer to the Airport given the presence of suitable grassland and open woodland habitat in the surrounding lands.

**Occurrence within the Airport Study Area.** Badgers are rare on the Plain but nevertheless could inhabit grassland/ruderal areas and the more open parts of oak woodlands in the Airport Study Area. The grasslands/ruderal habitats associated with the former landfill west of Taxiway W (see Figure 11 in Appendix A), in the areas of Airport Creek and along Windsor Road generally provide the following suite of attributes potentially suitable for American badgers (U.S. Forest Service 2011): (1) sufficient prey base – i.e. large populations of pocket gophers; (2) relatively open, uncultivated ground; and (3) dry friable soils that can be readily excavated. Although the first two attributes characterize the runway infield portion of the Airfield Study Area and in the grasslands west and north of Runway 1-19, the third attribute does not. As discussed above for burrowing owls, soils within the infield area are generally not well drained and subject to ponding as evidenced by the presence of extensive areas of wetlands and by the irrigation system. Portions of this area may however be dry enough in the summer to support this species.

Badgers were not observed within the Airport Study Area during field surveys; potential den sites were not observed, nor was there any evidence of badger digs. However, systematic (protocol level) surveys for badgers have not been conducted and potentially suitable habitat occurs. Therefore, the potential for this species to be present cannot be ruled out.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and grading activities for the Proposed Project in open grasslands and woodlands would have the potential to destroy American badger dens, if present. Therefore, the Proposed Project would have the potential to adversely affect American badgers.

**Impact 3.4.1:** Potential destruction or disturbance of occupied American badger dens, if present.

**Mitigation Measure 3.4.1:** The County shall implement the following avoidance and minimization measures prior to and during construction:

- 1. Pre-construction Surveys.** A pre-construction survey for the presence of the badger dens and signs of badger occupancy shall be conducted by the Project Biologist in all grasslands that would be affected by the Proposed Project and within 100 feet of the project limits. The survey shall be completed no more than seven days prior to the initiation of ground-disturbing activities. Pre-construction surveys shall be repeated as necessary if ground-disturbing activities are delayed or postponed.
- 2. Den Monitoring.** If potential dens are observed within the project area or the 100-foot buffer area, then the Project Biologist shall implement a monitoring program to determine if the dens are active. Monitoring shall be done using remote triggered cameras or tracking media placed at the den entrance. Cameras or tracking media shall be operated for a minimum of three nights. If no activity is observed at the den during the monitoring period, then the den shall be excavated by hand on the morning following the third night of monitoring. The den shall be backfilled to prevent reuse. All den excavations shall be coordinated with the CDFG.
- 3. Monitoring of Active and Natal Dens.** If a den is determined to be active, the den shall be monitored for an additional 3 nights to determine if the badgers are using the den continually. Special care shall be taken during the period of March through July when badger cubs may be present in the den. Excavation of natal dens shall not be allowed until it is determined by the Project Biologist that the young have left the den and are able to forage independently. The presence of a natal den within the project area or buffer area shall be reported to CDFG within 24 hours.
- 4. Den Excavation.** During the entire year, no excavation of the dens shall be allowed until monitoring results demonstrate that the den has been unoccupied for at least three nights. Once the den has been determined to be unoccupied for a period of at least three nights, the den may be excavated by hand and backfilled.
- 5. Den Blocking.** Outside of the period when young may be present in the den (August through February), measures may be taken to discourage the use of continually occupied dens. This may include blocking the entrance to the den or other methods approved by CDFG. The den must be monitored during this period to ensure that badgers are not occupying the den. Excavation and backfilling may occur once the den is determined to be unoccupied for at least three nights.

6. **Reporting.** Within 30 days of completion of relocation work, the Project Biologist shall prepare a report documenting all badger den monitoring, excavation, and blocking work conducted for the project.

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities for any long-term elements in grassland/ruderal habitats would have the potential to affect American badgers for the reasons cited above. Whether such impacts could occur would depend on the future proposed locations of these elements.

### 3.4.2 Burrowing Owl (*Athene Cunicularia*)

**Description.** The burrowing owl is a California Species Special Concern; it has no federal listing status. Burrowing owls occur in open, well-drained grasslands with abundant small mammal burrows, particularly those of California ground squirrels (Shuford and Gardali 2008). This species has undergone substantial population declines throughout central and coastal California, primarily due to habitat loss (DeSante et al. 1997). Burrowing owls prefer areas with short vegetation and are often found in human-modified areas including riprap, concrete, and rubble piles.

**Distribution.** Burrowing owls are distributed throughout California, except the coastal counties north of Marin County where they are rare (Shuford and Gardali 2008). They were once abundant but have undergone considerable decline in population, particularly where urbanization has occurred in the central and southern coastal regions of the state. They have been observed only sparingly in Sonoma County (Burrige 1995, Shuford and Gardali 2008).

**Occurrence in Airport Vicinity.** Burrowing owls occur only as a rare winter visitor or migrant on the Plain, and are not known to nest there. The CNDDDB does not report any occurrences on the Plain.

**Occurrence within the Airport Study Area.** A single burrowing owl was observed by LSA biologists during January 2003 within the Airport Study Area (see Figure 6 in Appendix A). This observation is consistent with the premise that burrowing owls are expected to occur occasionally on the Plain as a rare winter visitor or migrant, but are not known to nest on the Plain. The absence of ground squirrels on the Plain and in the Airport Study Area greatly reduces the habitat suitability for burrowing owls.

The paucity underground retreats, such as ground squirrel burrows, would limit the suitability of the Airport Study Area as breeding or wintering habitat for this burrowing owls. Botta's pocket gopher burrows occur commonly throughout the grassland/ruderal habitats in the Airport Study Area, but these burrows are generally too small to be used by burrowing owls. Nevertheless, burrowing owls have been documented in the Imperial Valley to occasionally use the burrows of this species by enlarging the existing burrows where soils are not compacted (Shuford and Gardali 2008). Gophers are also a major prey species for burrowing owls, so an abundance of gophers at the Airport would provide a large prey base for burrowing owls.

Although the Airport Study Area does not support ground squirrels, there are potentially suitable burrow sites found at numerous culverts, debris and rubble piles around the Airport (see Figure 11 in Appendix A). The former landfill area west of Taxiway W contains various rubble and debris piles that could provide suitable burrow habitat (see Figure 11 in Appendix A).

Burrowing owls have adapted to human-altered and disturbed environments and often occur within airport infields where the following habitat attributes typically exist: (1) open, well-drained terrain, (2) short, sparse vegetation that allows visibility of approaching predators, and (3) underground burrows (LSA 2009). The grasslands within the infield of the Airport Study Area (between Runways 1-19 and 14-32), and in the grasslands west and north of Runway 1-19, generally do not provide this combination of habitat attributes. Although these areas contain short grassland vegetation that is regularly mowed, much of these areas are poorly drained as evidenced by the prevalence of extensive areas of seasonal wetlands (see Figure 11 in Appendix A). These drainage conditions are probably exacerbated by the regular wastewater irrigation that is conducted in the much of the infield (see Figure 11 in Appendix A). More importantly, the lack of suitable underground burrows would suggest that occupied burrows probably do not occur in the infield.

Wildlife biologist have not observed evidence of occupied burrowing owl burrows (e.g. molted feathers, scat pellets, prey remains, whitewash at burrow entrances) within the Airport Study Area. However, systematic (protocol level) surveys for burrowing owls have not been conducted. Under CDFG guidelines, the observed presence of a single burrowing owl is sufficient to consider a site as occupied habitat, regardless of whether or not occupied burrows are seen (CDFG 1993). Therefore, based on the presence of limited suitable burrow sites (primarily culverts and debris/rubble piles) and the observed presence of one individual of this species, the potential for burrowing owls to be present in occupied burrows within the Airport Study Area cannot be ruled out.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and grading activities for the Proposed Project in open grassland/ruderal areas would have the potential to destroy burrowing owl burrows, and/or disturb breeding owls, if present. Therefore, the Proposed Project would have the potential to adversely affect burrowing owls.

**Impact 3.4.2:** Potential destruction or disturbance of occupied burrowing owl nesting sites, if present.

**Mitigation Measure 3.4.2:** The County shall implement the following avoidance and minimization measures prior to and during construction:

- 1. Pre-construction Surveys.** The Project Biologist shall conduct pre-construction surveys within grasslands and within all potential human-made structures (e.g., culvert, debris piles) that will be affected by proposed project construction work. Surveys shall be conducted during the breeding season (February 1 and August 31), no more than 30 days prior to the anticipated start of construction. Surveys shall be conducted from one hour before to two hours after sunrise and/or two hours before to one hour after sunset in order to maximize the opportunity of observing owls on the site. If ground-disturbing work is delayed or suspended for more than 30 days following the preconstruction survey, the Project Biologist shall re-survey the site within 7 days of the start of construction.
- 2. Standard Buffer Zones.** If breeding or wintering burrowing owls are observed in the construction area, avoidance measures shall be implemented in accordance with the standardized CDFG protocols. No disturbance shall occur within 160 feet of occupied

burrows during the non-breeding season of September 1 through January 31 or within 250 feet during the breeding season of February 1 through August 31.

3. **Non-standard Buffer Zones.** Construction buffers may be reduced from the distances provided above if a site-specific analysis prepared by the Project Biologist indicates that the nesting pair(s) or wintering owl(s) would not be adversely affected by construction activities. CDFG must approve this analysis before construction can proceed. If a smaller buffer is approved by CDFG, the Project Biologist shall conduct monitoring for a minimum of 10 consecutive days following the initiation of construction to verify that the nesting pair does not exhibit adverse reaction to construction activities (e.g., changes in behavioral patterns, reactions to noise), and to verify that the burrows are not in danger of collapse due to equipment traffic. Monitoring shall continue at least once a week through the nesting/wintering cycle at that site to verify that no change in behavior by the owls occurs.
4. **Passive Relocation.** Passive relocation measures may be implemented to encourage owls to move away from the work area prior to construction, subject to the approval of CDFG. Passive relocation would entail the installation of one-way doors in the burrows. The doors would be left in place for a minimum of 48 hours, and monitored daily to evaluate owl exclusion and to ensure doors are functioning properly. Burrows would then be excavated, using hand tools whenever possible, and re-filled to prevent reoccupation. Sections of flexible plastic pipe would be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.
5. **Reporting.** Within 30 days of completion of relocation work, the Project Biologist shall prepare a report documenting all passive relocation work conducted for the Proposed Project.

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities for any long-term elements in grasslands and ruderal areas would have the potential to affect burrowing owls for the reasons cited above. Whether such impacts could occur would depend on the future proposed locations of these elements.

### 3.4.3 California Tiger Salamander (*Ambystoma Californiense*)

**Description.** The following discussion of CTS biology is based on Shaffer and Trenham (2005) and Stebbins (2003). The Santa Rosa Plain Distinct Population Segment of CTS is a federally-listed Endangered species; CTS is also a state-listed Threatened species. Elsewhere in California, the species is federally-listed as Threatened, except for the Santa Barbara DPS, which is also listed as Endangered. Suitable habitat for CTS occur within seasonal wetlands, vernal pools, or slow-moving, calm streams that typically do not support fish, bullfrogs, red swamp crayfish (*Procambarus clarkii*), or signal crayfish (*Pacifastacus leniusculus*). Upland habitat with small mammal burrows must be adjacent or near to the breeding habitat.

CTS spend the majority of their lives underground in California ground squirrel (*Spermophilus beecheyi*) or Botta's pocket gopher burrows, or in other suitable underground retreats. On the Plain, where California ground squirrels appear to be absent or very rare, CTS use primarily pocket gopher burrows. CTS emerge from their burrows on only a few nights each year during the rainy season to migrate to their breeding ponds. Breeding ponds and streams usually hold water through the month of May to allow time for larvae to fully metamorphose.

**Distribution.** CTS occur in central California from the central Sacramento Valley to the central San Joaquin Valley and surrounding foothills of both the Coast Range and the Sierra Nevada. The species is also recorded from the San Francisco Bay region, the Monterey Bay region, and valleys and foothills in San Luis Obispo and Santa Barbara counties. The actual occurrence of the species within this range is restricted to locations where aquatic breeding sites are surrounded by suitable upland habitat.

**Occurrence in Airport Vicinity.** The majority of CTS occurrence records on the Plain are located southwest of Santa Rosa (i.e., over 7.5 miles) south of the Airport (CNDDDB 2011). Although the Airport is within the presumed historic geographic range of CTS, there are no records of natural occurrences of this species within the Airport Vicinity. The closest known occurrence of this species is an introduced population located approximately 3.2 miles southeast of the Airport at the Alton Lane Mitigation Site (see Figures 5 and 12 in Appendix A). The landscape surrounding the Airport is dominated by agricultural land uses (e.g., vineyards) and developed areas generally not favorable to CTS; however, there are also sizable patches of non-native grassland and pasture land (see Figure 12 in Appendix A).

The Alton Lane Mitigation Site, south and west of Alton and Fulton roads, respectively, is a mitigation site composed of naturally-occurring and artificially-created vernal pools and swales. CTS larvae were first reported at the site in 1996 and then again in 2002 (CNDDDB 2011). However, the occurrence of CTS at this site is the result of introduced individuals and not a naturally-occurring population (CH2MHill 1995). The next closest known, extant breeding area is at the CDFG Wright Mitigation Bank at Wright Avenue and Hall Road about 6 miles south of the Airport. Another large breeding site occurs about 6.5 miles south of the Airport at Kelly Farm and Duer Road.

CTS are considered potentially present in the Airport Vicinity based on a presumed historic range (Conservation Strategy Team 2005). However, there are no known records of CTS in the northern portion of the Plain (i.e., north of Mark West Creek) and the only known occurrence north of Santa Rosa Creek is the introduced population at the Alton Lane Mitigation Site, discussed above. Biologists have also conducted aquatic surveys for CTS larvae at a number of locations within the Airport Vicinity over the past few years; larva have not been found on any of these sites (LSA 2005a). Other aquatic features along Windsor Road on the west side of the Airport were sampled as part of the City of Santa Rosa's Geysers Recharge project and no CTS were observed (Tim Lacy, LSA Wildlife Biologist, pers. com.). Field sampling and distributional information all suggest that CTS are absent from the area around of the Airport.

A large portion of the Plain, including the Airport Study Area, is currently proposed as Critical Habitat for the Sonoma County Distinct Population Segment of CTS, pursuant to a proposed rule published August 18, 2009 (74FR 41662 41673). A final rule of this designation has not yet been approved; nevertheless, federal ESA guidelines require the proposed designation to be considered when assessing impacts under Section 7 of the federal Endangered Species Act.

**Occurrence within the Airport Study Area.** Field sampling (see below) and distributional information suggest that CTS does not occur in the vicinity. All of the records of occurrences of CTS are 3.2 miles or more from the Airport, well beyond the distances of 0.4 to 1.0 miles that CTS are known to travel during movements to breeding sites (USFWS 2009c). There are no known

populations of CTS in the northern portion of the Plain (i.e., north of Mark West Creek) and the only known occurrence north of Santa Rosa Creek is the population at the Alton Road site which is apparently introduced.

Despite the probable absence of CTS from the Airport Study Area, field assessments by biologists have verified the presence of suitable upland dispersal habitat. Botta's pocket gopher (*Thomomys bottae*) burrows occur commonly throughout the Airport Study Area's annual grasslands and ruderal areas. Pocket gopher burrows provide important upland habitat for CTS during the dry season. California ground squirrel (*Spermophilus beecheyi*) appears to be absent as is generally the case throughout much of the Plain.

Suitable breeding habitat does not occur within the Airport Study Area. Vernal pools and seasonal wetlands that occur within the Airport Study Area are generally too shallow to provide suitable breeding habitat for CTS. Nevertheless, biologists have dip-net surveyed the deeper pools and swales found in the Goldfields Preserve, SACMA, and the SACMA-2 Preserve between 2001 and 2007. The pools were sampled once each spring (in years when the pools retained surface water into the mid-spring) on an annual basis and no CTS larvae have been observed (LSA 2007). The Pacific treefrog (*Pseudacris regilla*) is the only amphibian that has been observed in the pools.

The Airport Study Area also contains several man-made ponds constructed for borrow materials and other purposes (see Figure 7 in Appendix A). These ponds are not suitable as breeding sites for CTS due to the observed presence of American bullfrogs and predatory fishes, including both native and non-native species. Bullfrogs have been observed in Pond 4; largemouth bass, and blue gills have been observed in Pond 6. The unsuitability of the ponds for CTS was verified by aquatic surveys in the spring of 2011. Seining results indicated the presence of a large breeding population of bullfrogs in Pond 4 and a large breeding population of largemouth bass in Pond 6 (LSA 2011b).

CTS is unlikely to occur within the Airport Study Area based on the lack of historical records of CTS from the northern portion of the Plain (i.e., north of Santa Rosa Creek), distance from known populations and migratory barriers, the negative finding of various surveys for CTS in the Airport Vicinity, and the unsuitability of ponds as potential breeding habitat. Nevertheless, under the Conservation Strategy and the PBO, the Airport is located within the region of the Plain within which all non-hardscaped lands are considered to be suitable habitat for CTS (see Figure 8 in Appendix A). Therefore, the Airport Study Area supports suitable habitat for this species (see Figure 13 in Appendix A).

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would temporarily affect 91.6 acres and permanently affect another 38.9 acres of suitable habitat for CTS (see Figure 13 in Appendix A). (Temporary impacts would occur in grassland and ruderal areas that would be temporarily disturbed by grading activities during construction but would not be hardscaped.) Therefore, the Proposed Project would adversely affect CTS.

**Impacts on Proposed Critical Habitat – Short-term Elements.** The Airport Study Area occurs within the boundaries of proposed Critical Habitat for the Sonoma County distinct population of the CTS (USFWS 2009c). Under the Proposed Project, approximately 61.6 acres of proposed Critical Habitat area would be temporarily affected and another 38.9 acres would be permanently affected.

Therefore, the Proposed Project has the potential to destroy or adversely modify Proposed Critical Habitat for the Sonoma County Distinct Population of CTS.

**Impact 3.4.3:** Potential take of California tiger salamanders; loss of suitable habitat for CTS.

**Mitigation Measure 3.4.3-A:** In order to avoid or minimize take of CTS, the County shall implement the following avoidance and minimization measures to be applied before and during construction work. These measures are consistent with the Conservation Strategy and PBO, which allow standard avoidance and minimization measures to be adjusted or selectively applied based on site-specific factors. Given the improbability of CTS actually occurring at the Airport, avoidance and minimization measures shall be limited to the following:

1. **USFWS Approved Project Biologist.** A USFWS approved biologist (Project Biologist) shall monitor construction work, and shall have the authority to halt construction work as needed to ensure compliance with the measures contained herein. Work shall commence only when authorized by the Project Biologist. Only USFWS approved biologists shall be allowed to handle CTS.
2. **Daily Monitoring.** Before the start of work each day, a construction monitor shall check for CTS under any equipment such as vehicles and stored pipes.<sup>20</sup> The monitor shall also check all steep-walled holes or trenches greater than 1-foot deep for CTS. If a CTS is found, the biological monitor shall immediately contact the Project Biologist, who shall be responsible for capturing and translocating the CTS in accordance with the requirements of the PBO.
3. **Equipment Maintenance.** All equipment shall be maintained such that no leaks of automotive fluids such as gasoline, oils, or solvents will occur. Hazardous materials such as fuels, oils, solvents, etc., shall be stored in sealable containers in a designated location that is at least 200 feet from aquatic habitats. All fueling and maintenance of vehicles and other equipment and staging areas shall be located at least 200 feet from any aquatic habitat.
4. **Construction Timing.** In order to avoid the potential for take of adult CTS which migrate across upland areas during the rainy season, grading and clearing work shall only be conducted between April 15 and October 15, of any given year, depending on the level of rainfall and site conditions. Any grading or clearing work conducted between October 16 and April 14 shall only be conducted with the prior approval of CDFG and USFWS.
5. **Revegetation.** Project areas temporarily disturbed by construction activities shall be revegetated with an erosion control seed mix containing grassland species native to the Plain.

**Mitigation Measure 3.4.3-B:** As compensation for temporary adverse impacts to 91.6 acres and permanent adverse impacts to 38.9 acres of suitable CTS habitat, the County shall implement either of the following mitigation Projects in accordance with the interim mitigation guidelines of the Conservation Strategy and the requirements of the PBO:

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<sup>20</sup> A designated construction monitor shall be one or more supervisory construction personnel who are trained by the Project Biologist to verify compliance with all biological avoidance and minimization measures.

- 1. Mitigation Credit Purchase.** The County shall acquire 26.1 acres of CTS mitigation credits from a USFWS/CDFG-approved off-site mitigation or conservation bank on the Plain, resulting in an overall mitigation ratio of 0.2:1.<sup>21</sup>
- 2. Dedicated Mitigation Site.** The County shall preserve at least 26.1 acres of CTS habitat at an off-site mitigation area on the Plain. The off-site mitigation area shall be approved by the USFWS, and shall be managed in perpetuity under a USFWS/CDFG-approved conservation easement, management plan, and non-wasting endowment. The mitigation habitat may be at the same location as the plant mitigation habitat required under Section 3.1 above. A 5-year monitoring plan for verifying compliance with this mitigation measures shall be prepared by the Project Biologist. The monitoring plan shall include detailed monitoring protocols, performance goals, reporting requirements, and potential remedial measures; the plan shall be subject to the review and approval of the USFWS and CDFG prior to the start of work.

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities for long-term elements not proposed within existing developed areas would have the potential to temporarily or permanently affect suitable habitat for CTS, for the reasons cited above. Whether such impacts could occur would depend on the future proposed locations of these elements.

#### **3.4.4 Loggerhead Shrike (*Lanius Ludovicianus*)**

**Description.** Loggerhead shrike is a California Species Special Concern; it has no federal listing status. Loggerhead shrikes occur in open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. Their preferred habitat contains shrublands and open woodlands where there is extensive grass cover and areas of bare ground within which they prey upon large insects, small birds, and small mammals. They also need “impaling” sites (e.g., barbed wire fences, thorny, multi-stemmed fences) for prey manipulation and storage (Shuford and Gardali 2008). Shrikes primarily nest in the lower branches of dense shrubs and tall trees, although they have also been observed nesting in buildings and debris piles (LSA obs.).

**Distribution.** This species is distributed throughout California except for mountain ranges at higher elevations. They are uncommon in Sonoma County, where their numbers have been substantially reduced from historic levels (Shuford and Gardali 2008).

**Occurrence in Airport Vicinity.** There are no documented breeding occurrences of this species within the Airport Vicinity (CNDDDB 2011).

**Occurrence within the Airport Study Area.** Although no shrikes have been observed in the Airport Study Area, shrikes could potentially nest in the site’s trees and large shrubs, and forage in the open grasslands. Suitable nesting habitat would be found where grasslands abut oak and riparian woodlands, and possibly where debris piles are found in grassland and ruderal areas.

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<sup>21</sup> Under USFWS and Corps policies for the Santa Rosa Plain, units of mitigation may serve multiple habitat/species mitigation needs. For example, mitigation banks offer the sale of credits that simultaneously meet CTS/plant/wetland mitigation needs. Therefore, the mitigation acreages described above for impacts to listed plants may also help fulfill CTS mitigation needs (e.g., the 4.4 acres of plant preservation/wetland creation credits may also provide 4.4 acres of CTS mitigation credits).

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and general construction work for the Proposed Project in grasslands and woodlands would have the potential to destroy or disturb occupied loggerhead shrike nesting sites, if present. Therefore, the Proposed Project would have the potential to adversely affect loggerhead shrikes.

**Impact 3.4.4:** Potential disturbance of occupied loggerhead shrike nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities for any long-term elements in grasslands and woodlands would have the potential to affect loggerhead shrike nesting sites for the reasons cited above. Whether such impacts could occur would depend on the future proposed locations of these elements.

### 3.4.5 Northern Harrier (*Circus Cyaneus*)

**Description.** The northern harrier is a California Species Special Concern; it has no federal listing status. The preferred habitats of northern harriers are freshwater wetlands and salt marshes, although they are also commonly found over grasslands and agricultural fields with large populations of voles and other small rodents (Shuford and Gardali 2008). Harriers breed from mid-March to September, building their nests on the ground, largely within undisturbed patches of dense tall vegetation.

**Distribution.** Northern harriers are widespread in California, although they have become uncommon in the southern part of the state where many local populations have been extirpated (Shuford and Gardali 2008).

**Occurrence in Airport Vicinity.** This species is a fairly common resident in Sonoma County with an increase in numbers as migrants arrive as winter visitors. They also occur relatively commonly on the Plain and within the Airport Vicinity (Burrige 1995).

**Occurrence within the Airport Study Area.** Northern harriers have been observed flying over the Airport Study Area (LSA 2010a). Suitable nesting habitat is found within grasslands in the Airport Study Area, however, no nests have been observed during field surveys conducted during the breeding season (LSA 2006c, 2010a). Since most grasslands at the Airport are mowed, the lack of tall patches of vegetation may limit the availability potentially suitable nesting site. Additionally, human disturbance is a known source of nest failures for this species (Shuford and Gardali 2008). Mowing of grasslands could disturb or destroy nest sites; active airport operations, including aircraft and vehicular movements, could limit the suitability of potential nesting habitats. Nevertheless, due to the observed presence of this species in the Airport Study Area, there exists a potential for nesting to occur in grassland areas.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and general construction work for the Proposed Project in grasslands would have the potential to destroy or disturb occupied northern harrier nesting sites, if present. Therefore, the Proposed Project has the potential to adversely affect northern harriers.

**Impact 3.4.5:** Potential disturbance of occupied northern harrier nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities for any long-term elements in grasslands would have the potential to affect northern harrier nesting sites for the reasons cited above. Whether such impacts could occur would depend on the future proposed locations of these elements.

### **3.4.6 Pallid Bat (*Antrozous Pallidus*)**

**Description.** The pallid bat is a California Species Special Concern; it has no federal listing status. Pallid bats prefer open, lowland areas and roost in cliff fissures, abandoned buildings, and under bridges (Jameson and Peeters 2004). They are commonly found in dry habitats with rocky areas for roosting. They primarily roost in rock crevices and buildings. Pallid bats feed on insects such as crickets and scorpions, and are capable of consuming up to half their weight in insects every night. Preferred foraging habitat for pallid bats occurs in open areas, such as grasslands, where their foraging flights are 2 – 8 feet above the ground (Zeiner et. al. 1990).

**Distribution.** Pallid bats are year round residents throughout California except for the higher elevation areas. The species is not common in Sonoma and Napa Counties; only one substantial extant roosting site has been documented (Bolster 1998).

**Occurrence in Airport Vicinity.** Several pallid bat occurrences have been documented in the Airport Vicinity. The closest occurrence is approximately 2.9 miles from the Airport outside the Plain (CNDDDB 2011).

**Occurrence within the Airport Study Area.** All open habitat types within the Airport Study Area (grasslands and ruderal areas, open areas of woodlands) provide suitable foraging habitat for this species. Although riparian woodlands could potentially provide marginally suitable day roosting habitat, the woodlands in the Airport Study Area are unlikely to support this species due to a lack of trees with large hollows (cavities) suitable for roosting. Suitable night roosts are typically in more open sites (Zeiner et. al. 1990). The abandoned bunker south of Taxiway B and the old out-buildings in the southeastern corner of the Airport Study Area may provide suitable night roost sites for this species.

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would not disturb any of suitable roosting sites for this species (i.e., the abandoned bunker south of Taxiway B, the old out-buildings in the southeastern corner of the Airport Study Area). Therefore the Proposed Project would not affect this species.

**Impacts of the Proposed Project – Long-term Elements.** Property acquisition under the long-term Proposed Project elements could potentially affect this species if the acquisition were to entail demolition of abandoned buildings and other structures.

### 3.4.7 Townsend's Western Big-Eared Bat (*Corynorhinus Townsendii*)

**Description.** Townsend's western big-eared bat is a California Species Special Concern; it has no federal listing status. Townsend's western big-eared bats lives in a variety of habitats, primarily moist sites within coastal conifer and broad-leaf forests, oak woodlands, arid grasslands and deserts, and high elevation forests and meadows. This bat species hibernates during the winter, often when temperatures are around 32° to 53°F, and forms feeding, maternity, and hibernation roosting colonies. Roosting sites include buildings, and other human-made structures free of human disturbance. This species is particularly vulnerable to human disturbance and will readily abandon roosting sites if visited by humans (Williams 1986).

**Distribution.** Townsend's western big-eared bats are year round residents throughout California except for the higher elevation areas. The species is not common in Sonoma and Napa Counties.

**Occurrence in Airport Vicinity.** There are no documented occurrences of this species within 10 miles of the Airport (CNDDDB 2011).

**Occurrence within the Airport Study Area.** Townsend's western big-eared bats could forage in the Airport Study Area. Suitable roosting habitat is limited to the old out-buildings in the southeastern corner of the Airport Study Area and the abandoned bunker south of Taxiway B.

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would not disturb any of suitable roosting sites for this species (i.e., the abandoned bunker south of Taxiway B, the old out-buildings in the southeastern corner of the Airport Study Area). Therefore the Proposed Project would not affect this species.

**Impacts of the Proposed Project – Long-term Elements.** Property acquisition under the long-term Proposed Project elements could potentially affect this species if the acquisition were to entail demolition of abandoned buildings and other structures.

### 3.4.8 Tricolored Blackbird (*Agelaius Tricolor*)

**Description.** Tricolored blackbird is a California Species Special Concern at its nesting colonies; it has no federal listing status. Tricolored blackbirds prefer to nest in large dense stands of emergent marsh vegetation, but will also nest in upland locations that support dense stands of herbaceous vegetation, such as large patches of thistle and other rank green weedy growth. They nest from mid-April through mid-July. This species will travel up to 4 miles to forage (Zeiner et al. 1990).

**Distribution.** This species occurs as a breeding species throughout the Central Valley of California as well as coastal counties from Sonoma County southward. In Sonoma County, they occur primarily in small flocks in coastal areas (Shuford and Gardali 2008).

**Occurrence in Airport Vicinity.** The CNDDDB does not list any breeding occurrences of this bird species within 10 miles of the Airport Study Area (CNDDDB 2011). However the Sonoma County Breeding Bird Atlas (Burrige 1995) reported several historical occurrences of breeding colonies on

the Plain, including one in the vicinity of the Sonoma County Airport (dated April 1976). The exact location of the historic breeding site near the Airport is unknown; however, if the breeding site is extant, it is unlikely to be in the Airport Study Area. Monthly surveys of birds within the Airport Study Area have not detected any colonies or individuals of this species (LSA 2006, 2010a).

**Occurrence within the Airport Study Area.** This species is unlikely to nest on the site due to the limited freshwater marsh habitat in the Airport Study Area. Nevertheless, the potential for this species to nest in the marsh areas associated with the ponds cannot be ruled out.

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project could remove or disturb potential nesting site for tricolored blackbirds, if present within the marsh areas (associated with the ponds) that would be filled.

**Impact 3.4.8:** Potential disturbance of occupied tricolored blackbird nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, tree removal or trimming, and construction activities for long-term elements in the vicinity of marsh areas would have the potential to affect tricolored blackbird nesting sites. This could include pond filling within acquired parcels, if proposed.

### 3.4.9 Western Pond Turtle (*Actinemys Marmorata*)

**Description.** Western pond turtle is a California Species Special Concern; it has no federal listing status. Western pond turtles use permanent or nearly permanent water bodies in a variety of habitat types, including ponds, marshes, rivers, streams, irrigation ditches, woodlands, and open forests. The aquatic habitat may be comprised of either mud or rocky substrates and usually contains some vegetation. Habitat quality often seems to be positively correlated with the number of available basking sites (Jennings and Hayes 1994).

Western pond turtles seem to avoid areas lacking in significant refugia (Holland 1994). Basking sites may be rocks, logs, vegetation, terrestrial islands within the aquatic habitat, and human-made debris. Upland habitats are also important to northwestern pond turtles for nesting, overwintering, and overland dispersal (Holland 1994). Nesting sites may be as far as 1,300 feet or more from the aquatic habitat, although usually the distance is much less (Jennings and Hayes 1994, Slavens 1995). In northern California, hatchling western pond turtles overwinter inside the nest chamber and emerge the following spring. Hatchlings utilize shallow, slow-moving waters with emergent vegetation, such as that found along side channels of stream or pond margins; while juveniles one year old or more tend to utilize the same aquatic habitats as adults.

**Distribution.** Western pond turtles are found primarily along Pacific slopes drainages in California at elevations ranging from sea level to 6,700 feet (Stebbins 2003). This species occur throughout much of the San Francisco Bay area, but has declined or been extirpated from many historic localities, especially in urban areas (Stebbins 2003).

**Occurrence in Airport Vicinity.** The CNDDDB records numerous occurrences of western pond turtle in the Airport Vicinity (see Figure 6 in Appendix A). The nearest occurrence is along Pool Creek immediately north of the Airport. This species commonly occurs along the Russian River.

**Occurrence within the Airport Study Area.** Western pond turtles occur in Pond 6 and along Airport Creek within the Airport Study Area; they are also likely to be present in other ponds and along the Redwood and Ordinance Creek corridors. All of these ponds and creek corridors contain suitable basking sites for this species (primarily mud banks) and suitable adjacent upland habitat for overwintering and nesting. The stream corridors also provide suitable hibernation habitat (e.g., leaf litter, tree root masses) for pond turtles to retreat to during high water stages. Foraging western pond turtles are known to move from pool to pool along creek corridors for distances of up to 3 miles (LSA 2009). Therefore, Airport and Redwood Creeks may support foraging pond turtles from adjacent stream reaches both upstream and downstream from the Airport.

Female pond turtles typically construct nests between 33 - 623 feet from a waterbody, however nests have been located as far as 1,318 feet from an aquatic site (LSA 2009). Most known nest sites occur on dry, well-drained soils with a high clay/silt content and a low (<15 degree) slope in open areas of grassland or herbaceous cover with little shrub or tree cover (LSA 2009). These conditions prevail in the vicinity of Pond 6 and in the upland areas adjacent to Airport and Redwood Creek riparian corridors (see Figure 14 in Appendix A). Therefore, a reasonable probability exists for nest sites to occur within upland areas proposed for grading in the vicinity of the Pond 6 and Airport Creek (see Figure 14 in Appendix A).

Pond 6 has an upland connection to Mark West Creek, which lies approximately 600 feet away, through a farm road passage beneath Laughlin Road (see Figure 14 in Appendix A). This passage may provide a movement corridor for western pond turtles moving between Pond 6 and Mark West Creek. Similarly, the Airport Creek corridor lies between 300 and 900 feet of Ponds 1 – 4 (see Figure 14 in Appendix A). These distances are all within the dispersal range of western pond turtles, which have the ability to move up to several miles across dry habitat in search of other waters. Pond turtles will disperse from ponds when the ponds dry, and will leave streams environments when waters are low and water temperatures are too hot, or under flood conditions.

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would remove Ponds 4 and 6, as well as an approximate 1,500-foot reach of Airport Creek. All of these habitats are occupied or potentially occupied by western pond turtles. The Proposed Project also would entail grading of upland areas adjacent to these aquatic features, potentially used as nesting, hibernating or dispersal habitat by pond turtles. As discussed above, there exist substantial areas of other suitable, connected habitat in other ponds and in Airport and Mark West Creeks that would be available for use by western pond turtles (and to which individual turtles could be relocated under the following mitigation measures). Therefore, the loss of occupied/suitable habitat under the Proposed Project is not a significant impact. However, the Proposed Project could result in the mortality or injury of individual pond turtles during construction, as a result of any of the following circumstances:

- 1) When disturbed, adult pond turtles typically will drop into the water and hide under rocks, logs or other debris, rather than migrate away from the water body. Pond and creek filling work would likely result in mortality or injury to such hiding turtles.
- 2) Earthmoving work could crush upland nesting sites of pond turtles.

- 3) Construction work could result in mortality or injury to adult pond turtles attempting to nest in adjacent upland sites within or near the construction area.

**Impact 3.4.9:** Mortality or injury to western pond turtles during construction.

**Mitigation Measure 3.4.9** Prior to the commencement of any earth-moving activity, construction, or vegetation removal in the vicinity of Ponds 4 and 6, and along the reach of Airport Creek affected by the project, the following measures shall be implemented:

1. **Temporary Fence Installation.** The contractor shall place a temporary chain link fence, two to three feet high, buried at least six inches deep between the proposed grading areas of Ponds 4 and 6 and the adjacent Ponds 3 and 5 to discourage adult female turtles from entering and nesting in the impact areas (see Figure 10 in Appendix A). The final fence design shall be subject to the approval of CDFG. Similarly, to the extent feasible, fencing shall be placed at the upstream and downstream limits of the Airport Creek work area (see Figure 10 in Appendix A), extending up the banks and into the adjacent uplands. Installation of the fencing shall be supervised by the Project Biologist. The fence mesh shall be of a size (approximately 3 by 3 inches) to allow hatchling turtles to pass through, but exclude adult females. This will allow hatching turtles that have over-wintered in the proposed grading area to leave the nest and return to the aquatic habitat. After the first year of grading, construction within the fenced areas can be conducted throughout the year because nesting females would have been excluded from these areas and nests would not be present. After construction is complete, the turtle exclusion fence may be removed.
2. **Pre-construction Surveys.** The project biologist shall survey the ponds and the creek habitat and any uplands that would be affected by construction work within 650 feet of the ponds and creek. This survey shall occur within two days of the onset of construction activities. If any pond turtles are encountered during the surveys, construction work may not commence in the vicinity until the biologist has relocated the pond turtle to nearby suitable, undisturbed aquatic habitat. The project biologist shall determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities.
3. **Daily Surveys.** A designated construction monitor shall conduct daily surveys in the fenced areas. If any western pond turtles are observed during the daily surveys, construction work shall cease until the project biologist has been notified and has relocated the turtles to nearby suitable, undisturbed habitat. The Project Biologist shall remain on call and be available, as needed, to relocate any western pond turtles discovered by the designated monitor during construction.
4. **Other Occurrences of Pond Turtles.** If any western pond turtles are found in other construction areas where fencing was deemed unnecessary, work shall cease until the project biologist has moved the individuals. The project biologist shall have the authority to stop all activities until appropriate corrective measures have been completed.
5. **Proper Field Practices.** To ensure that diseases are not conveyed between work sites by the project biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force shall be followed at all times (USFWS 2011).

6. **Reporting.** Within 30 days of the completion of pond turtle relocation work, the Project Biologist shall prepare a report documenting all pond turtle relocation work conducted for the project.

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, and construction activities within or in the vicinity of ponds and streams for any long-term elements would have the potential to affect western pond turtles for the reasons cited above. This could include pond filling within acquired parcels, if proposed.

#### **3.4.10 White-Tailed Kite (*Elanus Leucurus*)**

**Description.** White-tailed kite is designated by CDFG as a Fully Protected Species; it has no federal listing status. White-tailed kites nest in densely foliated trees and large shrubs located near suitable foraging habitat such as grasslands, marshes, and agricultural fields. They forage over open habitats with large populations of voles and other small rodents, and nest in isolated trees and along the edges or woodlands near open areas.

**Distribution.** The bulk of the state's population found in numerous counties west of the Sierra Nevada in lowlands and foothills, where it is often seen year-round. In Sonoma County, white-tailed kites are known to breed in open woodlands, grasslands and agricultural area in the southern part of the County, including along the Russian River and on the Santa Rosa Plain (Burridge 1995).

**Occurrence in Airport Vicinity.** The closest CNDDDB nesting occurrence is approximately 4.4 miles from the Airport.

**Occurrence within the Airport Study Area.** White-tailed kites have been observed foraging in the Airport Study Area, and may nest in the isolated willow stands or in the riparian woodlands along Redwood and Airport Creeks.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and tree removal work in the vicinity of the riparian woodlands along Airport Creek could destroy or disturb occupied white-tailed kite nests, if present.

**Impact 3.4.10:** Potential disturbance of occupied white-tailed kite nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, tree removal or trimming, and construction activities within the vicinity of riparian woodlands for any long-term elements would have the potential to affect white-tailed kites for the reasons cited above. This could include demolition and pond filling work within acquired parcels, if proposed.

### 3.4.11 Yellow-Breasted Chat (*Icteria Virens*)

**Description.** Yellow-breasted chat is a California Species of Special Concern at its nesting sites; it has no federal listing status. It nests in large stands of willow riparian woodlands with dense growths of understory vegetation, and other early successional riparian habitat with a well-developed shrub layer and open canopy.

**Distribution.** Yellow-breasted chat occurs in California as a migrant and summer resident. Its breeding habitat includes much of northern California, including Sonoma County, where it is known to breed in Annadel State Park (Shuford and Gardali 2008). It was known to occur historically in the Laguna de Santa Rosa (Burridge 1995).

**Occurrence in Airport Vicinity.** Although nesting by yellow-breasted chats has not been documented on the Plain, the species has been observed along Santa Rosa Creek and the Russian River in the vicinity of the Plain (Shuford and Gardali 2008). There are no documented breeding occurrences of this bird species within 10 miles of the Airport (CNDDDB 2011).

**Occurrence within the Airport Study Area.** This bird species is unlikely to nest in the Airport Study Area due to the limited willow riparian woodland present. However, the potential for this species to nest where willow scrub habitat (i.e. arroyo and red willow thickets) occur (i.e. along Airport Creek and within ponds) cannot be ruled out.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and tree removal work in the vicinity of the willow scrub habitats along Airport Creek and the ponds could destroy or disturb occupied yellow-breasted chat nests, if present.

**Impact 3.4.11:** Potential disturbance of occupied yellow-breasted chat nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, tree removal or trimming, and construction activities within or in the vicinity of willow scrub areas for any long-term elements would have the potential to affect yellow-breasted chats for the reasons cited above. This could include demolition and pond filling work within acquired parcels, if proposed.

### 3.4.12 Yellow Warbler (*Dendroica Petechia*)

**Description.** Yellow warbler is a California Species of Special Concern at its nesting sites; it has no federal listing status. It nests and forages primarily in riparian plant communities, particularly extensive willow thickets within riparian woodland habitat. In northern California, this species is particularly associated with riparian stands containing willows and Oregon ash trees (Shuford and Gardali 2008).

**Distribution.** Migratory populations of yellow warbler breed from northern Alaska and Canada southward to middle United States, and in the west into Mexico. This species breeds throughout northern California, including Sonoma County and several other Bay Area counties.

**Occurrence in Airport Vicinity.** This species is known or suspected to breed in riparian woodlands, primarily within the inland areas of Sonoma County (Burridge 1995). However, there are no documented breeding occurrences of this warbler within the Airport Vicinity.

**Occurrence within the Airport Study Area.** During field surveys for the Proposed Project, several male yellow warblers were heard within the Airport Creek riparian corridor. The species could potentially nest within the Airport and Redwood creek riparian corridors. The presence of willow scrub stands growing in association or in the vicinity of Oregon ash trees (i.e. along Airport Creek) would also suggest that suitable breeding habitat is present.

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving and tree removal work in the vicinity of the willow scrub habitats along Airport Creek and the ponds could destroy or disturb occupied yellow warbler nests, if present.

**Impact 3.4.12:** Potential disturbance of occupied yellow warbler nesting sites, if present.

**Mitigation Measure:** The County shall implement the pre-construction survey and occupied nest avoidance measures described below (Mitigation Measure 4.1).

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, tree removal and trimming, and construction activities within or in the vicinity of the riparian woodland and willow scrub habitats for any long-term elements would have the potential to affect yellow warblers for the reasons cited above. This could include demolition and pond filling work within acquired parcels, if proposed.

### **3.5 OVERALL CONSISTENCY WITH ENDANGERED SPECIES POLICIES UNDER THE SANTA ROSA PLAIN CONSERVATION STRATEGY AND PROGRAMMATIC BIOLOGICAL OPINION**

The *Final Santa Rosa Plain Conservation Strategy* (Conservation Strategy Team 2005) provides guidance as to the USFWS's policies for reviewing projects that affect listed species on the Plain. The Conservation Strategy provides the biological framework upon which the PBO is based, and provides avoidance/minimization measures and interim mitigation ratios for CTS and listed plants that are specifically incorporated into the PBO.<sup>22</sup> Projects that will require Corps permit approval (such as the Proposed Project) can be appended to the PBO and thereby provided individual take authorization, if the projects do the following: (1) apply the PBO's interim mitigation ratios, and (2) adhere to all applicable avoidance and minimization measures in the PBO.

The PBO potentially allows appendage of all projects on the Plain, regardless of size or extent of impact, with the exception of projects that would affect occupied Burke's goldfields or Sonoma sunshine habitat with populations of 2,000 or greater plants. The Proposed Project would not affect any occupied habitat for listed plant species and therefore potentially qualifies for appendage to the

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<sup>22</sup> Final mitigation ratios may be developed in the future at such time that a Conservation Strategy implementation plan is formally adopted and implemented by all local agencies and stakeholders on the Santa Rosa Plain.

PBO. However, the final decision to allow appendage rests with the USFWS which reserves the right to require a separate Section 7 consultation for any project based on the level of impacts, avoidance, minimization, or mitigation measures. The Corps and USFWS have followed a policy to apply the PBO only to those projects with 3.0 acres or less of impacts to seasonal wetlands; larger projects often require individual consultations with the USFWS.

Under the Conservation Strategy, the Airport is situated within the mapped area designated as “Potential for Presence of California Tiger Salamander and Listed Plants” (see Figure 8 in Appendix A). Additionally, the northern and western portions of the Airport are part of the “Windsor Plant Conservation Area” under the Conservation Strategy (see Figure 8 in Appendix A). The Proposed Project should be designed and conducted in accordance with the guidelines applicable to these two mapped areas, as follows:

**Conservation Strategy - “Potential for Presence of California Tiger Salamander and Listed Plants.”** Within this area, non-hardscaped lands are considered to be suitable habitat for CTS; the species cannot be assumed to be absent from a site unless protocol level trapping surveys have demonstrated their absence. Protocol level surveys have not been conducted at the Airport due to the impracticability of conducting such surveys within an operationally active Airport site. Therefore, this BRR recognizes all non-hardscaped lands within the Airport as suitable CTS habitat. Impacts for the temporary or permanent disturbance of these non-hardscaped lands should be mitigated in accordance with the Conservation Strategy and the associated PBO (USFWS 2007).

Vernal pools and other seasonal wetlands within this mapped area are considered suitable habitat for three federally-listed plant species (Sonoma sunshine, Burke’s goldfields, and Sebastopol meadowfoam). Under the Conservation Strategy and the PBO, all such wetland features must also be considered occupied habitat for the listed plants unless protocol level botanical surveys have demonstrated their absence. As described in this BRR, protocol level botanical surveys have been conducted at the Airport and the locations of all occupied habitat have been mapped (see Figure 9 in Appendix A). Consistent with the Conservation Strategy, the Proposed Project has been designed to avoid affecting all occupied habitat; impacts are limited to suitable habitat (see Figure 9 in Appendix A). Impacts to all suitable habitat should be mitigated in accordance with the Conservation Strategy and the associated PBO (USFWS 2007).

**Conservation Strategy - “Windsor Plant Conservation Area.”** Under Objective No. 2 of the Conservation Strategy, the following objectives are listed for the Windsor Plant Conservation Area:

1. Establish 75 to 150 acres of plant preserves of 25 to 100 acres each in the Windsor Plant Conservation Area.
2. Maintain at least 10 occurrences of both Sonoma sunshine and Burke’s goldfields throughout their known range on the Plain.
3. Preserve the one known population of many-flowered navarretia on the Plain.

The Proposed Project is consistent with Objectives 1 and 2. The Airport previously established and placed under permanent protection and management three preserves, encompassing approximately 41 acres, within which Burke’s goldfields populations occur: (1) the Goldfields Preserve, (2) the Runway 14-32 Preserve, and (3) the SACMA Preserve (see Figure 9 in Appendix A). These preserves

are identified in the Conservation Strategy as components of the overall “Windsor Plant Conservation Area” which encompasses Airport lands and seeks to protect an adequate distribution and size of listed plant populations throughout the area. The Proposed Project has been designed to fully avoid any temporary or permanent impacts to these three preserves.

The Proposed Project is also consistent with Objective No. 3. The one known occurrence of many-flowered navarretia is found within parcels adjacent to the northwest of the current Airport boundaries that would not be affected by the Proposed Project.

**Wetland Mitigation Requirements under Conservation Strategy.** Section 5.3.1 of the Conservation Strategy states that vernal pools and seasonal wetlands on the Plain should be replaced at a minimum ratio of 1:1; higher ratios may be needed depending on the quality of the wetland that is affected. All wetland replacement ratios provided in Section 3.0 meet or exceed the 1:1 replacement ratio.

## 4.0 POTENTIAL IMPACTS TO OTHER BIOLOGICAL RESOURCES

### 4.1 REMOVAL OR DISTURBANCE OF NESTING BIRDS

Earthmoving and tree removal work under the Proposed Project and the Programmatic Project could destroy occupied bird nests protected under the Migratory Bird Treaty Act and under Sections 3503, 3503.5, and 3513 of the CDFG Code. Construction activities could disturb birds in occupied nests, causing nest abandonment.

**Mitigation Measure 4.1.** The County shall implement the following mitigation measures in order to avoid and minimize potential adverse impacts to nesting birds:

- 1. Pre-construction Surveys.** If construction work is scheduled during the breeding season (February 1 through August 31), the project biologist shall conduct pre-construction surveys within and adjacent to the project disturbance zone to determine if nesting birds are present. Pre-construction surveys will not be required for construction work carried out in the non-breeding season (September 1 through January 31). The pre-construction surveys shall be conducted within 15 days prior to the start of work.
- 2. Buffer Zones.** If nesting birds are observed, the project shall avoid construction activity within 50 - 250 feet of the nest until the breeding season has ended, or the project biologist has confirmed that the young have fledged and are no longer reliant upon the nest or parental care for survival. The size of the nest buffer will be determined by the project biologist, in consultation with CDFG, based on the location of the nest, the nesting species present, and other factors that may affect potential nest abandonment.

### 4.2 LOSS OF JURISDICTIONAL WETLANDS AND OTHER WATERS OF THE UNITED STATES AND STATE OF CALIFORNIA.

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would result in the filling of the following jurisdictional wetlands and other waters:

<u>Wetland/Other Water Type</u>	<u>Fill Area</u>
vernal pools and other seasonal wetlands	4.4 acres
perennial and intermittent streams (creeks)	0.5 acre (1,486 l.f.)
ponds and marshes	2.1 acres
willow scrub	0.2 acre
<b>Total Fill Area</b>	<b>= 7.2 acres</b>

The specific vernal pool and seasonal wetland areas that would be affected are labeled on Figure 15 in Appendix A, and are summarized as follows:

- **Wetland Areas A, B, F and J** – Natural or created vernal pools and associated swales characterized by native and non-native vernal pool forbs and grasses, as described in Section 2.2. These features range from moderately shallow basins (approximately 6 – 12 inches deep) to deep pools (up to approximately 24 inches deep) and encompass approximately 2.5 acres.
- **Wetland Areas G, H and L** – Shallow to moderately shallow (approximately 3 – 12 inches deep) depressional areas characterized largely by non-native seasonal wetland forbs and grasses as described in Section 2.2, encompassing approximately 0.9 acres.
- **Wetland Area K** – Shallow to moderately shallow (approximately 3 – 12 inches deep) depressional areas and drainage ditches characterized largely by non-native seasonal wetland forbs and grasses as described in Section 2.2, encompassing approximately <0.1 acres.
- **Wetland Area E** – Shallow to moderately shallow (12 inches or less) drainage swales characterized by native and non-native vernal pool forbs and grasses, as described in Section 2.2, encompassing approximately <0.1 acres.
- **Wetland Areas D, I and M** – Shallow to deep (approximately 6 to greater than 24 inches) ditches and swales characterized by non-native seasonal wetland forbs and grasses as described in Section 2.2, encompassing approximately 0.2 acres.
- **Wetland Area C** – shallow to deep seasonal wetland vegetation surrounding Ponds 4 and 6, consisting of obligate native wetland plants (in deeper areas) to non-native seasonal wetland forbs and grasses in the shallower zones, encompassing approximately 0.6 acres.

The jurisdictional streams that would be impacted consist almost entirely of Airport Creek, as described in Section 2.2, with the exception of an approximately 0.02 acre proposed access road crossing of Upper Ordinance Creek, which is a channelized creek section. The ponds and associated marsh habitat that would be affected, and consist of Ponds 4 and 6, as described in Section 2.2. The jurisdictional willow scrub that would be affected also occurs along Ponds 4 and 6.

**Mitigation Measure 4.2.** The County shall implement the following mitigation measures to compensate for potential impacts to 7.2 acres of jurisdictional wetlands and other waters of the U.S. and State of California:

- A. Compensation for impacts to jurisdictional vernal pools and other seasonal wetlands.** As compensation for the filling of 4.4 acres of jurisdictional vernal pools and other seasonal wetlands, either of the following mitigation measures shall be implemented in accordance with the interim mitigation guidelines of the Conservation Strategy and the requirements of the PBO.<sup>23</sup>
- 1. Mitigation Bank Credit Purchase.** A total of 4.4 acres of vernal pool creation credits shall be purchased from a Corps-approved off-site mitigation bank on the Plain (resulting in an overall mitigation ratio of 1:1). Higher mitigation ratios may be required as the discretion of the Corps and/or North Coast RWQCB. Credit acquisition shall occur prior to the impacts.
  - 2. Dedicated Off-site Mitigation Area.** At least 4.4 acres of new vernal pools shall be constructed at a dedicated off-site location (resulting in an overall mitigation ratio of 1:1).

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<sup>23</sup> The FAA is unlikely to approve the establishment of an on-site wetland mitigation area due to the potential for attracting birds and other wildlife hazardous to flight operations. Therefore, only off-site wetland mitigation options are provided.

Higher mitigation ratios may be required as the discretion of the Corps and/or the North Coast RWQCB. The off-site location shall be subject to the approval of the Corps and RWQCB and shall be managed in perpetuity under a Corps and the RWQCB approved conservation easement, management plan, and non-wasting endowment. A detailed Mitigation and Monitoring Plan, subject to the approval of the Corps and the North Coast RWQCB, shall be prepared for the approved off-site mitigation. The plan shall be implemented prior to or simultaneous with the impacts.

**B. Compensation for impacts to jurisdictional willow scrub.** As compensation for the filling of 0.2 acre of jurisdictional willow scrub, either of the following mitigation measures shall be implemented:

- 1. Jurisdictional Willow Scrub Replacement.** At least 0.2 acre of willow plantings shall be established at a suitable off-site stream channel mitigation site within the Mark West Creek/Windsor Creek watershed area, subject to the approval of the Corps, RWQCB, and CDFG. The willow planting area shall be below the channel's ordinary high water line to allow for the re-establishment of new jurisdictional willow scrub habitat.
- 2. Mitigation outside the Local Watershed.** If sufficient suitable stream reaches for willow planting cannot be found within the Mark West Creek/Windsor Creek watershed, then other stream reaches on the Plain may also be used for compensatory mitigation, subject to the approval of the Corps, RWQCB, and CDFG.

**C. Compensation for impacts to jurisdictional streams.** As compensation for the filling of 0.5 acre (1,500 linear feet) of jurisdictional creeks and other streams, the following mitigation measure shall be implemented:

**Stream Channel Replacement.** The Proposed Project's 850 linear feet of constructed stream channel shall have a minimum width of 26 feet in order to allow for replacement at a 1:1 ratio of the 0.5 acre of stream channel that would be filled under the Proposed Project. The re-established stream channel shall be replanted with low statured shrub and/or herbaceous species that meet FAA guidelines for lands within and adjacent to a runway's Obstacle Free Area (OFA).

**D. Compensation for impacts to jurisdictional ponds and marsh.** As compensation for the filling of 2.1 acres of jurisdictional pond and marsh habitat, either of the following mitigation measures shall be implemented:

- 1. Dedicated Off-site Mitigation Area.** At least 2.1 acres of pond and/or marsh habitat shall be constructed at a dedicated off-site location (resulting in an overall mitigation ratio of 1:1). The off-site location shall be subject to the approval of the Corps and shall be managed in perpetuity under a Corps-approved conservation easement, management plan, and non-wasting endowment. A detailed Mitigation and Monitoring Plan, subject to the approval of the Corps and RWQCB, shall be prepared. The plan shall be implemented prior to or simultaneous with the impacts.

- 2. Mitigation Bank Credit Purchase.** A total of 2.1 acres of wetland credits shall be purchased from a Corps/RWQCB-approved off-site mitigation bank on the Plain (resulting in an overall mitigation ratio of 1:1). Credit acquisition shall occur prior to the impacts.

**Impacts of the Proposed Project – Long-term Elements.** Implementation of the following long-term elements would have the potential to affect vernal pools and other seasonal wetlands depending on the future proposed locations of these elements and their specific designs: new air traffic control tower, new taxi lanes for private use hangers, air cargo facility, and replacement run-up apron for Runway 32.

### **4.3 LOSS OF RIPARIAN WOODLAND AND NON-JURISDICTIONAL WILLOW SCRUB**

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would result in the loss of 3.7 acres of riparian woodland and 1.0 acre of non-jurisdictional willow scrub habitat. The locations of impacts are shown on Figure 16 in Appendix A. Approximately 0.5 acres of this impact would occur as a result of the filling of an approximately 1,500-linear foot reach of Airport Creek and re-routing of the filled reach into a new 850-linear foot channel and a 650-linear foot underground culvert for the purposes of meeting FAA Runway Safety Area (RSA) specifications. The remainder of the impact would be from removal of riparian vegetation along an approximately 470-linear foot segment of Airport Creek in order to provide airspace clearance for approaches to Runway 14, as required under FAA regulations.

**Mitigation Measure 4.3.** The County shall implement the following mitigation measures to compensate for the loss of 4.7 acres of riparian woodland and non-jurisdictional willow scrub habitat:

**Riparian/Willow Mitigation Plan.** A detailed riparian mitigation and monitoring plan shall be prepared and implemented. The plan shall entail the planting of native trees and shrub species that typically occur on the Plain, and shall occur along one or more stream reaches in the Mark West Creek/Windsor Creek watershed area, encompassing approximately 4.7 acres. If sufficient suitable stream reaches cannot be found within this watershed, then other stream reaches on the Plain may be used. All plantings shall be local genetic stock obtained from the Plain vicinity. The plan shall include planting designs and locations, species palette, quantities and specification of plantings, irrigation/watering plan, a monitoring plan, performance criteria, as well as a long-term, maintenance component.

The mitigation plan shall be subject to the review and approval of the RWQCB and CDFG. The plan shall include planting designs and locations, species palette, quantities and specification of plantings, irrigation/watering plan, a five-year monitoring and performance criteria, as well as a long-term maintenance component. The plan shall be implemented prior to or simultaneous with the impacts.

**Impacts of the Proposed Project – Long-term Elements.** Earthmoving, grading, tree removal/trimming, and construction activities within or in the vicinity of the riparian woodland and willow scrub habitats for any long-term elements would have the potential to affect yellow warblers for the reasons cited above. This could include demolition and pond filling work within acquired

parcels, if proposed. Whether these impacts could occur would depend on the future proposed locations of such elements.

#### **4.4 LOSS OF OAK WOODLAND AND INDIVIDUAL NATIVE TREES.**

**Impacts of the Proposed Project – Short-term Elements.** The Proposed Project would result in the loss of 0.8 acre of oak woodland, primarily in the vicinity of the Airport Creek channel relocation area northeast of Runway 14 (see Figure 10 in Appendix A). Additionally, various individual oak trees and other native trees occur within grassland/ruderal areas and within rural residential sites that would be affected by the Proposed Project.

**Mitigation Measure 4.4.** The County shall implement the following mitigation measures to compensate for potential loss of 0.8 acre of oak woodland and for the loss of individual native trees:

- 1. Tree Survey.** A tree survey shall be conducted by a certified arborist in all oak woodland areas and other areas with native trees that would be affected by the Proposed Project. The survey shall include all individual native trees with diameters of five inches diameter at breast height (DBH) that would be removed for the Proposed Project. The survey need not map the precise location of each affected tree but should be at a sufficient level of detail to ascertain the sizes and species of each native tree affected.
- 2. Mitigation Plan.** A detailed oak woodland mitigation and monitoring plan shall be prepared and implemented. The plan shall entail the planting of the same native tree species that are affected and shall occur, to the extent feasible, within the part of the Airport Study Area north of the approach end of Runway 14, but outside the Object Free Area (OFA). If full replacement of trees in this area is not feasible, then trees may be planted in other suitable areas within the Airport Study Area, outside of the OFAs. Replacement oak trees shall be planted at a 3:1 replacement ratio; other native tree species shall be replaced at a minimum 1:1 ratio. If sufficient area outside the OFAs cannot be found within the Airport Study Area, then other locations on the Plain may be used. All plantings shall be local genetic stock obtained from the Plain vicinity. The plan shall include planting designs and locations, species palette, quantities and specification of plantings, irrigation/watering plan, a monitoring plan, performance criteria, as well as a long-term maintenance component.

**Impacts of the Proposed Project – Long-term Elements.** Long-term Proposed Project elements, including tree removal/trimming work could affect oak woodlands or affecting individual native trees depending of the future proposed locations of such elements.

#### **4.5 DISTURBANCE OF AVOIDED SENSITIVE HABITATS DURING CONSTRUCTION**

**Impacts of the Proposed Project – Short-term Elements.** Earthmoving, grading, and other construction work has the potential to disturb sensitive habitats (i.e., wetlands, ponds, marshes, woodlands, and willow scrub) located outside the actual project development area. Such disturbance could occur as a result of: (1) vehicular and construction equipment operation and movement, (2)

material and equipment storage, (3) discharges/runoff of sediment and debris, and (4) unauthorized intrusions by construction personnel.

**Mitigation Measure 4.5.** The County shall implement the following mitigation measures to avoid and minimize potential adverse affects to sensitive habitats during construction:

- 1. Pre-construction Fence Installation.** The Project Biologist shall identify and mark with flagging the boundaries of all sensitive habitats within the immediate vicinity of construction areas, prior to staging and construction/ground disturbing activities. The boundaries shall include as much of an upland buffer zone as is practicable based on the proximity of the work areas. Temporary construction fencing shall be erected by the contractor along the marked boundaries to prevent inadvertent entry into the sensitive habitats by equipment or personnel. If fencing is not feasible in some areas due to operational constraints by the FAA, sensitive locations will be delineated on the construction plans.
- 2. Sediment Control.** When working in the vicinity of a sensitive habitat, the contractor shall implement appropriate measures to confine any sediment, construction materials, and site runoff to the immediate work area. These measures shall include the use of silt fencing as appropriate based on site circumstances.
- 3. Regular Inspections.** For work activities within the vicinity of any sensitive habitat, a designated construction monitor shall conduct daily pre-work inspections to ensure that all fencing is undisturbed and that no intrusions into the protected habitat areas have occurred. All damage or disturbance of the fencing shall be immediately repaired. If any intrusions or other disturbance of the protected habitats is observed, the project biologist and construction supervisor shall be notified immediately. The project biologist shall determine what remedial work is required, and shall have the authority to require that all work in the vicinity of the disturbance be halted until the remedial work has been successfully implemented.

The project biologist shall also regularly inspect and monitor construction-related activities to ensure that no intrusions or other disturbances within the fenced boundaries have occurred. At a minimum, inspections by the biologist shall occur on a weekly basis and/or within 24 hours of any storm event.

**Impacts of the Proposed Project – Long-term Elements.** Long-term Proposed Project elements entailing earthmoving, grading, and other construction work would have the potential to disturb sensitive habitats (i.e., wetlands, ponds, marshes, woodlands, and willow scrub) located outside the actual project element areas. Whether these impacts could occur would depend on the future proposed locations of such elements.

## 4.6 LOSS OF AIRPORT CREEK WILDLIFE MOVEMENT CORRIDOR

**Impacts of the Proposed Project – Short-term Elements.** The existing Airport Creek riparian corridor provides a suitable zone for the passage of wildlife across the site. This existing corridor would be replaced by a lightly vegetated 850-linear foot channel and a 650-linear foot underground culvert beneath the graded RSA. The existing corridor's dense vegetative cover, mesic-shaded conditions, and aquatic habitat facilitate movement by aquatic fauna, amphibians, reptiles and small and large mammals. The corridor likely facilitates inter-population movement (i.e., long-term genetic

flow) as well as small travel pathways (i.e., daily movement corridors within an animal's territory) for terrestrial fauna utilizing riparian and/or adjacent upland habitats upstream and downstream of the Airport. While small travel pathways usually facilitate movement for daily home range activities, such as foraging or escape from predators, they also provide connections between outlying populations and the main corridor, permitting an increase in gene flow among populations.

Several types of fauna could be particularly affected by the loss of the existing Airport Creek corridor. Common mammal species known to occur or potentially occurring at the Airport (e.g., mule deer, coyote, bobcat - *Lynx rufus*, and gray fox - *Urocyon cinereoargenteus*), would lose suitable cover for movement. Species with very small home ranges such as California slender salamander and arboreal salamander could be particularly vulnerable to genetic isolation due to corridor loss. Species that migrate along stream corridors to find suitable stream pools for breeding, such as California newt (*Taricha torosa*) and rough-skinned newt (*Taricha granulosa*) could also be adversely affected.

Similarly, western pond turtles could have their breeding behavior disrupted; females may travel along stream corridors to seek out suitable upland nesting sites along and adjacent to the stream banks. Species with extensive foraging ranges along stream corridors are also vulnerable. For example, western pond turtles are known to forage from pool to pool for distances of up to 3,000 feet along a stream corridor (Bury 1972), but avoid expanses of open water without shaded cover.

Potential effects to aquatic and terrestrial species movements would be partially mitigated by proposed culvert design. The culvert would be a minimum 8 feet wide and 6 feet high arch or box culvert with a natural bottom which could accommodate wildlife passage.

**Mitigation Measure 4.6.** The County shall implement the following mitigation measures to avoid and minimize potential impacts from the loss of the Airport Creek riparian corridor:

- 1. Woodland mitigation plan.** To the extent allowable under FAA safety guidelines and policies for the Runway 14 OFA and wildlife hazard management, the woodland mitigation plan to be implemented under Mitigation Measure 4.4 should be located within the part of the Airport Study Area that lies north of the new Runway 14 RSA, outside of the OFA. Planting in this location could allow for a new vegetated corridor to gradually become re-established in the vicinity to the existing Airport Creek corridor.
- 2. Shrub and herbaceous planting along the 850-foot relocated stream channel.** Mitigation measure 4.2b calls for the planting of low statured shrub and/or herbaceous species along the relocated open channel banks in accordance with FAA guidelines for lands within and adjacent to a runway's Obstacle Free Area (OFA). This replanting should allow for the development of partial channel cover that would be conducive to the passage of small wildlife.

**Impacts of the Proposed Project – Long-term Elements.** The long-term elements of the Proposed Project would not affect wildlife movement corridors.

## 4.7 SUMMARY OF IMPACTS - PROPOSED PROJECT

Table C summarizes all impacts of the Proposed Project by habitat type and associated special-status species.

**Table C: Summary of Proposed Project Impacts**

Existing Habitat or Habitat Feature	Habitat Loss under Proposed Project	Impacts under the Proposed Project
<p><b>Grassland/Ruderal</b> 784.4 acres</p>	<p>117.7 acres</p>	<ul style="list-style-type: none"> <li>• <b>3.2.4:</b> Loss or disturbance of a pappose tarplant population</li> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS</li> <li>• <b>3.4.2:</b> Potential loss of occupied burrowing owl burrows, if present</li> <li>• <b>3.4.5; 4.1:</b> Removal or disturbance of nesting birds (ground nesters), if present</li> <li>• <b>3.4.1:</b> Potential destruction or disturbance of American badger dens, if present</li> </ul>
<p><b>Vernal Pools and Other Seasonal Wetlands</b> 44.7 acres</p>	<p>4.4 acres of jurisdictional wetlands</p>	<ul style="list-style-type: none"> <li>• <b>3.2.1; 3.2.6; 3.2.7:</b> Loss of suitable habitat for Sonoma sunshine, Sebastopol meadowfoam, and Burke’s goldfields</li> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS.</li> <li>• <b>4.2:</b> Loss of jurisdictional wetlands and other waters of the U.S. and State of California</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> </ul>
<p><b>Pond and Marsh</b> 10.8 acres</p>	<p>2.1 acres of jurisdictional wetlands and other waters</p>	<ul style="list-style-type: none"> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS</li> <li>• <b>3.4.9:</b> Loss of western pond turtles and western pond turtle habitat</li> <li>• <b>3.4.8; 4.1:</b> Removal or disturbance of nesting birds, if present</li> <li>• <b>4.2:</b> Loss of jurisdictional wetlands and other waters of the U.S. and State of California</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> </ul>
<p><b>Creek Channel</b> 3.3 acres</p>	<p>0.5 acre (1,500 l.f.) of jurisdictional other waters</p>	<ul style="list-style-type: none"> <li>• <b>3.4.9:</b> Loss of western pond turtles and western pond turtle habitat</li> <li>• <b>4.2:</b> Loss of jurisdictional wetlands and other waters of the U.S. and State of California</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> </ul>
<p><b>Riparian Woodland</b> 22.1 acres</p>	<p>3.7 acres</p>	<ul style="list-style-type: none"> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS</li> <li>• <b>3.4.10; 3.4.11; 4.1:</b> Removal or disturbance of nesting birds, if present</li> <li>• <b>4.3:</b> Loss of riparian woodland</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> <li>• <b>4.6:</b> Loss of Airport Creek wildlife movement corridor</li> </ul>
<p><b>Willow Scrub/Woodland</b> 9.5 acres</p>	<p>1.2 acres, including 0.2 acre of jurisdictional wetlands</p>	<ul style="list-style-type: none"> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS</li> <li>• <b>3.4.12; 3.4.13:</b> Removal or disturbance of nesting birds, if present</li> <li>• <b>4.2:</b> Loss of jurisdictional wetlands and other waters of the U.S. and State of California</li> <li>• <b>4.3:</b> Loss of non-jurisdictional willow scrub habitat</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> </ul>

Existing Habitat or Habitat Feature	Habitat Loss under Proposed Project	Impacts under the Proposed Project
<b>Oak Woodland</b> 30.4 acres	0.8 acre	<ul style="list-style-type: none"> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS</li> <li>• <b>4.1:</b> Removal or disturbance of nesting birds, if present</li> <li>• <b>4.4:</b> Loss of oak woodland and individual oak trees</li> <li>• <b>4.5:</b> Disturbance of avoided sensitive habitats during construction</li> </ul>
<b>Non-hardscape Rural Residential/Cultivated</b> 71.0 acres	0.1 acre	<ul style="list-style-type: none"> <li>• <b>3.4.3:</b> Loss of suitable CTS habitat; destruction or adverse modification of proposed Critical Habitat for CTS.</li> <li>• <b>4.1:</b> Removal or disturbance of nesting birds, if present</li> </ul>

## 5.0 REPORT CONTRIBUTORS

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## **6.1 PERSONAL COMMUNICATION**

Ben Solvesky, USFWS, E-mail communication with Tim Lacy, LSA Associates, July 9, 2009. regarding the potential for CRLF to occur on the Santa Rosa Plain

Tim Lacy, LSA Wildlife Biologist, LSA Associates; conversation with George Molnar concerning past CTS surveys conducted for the City of Santa Rosa Geysers Recharge project.

Tyson Robertson, P.E., Brelje & Race Consulting Engineers for the Proposed Project; conversation with George Molnar summarizing the Proposed Project's storm water management plan. March 2011.

