

APPENDIX I

BIOLOGICAL RESOURCES

This appendix contains the Biological Resources Assessment prepared for the Environmental Impact Statement and Environmental Impact Report, as well as the Section 7 Biological Assessment submitted to the US Fish and Wildlife Service.

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Biological Resource Assessment, April 2011

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Biological Resources Assessment

±213-Acre Gness Field Airport
Marin County, California

Prepared for: Landrum and Brown, Inc.

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Submitted by:

 **FOOTHILL ASSOCIATES**

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1.0 EXECUTIVE SUMMARY

Foothill Associates' biologists conducted a biological resources assessment and a formal delineation of waters of the U.S. on March 3, 4, and April 15, 2008, on the Gness Field study area located within Marin County, California. The study area is located immediately east of Highway 101 and approximately one mile north of the City of Novato. The study area includes the developed portions of the airfield and the acreage immediately surrounding the airfield. The purpose of this document is to summarize the general biological resources in the study area, to assess the suitability of the study area to support special-status species and sensitive habitat types, and to provide recommendations for regulatory permitting or further analysis that may be required prior to development activities occurring within the study area. This document is intended to be the primary source document for biological resources.

The Gness Field study area consists of ±213 acres of land that is composed of a mixture of developed areas associated with the airfield and annual grassland and wetland habitats on the perimeters of the field. The airfield is protected by a perimeter levee and ditch system. Land uses surrounding the study area include annual grassland used for grazing, commercial complexes, and saltwater marsh. Known or potential biological constraints on the study area include the following:

- Potential for winter dispersal of red-legged frog into the proposed runway extension area;
- Potential winter foraging habitat for California black rail;
- Habitat for California clapper rail in the proposed runway extension area;
- Habitat for salt marsh harvest mouse in the proposed runway extension area;
- Potential nesting habitat and foraging habitat for raptors, including western burrowing owl;
- Potential nesting habitat for other bird species protected by the MBTA, including loggerhead shrike and tricolored blackbird;
- Sensitive habitats including jurisdictional waters of the United States (depressional seasonal wetland, riverine seasonal wetland, slope seep, high brackish marsh, perennial drainage, and ditches); and
- Protected trees.

2.0 INTRODUCTION

This report summarizes the findings of a biological resources assessment and a wetland delineation completed for the ±213-acre Gness Field study area, located within Marin County, California. This document addresses the onsite physical features, as well as plant communities present and the common plant and wildlife species occurring, or potentially occurring, on the study area. Furthermore, the suitability of habitats to support special-status species and sensitive habitats are analyzed and recommendations are provided for any regulatory permitting or further analysis required prior to development activities occurring within the study area.

3.0 REGULATORY FRAMEWORK

The following describes federal, state, and local environmental laws and policies that are relevant to the study of impacts to biological resources near the Marin County Airport – Gness Field.

3.1 Federal Laws and Policies

3.1.1 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) was signed into law in 1970. NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

To meet NEPA requirements, federal agencies prepare detailed environmental assessments (EA) and Environmental Impact Statements (EIS) to assess the potential impacts of federally directed projects on the environment. The FAA has specific guidelines for meeting the requirements of NEPA as it relates to FAA-directed projects (see **Section 3.2**).

NEPA Significance Criteria

The following criteria are used to determine if a project will result in “significant impact” under NEPA. According to the NEPA Regulations adopted by the President’s Council on Environmental Quality (CEQ) (40 CFR 1500-1508), the term *significantly* is based on the twin criteria of *context* and *intensity* (40 CFR 1508.27). *Context* means the affected environment in which a proposed action would occur; it can be local, regional, national, or all three, depending upon the circumstances. *Intensity* means the degree to which the proposed action would involve one or more of the following 10 criteria:

- Adverse effects associated with “beneficial projects”;
- effects on public health or safety;
- unique characteristics of the geographic area (e.g., historic resources, park lands, prime farmland, wetlands, wild and scenic rivers, ecologically critical areas);
- degree of controversy;
- degree of highly uncertain effects or unique or unknown risks;
- precedent-setting effects;
- cumulative effects;
- adverse effects on scientific, cultural, or historical resources;
- adverse effects on endangered or threatened species or designated critical habitat (pursuant to the Endangered Species Act); and
- violations of federal, state, or local environmental law.

3.1.2 Federal Endangered Species Act

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

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

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

FAA Significance Criteria

A significant impact to Federally-listed threatened and endangered species would occur when the USFWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area. The involvement of Federally listed threatened or endangered species and the possibility of impacts as potentially serious as extinction or extirpation, or destruction or adverse modification of designated critical habitat, are factors weighing in favor of a finding of significance. However, an action need not involve a threat of extinction to Federally listed species to meet the NEPA standard of significance. Lesser impacts including impacts on non-listed species could also constitute a significant impact. In consultation with agencies and organizations having jurisdiction or special expertise concerning the protection and/or management of the affected species, NEPA practitioners should consider factors affecting population dynamics and sustainability for the affected species such as reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), and the minimum population levels required for population maintenance.

3.1.3 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA), first enacted in 1916, prohibits any person, unless permitted by regulations, to: “pursue, hunt, take, capture, kill, attempt to take, capture or

kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird.” (16 U.S.C. 703).

The list of migratory birds includes nearly all bird species native to the United States. The Migratory Bird Treaty Reform Act (MBTRA) of 2004 further defined species protected under the act and excluded all non-native species. The statute was extended in 1974 to include parts of birds, as well as eggs and nests. Thus, it is illegal under MBTA to directly kill, or destroy a nest of, nearly any bird species, not just endangered species. Activities that result in removal or destruction of an active nest (a nest with eggs or young being attended by one or more adults) would violate the MBTA. Removal of unoccupied nests, or bird mortality resulting indirectly from disturbance activities, is not considered a violation of the MBTA.

3.1.4 Federal Jurisdiction of the Waters of the United States

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

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

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

3.1.5 Federal Aviation Administration Policies

Federal Aviation Administration Order 1050.1E, Environmental Impacts: Policies and Procedures

This order provides guidance regarding FAA policies and procedures for achieving compliance with NEPA and regulations issued by the Council on Environmental Quality for all FAA-administered projects. Appendix A of this order summarizes potential “impact categories” that must be considered during project planning and implementation. Section 8 of Appendix A provides requirements the FAA must meet in respect to analyzing project-related impacts to fish, wildlife, and plant species under NEPA and determining whether project-related impacts are significant.

As stated in Section 8.3, Significant Impact Thresholds, of Appendix A, a significant impact to Federally-listed threatened and endangered species would occur when the USFWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area. The involvement of Federally listed threatened or endangered species and the possibility of impacts as potentially serious as extinction or extirpation, or destruction or adverse modification of designated critical habitat, are factors weighing in favor of a finding of significance. However, an action need not involve a threat of extinction to Federally listed species to meet the NEPA standard of significance. Lesser impacts including impacts on non-listed species could also constitute a significant impact. In consultation with agencies and organizations having jurisdiction or special expertise concerning the protection and/or management of the affected species, NEPA practitioners should consider factors affecting population dynamics and sustainability for the affected species such as reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), and the minimum population levels required for population maintenance. Relevant information may be obtained from State and local wildlife management agencies and the scientific literature concerning wildlife management (e.g., USDA National Wildlife Research Center library).

Federal Aviation Administration Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions For Airport Actions

The Federal Aviation Administration’s Office of Airports (ARP) is responsible for identifying major Federal actions involving the Nation’s public-use airports. After determining that an airport sponsor is proposing a major Federal action, ARP is responsible for analyzing the environmental effects of that action and its alternatives. ARP issues Order 5050.4B to provide instruction on evaluating those environmental effects. Order 5050.4B supplements FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, which provides all FAA organizations with policies and procedures for complying with NEPA and the implementing regulations the Council on Environmental Quality has issued (40 CFR Parts 1500-1508).

Table 7.1, Significance Thresholds, summarizes the significant impact thresholds listed in FAA Order 1050.1E, which states that for Federally-listed species, impacts would be considered significant when the U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines a proposed action would likely jeopardize a species’ continued existence or destroy

or adversely affect a species' critical habitat. For non-listed species, consideration of scientific literature on and information from agencies having expertise addressing on the affected species must be given. Information on project effects on population dynamics; sustainability; reproduction rates; natural and artificial mortality (aircraft strikes); and the minimum population size needed to maintain the affected population must also be considered.

This Order adds additional guidance of Factors to Consider for Airport Actions. In the case of biological resources, the responsible FAA official should consider the following factors in consultation with organizations having jurisdiction or special expertise concerning the protection and/or management of the affected species. The official should complete the added analysis for each reasonable alternative that would cause long-term (i.e., greater than 1 year) habitat impacts.

- Consult with the appropriate agency or agencies to determine if an area sufficient to sustain species commonly found in the affected area would remain if the alternative were implemented.
- Determine if the alternative would affect habitat supporting floral or faunal species not commonly occurring in the project area. If yes, In consultation with the appropriate agency or agencies, determine if the alternative would affect a small tract of sensitive habitat needed for the survival or well-being of flora or fauna. Consider the locations of other nesting and breeding areas relative to the project's affected area and if resource agency or agencies indicate those areas could sustain the disturbed species

An Environmental Desk Reference for Airport Actions.

As a compendium to FAA Order 5050.4B, the Desk Reference summarizes applicable special purpose laws in one location for convenience and quick reference. Its function is to help FAA integrate the compliance of NEPA and applicable special purpose laws to the fullest extent possible. This integration should ensure that all environmental review procedures applicable to an airport action run concurrently rather than consecutively. The Desk Reference includes information addressing ways to evaluate potential environmental impacts due to a proposed airport action, and when appropriate, its reasonable alternatives. It also provides information on mitigation measures. Environmental Impact Statements (EISs) that FAA prepares are key parts of ARP's decision making process for airport actions. Therefore, responsible FAA officials must meet the requirements of Order 5050.4B when preparing those documents. In addition, ARP recommends that responsible FAA officials and other users refer to this Desk Reference for guidance to help integrate applicable special purpose laws with NEPA.

3.2 State of California Laws and Policies

3.2.1 California Environmental Quality Act (CEQA)

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based

on these examples, impacts to biological resources would normally be considered significant if the project would result in any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by California Department of Fish and Game or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional or state habitat conservation plan.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. This is necessary because although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of, an important resource on a population-wide or region-wide basis.

3.2.2 California Endangered Species Act

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

"take" of a listed species is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code § 2081).

3.2.3 California Fish and Game Code

Section 3503.5 of the California Fish and Game Code states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Disturbance activities that result in abandonment of an active bird-of-prey nest in areas adjacent to the disturbance may also be considered a violation of the Fish and Game Code.

3.2.4 Species of Concern

In addition to formal listing under FESA and CESA, species receive additional consideration by CDFG, USFWS and lead agencies during the CEQA process. Species that may be considered for review are included on a list of “Species of Special Concern,” developed by these resource agencies. It tracks species in California whose numbers, reproductive success, or habitat may be in decline.

3.2.5 California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low population numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings:

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

3.2.6 State Jurisdiction of the Waters of the United States

CDFG is a trustee agency that has jurisdiction under Section 1600 *et seq.* of the California Fish and Game Code. Under Section 1602, a private party must notify CDFG if a proposed project will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds...except when the department has been notified pursuant to Section 1601.” If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFG may propose reasonable measures that will allow protection of those resources. If these

measures are agreeable to the parties involved, they may enter into an agreement with CDFG identifying the approved activities and associated mitigation measures.

3.3 Marin County Laws and Policies

The Marin Countywide Plan provides guidance and recommendations regarding preservation and management of natural resources within the County. The City-Centered Corridor along Highway 101 and adjacent to the Bay is designated for concentrated urban development and for protection of designated environmental resources. Gness Field would presumably fall under this portion of the Countywide Plan. Applicable executive summaries of the County guidelines to Gness Field are provided below. Additional detail is available in the Marin Countywide Plan including goals and objectives for preservation of specific biological resources within the County.

3.3.1 Bayfront Conservation Zone

The Bayfront Conservation Zone includes tidal marshes, seasonal marshes, lagoons, natural wetlands, and low-lying grasslands overlying historic marshlands. Three subzones exist within the Bayfront Conservation Zone: 1) the Tidelands Subzone, areas subject to tidal action; 2) the Diked Bay Marshlands and Agricultural Subzone, former marshlands which have been diked and often filled for agricultural and urban uses; and 3) the Shoreline Subzone, steep shoreline areas between roadways and Tidelands Subzones.

The County has adopted a zoning overlay district in unincorporated bayfront areas, requiring environmental assessment of existing conditions within the Bayfront Conservation Zone prior to preparation of master plans and development plans. Policies in this Plan encourage land uses that enhance wildlife and aquatic habitat, such as agriculture, wastewater reclamation, restoration of lands to tidal status, and flood basin.

In the Diked Bay Subzone, land uses are encouraged which provide or protect wetlands and which do not require diking, filling, or dredging. Other uses may be allowed if they are consistent with zoning designations and impacts are minimized and mitigated. Uses must also conform to applicable Federal and State regulations. Restoration of bay marshlands offers significant potential for habitat value and will be encouraged whenever possible.

Policies in this document preserve the dramatic viewsheds and coastal habitats in the Shoreline Subzone.

3.3.2 Stream and Creekside Conservation Areas

Policies in this document establish buffer zones called Stream Conservation Areas (SCAs) for the protection of riparian systems, streams, and related habitats. SCAs exist along perennial and intermittent streams, as defined by solid and dashed blue lines on USGS quad maps.

A Stream Conservation Area consists of a watercourse, surrounding banks, and a strip of land extending laterally from the top of both banks. Uses allowable in the Stream Conservation Area include: necessary water supply and flood control projects, improvements to fish and wildlife

habitat, grazing, agriculture, maintenance of channels for erosion control, water monitoring installations, and trails. Prohibited uses include, but are not limited to: roads and utility lines (except at crossings), confinement of livestock, dumping, use of motorized vehicles, and new structures.

3.3.3 Air Quality

Air quality policies follow Federal and State air quality guidelines for carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, and total suspended particulates for management of locally generated pollutants.

Although the ambient air quality in Marin is high, the County recognizes that Marin benefits from its upwind location relative to prevailing wind conditions in the Bay Area. The County should seek to reduce pollution generated by land uses and transportation. Air pollution has the potential to particularly affect "sensitive receptors" like hospitals and schools and air quality should be considered when locating these types of facilities.

3.3.4 Species Protection

The lands in Marin provide habitat for a rich variety of plants and animals. However, several species of plants and animals and some natural communities in Marin County are becoming increasingly rare, due to changes in the landscape caused by human activities. Through the development review process, the County seeks to protect the natural habitat from detrimental human activity.

3.3.5 The Built Environment

The built environment policies address aesthetic and environmental issues including, but not limited to: preservation of ridges and upland greenbelts, creekside development, design standards in planned district categories, and guidelines for the design of activity centers, preservation of cultural and archeological resources, and protection and enhancement of view corridors.

Several of these policies have been implemented through zoning and subdivision laws. Review procedures ensure that proposed developments comply with the County's conservation policies.

3.3.6 Open Space Program

The County's Open Space program targets land in each of the three environmental corridors to be reserved as permanent public open space for recreational or environmental protection purposes. Targets have actually been exceeded in the Inland Rural and Coastal Recreation Corridors, due to Federal and State parkland purchases and recreational use of lands acquired for watershed. However, only 56% of targeted lands in the City-Centered Corridor have been acquired, including all lands owned by public and quasi-public agencies.

The Open Space Program identifies a number of techniques for achieving the desired targets, such as transfer of development rights; zoning regulation (e.g. low density zoning); and, gift, dedication, or purchase of lands by the Open Space District or other public entity.

4.0 METHODS

Available information pertaining to the natural resources of the region was reviewed. All references reviewed for this assessment are listed in the References section of this document. Site-specific information was reviewed including the following sources:

- California Department of Fish and Game. 2010. *California Natural Diversity Data Base (CNDDDB)*. Sacramento, California;
- Foothill Associates. 2009. Final Delineation of Wetlands and Request for Clean Water Act and Rivers and Harbors Act Jurisdictional Determination.
- Foothill Associates. 2010. Results of the 2010 Focused Survey for Soft Bird's Beak (*Cordylanthus mollis* ssp. *mollis*) on the Gness Field Airport Property in Marin County, CA.;
- Kleinfelder. 2008. Preliminary Botanical Assessment for the Proposed Gness Field Airport Runway Expansion Project, Marin County, California;
- Kleinfelder. 2009. Focused Soft Bird's Beak Survey for the Proposed Gness Field Airport Runway Expansion Project, Marin County, California;
- Natural Resources Conservation Service. 1985. *Soil Survey of Marin County, California*. U.S. Department of Agriculture;
- R.C. Fuller Associates. 2001. Levee Reconstruction Project, Marin County Airport, Initial Study;
- U.S. Fish and Wildlife Service. 2010. Federal Endangered and Threatened Species that may be affected by Projects in the Petaluma River 7.5 minute series quadrangle. Sacramento, California; and
- U.S. Geological Survey (USGS). 1954. Photorevised 1980. *Petaluma River, California*. 7.5-minute series topographic quadrangle. United States Department of Interior.

Foothill Associates' biologists conducted field surveys on March 3, 4 and April 15, 2008 to evaluate biological resources and delineate waters of the U.S. within the study area. Kleinfelder botanists conducted a focused plant survey on the study area in March 2008 and July 2009 (**Appendix A**). In 2010, Foothill Associates conducted follow up focused survey for soft birds' beak on July 21, August 18, and September 16, 2010. The results of those botanical surveys are incorporated into this biological resources assessment. The study area was systematically surveyed on foot to ensure total search coverage, with special attention given to identifying those portions of the study area with the potential for supporting special-status species and sensitive habitats. During the field surveys, biologists recorded plant and animal species observed, as well as characterized biological communities occurring onsite.

During focused botanical surveys for soft bird's beak, methodology at the site specifically included walking transects approximately 25 feet apart in areas where transects could be walked (i.e. parallel to the runway, in open areas north of the existing facility). In areas where topography or drainages precluded straight line inspection, meandering transects were utilized to

ensure coverage of the site (i.e. areas in the southern portions of the airport and within the ditched areas around the runway and facilities). More time was spent in areas containing water and wetland areas, as these areas were perceived to have a higher potential of supporting soft bird's beak. Each of the three surveys was completed in 5 to 6 hours at the site. A Trimble Geo XT was loaded with a map of the survey area and background file of wetlands occurring on the site to aid in navigation over the more remote sections of the site and to ensure complete coverage.

The 2010 focused soft bird's beak surveys were conducted during the species' flowering period (July – November) for optimal identification potential. In accordance with the CNPS Botanical Survey Guidelines, the survey was conducted by personnel with the following qualifications: experience with conducting floristic surveys; intimate knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area, including special-status and locally significant plants; familiarity with the appropriate state and federal statutes related to plants and plant collecting, and experience with analyzing impacts of project activities on native plants and plant communities. See **Appendix A** for detailed information regarding survey personnel qualifications. See **Appendix D** for additional information regarding the focused Soft Birds Beak survey.

As part of this assessment, Foothill Associates' biologists prepared a wetland delineation utilizing the Corps' 1987 three-parameter methodology to delineate potentially jurisdictional waters of the United States. This methodology requires the collection of hydric soils, hydrophytic vegetation, and hydrologic data at several locations to establish the jurisdictional edge of waters of the United States. The results of this delineation are provided under separate cover and were verified by the Corps in a letter dated August 27, 2009. The findings of the delineation of waters of the U.S. are also summarized within this report and are covered in the delineation report referenced above.

5.0 RESULTS

5.1 Site Location and Description

The study area is located in Marin County immediately east of Highway 101 and approximately one mile north of the City of Novato. Land uses surrounding the study area include annual grassland and brackish marsh to the north and east, salt marsh to the south, and annual grassland and Highway 101 to the west. The study area is located within an un-numbered section, Township 4 North, Range 7 West, of the USGS 7.5-minute series Petaluma River quadrangle (**Figure 1**).

The study area consists of ±213 acres of land that is currently composed of developed areas associated with the airfield and annual grassland and wetland communities on the perimeters of the field.

5.2 Physical Features

5.2.1 Topography and Drainage

Topography in the study area is mostly level, with elevations ranging from approximately 0 to 15 feet above mean sea level (MSL). The airfield is surrounded by a series of levees and is located on fill, while the perimeters of the study area contain a mixture of high brackish marsh and channels that convey brackish water. Interspersed within the brackish marsh are smaller areas of upland annual grassland habitat. The surrounding lands are protected by a levee system and pumps that convey water into the Petaluma River to the east of the study area.

5.2.2 Soils

The Natural Resources Conservation Service (NRCS) has mapped three soil units on the study area (**Figure 2**). The soil units that occur onsite include **Reyes clay**; **Urban land-Xerorthents complex, 0 to 9 percent slopes**; and **Xerorthents, fill**. General characteristics associated with these soils types are described below.

- **Reyes clay:** This soil type is very deep and somewhat poorly drained. It is found on reclaimed tidelands between 0 and 10 feet above MSL. It formed in alluvium derived from various rock sources. Slopes are generally between 0 and 2 percent. Permeability is slow and runoff is slow. Native vegetation is generally composed of wetland plant communities.
- **Urban land-Xerorthents complex, 0 to 9 percent slopes:** This soil type is found on valley floors, toes of cut slopes, and tidelands covered with fill between 0 and 500 feet above MSL. The soil is composed of 70 percent urban land and 20 percent Xerorthents. The Urban land component consists of areas covered by roads and developed structures. Runoff within this component is rapid. Xerorthents consist of cut or fill areas. The original soils are often graded and contain mixed soil horizons. The characteristics of Xerorthents are highly variable.

- **Xerorthents, fill:** This soil type consists of soil material that has been moved mechanically and mixed. Most of this unit is contained in urban areas. Xerorthents are loamy and well-drained. Permeability and runoff characteristics vary.

5.3 Biological Communities

Two major biological communities occur within the Gness Field study area including annual grassland and high brackish marsh (**Figure 4**). Within these two primary communities are also additional wetland communities. These communities support habitat to a number of common species of wildlife and also support suitable habitat for special-status species. Each of the biological communities including associated common plant and wildlife species observed, or that are expected to occur within these communities are described below. Plant and animal species observed within the study area during the biological assessment are listed in **Appendices B** and **C** respectively.

5.3.1 Annual Grassland

This is the dominant upland plant community within the study area. Along with high brackish marsh, these two vegetation communities comprise the majority of natural vegetation within the study area. Annual grassland is characterized primarily by an assemblage of non-native grasses and forbs. Dominant grass species consists of soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and wild oat (*Avena fatua*). Common herbaceous non-natives include yellow star thistle (*Centaurea solstitialis*), wild radish (*Raphanus sativa*), sweetclover (*Melilotus alba*) and thistle (*Carduus* sp.). Minor plant species include coyotebrush (*Baccharis pilularis*), valley oak (*Quercus lobata*), bindweed (*Convolvulus discolor*), California poppy (*Eschscholzia californica*) and Himalayan blackberry (*Rubus discolor*). This grassland would be considered an upland grassland community as opposed to the grass-dominated high brackish marsh described below, which is considered a wetland community.

Annual grassland habitat supports breeding, foraging, and shelter habitat for several species of wildlife. Species observed or expected to occur in this habitat include savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), white-tailed kite (*Elanus leucurus*), western burrowing owl (*Athene cunicularia hypugaea*), northern harrier (*Circus cyaneus*), black-tailed jackrabbit (*Lepus californicus*), and gopher snake (*Pituophis melanoleucus*).

5.3.2 High Brackish Marsh

A total of **58.96** acres of high brackish marsh wetlands were delineated and verified within the study area. This wetland community is the major plant community within the study area outside of the developed airfield. It is dominated by a combination of saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*) and saltbush (*Atriplex* sp.). Other minor plant species within this community include pickleweed (*Salicornia* sp.), bristly ox-tongue (*Picris echioides*), and cocklebur (*Xanthium strumarium*). Since this vegetation community is dominated by a grass species, it can generally be considered as a grassland habitat. However, this is a wetland vegetation community as opposed to the upland annual grassland habitat described previously.

Brackish marsh supports breeding and foraging habitat for a variety of wildlife. Species observed within this community during the biological assessment include northern harrier (*Circus cyaneus*), red-winged blackbird (*Agelaius phoeniceus*), short-eared owl (*Asio flammeus*), black-necked stilt (*Himantopus mexicanus*), killdeer (*Charadrius vociferus*), marsh wren (*Cistothorus palustris*), and San Pablo song sparrow (*Melospiza melodia samuelis*).

5.3.3 Other Wetlands and Waters of the United States

Depressional Seasonal Wetland

A total of **3.59** acres of depressional seasonal wetlands have been delineated and verified within the study area. Depressional seasonal wetlands exhibit a hydrologic regime dominated by saturation, rather than inundation. Depressional seasonal wetlands were identified on the site as depressions within the topography with a hydrologic regime dominated by saturation and capable of supporting hydrophytic plant species and hydric soils. Plant species in depressional seasonal wetlands are adapted to withstand short periods of saturation or saturated soils conditions but will not withstand prolonged periods of inundation, as is common in vernal pools.

Riverine Seasonal Wetland

A total of **0.52** acre of riverine seasonal wetlands has been delineated and verified within the study area. Riverine seasonal wetlands are defined by a hydrologic regime dominated by unidirectional flow of water. Riverine seasonal wetlands typically occur in topographic folds or swales and represent natural drainages that convey sufficient water to support wetland vegetation. Riverine seasonal wetlands typically convey water during and shortly after storm events. Riverine seasonal wetlands may have a moderately defined bed and bank and often exhibit sufficient gradient to convey water off of the site. As in depressional seasonal wetlands, plant species found within riverine seasonal wetlands are typically adapted to a hydrologic regime dominated by saturation rather than inundation.

Slope Seep

A total of **2.95** acres of seep have been delineated and verified within the study area. Seeps are characterized as areas where groundwater intersects with the soil surface. Typically, flow from seeps continues for some period after the rainy season and may continue all year. Seeps can support isolated wetland vegetation (such as on a hillside) or they may form the headwaters of a riverine seasonal wetland or other jurisdictional drainage feature. Vegetation in seeps often consists of plant species associated with seasonal and perennial marsh habitats. When seeps flow for only short periods beyond the rainy season and into the warm season, herbaceous perennial wetland species typically dominate. Seeps that persist for longer periods may support woody, perennial, obligate species.

Perennial Drainage

A total of **2.48** acres of perennial drainage have been delineated and verified within the study area. Perennial drainages are features that may not meet the three-parameter criteria for vegetation, hydrology and soils but do convey water and exhibit an “ordinary high water mark.”

Perennial drainages generally convey unidirectional water flows throughout the entire year. Perennial drainages typically consist of a channel, bed and bank and are devoid of vegetation due to the scouring effect of flowing water. Perennial drainages are often bordered by wetland vegetation communities of various composition and cover depending on flow rates, duration of flows and soil types.

Ditches

A total of **6.20** acres of ditches have been delineated and verified within the study area. Ditches excavated in upland areas and draining entirely uplands are typically considered non-jurisdictional features by the Corps. However, the ditches on the site typically drain at least some wetland areas and often connect to wetland features. Therefore, the ditches on the site are considered jurisdictional features.

5.4 Special-Status Species

Special-status species are plant and animal species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and may require specialized habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Listed or proposed for listing under CESA or FESA;
- Protected under other regulations (e.g. Migratory Bird Treaty Act);
- CDFG Species of Special Concern;
- Listed as species of concern by CNPS or USFWS; or
- Receive consideration during environmental review under CEQA.

Special-status species considered for this analysis are based on queries of the CNDDDB, the USFWS and CNPS species lists (online versions) for the Petaluma River quadrangle and the eight surrounding quadrangles. **Table 1** includes the common name and scientific name for each species, regulatory status (federal, state, local, CNPS), habitat descriptions, and potential for occurrence on the study area. **Figure 3** depicts the locations of special-status species recorded in the CNDDDB within five miles of the study area. The following set of criteria has been used to determine each species' potential for occurrence on the study area:

- **Present:** Species is known to occur on the study area, based on CNDDDB records, and/or was observed onsite during the field survey(s).
- **High:** Species is known to occur on or near the study area (based on CNDDDB records within five miles, and/or based on professional expertise specific to the study area or species) and there is suitable habitat onsite.
- **Low:** Species is known to occur in the vicinity of the study area, and there is marginal habitat onsite.-**OR-**Species is not known to occur in the vicinity of the study area, however there is suitable habitat onsite.

- **No:** There is no suitable habitat for the species onsite. **-OR-** Species was surveyed for during the appropriate season with negative results.

Only those species that are known to be present or that have a high or low potential for occurrence will be discussed further following **Table 1**.

Table 1 — Listed and Special-Status Species Potentially Occurring on the Study Area or in the Vicinity

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Plants				
Alkali milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	--;--;--;1B	Alkali sink and freshwater wetlands. Typically found in playa salt flats and vernal pools. Generally extirpated from the Bay Area.	March-June.	No. Species is not known to occur in the vicinity of the study area and was surveyed in 2008 with negative results.
Baker's larkspur <i>Delphinium bakeri</i>	FE;--;--;1B	Restricted to a single occurrence along Salmon Creek. Found in northern coastal scrub, coastal prairie, and broad-leaf forest habitats.	March-May.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Baker's manzanita <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i>	--;--;--;1B	Found in chaparral and broadleaf forests of Sonoma County.	February-April.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	--;--;--;1B	Vernal pools and moist meadows within annual grasslands and coniferous forests north of San Francisco.	April-July.	No. Study area does not contain suitable habitat for this species.
Baker's stickyseed <i>Blennosperma bakeri</i>	FE;CE;--;1B	Found in vernal pools of the Sonoma area of Sonoma County.	March-May.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Beach layia <i>Layia carnosa</i>	FE;CE;--;1B	Found on stabilized dune and coastal scrub habitats. Known from Humboldt and Monterey counties and from Point Reyes in Marin County.	March-July.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Bent-flowered fiddleneck <i>Amsinckia lunaris</i>	--;--;--;1B	Valley grasslands and foothill oak woodlands.	March-June.	No. Species is not known to occur in the vicinity of the study area and was surveyed in 2008 with negative results.
Burke's goldfields <i>Lasthenia burkei</i>	FE;CE;--;1B	Found in vernal pools and swales in the Cotati Valley of Sonoma County and the southern portions of Lake and Mendocino counties.	April-June.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Clover lupine <i>Lupinus tidestromii</i>	FE;CE;--;1B	Coastal dunes and coastal prairie on the Monterey Peninsula.	April-June.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Cobb Mountain lupine <i>Lupinus sericatus</i>	--;--;--;1B	Chaparral, foothill woodland, and pine forest of Sonoma and Mendocino counties.	March-June.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE;--;--;1B	Found in vernal pools of open grasslands in Mendocino, Napa, Marin, Contra Costa, Alameda, Solano and Monterey counties.	March-June.	No. Species is not known to occur in the vicinity of the study area and study area does not contain suitable habitat.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Dwarf downingia <i>Downingia pusilla</i>	--;--;2	Vernal pools in Central Valley to coastal foothills.	March-May.	No. Study area does not contain suitable habitat for this species.
Fragrant fritillary <i>Fritillaria liliacea</i>	--;--;1B	Open grasslands in north coastal counties, especially Sonoma County.	February-March.	No. Species is not known to occur in the vicinity of the study area and was surveyed in 2008 with negative results.
Franciscan onion <i>Allium peninsulare</i> var. <i>franciscanum</i>	--;--;1B	Found in open grasslands of the Bay Area. Typically in areas with dry, clay soils.	May-June.	No. Study area does not contain suitable habitat for this species.
Jepson's leptosiphon <i>Leptosiphon jepsonii</i>	--;--;1B	Found in Sonoma, Lake, and Mendocino counties.	March-May.	No. Species is not known to occur in the vicinity of the study area.
Koch's cord-moss <i>Entosthodon kochii</i>	--;--;1B	Riverbanks on exposed soils.	Year-round.	No. Study area does not contain suitable habitat for this species.
Legenere <i>Legenere limosa</i>	--;--;1B	Found on the margins of vernal pools in the Central Valley and coastal areas.	April-June.	No. Study area does not contain suitable habitat for this species.
Marin checker lily <i>Fritillaria lanceolata</i> var. <i>tristulis</i>	--;--;1B	Found in coastal scrub and coastal prairie of Marin County.	February-April.	No. Study area does not contain suitable habitat for this species.
Marin County navarretia <i>Navarretia rosulata</i>	--;--;1B	Chaparral and closed-cone coniferous forest.	May-July.	No. Study area does not contain suitable habitat for this species.
Marin dwarf-flax <i>Hesperolinon congestum</i>	FT;CT;--;1B	Found in dry grasslands or chaparral in Marin, San Mateo, and San Francisco counties. Typically associated with serpentine soils.	April-July.	No. Study area does not contain suitable habitat for this species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Marin manzanita <i>Arctostaphylos virgata</i>	--;--;--;1B	Chaparral, evergreen forest, and pine forests of western Marin County.	January-March.	No. Study area does not contain suitable habitat for this species.
Marsh micoseris <i>Microseris paludosa</i>	--;--;--;1B	Vernally moist sites on marine terraces. Majority of known populations present on former Fort Ord.	April-June.	No. Species is not known to occur in the vicinity of the study area.
Mt. Tamalpais jewel-flower <i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i>	--;--;--;1B	Chaparral and valley grassland of western Marin County.	May-July.	No. Study area does not contain suitable habitat for this species.
Mt. Tamalpais manzanita <i>Arctostaphylos hookeri</i> ssp. <i>montana</i>	--;--;--;1B	Chaparral and valley grassland of western Marin County.	February-April.	No. Study area does not contain suitable habitat for this species.
Mt. Tamalpais thistle <i>Cirsium hydrophilum</i> var. <i>vaseyi</i>	--;--;--;1B	Serpentine seeps within mixed evergreen forest and chaparral of Marin County.	May-August.	No. Study area does not contain suitable habitat for this species.
Napa false indigo <i>Amorpha californica</i> var. <i>napensis</i>	--;--;--;1B	Broadleaf upland forest, chaparral, and coniferous forests of North Bay	April-July.	No. Study area does not contain suitable habitat for this species.
Narrow-anthered California brodiaea <i>Brodiaea californica</i> var. <i>leptandra</i>	--;--;--;1B	Valley grassland and foothill woodland of Sonoma, Napa, and Lake counties.	May-July.	No. Species not known from the vicinity of the study area.
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	--;CE;--;1B	Moist freshwater meadows and vernal pools of coniferous forests and mixed evergreen forests.	April-August.	No. Study area does not contain suitable habitat for this species.
Oval-leaved viburnum <i>Viburnum ellipticum</i>	--;--;--;2	Yellow pine forests and chaparral of coast range, foothill woodlands and Sierras.	May-June.	No. Study area does not contain suitable habitat for this species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	--;--;--;1B	Meadows and seeps of chaparral and valley grasslands in Sonoma, Lake, Napa, and Butte counties.	May-November.	No. Study area does not contain suitable habitat for this species.
Petaluma popcornflower <i>Plagiobothrys mollis</i> var. <i>vestitus</i>	--;--;--;1A	Coastal salt marshes of Sonoma County.	June-July.	No. Species is not known to occur in the vicinity of the study area.
Point Reyes bird's beak <i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	--;--;--;1B	Coastal salt marshes of central and northern California coastal counties.	June-October.	No. Species was not observed in botanical surveys performed in 2009 and 2010.
Point Reyes checkerbloom <i>Sidalcea calycosa</i> ssp. <i>rhizomata</i>	--;--;--;1B	Coastal salt and freshwater marshes in Marin, Sonoma, and Mendocino counties.	April-September.	No. Species was not observed in botanical surveys performed in 2009 and 2010.
Robust spineflower <i>Chorizanthe robusta</i> var. <i>robusta</i>	FE;--;--;1B	Chaparral and cismontane woodlands, coastal scrub, and coastal dune scrub in Bay Area.	April-September.	No. Study area does not contain suitable habitat for this species.
Round-headed beaked-rush <i>Rhynchospora globularis</i> var. <i>globularis</i>	--;--;--;2	Freshwater marshes in Sonoma County.	July-August.	No. Species is not known to occur in the vicinity of the study area.
Round-leaved filaree <i>California macrophylla</i>	--;--;--;1B	Grassland and shrublands of the Central Valley and Coast Ranges.	March-May.	No. Species was surveyed for in 2008 with negative results.
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	--;--;--;1B	Vernal pools, marshes, and swamps within valley and foothill grasslands.	April-June.	No. Species is not known to occur in the vicinity of the study area and was not observed in botanical surveys performed in 2008, 2009, or 2010.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	--;--;1B	Upland grasslands and coastal sage scrub communities of central California.	June-September.	No. Study area does not contain suitable habitat for this species.
Sebastopol meadowfoam <i>Limnanthes vinculans</i>	FE;CE;--;1B	Seasonally wet meadows and vernal pools of the Cotati Valley in Sonoma County.	April-May.	No. Species is not known to occur in the vicinity of the study area.
Showy Indian clover <i>Trifolium amoenum</i>	FE;--;1B	Valley and foothill grasslands and coastal bluff scrub of North Bay counties.	April-June.	No. Study area does not contain suitable habitat for this species.
Soft bird's beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	FE;CR;--;1B	Upper reaches of salt marsh and pickleweed marshes of San Pablo and Suisun Bay.	July-September.	No. Study area contains marginal habitat for the species. Focused surveys were conducted in 2009 and 2010 with negative results. See Appendix D .
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE;--;1B	Freshwater marshes in Sonoma and Marin counties.	May-July.	No. Study area does not contain suitable habitat for this species.
Sonoma canescent manzanita <i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i>	--;--;1B	Chaparral and yellow pine forest of North Coast of California.	January-April.	No. Study area does not contain suitable habitat for this species.
Sonoma ceanothus <i>Ceanothus sonomensis</i>	--;--;1B	Found in chaparral of Sonoma, Napa, and Lake counties.	February-April.	No. Study area does not contain suitable habitat for this species and species is not known to occur in the vicinity of the study area.
Sonoma spineflower <i>Chorizanthe valida</i>	FE;CE;--;1B	Coastal prairie of Marin and Sonoma counties.	June-August.	No. Study area does not contain suitable habitat for this species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Suisun Marsh aster <i>Symphyotrichum lentum</i>	--;--;--;1B	Brackish and freshwater marshes in the Sacramento Valley and San Francisco Bay.	May-November.	No. Species is not known to occur in the vicinity of the study area and was not observed in botanical surveys performed in 2008, 2009, or 2010.
Tamalpais jewel-flower <i>Streptanthus batrachopus</i>	--;--;--;1B	Chaparral and closed-cone pine forest of Marin and Lake counties. Typically associated with serpentine soils.	April-July.	No. Study area does not contain suitable habitat for this species.
Tamalpais lessingia <i>Lessingia micradenia</i> var. <i>micradenia</i>	--;--;--;1B	Chaparral and upland valley grassland of Marin County. Usually associated with serpentine soils.	July-October.	No. Study area does not contain suitable habitat for this species.
Tamalpais oak <i>Quercus parvula</i> var. <i>tamalpaisensis</i>	--;--;--;1B	Lower montane coniferous forests of Marin County.	March-April.	No. There is no suitable habitat on the study area for this species.
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	--;--;--;1B	Found in coastal prairie, chaparral, or upland annual grassland.	May-October.	No. Study area does not contain suitable habitat for this species.
Tiburon jewelflower <i>Streptanthus niger</i>	FE;	Found in annual grasslands on the Tiburon Peninsula in grasslands with serpentine soils.	May-June.	No. Study area does not contain suitable habitat or soils for this species.
Tiburon mariposa lily <i>Calochortus tiburonensis</i>	FT	Restricted to Ring Mountain in Marin County. Found in grassland communities on serpentine soils.	May-June.	No. Study area does not contain suitable habitat or soils for this species.
Tiburon paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	FE;CT;--;1B	Found in bunchgrass communities of Marin and Sonoma counties with serpentine soils.	April-June.	No. Study area does not contain suitable habitat or soils for this species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Western leatherwood <i>Dirca occidentalis</i>	--;--;--;1B	Found in North Coast coniferous forest, foothill woodland, and evergreen forests. Typically on the margins of riparian areas.	January-March.	No. There is no suitable habitat on the study area for this species.
Yellow larkspur <i>Delphinium luteum</i>	FE;CR;--;1B	Extant populations known only from the Bodega Bay area. Found in coastal prairie and coastal scrub habitats.	March-May.	No. Species is not known to occur in the vicinity of the study area.
Wildlife				
Invertebrates				
California freshwater shrimp <i>Syncaris pacifica</i>	FE;CE;--;--	Found in low gradient streams and riparian areas of North Coast.	Year-round.	No. There is no suitable habitat on the study area for this species.
Mission blue butterfly <i>Plebejus icarioides missionensis</i>	FE;--;--;--	Life cycle associated with perennial lupine species. Known from Fort Baker in Marin County and San Bruno Mountain.	March-July.	No. Species is not known from vicinity of the study area and study area lacks host plants for this species.
Myrtle's silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE;--;--;--	Found in coastal dune and prairie habitat in Point Reyes.	June-September.	No. Species is not known from vicinity of the study area and study area does not contain suitable habitat.
San Bruno elfin butterfly <i>Callophrys mossii bayensis</i>	FE;--;--;--	Rocky outcrops and scrub communities on the San Francisco peninsula. Host plant is stonecrop (<i>Sedum</i> sp.) Generally restricted to San Bruno Mountain.	February-April.	No. Species is not known from vicinity of the study area and study area does not contain suitable habitat or host plant species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Amphibians/Reptiles				
California red-legged frog <i>Rana aurora draytonii</i>	FT; CSC; --; --	Requires a permanent fresh water source and is typically found along quiet slow moving streams, ponds, or marsh communities with emergent vegetation.	Optimal detection is through aquatic sampling during the summer months, but care should be taken to apply a level of effort and to use a style of surveying appropriate to the site.	Low. There is no suitable breeding habitat for this species within the study area; however there is limited potential for the frog to disperse into the study area during winter months.
California tiger salamander (central population) <i>Ambystoma californiense</i>	FT;CSC;--;--	Breeds in seasonal freshwater pools, stock ponds, and backwater areas. Requires upland burrows for adult cover.	Optimal detection is during spring breeding movements or from sampling of suitable breeding ponds.	No. There is no suitable habitat on the study area for this species.
Foothill yellow-legged frog <i>Rana boylei</i>	--;CSC;--;--	Requires slow-moving freshwater streams with relatively permanent water sources.	Optimal detection is through aquatic sampling during the summer months, but care should be taken to apply a level of effort and to use a style of surveying appropriate to the site.	No. There is no suitable habitat for this species on the study area.
Spadefoot toad <i>Spea hammondi</i>	--;CSC;--;--	Breeds in seasonal freshwater wetlands and vernal pools. Requires upland refugia in summer months.	Breeding occurs from March-July.	No. There is no suitable breeding habitat for this species on the study area.
Western pond turtle <i>Actinemys marmorata</i>	--;CSC;--;--	Found in permanent or semi-permanent freshwater ponds or slow-moving streams. Typically requires mud-bottoms and banks with suitable basking sites.	Year-round.	No. There is no suitable habitat on the study area for this species.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Fish				
Central California coastal steelhead/ Central Valley steelhead <i>Oncorhynchus mykiss</i>	FT;CSC;--;--	Coastal freshwater streams and Sacramento and San Joaquin rivers and their tributaries.	Spawn in freshwater between December and June.	No. There is no suitable habitat for this species on the study area.
California coastal/ Central Valley Chinook salmon <i>Oncorhynchus tshawytscha</i>	FE ; CE; --; --	Sacramento and San Joaquin Rivers and their tributaries.	Various runs spawn throughout year. Various runs have different regulatory status.	No. There is no suitable habitat for this species on the study area.
Coho salmon <i>Oncorhynchus kisutch</i>	FE;CE;--;--	Sacramento and San Joaquin Rivers and their tributaries.	Year-round.	No. There is no suitable habitat for this species on the study area.
Green sturgeon <i>Acipenser medirostris</i>	FT;CSC;--;--	Sacramento River and its tributaries. Usually found near San Francisco Bay and Delta waters.	Year-round.	No. There is no suitable habitat for this species on the study area.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	--;CSC;--;--	Found in brackish to freshwater of San Francisco Bay and the Delta.	Year-round.	No. There is no suitable habitat for this species on the study area.
Tidewater goby <i>Eucyclogobius newberryi</i>	FE;CSC;--;--	Low-salinity estuaries from Southern California to the Bay Area.	Year-round.	No. There is no suitable habitat for this species on the study area.
Tomales roach <i>Lavinia symmetricus</i>	--;CSC;--;--	Tributaries of Tomales Bay.	Year-round.	No. There is no suitable habitat for this species on the study area and species is not known to occur in vicinity of study area.
Birds				
Black swift <i>Cypseloides niger</i>	--;CSC;--;--	Nests on coastal and mountain cliffs and other sheer ledges with protection from predators.	April-September.	No. There is no suitable nesting habitat for this species on the study area.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
California black rail <i>Laterallus jamaicensis coturniculus</i>	--;CT;--;	Breeds in emergent marshes of the San Francisco Bay and portions of the Central Valley.	Year-round.	Low. There is no suitable marsh habitat for this species in the study area for breeding; although suitable emergent marsh habitat exists to the south of the study area and the species could seasonally (winter) forage within the survey area.
California brown pelican <i>Pelecanus occidentalis californicus</i>	FE(PD);CE;--;-- (nesting colonies)	Found in coastal areas from Baja, California to British Columbia. Breeds on isolated islands.	Year-round.	No. There is no suitable breeding habitat for this species on the study area.
California clapper rail <i>Rallus longirostris obsoletus</i>	FE;CE;--;--	Found in salt and brackish water marshes on the California coast.	Year-round.	High. Based on preliminary consultation with the USFWS and the FAA, it has been determined that the area of the proposed runway extension is habitat for the California clapper rail. In addition, suitable marsh habitat for this species exists to the south of the study area and the species could seasonally (winter) forage within the survey area.
California least tern <i>Sternula antillarum browni</i>	FE;CE;--;--	Breeds in coastal areas throughout California. Requires sandy or gravel substrates outside of tidal influences.	April-September.	No. There is no suitable breeding habitat for this species in the study area.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Great blue heron <i>Ardea herodias</i>	--;--;--;-- (rookery sites protected)	Resident throughout California in freshwater and brackish marshes.	Year-round.	No. There is not suitable rookery habitat for this species on the study area. Species may forage within the study area.
Loggerhead shrike <i>Lanius ludovicianus</i>	--;CSC;--;--	Found in grassland and shrubland habitats throughout California.	Year-round.	Low. Limited breeding habitat within study area.
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT;CE;--;--	Pelagic species. Nests in redwood forests of coastal areas.	Typically only seen in inland areas during breeding season (April-August).	No. There is no suitable habitat for this species in the study area.
Northern harrier <i>Circus cyaneus</i>	--;CSC;--;--	Found in annual grasslands and marshlands throughout California.	Year-round.	Present.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT;CSC;--;--	Found in mature and old-growth conifer forests from Northern California to British Columbia.	Year-round.	No. There is no suitable habitat for this species in the study area.
Salt marsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	--;CSC;--;--	Found in emergent saltwater and brackish marshes of San Francisco and Suisun Bay.	Year-round.	No. There is no suitable marsh habitat for this species on the study area. Some suitable habitat exists immediately to the south of the study area.
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	--;CSC;--;--	Found in emergent saltwater and brackish marshes of San Francisco and Suisun Bay.	Year-round.	Present. Song sparrows are present within the study area. Based on location and habitat, they are presumed to be San Pablo song sparrows.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Tricolored blackbird <i>Agelaius tricolor</i>	--;CSC;--;--	Found in freshwater and brackish marshes throughout the Central Valley and Bay Area.	Year-round.	Low. Not expected to breed within study area. Suitable foraging habitat available.
Western burrowing owl <i>Athene cunicularia hypugaea</i>	--;CSC;--;--	Found in annual grassland habitats. Needs suitable burrow sites such as abandoned ground squirrel burrows.	February-August (some resident populations).	Present. Species was observed within study area during assessment.
Western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT;CSC;--;--	Coastal population found from Washington to Baja, California. Breeds on coastal beaches above tide line, salt ponds, and gravel bars within coastal estuaries.	Year-round.	No. There is not suitable nesting habitat present within the study area and there are no records for this species in the vicinity of the study area.
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FC;CE;--;--	Found in mature riparian areas of coastal streams and tributaries of the Colorado River in SE California.	April-August.	No. There is no suitable habitat for this species on the study area.
White-tailed kite <i>Elanus leucurus</i>	--;CFP;--;--	Nests in mature trees within annual grasslands and wetland habitats throughout California.	Year-round.	Present. Species was observed within study area during assessment.
Other Raptors (Hawks, Owls and Vultures)	MBTA and §3503.5 Department of Fish and Game Code	Nests in a variety of communities including cismontane woodland, mixed coniferous forest, chaparral, montane meadow, riparian, and urban communities.	Most nesting raptors are found in large trees but some nest on the ground. Nesting occurs typically from February through September.	High.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Mammals				
American badger <i>Taxidea taxus</i>	--;CSC;--;--	Found in a variety of grasslands, shrublands, and open woodlands throughout California.	Year-round.	Low. Study area contains some suitable burrow habitat. Not known from the vicinity of the study area.
Pallid bat <i>Antrozous pallidus</i>	--;CSC;--;--	Found throughout California. Roosts in tree cavities, barns, and abandoned buildings.	Year-round.	Low. Airport hangars provide some potential roosting habitat.
Point Reyes mountain beaver <i>Aplodontia marmorata marmorata</i>	--;CSC;--;--	Subspecies found in dense coastal scrub habitat from Cape Mendocino to Point Reyes.	Year-round.	No. There is no suitable habitat for this species on the study area and species is not known from vicinity of study area.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE;CE;--;--	Strongly associated with pickleweed-dominated saltwater marshes of San Francisco, Suisun, and San Pablo Bay.	Year-round (typically requires live-trapping for identification).	High. Based on preliminary consultation with the USFWS and the FAA, it has been determined that the brackish marsh area north of the proposed runway extension is habitat for the Salt marsh harvest mouse. Marginal habitat for this species occurs within the study area, specifically within the areas of man-made drainage, which provide (limited) connectivity with suitable habitats adjacent to the Petaluma River and east of a levee used to isolate the airport property from tidal flows and processes. Although pickleweed is present in the Study Area, the Study area does not contain pickleweed-dominated marsh. Marsh in study area is dominated by saltgrass and alkali heath.
Suisun shrew <i>Sorex ornatus sinuosus</i>	--;CSC;--;--	Occurs in tidal marshes of Suisun and San Pablo Bay.	Year-round.	No. Study area contains saltgrass marsh, but it is not subject to tidal influences and does not support significant emergent vegetation. No records from vicinity of study area.

Special-Status Species	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Identification Period	Potential for Occurrence
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	--;CSC;--;--	Found throughout California. Roosts in caves, abandoned buildings, bridges, and rock crevices.	Year-round.	Low. Airport hangars provide some potential roosting habitat.
Federally Listed Species: FE = federal endangered FT = federal threatened		California State Listed Species: CFP = California fully protected CE = California state endangered CT = California state threatened CR = California state rare CSC = California Species of Special Concern		CNPS* List Categories: 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 common elsewhere 3 = plants about which we need more information 4 = plants of limited distribution Other Special-Status Listing: SLC = species of local or regional concern or conservation significance
<i>Source: Foothill Associates</i>				

5.4.1 Listed and Special-Status Plants

Based on a records search of the CNDDDB and the USFWS list, special-status plant species have the potential to occur onsite or in the vicinity of the study area. Based on field observations and literature review specific to the special-status plants listed in **Table 1**, the potential for occurrence has been determined for each species.

No special-status plant species are known to be present or are considered to have a high potential to occur within the study area. Focused plant surveys were performed on the site in March of 2008 July of 2009, and July, August, and September of 2010 to survey for potentially occurring special-status blooming plant species. No special-status plants were found during the surveys. Therefore, no special-status plant species are expected to occur within the study area.

5.4.2 Listed and Special-Status Animals

Based on a records search of the CNDDDB and the USFWS list, special-status animal species have the potential to occur onsite or in the vicinity. Based on field observations and literature review specific to the special-status animals listed in **Table 1**, the potential for occurrence has been determined for each species.

Species that are known to be present or that are considered to have a high potential to occur onsite include salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus longirostris obsoletus*), northern harrier (*Circus cyaneus*), San Pablo song sparrow (*Melospiza melodia samuelis*), western burrowing owl (*Athene cunicularia hypugaea*), white-tailed kite (*Elanus leucurus*), and various other protected raptor species.

The species that are considered to have a low potential onsite include California red-legged frog (*Rana aurora draytonii*), California black rail (*Laterallus jamaicensis coturniculus*), loggerhead shrike (*Lanius ludovicianus*), tricolored blackbird (*Agelaius tricolor*), American badger (*Taxidea taxus*), pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

Federally Threatened and Endangered Bird and Animal Species

Based on a records search of the CNDDDB, the USFWS list, and informal consultation with the USFWS, no special-status animal species are known to occur on the site or in the immediate vicinity of DVO. However, the USFWS has determined that the brackish marsh areas that surround the Airport should be considered marginal habitat for the Federally-endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and for the Federally-endangered California clapper rail (*Rallus longirostris obsoletus*). The FAA has concurred with this determination.

Coordination with the National Marine Fisheries Service (NMFS) confirmed that there is no Essential Fish Habitat present as defined by the NMFS in accordance with the Magnuson-Stevens Act (**Appendix E**).

Species Present or with a High Potential for Occurrence

Salt Marsh Harvest Mouse

The salt marsh harvest mouse (SMHM) (*Reithrodontomys raviventris*) is a small native rodent in the Cricetidae family. There are two subspecies: the northern (*R. r. halicoetes*) distribution and southern (*R. r. raviventris*) distribution. The northern subspecies inhabits the marshes of the San Pablo and Suisun bays, while the southern subspecies inhabits the marshes of Corte Madera, Richmond and South San Francisco Bay. Both subspecies do have grooved upper front teeth, but generally only the southern subspecies has a cinnamon- or rufous-colored belly.

Salt marsh harvest mice are critically dependent on dense cover and their preferred habitat is pickleweed (*Salicornia virginica*) marsh. Harvest mice are seldom found in cordgrass or alkali bulrush. In marshes with an upper zone of peripheral halophytes (salt-tolerant plants), this species uses this vegetation to escape the higher tides and may even spend a considerable portion of their lives there. This species also moves into the adjoining grasslands during the highest winter tides. Salt marsh harvest mice forage on leaves, seeds and stems of plants and prefer fresh green grasses in the winter. During the remainder of the year, they forage on pickleweed and saltgrass. The northern subspecies of the salt marsh mouse can drink sea water for long periods, but prefers fresh water. The southern subspecies can't subsist on sea water though it prefers moderately salty water over fresh.

Although salt marsh harvest mice are active mainly at night, they are sometimes active during daylight hours. This species swims very well, in contrast to the western harvest mouse, which is a poor swimmer. Salt marsh harvest mice breed throughout spring into autumn. Each female usually has only one or two litters per year, while the average litter size is about four. Nests are quite minimal, often built over old birds' nests, whereas members of the southern group often do not build a nest.

There is one documented occurrence of the salt marsh harvest mouse associated with suitable habitat adjacent to the Petaluma River to the north of the study area (CNDDDB 2010). Connected to these suitable habitat areas are two channelized ditches that convey seasonal water from accumulated precipitation away from the site. These ditches lead to pumps that discharge the water into the Petaluma River and effectively drain the Gness Field Airport property and CDFG Burdell Unit, which is situated between the Airport and the levee separating these areas from natural tidal marsh. These ditches are considered narrow bands of hydrological connectivity with areas of the Petaluma River that are known to provide suitable habitat for SMHM. Even though habitats on site are highly compromised as tidal marsh habitat, drained and grazed by cattle, and there are only sparse stands of discontinuous pickleweed within the study area, it had been determined through informal consultation with the USFWS (Pers., Comm. USFWS/CDFG 2010) that there is a potential for the mouse to utilize these ditches to gain access to the study area. Therefore, the USFWS has determined that the brackish marsh area north of the proposed runway extension area is habitat for the SMHM.

California Clapper Rail

The California clapper rail (*Rallus longirostris obsoletus*) is one of the largest rails (family Rallidae), measuring 32-47 centimeters (13-19 inches) from bill to tail. It is characterized by its hen-like appearance and a long slightly downward-curving bill. This species is olive-brown dorsally; with a cinnamon-buff colored breast and dark flanks crossed by white bars and white undertail coverts. These are often exposed when this species is agitated. With the exception of reproductive differences, male and female rails differ morphologically only in size. In general, males are slightly larger, while juveniles have a paler bill and darker plumage, with a gray body, black flanks and sides, and indistinct light streaking on flanks and undertail coverts.

The breeding season of California clapper rails begins by February. Nesting starts in mid-March and extends into August. The end of the breeding season is typically defined as the end of August, which corresponds with the time when eggs laid during re-nesting attempts have hatched and young are mobile. Clutch sizes range from 5 to 14 eggs. Both parents share in incubation and rearing.

Clapper rails are most active in early morning and late evening, when they forage in marsh vegetation in and along creeks and mudflat edges. They often roost at high tide during the day. Throughout their distribution, California clapper rails occur within a range of salt and brackish marshes. In south and central San Francisco Bay and along the perimeter of San Pablo Bay, rails typically inhabit salt marshes dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*). Pacific cordgrass dominates the middle marsh zone throughout the south and central Bay.

In the North Bay (Petaluma Marsh, Napa-Sonoma marshes, Suisun Marsh), clapper rails also live in tidal brackish marshes that vary significantly in vegetation structure and composition. Use of brackish marshes by clapper rails is largely restricted to major sloughs and rivers of San Pablo Bay and Suisun Marsh, and along Coyote Creek in south San Francisco Bay. Clapper rails have rarely been recorded in nontidal marsh areas.

There is no suitable nesting habitat within the study area. However, because there is limited marginal habitat within the site during winter months, when water inundates historical high marsh areas comprising portions of the survey area, there is a potential for the species to utilize the site. Therefore, it had been determined through informal consultation with the USFWS that the proposed runway extension area is habitat for the California clapper rail (Pers. Comm. USFWS/CDFG 2010).

Northern Harrier

The northern harrier is a large gray or brown raptor species. The female is typically larger than the male. It is typically inhabits marshes, oak savannahs, wetlands, or grasslands. Northern harriers are usually year-round residents in California. Some individuals from other areas will over-winter in California. Nests are typically built on the ground or in low shrubs. Northern harriers typically feed on small mammals, reptiles, and insects. It is considered a California Species of Special Concern by the California Department of Fish and Game. There are no records in the CNDDDB for this species within five miles of the site (CNDDDB 2010). However, this species is more widespread in California than CNDDDB records would indicate. Northern harriers were observed within the study area during the biological assessment. Therefore, this species is considered to be present within the study area and have a potential to nest within the annual grassland and high brackish marsh communities within the study area.

San Pablo Song Sparrow

This subspecies of song sparrow is found in the San Pablo Bay area of the greater San Francisco Bay. Differences between this subspecies and other subspecies of song sparrows are primarily based on genetic differences. The breeding season for this species is typically March through August. There are five records in the CNDDDB for this species within five miles of the study area (CNDDDB 2010). Song sparrows were observed within the study area during the biological assessment. Given that song sparrows were observed within the study area and records for this subspecies exist in the immediate vicinity, this species is presumed to be present within the study area.

Western Burrowing Owl

Western burrowing owl is a small ground-dwelling owl that occurs in western North America from Canada to Mexico, and east to Texas, and Louisiana. Although in certain areas of its range western burrowing owls are migratory, these owls are predominantly non-migratory in California (Zeiner *et al.* 1990). The breeding season for western burrowing owls occurs from February to August, peaking in April and May (Zeiner *et al.* 1990). Western burrowing owls nest in burrows in the ground, often in old ground squirrel burrows. This owl is also known to use artificial burrows including pipes, culverts, and nest boxes. There are six CNDDDB records for this species within five miles of the study area (CNDDDB 2010) and western burrowing owls were observed

during the biological assessment. Suspected burrow locations for this species are shown in **Figure 5**. Therefore, burrowing owls are considered to be present in the study area.

White-Tailed Kite

The white-tailed kite is a resident species throughout California where there is suitable habitat. Their population is scattered widely throughout California during the non-breeding season. They occur in low elevation grassland, agricultural, wetland, oak-woodland, and oak-savannah habitats, and riparian areas adjacent to open areas (Small 1994). Nests are placed in trees and large shrubs, most nests are on habitat edges and are placed in upper third of the tree (Dunk 1995). This species is considered both a California State Species of Special Concern and a Fully Protected Species (CDFG 2005). There is one record for this species within five miles of the study area (CNDDDB 2010). This species was observed foraging within the study area during the biological assessment. Therefore, this species is considered to be present within the study area and have a potential to nest within the annual grassland and high brackish marsh communities within the study area.

Other Raptor Species

Other raptor species forage and nest in a variety of habitats throughout Marin County. Several raptor species were observed within the study area during the biological assessment. Raptor nests are protected under the MBTA and Section 3503.5 of the California Fish and Game Code, which makes it illegal to destroy any active raptor nest. There are some limited nesting sites for raptors both within the airfield grounds and outside of the perimeter of the airfield. Consequently, raptors and other migratory birds are likely to forage and nest on the site.

Species with a Low Potential for Occurrence

California Red-legged frog

The California red-legged frog is the largest native frog in the Western United States. It is genetically distinct from the Northern red-legged frog (*Rana aurora aurora*) and the California red-legged frog receives federal protection, while the other subspecies (*R. a. aurora*) or intergrades do not. The California red-legged frog is a relatively large frog (1.75-5.25 in. SVL), has a light jaw stripe ending in front of the shoulder, and possesses two unique and well defined dorsal-lateral folds on its back that begin just behind the eyes and extend towards its posterior. The California red-legged frog was historically present in the central valley of California, however its current range extends from the southern border of California to the southern portion of Mendocino County and extends northeast to Plumas and Placer counties, and south along the foothills of the Sierra-Nevada's from Plumas County to the northeast portion of Madera County; possibly also Mono County. This species has been found at elevations between sea level and 8,000 feet. California red-legged frog adults are most likely found in deep pools of fresh water, such as ponds, marshes, springs, reservoirs and streams with abundant overhanging vegetation. Juveniles, frog eggs, and adults have also been found in ephemeral creeks, ponds, and drainages that lack riparian vegetation. This species spends most of the year underground, where members seek refuge from desiccating weather by constructing and residing in small burrows. These frogs often breed in fresh water ponds and drainages between the months of November and March. Disappearing from seventy percent of its historical range, the California red-legged frog has

suffered huge declines due to over harvesting, habitat loss, non-native species introductions, and urban encroachment. There are two records in the CNDDDB for this species within five miles of the site and these occurrences are east of the Petaluma River. This species was not found on the site during the field assessment. Due to the fact that the site is primarily high brackish marsh and it requires freshwater aquatic habitats to persist, it is unlikely the frog would occur within the project site. Therefore, California red-legged frog would have low potential to occur within the study area only during winter months, if possibly dispersing from localized freshwater habitat areas.

California Black Rail

The range of California black rail is highly irregular and not well understood. It is thought that these rails are year-round residents of the habitat in which they are found. The species inhabits thick emergent wetland vegetation, once thought to occur typically in salt and tidal marshes, but recent evidence suggests a wider range of habitat types. This species may even be found in smaller patches (~1 acre) of isolated, dense wetland vegetation and may colonize unoccupied suitable habitat more readily than assumed. There are 4 CNDDDB records for California black rails within five miles of the study area and the species has been observed in Black John Slough just south of the study area. Although there is marginal habitat within the site for the majority of the year, during winter months, when water inundates historical high marsh areas comprising portions of the survey area, there is a low potential for the species to utilize the site (Pers. Comm USFWS/CDFG 2010). There is no suitable nesting habitat within the study area.

Loggerhead Shrike

Loggerhead shrikes are common residents and winter visitors of valleys and foothills throughout California. The loggerhead shrike utilizes open habitats with scattered shrubs and trees, posts, fences, utility lines, and occurs often in cropland (Zeiner *et al.* 1990). The highest density of shrikes occurs in open valley foothill grassland areas with occasional shrubs and available perch sites. Shrikes are predators and are often observed at a fixed perch site; they hunt from perches for lizards, large insects and small mammals where often they spear prey on fence posts or thorns. This species nests from March to May, building twig nests within the dense foliage of shrubs or trees that conceal the nest. There are no records in the CNDDDB for this species within five miles of the site (CNDDDB 2010). However, this species is more widespread in California than CNDDDB records would indicate. This species was not observed within the study area during the biological assessment. However, the salt marsh and grassland habitats provide foraging habitat for this species and there are some limited areas available for nesting within the study area. Therefore, the potential for this species to occur within the study area is low.

Tricolored Blackbird

The tricolored blackbird is a colonial nester of marshy areas throughout the Central Valley and coastal California. It can be observed in the Central Valley year-round and is typically a resident throughout its range, however tricolored blackbirds that occur in northeastern California have been known to migrate south during fall and winter months. Tricolored blackbirds breed near freshwater, preferably in emergent marsh areas with tall, dense cattails (*Typha* spp.) but will also nest in willow (*Salix* spp.) thickets. Nests are usually located a few feet over water or may be

hidden on the ground in vegetation. Blackbirds build nests of mud and plant material. Blackbirds are highly colonial; nesting areas must be large enough to support a minimum colony of at least 50 pairs. Tricolored blackbirds are omnivorous and often shift their diet from insects and spiders during the spring season, to seeds, cultivated grains, rice and oats during fall and winter months. Blackbirds forage on the ground in croplands, grassy fields, and flooded rice fields. There is one record in the CNDDDB for this species within five miles of the study area (CNDDDB 2010). This species was not observed within the study area during the biological assessment. However, there are some limited areas of suitable nesting habitat in the northern portion of the study area near the railroad right of way. Therefore, this species has a low potential to occur within the study area.

American Badger

The distribution of American badger occurs from Alberta, Canada southward to central Mexico and eastward from the Pacific coast to Ohio. They range throughout the state of California but are absent from humid coastal forests of Del Norte county and Humboldt county. Suitable habitat for badgers is characterized by grasslands, shrub, mountain meadow, and open stages of most habitats with dry soil. Badgers habitat in mountainous areas requires large, treeless meadows and expanses near timberline. They dig burrows in soil for cover, or reuse old burrows (Ahlborn 1983). They prey mostly on fossorial rodents such as gophers, ground squirrels, marmots, and kangaroo rats. They will also eat a variety of other animals including mice, woodrats, birds and insects (Ahlborn 1983). There is one record in the CNDDDB within five miles of the study area (CNDDDB 2010). This species was not observed within the study area during the biological assessment. However, the levees surrounding the airfield contain some suitable burrows for this species and there is some suitable habitat for this species. Therefore, the potential for this species to occur within the study area is low. Given the low likelihood of occurrence for this species within the study area, no specific mitigation measures are provided for this species since it is unlikely that airport construction would have a significant impact on the local or regional populations of this species.

Special-Status Bat Species

The study area contains suitable roosting habitat for special-status bat species including pallid bat and Townsend's big-eared bat. The airport hangars provide potential roost sites for these species and the surrounding grasslands and wetlands provide suitable foraging habitat for these species. There is one record in the CNDDDB within five miles of the study area (CNDDDB 2010) for pallid bat and no bat species were observed during the biological assessment. Therefore, the potential for these species to occur within the study area is low. Since potential bat roosting areas such as hangars would not be anticipated to be impacted by any airfield construction projects, no mitigation for special-status bat species would be expected to be necessary.

5.5 Sensitive Habitats

Sensitive habitats include those that are of special concern to resource agencies or those that are protected under CEQA, Section 1600 of the California Fish and Game Code, and/or Sections 401 and 404 of the Clean Water Act. Additionally, sensitive habitats are protected under the specific policies outlined in the Marin County General Plan. Sensitive habitats known to occur onsite,

which include wetlands/waters of the U.S., depressional seasonal wetlands, riverine seasonal wetlands, slope seep, high brackish marsh, and a perennial drainage (**Figure 4**).

All of the sensitive habitats mentioned above are jurisdictional waters of the U.S. and therefore are regulated by the Army Corps of Engineers. Permits will be required under the Clean Water Act for any project-related impacts to any of these features determined to be jurisdictional.

5.5.1 Jurisdictional Waters of the United States

Jurisdictional waters of the United States located on Gness Field Airport total approximately 74.70 acres. This acreage includes 3.59 acres of depressional seasonal wetland, 0.52 acre of riverine seasonal wetland, 2.95 acres of slope seep, 58.96 acres of high brackish marsh, 2.48 acres of perennial drainage, and 6.20 acres of ditches (**Figure 5**). To date, potential wetland areas on the study area have been formally delineated. The Corps has verified these acreages as of the date of preparation of this revised biological assessment.

Jurisdictional waters of the United States include jurisdictional wetlands as well as all other waters of the United States such as creeks, ponds, and intermittent drainages. Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Corps 1987). The majority of jurisdictional wetlands in the United States meet three wetland assessment criteria: hydrophilic vegetation, hydric soils, and wetland hydrology. Jurisdictional waters of the United States can also be defined by exhibiting a defined bed and bank and ordinary high watermark (OHWM). As discussed in Regulatory Framework, jurisdictional waters of the United States are subject to Section 404 of Clean Water Act and are regulated by the Corps.

5.5.2 Wildlife Migration Corridors

Wildlife movement zones are important for the movement of migratory wildlife populations. Corridors provide foraging opportunities and shelter during migration. Generally, wildlife movement zones are established migration routes for many species of wildlife. Movement corridors often occur in open areas or riverine habitats that provide a clear route for migration in addition to supporting ample food and water sources during movement.

The study area does not contain any vegetation community such as a riparian woodland or similar community that would serve as a significant wildlife migration corridor. Local wildlife may move within the study area in a similar fashion as areas immediately adjacent to the airfield.

5.6 Protected Trees

5.6.1 Marin County

Marin County protects individual native trees with a diameter at breast height (DBH) of six inches or greater. A tree removal permit is required for the removal of protected trees and replacement at a ratio of 2:1 is required. The northern portion of the study area contains some

scattered oak trees especially north of the railroad right of way. There are also some trees within the airfield that are potentially regulated by Marin County.

6.0 CONCLUSIONS, IMPACTS AND MITIGATION RECOMMENDATIONS

As discussed, the Gness Field study area consists of land that supports primarily developed areas, annual grassland, and high brackish marsh. Known or potential biological constraints on the study area include the following:

- Potential for winter dispersal of red-legged frog into the proposed runway extension area;
- Potential winter foraging habitat for California black rail;
- Habitat for California clapper rail in the proposed runway extension area;
- Habitat for salt marsh harvest mouse in the proposed runway extension area;
- Potential nesting habitat and foraging habitat for raptors, including western burrowing owl;
- Potential nesting habitat for other bird species protected by the MBTA, including loggerhead shrike and tricolored blackbird;
- Sensitive habitats including jurisdictional waters of the United States (depressional seasonal wetland, riverine seasonal wetland, slope seep, high brackish marsh, perennial drainage, and ditches); and
- Protected trees.

6.1 California Red-legged Frog

Although there are no localized occurrences west of the Petaluma River and the site consist primarily of high brackish marsh, there is a low potential that dispersing red-legged frogs could occur on the site during the winter season. For this reason, all construction activities should be performed in the dry season work window of May 15 to October 15. If work activities that may negatively affect the frog cannot be confined to this work window, a pre-construction survey within 48 hours of ground disturbance shall be performed by a qualified biologist. Additionally, a worker environmental awareness program (WEAP) training shall be conducted for all construction staff by a qualified biologist. The WEAP training shall include information regarding the life history of the frog, the federal and state listing status of the frogs and implications of taking the frog, and pictures of the frog shall be disseminated to the all workers for positive identification of the frog.

6.2 California Black Rail

Through informal consultation with the CDFG during pre-project planning, a determination was made that potential exists for black rail to occur within the study area during winter months to forage or disperse. The species is also known to occur in Black John Slough south of the Gness Field Airport property. If suitable habitat for the black rail is impacted by the Project, mitigation for habitat impacts will be determined through consultation with the CDFG. Presumably, habitat mitigation as required by the USFWS for the salt marsh harvest mouse and clapper rail will compensate for impacts to black rail habitat within the site. Additionally, construction associated with the Project is scheduled for dry periods of the year and black rail is not expected

to occur during this time within the study area. During formal CESA consultation with the CDFG for black rail habitat impacts and avoidance measures, it will be determined whether a “take” permit from the CDFG will be required to complete the Project, or whether construction timing will result in complete avoidance of the species.

6.3 California Clapper Rail

Through informal consultation with the USFWS during pre-project planning, a determination was made that potential exists for the California clapper rail to occur within the study area during the winter season to forage or disperse. Therefore, the proposed runway extension area has been determined to be habitat for the California clapper rail. For any habitat for the California clapper rail that is impacted by the Project, mitigation for impacts to habitat will be determined through consultation with the USFWS and/or CDFG. Presumably, habitat mitigation as required by the USFWS for the salt marsh harvest mouse will compensate concurrently for impacts to California clapper rail habitat within the site.

Additionally, construction associated with the Project is scheduled for dry periods of the year and California clapper rail is not expected to occur during this time within the study area. During formal ESA Section 7 consultation with the USFWS for impacts to California clapper rail habitat impacts, it will be determined whether a “take” permit will be required to complete the Project or whether construction timing will result in complete avoidance of the species.

6.4 Salt Marsh Harvest Mouse

Through informal consultation with the USFWS during pre-project planning, a determination was made that potential exists for the SMHM to occur within the study area, and specifically in habitat areas associated with the runway expansion. Habitat areas comprised of high brackish marsh and adjacent uplands north of the proposed runway extension are considered SMHM habitat.

For SMHM habitat that is impacted by the Project, mitigation will be determined through consultation with the USFWS and/or CDFG. Presumably, habitat mitigation as required by the USFWS for the California clapper rail will compensate concurrently for impacts to SMHM habitat within the site.

To minimize effects to the mouse, impact areas related to the runway expansion will be completely fenced off with SMHM exclusion fencing as necessary. To ensure proper installation of fencing design and materials a USFWS-approved biologist will approve fence installation methods and the USFWS will review and approve location and design specifications for proposed SMHM exclusion fencing. During the exclusionary fence installation, a USFWS-approved biologist will monitor for SMHM avoidance.

When conducting land clearing activities including grubbing and vegetation removal, it may be necessary to remove vegetation utilizing hand tools or other methods acceptable to the CDFG and USFWS. A USFWS-approved biologist will be onsite during initial ground disturbance and vegetation removal.

A USFWS-approved biologist will monitor and instruct Marin County staff and/or construction contractor in the materials and methods required for proper installation of SMHM exclusion fencing, to train the construction crew on approved avoidance measures and on the life history of SMHM, to train Marin County and/or construction contractor staff in appropriate monitoring techniques and methods for salt marsh harvest mouse protection (so that these individuals can conduct daily monitoring on their own for the duration of the project work), and the USFWS-approved biologist will be available on an “on-call” basis for the entirety of the Project.

A qualified biological monitor designated by the County will conduct daily monitoring on the project site during work activities that are occurring within SMHM habitat. If a SMHM is observed on the project site, work will stop and the USFWS-permitted and/or approved biologist will be notified. If the mouse leaves the work area of its own volition, then work can proceed only if approved by the USFWS-permitted or approved biologist. If the mouse does not leave the project site, then no work will be re-started until the USFWS has been notified and additional avoidance measures, if any, are discussed and implemented.

During formal ESA Section 7 consultation with the USFWS for impacts to SMHM habitat impacts, it will be determined whether a “take” permit will be required to complete the Project, or whether construction minimization measures will result in complete avoidance of the species.

6.5 Burrowing Owl

As mentioned previously, burrowing owls were observed during the biological assessment on the levees surrounding the airstrip (**Figure 5**). Mitigation for project impacts that result in relocation of burrowing owls and loss of burrows and/or foraging habitat may be required for CEQA projects (CDFG recommends 6.5 acres of foraging habitat for burrowing owl be preserved for each active burrow that would be impacted by project activities). The lead agency under CEQA, in coordination with CDFG, is responsible for prescribing appropriate mitigation for any project-related impacts to burrowing owls.

At a minimum, the CEQA lead agency will require a pre-construction clearance survey be performed prior to any construction activity for any of the proposed alternatives. It is recommended that a burrowing owl survey be conducted no more than 30 days prior to the onset of construction. Burrowing owls can be present during all times of the year in California, so this survey is recommended regardless of the time construction activities occur. If active owl burrows are located during the pre-construction survey, it is recommended that a 250-foot buffer zone be established around each burrow with an active nest until the young have fledged and are able to exit the burrow. In the case of occupied burrows without active nesting, active burrows after the young have fledged, or if development commences after the breeding season (typically February 1-August 31), passive relocation of the birds should be performed. Passive relocation involves installing a one-way door at the burrow entrance, which encourages the owls to move from the occupied burrow. CDFG should be consulted for current guidelines and methods for passive relocation of any owls found on the site.

6.6 Other Raptors

As discussed earlier, several species of raptors forage and may nest on or immediately adjacent to the study area. A northern harrier, an American kestrel, a red-tailed hawk, and a white-tailed kite were observed foraging within the study area. There are some suitable nesting sites within the airfield proper and in scattered locations of the study area. Active raptor nests are protected by the California Fish and Game code Section 3503.5 and the MBTA. For this reason, if construction is expected to occur during the nesting season (February 1-August 31), a pre-construction raptor survey is recommended for any of the proposed alternative alignments to determine if active raptor nests are present on or within 500 feet of the site. The survey should be conducted by a qualified biologist no more than 30 days prior to the onset of construction. If the nests are found and considered to be active, construction activities should not occur within 500 feet until the young have fledged or the biologist determines that the nest is no longer active. If construction activities are proposed to occur during the non-breeding season (September 1-January 31), a survey is not required and no further studies are necessary.

6.7 Other Bird Species Protected by the MBTA

The trees, shrubs, and grasslands on the study area provide suitable nesting habitat for a number of common and special-status birds protected solely by the MBTA. As discussed, the MBTA prohibits the killing of migratory birds. Therefore, if any vegetation removal occurs during the typical avian nesting season (February 1-August 31), a pre-construction survey is recommended for any of the proposed alternative alignments to determine if active nests are present on the study area. The survey should be conducted by a qualified biologist no more than two weeks prior to the onset of vegetation removal. If active nests are found on the study area, disturbance or removal of the nest should be avoided until the young have fledged and the nest is no longer active. Extensive buffers, such as those recommended for nesting raptors, are not necessary for nesting avian species protected solely by the MBTA. However, depending on the species, study area conditions, and the proposed construction activities near the active nest, a small buffer may be prescribed, as determined by the biologist. Alternatively, vegetation removal could be scheduled to avoid all potential impacts. Vegetation removal conducted between September 1 and January 31 will prevent impacts to nesting birds or unfledged young.

6.8 Wetland Impacts

The site supports a total of 74.70 acres of verified jurisdictional waters of the United States. Included in this total acreage is 3.59 acres of depressional seasonal wetland, 0.52 acre of riverine seasonal wetland, 2.95 acres of slope seep, 58.96 acres of high brackish marsh, 2.48 acres of perennial drainage, and 6.20 acres of ditch (**Figure 5**).

Alternative A (no Action Alternative) would result in no impacts to regulated wetlands (**Figure 6**). Alternative B would result in impacts to 12.60 acres of regulated wetlands including 10.29 acre of high brackish marsh, 1.57 acre of ditch/canal, 0.59 acre of perennial drainage and 0.15 acre of depressional seasonal wetland (**Figure 7**). Alternative D would result in 13.42 acres of impacts to regulated wetlands including 11.11 acre of high brackish marsh, 1.57 acre of ditch/canal, 0.59 acre of perennial drainage, and 0.15 acre of depression seasonal wetland (**Figure 8**).

These areas are regulated by the Corps. Consequently, the appropriate Section 404 permit will be required for any project-related impacts to jurisdictional features. Any waters of the United States that would be lost or disturbed should be replaced or rehabilitated on a “no-net-loss” basis in accordance with the Corps’ mitigation guidelines. Habitat restoration, rehabilitation, and/or replacement should be at a location and by methods agreeable to the Corps.

If a 404 permit is required for the proposed project, water quality concerns during construction would be addressed in a Section 401 water quality certification from the Regional Water Quality Control Board. A Storm Water Pollution Prevention Plan (SWPPP) would also be required during construction activities. SWPPPs are required in issuance of a National Pollutant Discharge Elimination System (NPDES) construction discharge permit by the U.S. Environmental Protection Agency. Implementation of Best Management Practices (BMPs) during construction is standard in most SWPPPs and water quality certifications. Examples of BMPs include stockpiling of debris away from regulated wetlands and waterways; immediate removal of debris piles from the site during the rainy season; use of silt fencing and construction fencing around regulated waterways; and use of drip pans under work vehicles and containment of fuel waste throughout the site during construction.

6.9 Protected Trees

6.9.1 *Marin County*

If protected trees are expected to be removed as part of a proposed project, an arborist report prepared by an International Society of Arboriculture-certified arborist is recommended to document the size, species, and health of regulated trees within the study area. The County will also require replacement plantings for any regulated trees that are removed.

6.9.2 *Federal Aviation Administration*

Prior to citing potential mitigation tree plantings and as part of the tree evaluation performed for the site, FAA regulations pertaining to wildlife/birdstrikes and overall safe operation should be evaluated to prevent possible safety issues. The FAA requires an airport to limit the height of objects in the vicinity of airports to prevent their interference with the safe and efficient operation of the airport (FAA, 1987). This would include limiting the height of trees within a certain distance of the operations of the airport.

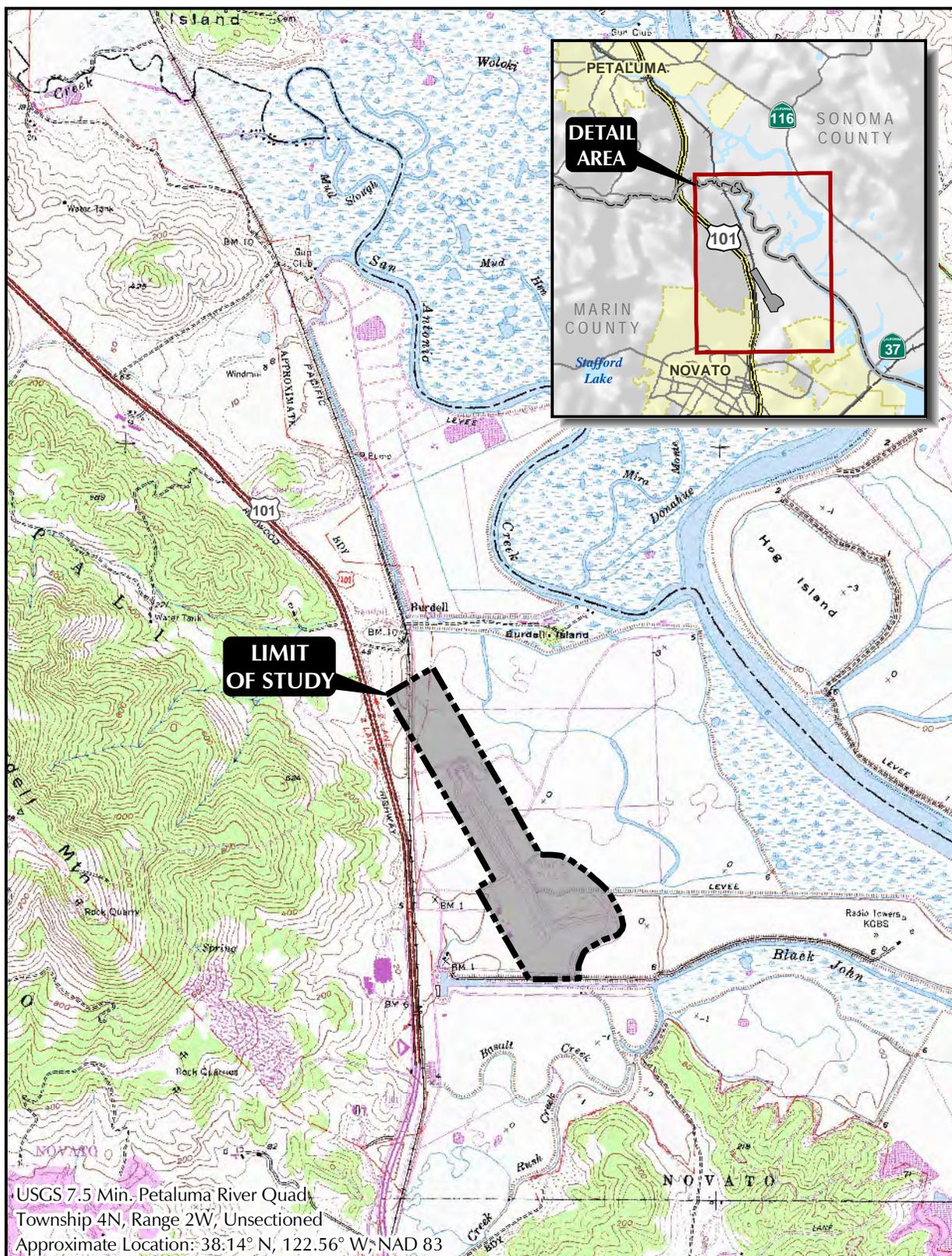
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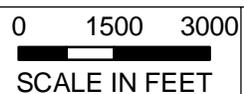
Personal Communication

- USFWS/CDFG. 2010. Conference call on September 9, 2010 with USFWS representatives Ryan Olah and Joseph Terry, Marin County (Eric Stager, Ken Robbins, and John Roberto), Federal Aviation Administration (Douglas Pomeroy), Department of Fish and Game (Greg Martinelli, Karen Taylor, and Tom Huffman), Landrum and Brown (Rob Adams and Sara Hassert), Foothill Associates (Brian Mayerle and Ryan Brown), and ESA (Brian Pittman).



USGS 7.5 Min. Petaluma River Quad
 Township 4N, Range 2W, Unsectioned
 Approximate Location: 38.14° N, 122.56° W, NAD 83

SITE AND VICINITY

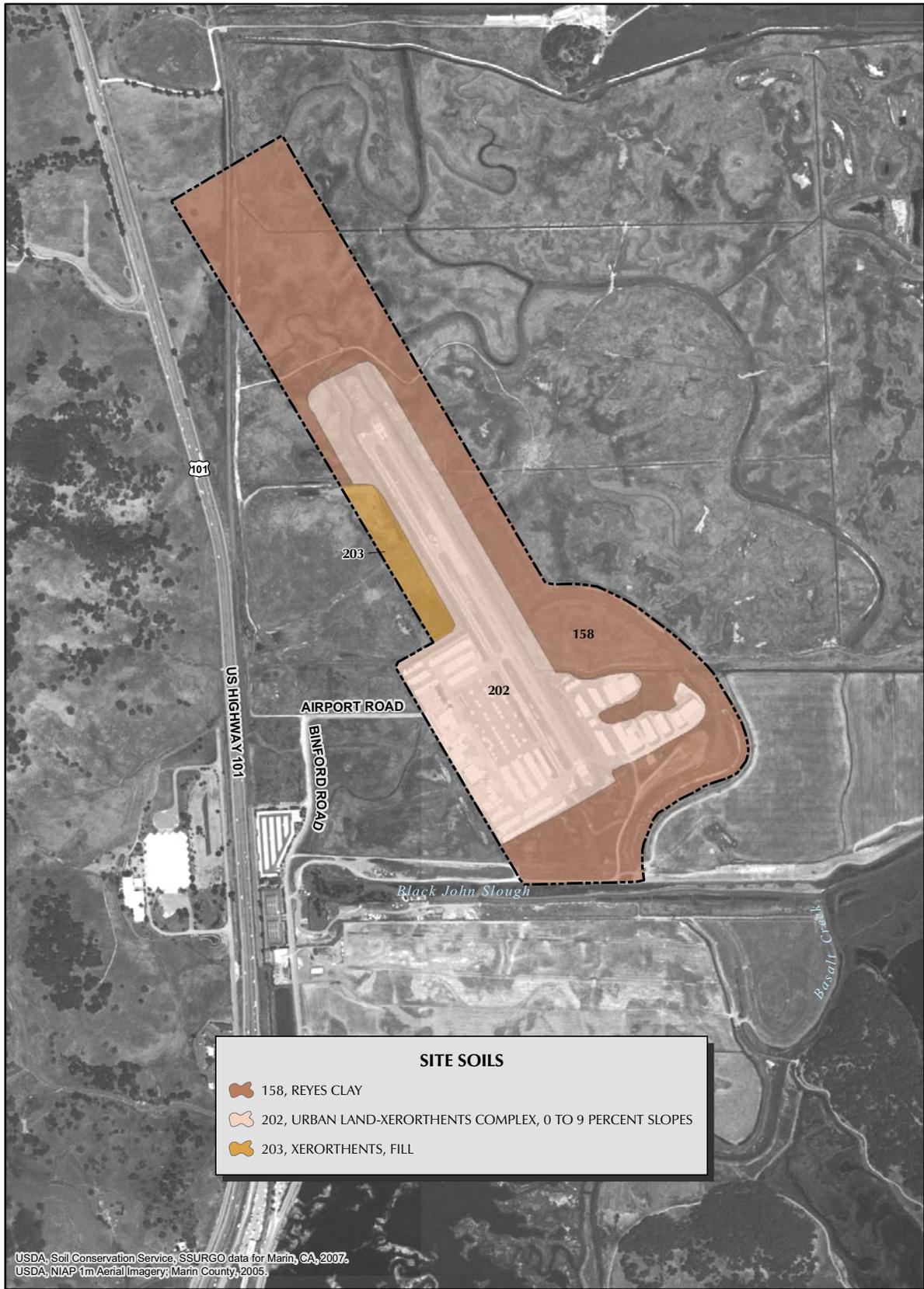


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 Date: 04/29/08

FIGURE 1

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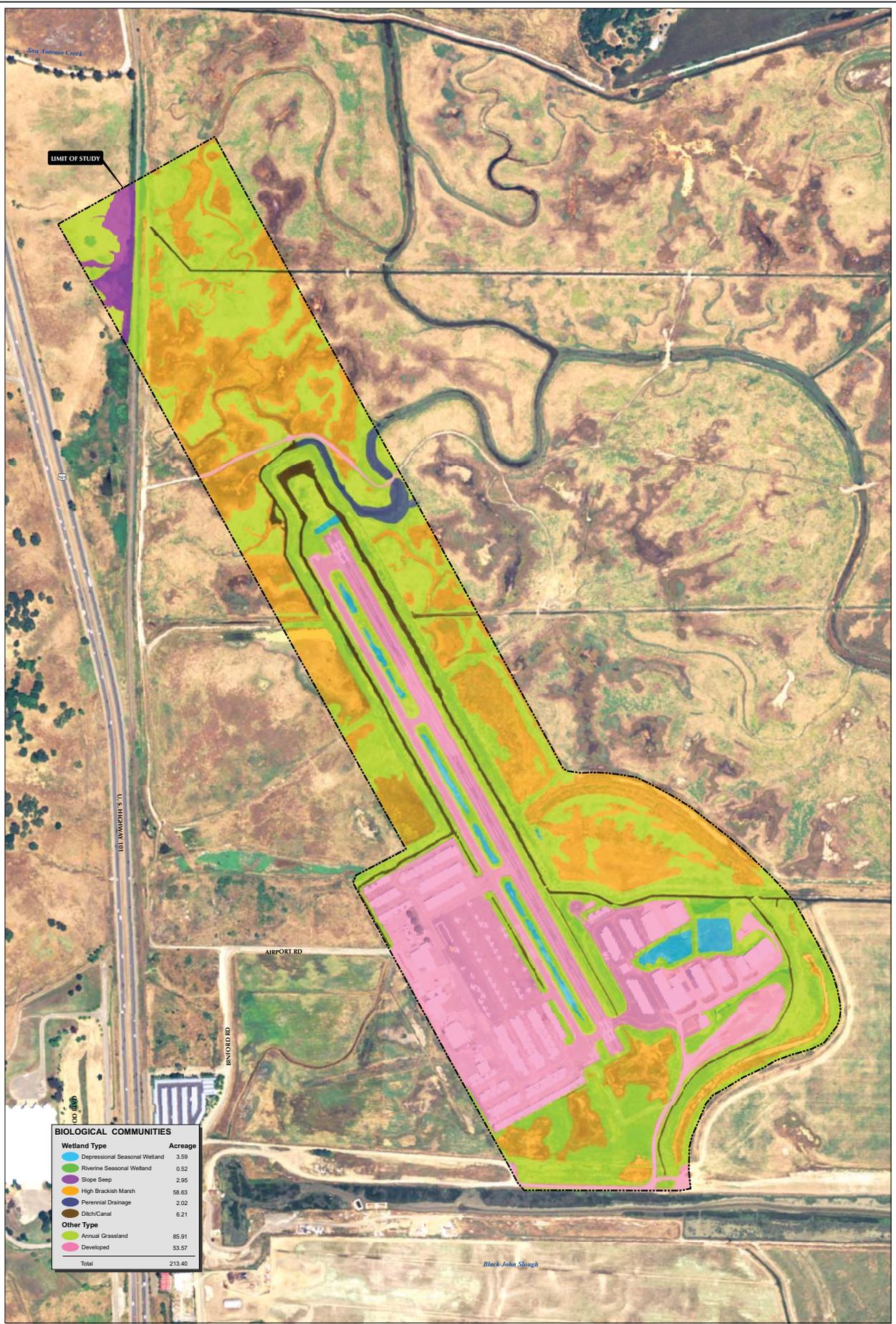
USDA, Soil Conservation Service, SSURGO data for Marin, CA, 2007.
 USDA, NIAP 1m Aerial Imagery; Marin County, 2005.

SOILS

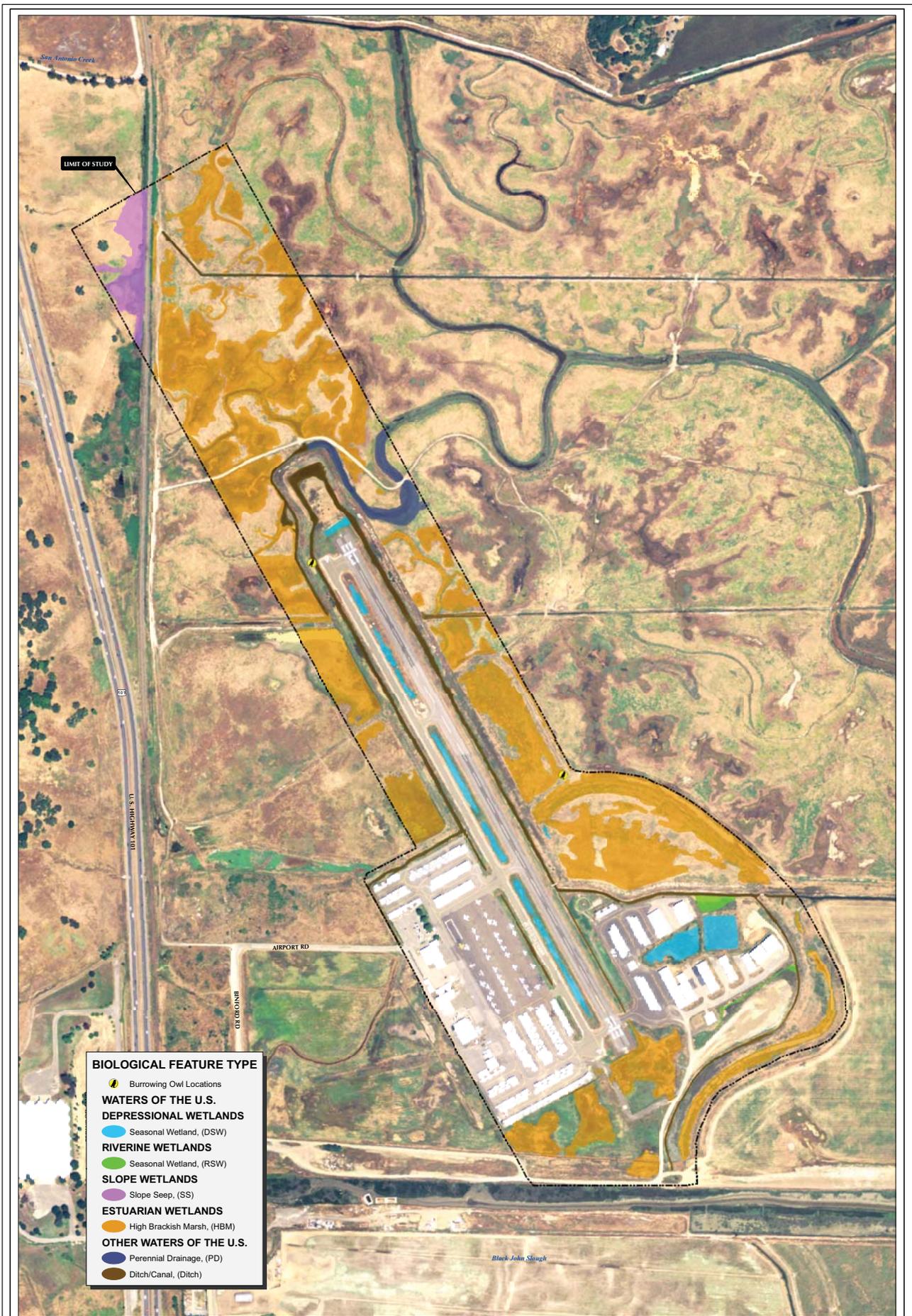
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BIOLOGICAL COMMUNITIES



BIOLOGICAL CONSTRAINTS

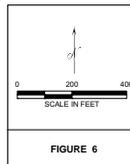


WATERS OF THE U.S. CLASSIFICATION	ACREAGE IMPACTED	ACREAGE AVOIDED	TOTAL	CLASSIFICATION	ACREAGE IMPACTED	ACREAGE AVOIDED	TOTAL
ADJACENT				ADJACENT SECTION 10 WATERS			
DEPRESSIONAL WETLANDS				SLOPE WETLANDS			
Seasonal Wetland (DSW)	N/A	3.59	3.59	Slope Swale (SS)	N/A	1.06	1.06
RIVERINE WETLANDS				ESTUARINE WETLANDS			
Seasonal Wetland (RSW)	N/A	0.52	0.52	High Brackish Marsh (HBM)	N/A	7.40	7.40
SLOPE WETLANDS				ABUTTING SECTION 10 WATERS			
Slope Swale (SS)	N/A	1.89	1.89	Other Waters of the U.S.			
ESTUARINE WETLANDS				Perennial Drainage (PD)	N/A	0.67	0.67
High Brackish Marsh (HBM)	N/A	51.56	51.56	Diary/Canal (Dch)	N/A	0.38	0.38
ABUTTING				TOTAL			
OTHER WATERS OF THE U.S.					N/A	74.70	74.70
Perennial Drainage (PD)	N/A	1.81	1.81				
Diary/Canal (Dch)	N/A	5.82	5.82				

OTHER FEATURES
Project Boundary
Existing Runways and Buildings

NOTES

- Waters of the U.S. verified by U.S. Army Corps of Engineers 828P03, #2008-0029N.
- Digital base data provided by Miami County. Contour interval is 5 feet.
- The Hydrologic Unit Code for this site is 18050002.
- This delineation utilizes the Corps 1987 three-parameter methodology, the Rapanos Guidance and the Arid West Supplement to delineate jurisdictional waters of the U.S.
- Waters of the U.S. were mapped using a Trimble Global Positioning System (GPS).
- The extent of Section 10 waters is delineated based on aerial photo interpretation.



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WETLAND IMPACTS: ALTERNATIVE A

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FIGURE 6

Figure to be updated after USFWS consultation



WATERS OF THE U.S.				ADJACENT SECTION 10 WATERS				OTHER FEATURES				NOTES	
CLASSIFICATION	ACREAGE IMPACTED	ACREAGE AVOIDED	TOTAL	CLASSIFICATION	ACREAGE IMPACTED	ACREAGE AVOIDED	TOTAL	Project Boundary	Other				
ADJACENT				ADJACENT SECTION 10 WATERS					Project Boundary	• Waters of the U.S. verified by U.S. Army Corps of Engineers 8/28/03. #22008-00293N.			
DEPRESSIONAL WETLANDS				SLOPE WETLANDS					Detailed Study Area	• Digital base data provided by Miami County. Contour interval is 5 foot.			
Seasonal (DSW)	0.15	3.44	3.59	Slope Swale (SS)	N/A	1.06	1.06		Existing Runway and Buildings	• The Hydrologic Unit Code for this site is 18050002.			
RIVERINE WETLANDS				High Brackish Marsh (HBM)	2.23	5.17	7.40		Proposed Disturbance Area	• This delineation utilizes the Corps 1987 three-parameter methodology, the Riparian Guidance and the Aerial Wetland Supplement to delineate jurisdictional waters of the U.S.			
Seasonal Wetland (RSW)	N/A	0.52	0.52	ABUTTING SECTION 10 WATERS						• Waters of the U.S. were mapped using a Trimble Global Positioning System (GPS).			
SLOPE WETLANDS				Parental Drainage (PD)	0.21	0.46	0.67			• The extent of Section 10 waters is delineated based on aerial photo interpretation.			
Slope Swale (SS)	N/A	1.89	1.89	Disturb/Canal (Dist)	0.23	0.15	0.38						
ESTUARINE WETLANDS				TOTAL									
High Brackish Marsh (HBM)	9.80	41.76	51.56		14.72	59.98	74.70						
ABUTTING													
OTHER WATERS OF THE U.S.													
Parental Drainage (PD)	0.59	1.22	1.81										
Disturb/Canal (Dist)	1.51	4.31	5.82										

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WETLAND IMPACTS: ALTERNATIVE B

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FIGURE 7

Figure to be updated after USFWS consultation



WATERS OF THE U.S.			ACREAGE IMPACTED			ACREAGE AVOIDED			TOTAL								
CLASSIFICATION	IMPACTED	AVOIDED	IMPACTED	AVOIDED	TOTAL	CLASSIFICATION	IMPACTED	AVOIDED	IMPACTED	AVOIDED	TOTAL						
ADJACENT																	
DEPRESSIONAL WETLANDS																	
Seasonal Wetland (DSW)	0.15	3.44	3.44	0.15	3.59	ADJACENT SECTION 10 WATERS											
SLOPE WETLANDS																	
Seasonal Wetland (BSW)	NA	0.52	0.52	0.00	0.52	SLOPE WETLANDS											
Seasonal Wetland (BSW)	NA	0.52	0.52	0.00	0.52	ESTUARINE WETLANDS											
SLOPE WETLANDS																	
Slope Water (SS)	NA	1.89	1.89	0.00	1.89	High Brackish Marsh (HBM)											
ESTUARINE WETLANDS																	
High Brackish Marsh (HBM)	10.56	41.00	51.56	0.00	51.56	OTHER WATERS OF THE U.S.											
ABUTTING																	
OTHER WATERS OF THE U.S.																	
Perennial Drainage (PD)	0.89	1.22	1.81	0.00	1.81	PERMANENT WATERS OF THE U.S.											
Drain/Canal (D/C)	1.37	4.45	5.82	0.00	5.82	PERMANENT WATERS OF THE U.S.											
TOTAL																	
ADJACENT SECTION 10 WATERS																	
SLOPE WETLANDS																	
Slope Water (SS)	NA	1.06	1.06	0.00	1.06	ESTUARINE WETLANDS											
ESTUARINE WETLANDS																	
High Brackish Marsh (HBM)	2.14	5.26	7.40	0.00	7.40	OTHER WATERS OF THE U.S.											
ADJACENT SECTION 10 WATERS																	
OTHER WATERS OF THE U.S.																	
Perennial Drainage (PD)	0.21	0.46	0.67	0.00	0.67	PERMANENT WATERS OF THE U.S.											
Drain/Canal (D/C)	0.23	0.15	0.38	0.00	0.38	PERMANENT WATERS OF THE U.S.											
TOTAL																	
ADJACENT SECTION 10 WATERS																	
PERMANENT WATERS OF THE U.S.																	
PERMANENT WATERS OF THE U.S.																	
PERMANENT WATERS OF THE U.S.																	

OTHER FEATURES		NOTES	
	Project Boundary		Waters of the U.S. verified by U.S. Army Corps of Engineers 8/28/03, #2208-0023N.
	Existing Runway and Buildings		Digital base data provided by Miami County. Contour interval is 5 feet.
	Proposed Development Area		The Hydrologic Unit Code for this site is 18050002.
			This delineation utilizes the Corps 1987 three-parameter methodology, the Riparian Guidance and the Arid West Supplement to delineate jurisdictional waters of the U.S.
			Waters of the U.S. were mapped using a Trimble Global Positioning System (GPS).
			The extent of Section 10 waters is delineated based on aerial photo interpretation.

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WETLAND IMPACTS: ALTERNATIVE D

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FIGURE 8

Appendix A — Surveyor Qualifications



Brian C. Mayerle Vice President/Principal Biologist

Education

Bachelor of Science, Ecology & Systematic Biology, California Polytechnic State University, San Luis Obispo

Certifications and Permits

California Resident Scientific Collecting Permit, California Department of Fish and Game

Wetland Delineation Certification Course, WTI

Affiliations

Association of Environmental Professionals

California Native Plant Society (CNPS)

Experience

Foothill Associates, Vice President

Foothill Associates, Senior Biologist

EDAW, Project Biologist

Michael Brandman Associates, Biologist

EARTH TECH, Staff Biologist

Brian C. Mayerle, is a Principal Biologist that manages and oversees Planning and Permitting Division. Brian has 20 years of experience in resource analysis and management, specifically relating to habitat restoration, botanical and wildlife surveys, biological assessment, wetland delineation, and regulatory analysis and permitting.

Brian is an expert with the provisions of Sections 401 and 404 of the Clean Water Act (CWA), Sections 1601-1603 of the California Department of Fish and Game (CDFG) Code, CEQA, the National Environmental Policy Act (NEPA), the federal Migratory Bird Treaty Act (MBTA), and the state of California and federal Endangered Species Acts. He is also an expert with many local ordinances and policies protecting natural resources in northern California, and with survey protocols established by state and federal regulatory agencies, including the United States Fish and Wildlife Service (USFWS), CDFG, and the United States Army Corps of Engineers (Corps). Brian has conducted extensive field work throughout California and has led teams of field biologists on complex field projects with diverse geography and resources.

Representative Experience

Tahoe Boca EIR Biological Resources Section (aka Canyon Springs), Truckee, CA. Brian assisted with the Biological Resources Section as input to the Tahoe Boca Draft EIR prepared by Quad Knopf for the Town of Truckee. The large, proposed residential development located in the Sierra Nevada spans approximately 284 acres in the eastern portion of the Town of Truckee and five acres in Nevada County. Brian performed an assessment of sensitive resources on the site, including plants, wildlife, and wetlands.

Lake Front at Walker Ranch EIR, Lake Almanor, CA. Brian oversaw preparation an Environmental Impact Report for the Lake Front at Walker Ranch project in Plumas County. The project proposes a mixed use development located on approximately 1,397 acres on the Lake Almanor peninsula. A total of 1,674 residential units are proposed and include a variety of densities ranging from 8 dwelling units per acre to estate lots, with 1 unit per 1.5 acres. The project considers onsite wastewater treatment, recycled water for golf course irrigation, open space preserves, bald eagle habitat, and deer migration corridor and roadway/deer crossing. The EIR analyzes potential impacts related to aesthetics (visual impacts from Lake Almanor), water quality, biological resources (including potential impacts to existing bald eagle nests), population and housing, noise, air quality, and traffic. The Final EIR was certified by Plumas County on March 2, 2010.

Dorris Ridge Reservoir Subdivision, Alturas, CA. Brian assisted with preparation of a jurisdictional wetland delineation and a biological resources assessment for the subdivision of a 2,000 acre ranch near Alturas, California. The delineation of habitat included migration routes for mule deer and pronghorn, nesting habitat for greater sandhill cranes, and many other threatened and endangered species. Brian performed follow up pronghorn field work and migration route observation and



then worked with the landowner and CDFG to devise a plan to minimize impacts to wintering pronghorns.

Specifically, he helped analyzed the onsite habitat for pronghorn breeding ground and foraging ground suitability, mapped active pronghorn use on the property, conceptually planned mitigation and restoration of a large portion of the adjacent ranch property that abuts the reservoir (with the goal of improving waterfowl nesting habitat fisheries habitat, and upland wildlife habitat), identified areas of dense juniper trees that could be removed/thinned to improve the habitat for breeding pronghorn populations, and helped redesign the subdivision to allow a wider migration corridor without losing acreage in the development footprint. Brian also conducted sensitive plant surveys for the project area. Continuing work includes working with the property owner on compliance with the terms of their agreements and assisting with implementation of restoration/mitigation measures.

Auburn Lake Trails Water Treatment Plant Environmental Documentation, El Dorado County, CA. Brian is project manager for preparation of a joint CEQA/NEPA document in support of securing a USDA Loan for improvements to the Auburn Trails Water Treatment Facility for the Georgetown Divide PUD located in El Dorado County, CA. He oversaw preparation of a combined CEQA Initial Study/Mitigated Negative Declaration and NEPA Environmental Assessment/Finding of No Significant Impact. The environmental review was performed concurrently with the preliminary engineering report. USDA is the NEPA Lead Agency and the Georgetown Divide Public Utility District is the CEQA Lead Agency. The Public Review Draft was released on April 29, 2010 for comment.

Ward Ranch, Cottonwood, CA. Brian is project manager for biological studies and permitting for the 317 acre Ward Ranch site. The site is composed of annual grassland and blue oak woodland, with a section of Antelope Creek, a pond, and associated tributaries occurring on the site. The biological resources assessment included observations of botanical and wildlife on site. Potential biological constraints on the site include the following habitat for special-status plant species including pink creamsacs and silky cryptantha; nesting and foraging habitat for raptors, including western burrowing owl; habitat for northwestern pond turtle; special-status salmonid habitat; and sensitive habitats (jurisdictional waters of the United States and oak woodland.)

Anderson Landfill Culvert Repair, Anderson, CA. Brian was project manager to prepare a biological and wetland constraints analysis for a culvert removal project at the Anderson Landfill. The project occurs within an unnamed drainage tributary to Cottonwood Creek and a large seasonal marsh area occurs upstream of the existing culvert and road crossing.

These features are both waters of the U.S. and regulated by local, state, and federal agencies. Foothill Associates' biologists conducted a field survey of the site on foot to record plant and animal species, and observed and characterized biological communities. Special attention was given to identifying those portions of the site with the potential for supporting special-status species and sensitive habitats.

Oasis Road Specific Plan EIR - Hawley Road Extension, Redding, CA. Brian managed preparation an independent report for the Oasis Road Specific Plan area for use in identifying wetland and other biologic constraints in the Specific Plan area. The document was prepared in support of the DEIR. Biologists reviewed available materials regarding site conditions, biological resources, and wetlands in the Specific Plan Area (e.g. USGS topographic maps, NRCS soils maps, and California Natural Diversity Database). Brian conducted field assessments to identify dominant plant communities, characterize wildlife habitat, locate sensitive areas, and evaluate the potential for the property to support special-status species, including rare plant species. Brian also conducted a formal wetland delineation for the Specific Plan Area not previously delineated, which is approximately 70% of the site.

Gross Field Airport Runway Extension EIS/EIR, Marin County. Brian is project manager for preparation of preliminary site assessments and EIS/EIR analyses and documentation to accurately assess and document the foreseeable direct, indirect and cumulative impacts associated with the proposed Marin County Airport (Gross Field) runway and taxiway extensions, as well as drainage realignments and the construction of levees to protect the runway extension from flooding. Brian led the project team to conduct a biological assessment and performed focused surveys for special-status species on the 213-acre project site. As part of the wetland delineation, Brian conducted a field review with the Corps of Engineers that verified the extent of the jurisdictional Section 10 and 404 waters, including wetlands on the site.

Persephone Ranch, Napa County. Brian served as project manager to prepare an Initial Study, biological resources assessment, wetlands delineation, Clean Water Act Section 404 Individual Permit, Water Quality Certification, and Streambed Alteration Agreement in support of appropriation of approximately 420 acre-feet of water from the Upper Putah Creek Watershed for expanded vineyard irrigation in Napa County. The project consists of expansion of an existing onsite reservoir and construction of two new reservoirs. Additionally, a culvert crossing will be replaced with a span bridge over Burton Creek. The channel bank will be sloped and re-vegetated with native species for bank stabilization and erosion control.



Hemsted Rodeo Biological Constraints Analysis, Anderson, CA. Brian managed a biological constraints analysis for the proposed 3A Ranch project site east of Anderson, California. Analysis provides an overview of the general biological resources located on the site including habitats, plant and wildlife species, and potential waters of the U.S. The analysis also includes an assessment of the suitability of habitats to potentially support special-status species, including White-tailed Kite, migratory birds, bats, salmonids, and fox sedge.

Selected Publications

Mulroy, T. M. Dungan, R. Rich, and **B. Mayerle**. 1992. Wildland Weed Control in Sensitive Native Communities (co-author)

Mayerle, B. 1992. The Effects of Wood Smoke On Overwintering Clusters of Monarch Butterfly (*Danaus plexippus*) Clusters. Senior Thesis-California Polytechnic State University, San Luis Obispo





David Bise, ISA
Resource Assessment Division Manager
Senior Biologist/Arborist

Education

Master of Science, Wildlife Management, Department of Environmental Science Policy and Management, University of California, Berkeley, 1998

Bachelor of Science, Zoology, Department of Zoology, University of California, Davis, 1992

Affiliations

Member of the Wildlife Society

Member of Audubon Society

ISA Certified Arborist

Experience

Foothill Associates, Biologist

Sapphos Environmental, Wildlife Biologist

EDAW, Inc., Wildlife Biologist

AMEC Earth and Environmental, Wildlife Biologist

San Bernardino County Museum, Field Technician

U.S. Forest Service Redwood Sciences Laboratory, Bird Banding Technician

USGS, Field Technician

UC Berkeley, Field Station Manager

David Bise is the Resource Assessment Division Manager, Senior Biologist, and ISA Certified Arborist specializing in biological assessments and regulatory compliance. He has over eleven years of professional experience in the environmental sciences including experience performing special-status species surveys, California and federal Endangered Species Act compliance, impact analysis, habitat mitigation and monitoring, and coordinating with multiple regulatory agencies, municipalities, developers, and their legal representatives to resolve environmental issues.

Representative Experience

Camp Pendleton, San Diego County, California. Performed mitigation monitoring and construction monitoring for special-status species involved with linear pipeline project. Special-status species included coastal California gnatcatcher (*Polioptila californica*), arroyo toad (*Bufo californicus*), and least Bell's vireo (*Vireo bellii pusillus*).

California City, California. Conducted focused surveys for desert tortoise, Mohave ground squirrel and rare plant surveys for proposed automobile test track. Work conducted in creosote scrub habitat in Mohave desert.

Camp Pendleton, San Diego County, California. Assisted with conducting special-status species assessments and preparation of environmental assessment for INRMP covering Advanced Amphibious Assault Vehicle (AAAV) deployment on Camp Pendleton.

Camp Pendleton, San Diego County, California. Conducted focused survey for coastal California gnatcatcher on a proposed base housing site.

Camp Pendleton, San Diego County, California. Performed mitigation monitoring and construction monitoring for special-status species involved with linear pipeline project. Special-status species included coastal California gnatcatcher (*Polioptila californica*), arroyo toad (*Bufo californicus*), and least Bell's vireo (*Vireo bellii pusillus*).

Camp Pendleton, San Diego County, California. Performed mitigation monitoring and construction monitoring for special-status species involved with linear pipeline project. Special-status species included coastal California gnatcatcher (*Polioptila californica*), arroyo toad (*Bufo californicus*), and least Bell's vireo (*Vireo bellii pusillus*).

Camp Pendleton, San Diego County, California. Performed mitigation monitoring and construction monitoring for special-status species involved with linear pipeline project. Special-status species included coastal California gnatcatcher (*Polioptila californica*), arroyo toad (*Bufo californicus*), and least Bell's vireo (*Vireo bellii pusillus*).



City of Chico, San Bernardino County, California. Performed protocol surveys for burrowing owls (*Athene cunicularia*) and assisted in developing mitigation monitoring plan for potential impacts to burrowing owls associated with proposed residential housing development.

City of Dixon, Sonoma County, California. Performed protocol surveys for burrowing owl on a proposed development site in the City of Dixon.

City of Elk Grove Wetland Preserve Monitoring. Conducted wetland plant community monitoring for wetland preserve area within City of Elk Grove.

City of Fairfield, Solano County, California. Conducted wetland assessment and arborist survey for proposed apartment complex in City of Fairfield, California.

City of Folsom SOI, Sacramento County, California. Conducted wetland delineation, biological assessment, and special-status species surveys on proposed 1500-acre development in eastern Sacramento County.

City of Lancaster, Los Angeles County, California. Conducted rare plant surveys and nesting bird surveys for proposed church site.

City of Mohave, Los Angeles County, California. Conducted biological resource assessment and constraints analyses for proposed wind energy sites.

City of Needles, San Bernardino County, California. Performed protocol surveys for southwestern willow flycatcher along the lower Colorado River from the Grand Canyon to Lake Havasu. Performed nest searching, nestling banding, and nest searching, and nest monitoring.

City of Rancho Cordova Preserve Vegetation Monitoring, Rancho Cordova, California. Conducted vernal pool and seasonal wetland vegetation monitoring as part of preserve mitigation monitoring plan.

City of Rocklin, Placer County, California. Prepared a conservation plan for valley elderberry longhorn beetle habitat in Clover Valley.

City of Sacramento, Sacramento County, California. Performed focused nesting surveys for Swainson's hawks and prepared contractor education materials for residential development in Natomas Basin according to Natomas Basin HCP guidelines. Conducted pre-construction surveys for special-status plant and animal species.

City of Sacramento, Sacramento County, California. Performed protocol surveys for burrowing owl for a proposed development in the City of Sacramento. Developed a low-effect habitat conservation plan for potential project impacts to the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

City of Sacramento, Sacramento County, California. Performed focused nesting surveys for Swainson's hawks and prepared contractor education materials for residential development in Natomas Basin according to Natomas Basin HCP guidelines. Conducted pre-construction surveys for special-status plant and animal species.

City of Sacramento, Sacramento County, California. Performed focused nesting surveys for Swainson's hawks and prepared contractor education materials for residential development in Natomas Basin according to Natomas Basin HCP guidelines. Conducted pre-construction surveys for special-status plant and animal species.

City of Sacramento, Sacramento County, California. Performed protocol surveys for burrowing owl for a proposed development in the City of Sacramento. Developed a low-effect habitat conservation plan for potential project impacts to the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

City of Truckee, Nevada County, California. Conducted special-status species assessment for proposed housing development.

Davis Unified School District, City of Davis, California. Conducted biological resource assessments for proposed school sites. Potential biological issues included Swainson's hawk nesting and foraging habitat and burrowing owl habitat.

El Dorado County, California. Performed focused surveys for special-status plant species on proposed development sites. Prepared botanical survey reports.

Immigration and Naturalization Service, San Diego County, California. Conducted special status species surveys for the border fence project along the international border in San Diego. Special status surveys included coastal California gnatcatcher, Quino checkerspot butterfly, and burrowing owl. Assisted in conducting rare plant surveys.

Marin County, California. Prepared biological assessment and conducted special-status species surveys for proposed runway extension for Marin County airport.

Needles, California. Conducted focused surveys and nest monitoring for southwestern willow flycatchers in riparian habitat along the lower Colorado River from the Grand Canyon to Lake Havasu. Also conducted habitat assessments and point counts for yellow-billed cuckoo and other neotropical migrants in areas where willow flycatchers were nesting.

Owens Lake, Inyo County, California. Performed special status species surveys and was primary author for environmental impact report for proposed dust control projects for Owens Lake dry lake bed. Tasks included snowy plover monitoring, mitigation



program creation, and agency coordination. Primary author biological resources analysis for CEQA documentation. Project manager in charge in subconsultants conducting special status species surveys.

Sacramento County Special-status wetland plant survey. Conducted focused plant surveys for special-status vernal pool and seasonal wetland plants.

Southern California Edison, San Diego and Riverside Counties, California. Performed special status surveys and construction monitoring for proposed transmission lines.

U.S. Forest Service, Klamath Lake Oregon. Primary bander and nest searcher for U.S. Forest Service.

Certifications and Permits

- U.S. Fish and Wildlife Service 10(a) survey permit for coastal California gnatcatcher (*Polioptila californica*), southwestern willow flycatcher (*Empidonax trallii extimus*), special-status invertebrates (fairy shrimp), and Quino checkerspot butterfly (*Euphydryas editha quino*)
- California Department of Fish and Game Scientific Collecting Permit
- Federal Bird Banding Permit
- Attended survey workshop for California red-legged frog (*Rana aurora draytonii*)
- Trained by Bureau of Land Management to survey for flat-tailed horned lizard (*Phrynosoma coronatum*)
- Attended desert tortoise society desert tortoise (*Gopherus agassizi*) survey workshop
- Attended burrowing owl symposium
- Attended special-status amphibians and reptiles workshop
- ISA Certified Arborist #WE-7643A





John C. Heal Environmental Scientist

Education

Master's Degree, Environmental Studies, 1993, Evergreen State College, Olympia, Washington

B.A., Environmental Studies/Economics, 1983, Evergreen State College, Olympia, Washington

Affiliations

Certified Professional Wetland Scientist #00001386

Experience

Foothill Associates, Environmental Scientist

Bionomics Inc., Senior Ecologist

Dames and Moore, Senior Biologist

King County Surface Water Management, Senior Water Quality Engineer

Jefferson County, Water Quality Planner

John Heal is an aquatic ecologist with 17 years of experience in assessing wetlands, stream systems, watershed planning, and fish and wildlife management. This experience includes the assessment of hydrologic and water quality impacts to wetlands from urbanization, monitoring of wetlands and water quality, and the development of large-scale multi-objective monitoring plans. His mitigation planning experience is extensive, and is based on creative but practical solutions to the problems of surface water management and the protection and enhancement of wetland and stream functions. John has collected GPS data on wetland boundaries and other habitat features and assisted with GIS analysis. Along with an extensive amount of field work, his experience includes the interpretation of aerial photographs and soils surveys. His restoration experience includes field assessment, design, permitting, construction oversight, and the design and implementation of monitoring programs. John is a Certified Professional Wetland Scientist and has both Bachelor's and Master's degrees in Environmental Studies.

Representative Experience

Water Quality Planning—Developed watershed plans for watersheds in Mendocino, Trinity, Placer, and Sacramento Counties in California and in Jefferson and San Juan Counties, Washington. Issues included stream channel morphology, bank stability, fish and shellfish habitat, wildlife, invasive species, watershed stewardship, water quality protection, flood damage control, and stream restoration.

Wetlands, Streams, and Biological Assessments—Conducted wetland delineations, stream surveys, and Biological Assessments in Placer, Sacramento, El Dorado, Nevada, Tuolumne, San Diego, Santa Barbara, Mendocino, Lake, Yolo, and Yuba Counties. Resources included vernal pools, seasonal and perennial streams, and priority plant, fish, and wildlife species. Mapped wetlands with GPS system and provided photo documentation. Conducted raptor surveys by observing and identifying wildlife, habitat features, and the presence of nests.

Wetland and Water Quality Monitoring—As Senior Ecologist, developed wetlands and water quality mitigation plan and monitoring program for on-site wetlands and buffers. Monitored vegetation transects, wildlife, wetland hydrology and several water quality parameters. Provided photo-documentation and written monitoring reports.

Watershed Restoration—Conducted stream survey and design of Chinook habitat restoration for Secret Ravine Creek. Assisted with building consensus between landowners, the City of Rocklin, and the California Department of Fish and Game for approval of the riparian restoration plan.



Secret Ravine Creek Feasibility Study-Assisted with the study of the feasibility of restoration of the floodplain, channel and riparian areas at three locations along Secret Ravine in Placer County. The feasibility study examined characteristics of creek and the potential to meet four objectives: improve habitat, mitigate flood damage, improve water quality and increase opportunities for recreation. The analysis covered environmental permitting, habitat enhancement, revegetation design, and a fatal flaws analysis. Issues included listed species of Chinook and steelhead, Valley Elderberry Longhorn beetle, water quality, and channel morphology in a system that had been hydraulically mined in the gold rush era.

Tehama West Watershed Assessment - Conducted a literature review, field reconnaissance and photography, and wrote summary chapters on the vegetation and wildlife in the Tehama West watershed as part of a larger effort of watershed assessment. Worked cooperatively in reviewing and developing the GIS databases required for the literature review. Topics included Arundo, sensitive botanical resources, invasive plant species, noxious weeds, threatened and endangered wildlife, critical habitats, vernal pools, and data gaps. The chapters included conclusions and recommendations for further research and watershed restoration.

Wetland and Water Quality Monitoring - As Senior Ecologist, developed wetlands and water quality mitigation plan and monitoring program for on-site wetlands and buffers. Monitored vegetation transects, wildlife, wetland hydrology and several water quality parameters. Provided photo-documentation and written monitoring reports.

Central Valley Resources Assessments, northern California - Conducted wetland delineations and Biological Assessment in a gravel mine locations in Sacramento and Yuba Counties. Resources included vernal pools, seasonal streams, and priority plant and wildlife species. Mapped wetlands with GPS system and provided photo documentation. Conducted raptor survey by observing and identifying wildlife, habitat features, and the presence of nests.

Provided assistance with data analysis in the study of land use changes on the hydrologic and vegetative response of wetlands in western Washington State. As Senior Water Quality Engineer, conducted literature review and compiled data for trend analysis. Analyzed correlations between urbanization and changes in wetland hydroperiod response, plant communities, water quality, and wildlife utilization.





Ryan Brown

Regulatory Biologist/ISA Certified Arborist

Education

Bachelor of Science, Biological Sciences, CSU, Chico, 2001

Certifications

ISA Certified Arborist, WE-7377A

ESA Section 10(a)(1)(A) Permittee for Vernal Pool Shrimp

Experience

Owner, Blossomland Arborist Service

Biologist/ISA Certified Arborist, Gallaway Consulting, Inc.

Fish and Wildlife Technician, Thomas R. Payne and Associates

Fish and Wildlife Scientific Aid, California Department of Fish and Game

Research Assistant, Chico Research Foundation, CSU, Chico

Student Assistant, Department of Water Resources

Publications

Light-trapping of Larval and Juvenile Northern Pike, *Esox lucius*, From Lake Davis, California, Spring 2003. CA Fish and Game 92(1): 149-155.

Training

CEQA Step-by-Step, UC Davis Extension

Biology and Management of the Red Legged Frog, Alameda County Conservation Partnership Workshop

Ryan Brown is a Regulatory Biologist with ten years of experience working in the natural resources field. He currently manages projects for Foothill Associates utilizing a broad skillset in biological assessment and regulatory permitting for support and incorporation into NEPA and/or CEQA documentation. The experience gained performing biological assessments and wetland delineations, writing the technical documents detailing survey results, assessing environmental impacts, and preparation of permitting packages for the USACE, RWQCB, and CDFG, has given him the wherewithal to manage a wide array of project types. Ryan has quickly gained experience in agency consultation, communicates effectively, and is a proficient negotiator. Ryan routinely works with construction contractors to perform construction monitoring and reporting for environmental compliance. He is USFWS permitted to survey for vernal pool shrimp, is an ISA certified arborist, and has studied all life stages of Central Valley Chinook salmon and steelhead.

Representative Experience

Project Management - Plans, organizes, and manages personnel and resources to accomplish environmental review and regulatory compliance as required for construction projects within a well-defined schedule and budget.

Biological Assessments - Performs botanical, wildlife and habitat surveys on Project sites ranging from under 1 acre to over 1000-acres. Utilizing survey results Ryan writes detailed reports for NEPA and CEQA support for a wide array of public and private projects. Documentation routinely produced includes Biological Resource Assessments for CEQA and ESA Section 7 Biological Assessments for NEPA and formal USFWS consultation.

Regulatory Permitting - Reviews documentation, consolidates information, and produces complete permit packages for local, state and federal regulatory agencies. Has successfully obtained nationwide permits (USACE), streambed alteration agreements (CDFG), water quality certifications (RWQCB), biological opinions (USFWS), and letters of technical support (USFWS) for construction projects.

Rare Plant Surveys - Performs rare plant surveys for CNPS, CDFG, and USFWS listed plant species. Conducts surveys following CNPS, CDFG, and USFWS survey guidelines / protocols for rare plants in Butte, Tehama, Sacramento, Placer, Marin, and Napa Counties.

Construction Coordination and Monitoring - Coordinates with construction superintendents and foremen to assure environmental compliance relating to local, state, and federal permit regulations in various habitat types. Monitors all stages of on-the-ground construction.

Wetland Delineation - Ryan has conducted wetland delineations on numerous small and large project and mitigation sites within Butte, Shasta, Tehama, Placer, Marin, and Sacramento counties.



USFWS/CDFG/USFS Protocol Survey Experience - Ryan has performed protocol surveys for vernal pool crustaceans, red-legged frog, foothill and mountain yellow-legged frog, leopard frog, northern goshawk, northern pond turtle, butte county meadowfoam, soft birds beak, Baker's navarretia, fox sedge, adobe lily, and red bluff dwarf rush.

Oak Woodland Restoration - Ryan is a certified arborist. He performs tree inventories and develops site-specific mitigation/re-planting measures to compensate for small- and large-scale oak tree impacts.

Representative Experience

Canyon Knolls/ Tuscan Village, Tehama Deer Herd Migration Corridor Study, Butte County. - In coordination with the County CDFG biologist and a localized land owner, Ryan developed a methodology to conduct day and night field surveys to determine Tehama deer herd migratory deer use of 2 parcels totaling 280 acres in Butte Creek Canyon. Site evaluation looked at movement versus migration routes, and attempted to estimate deer counts, sex ratios, and age class of deer.

All Nations Church, Los Angeles County. Ryan helped prepare a Biota Report pursuant to County of Los Angeles Department of Regional Planning guidelines. The report evaluates the proposed environmental impacts proposed by the Project and incorporates recommendations from the Sensitive Environmental Area Technical Advisory Committee (SEATAC) and the Regional Planning Biologist along with mitigations and thresholds of significance. Ryan has met with Los Angeles County Planning Staff and SEATAC to evaluate Project alternatives and avoidance and mitigation measures to preserve habitat qualities of a parcel zoned a Sensitive Environmental Area by LA County.

Beale Air force Base Floristic Monitoring, Yuba County. Ryan performed vernal pool floristic monitoring on Beale Air force Base and has an existing Base Pass until 26 APR 11.

Chico Water Pollution Control Plant, Butte County. Ryan worked with the prime contractor Gateway Pacific to install and implement environmental protection measures as directed by the Projects EIR, Biological Opinion, and CDFG consistency determination for this project which increased the City's WPCP capacity and relocated the outfall on the Sacramento River bank. Species potentially affected included Central Valley salmonids, green sturgeon, bank swallow, and VELB. Ryan also wrote a Re-vegetation and Monitoring Plan for bank impacts to the Sacramento River which was reviewed and approved by the CDFG and NMFS. Ryan oversaw and coordinated with other Foothill Associates staff to monitor and provide environmental oversight for this \$4.2 million Capital Improvement project.

Creekview Professional Center Biological Studies, Sacramento County. Ryan assisted with the biological constraints analysis and arborist survey, for this 7.75-acre site; formerly a gravel mining operation and proposed for commercial infill. Studies supported regulatory permits, including Clean Water Act Section 401 Water Quality Certification, Nationwide Permit #39 Pre-construction Notification, and Section 1602 Streambed Alteration Agreement. Ryan negotiated terms for ESA Section 7 Consultation for California red-legged frog and received a Biological Opinion from the USFWS.

Gross Field Airport Runway Extension EIS/EIR, Marin County. Ryan was part of the Foothill team conducting a biological resources assessment and a wetland delineation on the 213-acre site in support of a preliminary site assessments and EIS/EIR analyses and documentation associated with the proposed runway and taxiway extensions, as well as drainage realignments and the construction of levees to protect the runway extension from flooding. Ryan is currently performed focused surveys for the federally listed endangered soft birds beak and salt marsh harvest mouse habitat.

Gridley Boat Ramp Improvement, Butte County. Ryan was project manager for a biological resources assessment on the 5.45-acre City of Gridley boat ramp and public river access area improvement project along the Feather River. The assessment report summarizes the general biological resources on the site, assesses the suitability of the site to support special-status species and sensitive habitat types, and provides recommendations for regulatory permitting or further analysis that may be required. Ryan wrote the ESA Section 7 Biological Assessment for USFWS/NOAA consultation regarding Central Valley steelhead, spring-run Chinook salmon, green sturgeon, Essential Fish Habitat and critical habitat for salmonids, and valley elderberry longhorn beetle.

Pope Valley, Persephone Ranch Regulatory Permitting, Napa County. Ryan conducted a biological resources reconnaissance survey and wetland delineation on this 345-acre active vineyard, including native oak woodland, riparian and annual grassland habitats. Ryan wrote the biological reporting document to support CEQA analysis of the Project, a Vegetation and Monitoring Plan as required by the CDFG for a streambed alteration agreement and performed a rare plant survey on the property.

Sycamore Pool/ 1-mile Dam, Butte County. Ryan assisted with the biological evaluation and permitting efforts, including a Nationwide 3, streambed alteration agreement and water quality certification for this City of Chico Project. Ryan also assisted with ESA Section 7 consultation for federally listed salmonids with potential to occur in Big Chico Creek.





MEHAGAN HOPKINS, CSST

BIOLOGIC COORDINATOR

Summary of Experience

Ms. Hopkins has experience in a wide range of projects, including biological habitat assessments, wetland delineations and permitting, endangered species surveys, environmental due diligence assessments, subsurface investigations, hazardous waste remediation, asbestos surveys and asbestos abatement monitoring. As a Biologist, Ms. Hopkins has experience including wetland delineations and permitting in accordance with the U.S. Army Corps of Engineers, Streambed Alteration Agreement permitting in accordance with the California Department of Fish and Game requirements, sensitive species habitat assessments and endangered species construction monitoring. As an Environmental Scientist, she has performed numerous due diligence surveys, directed site assessments, hazardous building materials surveys and remedial actions at a variety of sites, including urban redevelopment projects, industrial properties, and sites of leaking underground storage tanks (USTs). Ms. Hopkins' project experience includes educational, governmental, transportation, residential, commercial, and privately owned sites.

Education

- BS, Biology, University of Southern California, California, 1999
- MA, Molecular and Cell Biology, University of California, Berkeley, California, 2003

Certifications

- California Site Surveillance Technician (CSST), No. 04-3712, DOSH, 2004
- Wetland Delineation Training, No. 4208, CA, 2006

Select Project Experience

The following is a representative selection of Mehagan Hopkins' project experience.

Costco, Western Burrowing Owl Survey and Eviction, Antioch, California

Ms. Hopkins acted as the lead biologist in support of a construction project in which Western Burrowing Owls were identified on-site less than two weeks prior to the anticipated start of construction. Ms. Hopkins acted as the primary point of contact for both the Client and the California Department of Fish and Game while concurrently performing a four-day, sunrise/sunset survey as per the CDFG guidelines. Although the project occurred during the beginning of the owls' breeding season, Ms. Hopkins was able to provide CDFG with evidence that breeding had not yet occurred on site, and obtain approval from CDFG to enact eviction measures. Ms. Hopkins also provided worker awareness training for site crews. Through Ms. Hopkins efforts, the project proceeded to unrestricted construction activities less than two weeks behind schedule.

City of San Ramon, California Red-Legged Frog Survey, San Ramon, California

Ms. Hopkins worked on a two-person team to assess the presence/absence of California Red-Legged Frog (*Rana aurora draytonii*) in three creeks located in San Ramon, California. Surveys consisted of night time eye-shine surveys conducted along the lengths of South San Ramon, Coyote and Norris Creeks. These surveys were conducted in support of a larger landslide repair project and were a critical part of obtaining the necessary project permits.

City of Modesto, Tuolumne River Repair Project, Modesto, California

Ms. Hopkins conducted a wetland delineation of a 0.84-acre segment of the Tuolumne River in Stanislaus County. The work was done in support of an emergency repair to stabilize a sewer pipeline located within the river bank, which had become undercut during the 2005 winter floods. The team surveyed a 413-foot stretch of the west bank of the Tuolumne River, a linear drainage, and determined that 0.26 acres bordering the river met the criteria for definition as a wetland. Ms. Hopkins subsequently acted as a biological monitor for the project, protecting water quality, salmon spawning habitat and valley elderberry long-horned beetle habitat.

MEHAGAN HOPKINS, CSST

BIOLOGIC COORDINATOR

City of San Ramon, Storm Damage Landslide Repair Permitting Project, San Ramon, California

Ms. Hopkins designed and implemented a spreadsheet style database for generation of Army Corps of Engineers Nationwide Permits, California Department of Fish and Game Lake and Streambed Alteration Applications and Regional water Quality Control Board Water Quality Certification Forms. The spreadsheet was utilized to generate permit applications for a project with 58 discrete sites. The spreadsheet eliminated the majority of the data entry, through a series of data look-up and calculation functions. This allowed for completion of the project with approximately 2/3 of the anticipated man-hours spent.

Ms. Hopkins also acted as biological monitor for the construction phase of the project, providing awareness training for contractors related to California red-legged frog and western pond turtle and observing work practices as the related to avoidance of increased water turbidity.

Premier Pacific Vineyards, EPP Preservation Ranch, Streambed Alteration Agreement Permitting, Annapolis, California

Team member on a project involving comprehensive biological surveys of a 20,000-acre former timberland parcel intended for partial development as vineyards. The project comprised a variety of tasks including regulatory and permitting services, biological surveys, botanical surveys, hill slope monitoring, and on-site watershed water quality monitoring. Ms. Hopkins primarily focused on wetland delineations and evaluation of road-stream crossings. She was the Assistant Task Leader for road-stream crossing field surveys, which were subsequently used for California Department of Fish & Game (CDFG) Streambed Alteration Agreement Applications. Ms. Hopkins assisted in scheduling and task specific training of crew members and was also one of the primary individuals responsible for data consolidation, data management, reporting and permitting activities. This required organization and interpretation of information collected during three field seasons for a total of approximately 250 unique crossings.

World Market Warehouse, Western Burrowing Owl Relocation, Stockton, California

Ms. Hopkins worked as part of a team to relocate several Western Burrowing Owls from a site proposed for development as warehouses. The work was done based in part upon consultation with the California Department of Fish and Game, and included passive relocation techniques, flushing and post-relocation monitoring.

Cooley Landing, Biological Resource Evaluation, East Palo Alto, California

Ms. Hopkins worked as part of a two-person team to evaluate the potential for biological resources at a generally undeveloped shoreline site slated for development as an interpretive center and recreational area. The work included observation of species on site with emphasis on threatened and endangered species, and documentation of observed habitat and vegetation types.

City of San Ramon, Wetland Delineation and Habitat Assessment, San Ramon, California

Ms. Hopkins worked on a two-person team to delineate emergent and seasonal wetlands along approximately 9,000 linear feet of the South San Ramon and Coyote Creeks in San Ramon, California. This work was performed in support of routine maintenance and repair activities expected to remove or otherwise impact portions of the identified wetlands.

Port of Stockton, U.S. Gypsum Drywall Facility, Stockton, California

Ms. Hopkins acted as part of a two person team to provide a variety of biological services in support of a development project at the Port of Stockton West Complex area. The project involved development of a 114-acre site for use as a drywall production facility, installation of utilities across a navigable waterway, installation of a conveyor system across several roadways from the dock area to the facility, and import of 600,000 cubic feet of soil from an off-site borrow site.

Ms. Hopkins initially worked on a general habitat assessment, which identified a nesting pair of Swainson's hawks; potential habitat for Western Burrowing Owl, Valley Elderberry Long-Horned Beetle, and additional raptor species; and potential seasonal wetlands. She subsequently performed focused species surveys and provided the Port with recommendations on minimization and mitigation procedures.

RENA OLBERNOLTE

STAFF SCIENTIST

Summary of Experience

Ms. Obernolte is a native oyster and salt marsh restoration specialist experienced in surveying and identifying San Francisco Bay invertebrates, salt marsh plants, shorebirds, migratory birds, and burrowing owls. She has a solid background in biology, ecology, and environmental issues. Ms. Obernolte is proficient in field studies using a variety of instruments and sampling strategies and is a NAUI certified scuba diver.

Education

- MS, Environmental Studies, San Jose State University, 1999
- BA, Aquatic Biology/Biochemistry, University of California, Santa Barbara, 1984

Publications and Papers

- „*Using Inbenthic Species to Assess the Ecological Status of Restored Salt Marshes*, MS Thesis, San Jose State University ,
- „*Biochimica et Biophysica Acta*. 1353: 287-297, Multiple splice variants of phosphodiesterase PDE4C cloned from human lung and testis.
- „*Gene* 129:239-247, The cDNA of a human lymphocyte cyclic-AMP phosphodiesterase (PDE IV) reveals a multigene family.
- „*Pain* 78:107-114, A tetrodotoxin-resistant voltage-gated sodium channel from human dorsal root ganglia.
- „*Cell Signal* 10:427-440, Comparison of recombinant human PDE4 isoforms: Interaction with substrate and inhibitors.
- „*Cell Biochemistry and Biophysics* 28:187-217, Purification and physical characterization of cloned human cAMP phosphodiesterases PDE-4C and -4D.
- „*Gene* 138:253-25, Isolation of a cDNA encoding a human rolipram-sensitive cyclic AMP phosphodiesterase.
- „*Proc. Natl. Acad. Sci. USA* 88:7724-7728, Expression cloning of a rat B2 bradykinin receptor.
- „*J. of Neurochem.* 54:60-69, Characterization of B-Amyloid precursor proteins with or without the protease-inhibitor domain using anti-peptide antibodies.

Select Project Experience

The following is a representative selection of Rena Olbernalte's project experience:

Native Olympia Oyster Restoration Project, San Rafael, California. - From 7/2005 to 6/2006

Assisted in deploying artificial oyster reefs, organized monitoring events, and conducted field monitoring of oyster growth and recruitment rates. Ms. Obernolte also prepared the JARPA permit applications.

South San Francisco Bay Salt Pond Restoration Project, San Jose, California. - From 10/2004 to 12/2004

Prepared a comprehensive literature review on the native pacific oyster (*Ostrea Conchaphila*) including its distribution, ecology, restoration techniques, and management recommendations.

Bay Trails Project, Oakland, California. - From 10/2004 to 12/2004

Conducted shorebird surveys including the presence of migratory ducks. Participated in field sampling to collect core samples of mudflats from a small boat as part of the invertebrate diversity and density study and identified and counted the invertebrates collected in the core samples.

Shoreline Sailing Lake Bivalve Study, Mountain View, California. - From 6/2001 to 12/2001

Conducted bivalve surveys using benthic grab sampling techniques from a small boat and designed the protocol for the sampling survey.



WILLIAM GOGGIN

WILDLIFE BIOLOGIST/PROJECT MANAGER

Summary of Experience

Mr. Goggin has over 15 years experience in professional wildlife biology and associated environmental studies and natural resource work experience. His comprehensive biological experience includes wildlife habitat assessments, botany and plant knowledge, wetland delineation/mitigation, environmental permitting and compliance, focused threatened/endangered plant and animal species studies and advanced ornithological studies. His ecological expertise, project management background, technical and scientific report writing skills and ability to provide clients with cost-effective, environmental solutions have been integral to his continued professional development.

Education

- BS, Wildlife Management, Humboldt State University, California, 1999

Certifications

- OSHA 40-Hour HAZWOPER, CSI, 2002-2005

Professional Affiliations

- The Wildlife Society, 2000- present
- Society of Wetland Scientists, 2001- present

Select Project Experience

The following is a representative selection of William Goggin's project experience:

City of San Ramon California Environmental Quality Act (CEQA) Compliance, San Ramon, California

Mr. Goggin serves as Project Manager for a multi-year, on-call environmental (Biological) compliance contract supporting various Public Works projects for the City of San Ramon. Studies performed include: Habitat Assessments, Permitting, Wetland Delineations and Special-Status Species Focused Surveys for the California Red-legged Frog (CRLF). Detailed GIS habitat maps created utilizing Trimble GPS technologies. Currently conducting a three-year, CRLF management survey requiring USFWS coordination and permits in support of on-going damage repair project. Mr. Goggin is the lead author for all resultant Biological/Habitat Assessment and focused survey reports. Annual contract exceeds \$50,000.

Port of Stockton, Programmatic Natural Resource Environmental Management, San Joaquin County, California

Project Manager/Project Biologist and primary client contact on various CEQA and NEPA developmental projects for the Port including: preparation of three Initial Studies/Mitigated Negative Declarations in support of a road widening project, a BA for a large commercial facility development involving approximately \$100,000 in special status species assessments, and permitting and wetland delineation services for a proposed bio-diesel manufacturing facility. He conducted pre-construction surveys for the western burrowing owl, Swainson's hawk and valley elderberry beetle. Mr. Goggin has performed and/or prepared at least 12 separate biological studies and documents for the Port over the past two years.

Fort Ord Habitat Management Plan, Natural Resource Permitting and CEQA Compliance, Monterey County, California

Project Biologist who served as task manager for wetland restoration, biological assessment and annual vegetation monitoring field survey effort on a multi-year, hazardous materials environmental contract at the former Fort Ord Army Base. Provided technical oversight of several on-going natural resource studies ranging from focused flora surveys for rare plants to monitoring restored wetlands; performed evasive species control and helped co-ordinate control burn, as it applied to on-base threatened species. Mr. Goggin managed production of annual monitoring and restoration report and utilized Trimble GPS technologies, and co-managed the overall project.

WILLIAM GOGGIN

WILDLIFE BIOLOGIST/PROJECT MANAGER

Parsons Slough Emergency Rail Bridge Replacement, Natural Resource Permitting and CEQA Compliance, Monterey County, California

Project Biologist for project that involved replacement of a Union Pacific Railroad (UPRR) timber structure with a concrete girder bridge across Parsons Slough in Monterey County. The project site is located within the extremely sensitive Elkhorn Slough National Estuary Research Reserve, bordering Monterey Bay National Marine Sanctuary. The project required extensive coordination with several federal, state and local agencies. His duties included preparation of all environmental documentation, characterizing plant communities, inventory of plant species, conducting wetland delineation of the project site, conducting focused biological surveys, construction monitoring, video wildlife monitoring and HCP report preparation.

Environmental studies conducted included: Initial Study/Mitigated Negative Declaration, Biological Evaluation, Wetland Assessment, Geotechnical Evaluation, Cultural Resources Investigation, Erosion Control Plan/Storm Water Pollution Prevention Plan, Noise Technical Study, Visual and Aesthetics Study, Habitat Assessment/Protocol Level Survey for the California Red-legged frog, Monitoring Plan, and a Bird Strike Survey. The project required the following permits and environmental impact evaluations: Section 1601 Streambed Alteration Agreement, Section 401 Water Quality Certification, NPDES permit, preparation of a SWPPP, USACE Nation Wide Permits, Section 106 Cultural Resource Study, Section 7/10 ESA formal Consultations with USFWS and NMFS, Coastal Development permit from CCC, coastal development permit from Monterey County Planning Department, a flood control permit from the Monterey County Water Agency, and CEQA/NEPA documentation. Other issues concern historical status, threatened and endangered species, and water quality.

Habitat Assessment and California Environmental Quality Act (CEQA) Compliance, Proposed Preservation Ranch Vineyard, Sonoma County, California

Task Manager for a three-year, approximately \$500,000 habitat assessment for a 22,000-acre former timberland in coastal Sonoma County proposed for conversion to vineyards. Studies performed included: Golden Eagle habitat assessment and focused survey, Northern Spotted Owl, Marbled Murrelet, general Raptor surveys, rare plant assessments, wetland delineation and road assessment surveys. The project required extensive use of Trimble GPS technologies. Fieldwork performed in extremely rugged Coastal Range terrain in extreme weather. Mr. Goggin was the lead author for resultant Biological/Habitat Assessment Report.

Eleven Bridge Replacement/Track Expansion Projects, Natural Resource Permitting and CEQA Compliance, Butte County, California

Project Manager for a Natural Resource Permitting and CEQA Compliance study of 11 Union Pacific Railroad (UPRR) bridges proposed for replacement/culvert installation located along the UPRR industrial-lead corridor in Butte County. Duties included preparation of an initial study and Notice of Exemption pursuant to CEQA guidelines; several biological studies including a Biological Assessment and Wetland Delineation. Key environmental issues of concern involved water quality and threatened and endangered species including the Giant Garter Snake, Elderberry Beetle, and Sacramento Splittail. As a consequence of project implementation, loss of wetlands occurred; credits were established through a wetland bank and a mitigation and monitoring plan was crafted to specifically address the functions and values for those impacted wetlands as well as the presumed presence of the Giant Garter Snake.

California Army National Guard, Camp Roberts and Camp San Luis Obispo, Programmatic Natural Resource Environmental Management. Monterey and San Luis Obispo Counties, California

Project Biologist responsible environmental program oversight assisting Camp Roberts and Camp San Luis Obispo National Guard Training Site's in support of various environmental projects to include, but not limited to: Threatened and Endangered Species Management Program, Natural Resources Management and the ITAM Program. Conducted management surveys for the San Joaquin Kit Fox, California Red-legged Frog, conducted habitat assessments for California Tiger Salamander, terrestrial invertebrates; performed bat clearance surveys on 100 World War II-era barracks scheduled for demolition and conducted a facility-wide wetland assessment. Mr. Goggin prepared resultant biological reports and co-managed the overall project.

WILLIAM GOGGIN

WILDLIFE BIOLOGIST/PROJECT MANAGER

Bay Area Rapid Transit (BART) SFO Expansion Project, Millbrae, California

Wildlife Biologist/Wetlands Scientist responsible for performing biological assessments and jurisdictional wetland delineation in support of San Francisco International Airport Expansion project. Conducted habitat assessments and prepared habitat distribution maps showing available suitable habitat for numerous endangered Bay Area species. Conducted focused surveys for San Francisco Garter Snake and Red-legged Frog. Prepared successful wetland restoration report, which was submitted to relevant trustee/responsible agencies for mitigation regarding project impacts.

Southwest Annex Flood Control Project, Biological Assessment/Wetland Delineation, Richmond, California

Contracted by local municipality to conduct initial site evaluation in support of land acquisition project for use of the site as a flood control basin. Task Manager for Biological Assessment/Wetland Delineation. Duties included: conducting wetland delineation, sensitive species habitat assessment, preparation of Biological Assessment and Wetland Delineation Reports.

Amtrak/Union Pacific Railroad Double Track Expansion along HWY 580-Corridor, Programmatic EIS/EIR & Permitting, Alameda County, California

Task Manager for several geological studies in support of a 30-mile double-track expansion for Amtrak commuter rail along the Highway 580 corridor. In cooperation with Amtrak California and the UPRR, the Capitol Corridor Joint Powers Authority (CCJPA) operates passenger and commuter rail service through the project corridor. The CCJPA plans to increase service between Oakland and San Jose from seven weekday round-trip trains to a minimum of 11 weekday round-trip trains by year 2003. The purpose of the proposed project is to relieve system rail congestion by eliminating service interruptions and delays caused by the present "bottleneck" conditions in the project corridor by providing continuous two-way rail capacity between Mowry Road and Auto Mall Parkway. Duties included regulatory compliance/permitting coordination in support of several local, state, and federal permits including but not limited to: S404 USACE Individual Permit, S1601 Streambed Alteration Agreement, S401 Water Quality Certification. Critical issues included wetland protection and mitigation, water quality, as well as Clapper rail and red-legged frog.

Double Track Expansion along the HWY 580-Corridor, Cities of Agnew to Santa Clara, California, Project Manager

This Union Pacific Railroad (UPRR) corridor project consists of constructing a second main line railroad track in a project corridor of approximately thirty miles long, extending from the Cities of Agnew to Santa Clara. In cooperation with Amtrak California and the Union Pacific Railroad (UPRR), the Capitol Corridor Joint Powers Authority (CCJPA) operates passenger and commuter rail service through the project corridor. Duties included regulatory compliance and coordination with several local, state, and federal trustee/responsible agencies in support of various permit requirements. Critical issues involve right-of-way and relocation near major bridge crossings at HWY 101.

Appendix B — Plant Species Observed on Gnos Field Airport

Plant Species Observed on the Gross Field Airport

Scientific Name	Common Name
<i>Avena fatua</i>	Wild oats
<i>Baccharis pilularis</i>	Coyotebush
<i>Brassica nigra</i>	Black mustard
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Softchess
<i>Centaurea solstitialis</i>	Yellow star-thistle
<i>Cirsium</i> sp.	Thistle
<i>Convolvulus arvensis</i>	Bindweed
<i>Cotula coronopifolia</i>	Brass buttons
<i>Cuscuta howelliana</i>	Dodder
<i>Cynara scolymus</i>	Artichoke
<i>Cynodon dactylon</i>	Bermudagrass
<i>Cyperus eragrostis</i>	Nutsedge
<i>Cytisus scoparius</i>	Scotch broom
<i>Deschampsia danthonioides</i>	Annual hair grass
<i>Distichlis spicata</i>	Saltgrass
<i>Eleocharis macrostachya</i>	Spikerush
<i>Epilobium brachycarpum</i>	Fireweed
<i>Erodium cicutarium</i>	Filaree
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus</i> sp.	Eucalyptus
<i>Foeniculum vulgare</i>	Wild fennel
<i>Frankenia salina</i>	Alkali heath
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Hemizonia fitchii</i>	Fitch's spike weed
<i>Hordeum marinum</i>	Barley
<i>Hypericum formosum</i>	St. John's wort
<i>Hypochoeris glabra</i>	Smooth cat's ear
<i>Juncus acutus</i>	Spiny rush
<i>Juncus mexicanus</i>	Mexican rush
<i>Juncus xiphioides</i>	Iris-leaved rush
<i>Lactuca serriola</i>	Prickly lettuce
<i>Limnanthes douglasii</i>	Meadowfoam
<i>Lolium perenne</i>	Perennial ryegrass
<i>Madia sativa</i>	Coast tarweed
<i>Malva neglecta</i>	Common mallow
<i>Melilotus alba</i>	Sweetclover
<i>Mentha pulegium</i>	Pennyroyal
<i>Oxalis pes-caprae</i>	Woodsorrel
<i>Plantago major</i>	English plantain
<i>Picris echioides</i>	Bristly ox-tongue
<i>Phalaris canariensis</i>	Canary grass
<i>Pimpinella anisum</i>	Anise
<i>Polygonum arenastrum</i>	Knotweed
<i>Polypogon monspeliensis</i>	Rabbitsfoot grass
<i>Quercus lobata</i>	Valley oak
<i>Ranunculus californicus</i>	Buttercup
<i>Raphanus sativa</i>	Field radish
<i>Rubus discolor</i>	Himalayan blackberry
<i>Rumex crispis</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle dock
<i>Salicornia</i> sp.	Pickleweed
<i>Salix</i> sp.	Willow
<i>Scirpus aquaticus</i>	Bulrush
<i>Senecio vulgare</i>	Groundsel
<i>Sidalcea malvaeflora</i>	Checkerbloom
<i>Solanum</i> sp.	Nightshade
<i>Sonchus oleraceus</i>	Sowthistle
<i>Spargularia</i> sp.	Sand spurry
<i>Trifolium</i> sp.	Clover
<i>Triticum aestivum</i>	Wheat
<i>Typha latifolia</i>	Cattail
<i>Verbascum thapsis</i>	Wooly mullein
<i>Vicia villosa</i>	Vetch
<i>Xanthium strumarium</i>	Cocklebur
<i>Xanthium spinosum</i>	Spiny cocklebur

Appendix C — Wildlife Species Observed on Gnos Field Airport

Animal Species Observed on the GROSS Field Airport

Scientific Name	Common Name
Reptiles/Amphibians	
<i>Sceloporus occidentalis</i>	Western fence lizard
Birds	
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Anas americana</i>	American widgeon
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas platyrhynchos</i>	Mallard
<i>Ardea alba</i>	Great egret
<i>Asio flammeus</i>	Short-eared owl
<i>Athene cunicularia hypugaea</i>	Western burrowing owl
<i>Aythya marila</i>	Greater Scaup
<i>Bucephala albeola</i>	Bufflehead
<i>Bucephala clangula</i>	Common goldeneye
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Carpodacus mexicanus</i>	House finch
<i>Cathartes aura</i>	Turkey vulture
<i>Catoptrophorus semipalmatus</i>	Willet
<i>Charadrius vociferus</i>	Killdeer
<i>Circus cyaneus</i>	Northern harrier
<i>Cistothorus palustris</i>	Marsh wren
<i>Corvus corax</i>	Common raven
<i>Elanus leucurus</i>	White-tailed kite
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Falco columbarius</i>	Merlin
<i>Himantopus mexicanus</i>	Black-necked stilt
<i>Melospiza melodia</i>	Song sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Sayornis nigrens</i>	Black phoebe
<i>Sturnella neglecta</i>	Western meadowlark
<i>Sturnus vulgaris</i>	European starling
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tringa melanoleuca</i>	Greater Yellowlegs
Mammals	
<i>Canis latrans</i> *	Coyote
<i>Lepus californica</i>	Black-tailed jackrabbit
<i>Spermophilus beecheyi</i>	California ground squirrel
<i>Thomomys mazama</i> *	Western pocket gopher
* sign	

Appendix D — Focused Soft Birds Beak Survey Methodology and Results

November 12, 2010

Ms. Sara Hassert
Landrum and Brown
8755 West Higgins Road, Suite 850
Chicago, IL 60631

Subject: Results of the 2010 Focused Survey for Soft Bird's Beak (*Cordylanthus mollis* ssp. *mollis*) on the Gness Field Airport Property in Marin County, CA.

Dear Ms. Hassert:

This report summarizes the results of a focused botanical survey for soft bird's beak (*Cordylanthus mollis* ssp. *mollis*). The purpose of this focused survey was to determine the presence or absence of this federally listed endangered, state listed rare, and California Native Plant Society (CNPS) ranked 1B.2 on the Gness Field Airport property for the proposed runway expansion area project site. The study area is located immediately east of Highway 101 and approximately one mile north of the City of Novato adjacent to Airport Road (**Figure 1**).

Regulatory Framework

Federal Endangered Species Act

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

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

FESA and Clean Water Act (CWA) Section 404 guidelines prohibit the issuance of wetland permits for projects that jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. The U.S. Army Corps of Engineers (Corps) must consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) when threatened or endangered

species under their jurisdiction may be affected by a proposed project. In the context of the proposed project, FESA would be initiated if development resulted in take of a threatened or endangered species or if issuance of a Section 404 permit or other federal agency action could result in take of an endangered species or adversely modify critical habitat of such a species.

California Environmental Quality Act (CEQA)

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would result in any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional or state habitat conservation plan.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. This is necessary because although the impacts would result in

an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of, an important resource on a population-wide or region-wide basis.

California Endangered Species Act

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

California Native Plant Society

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

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

Species Description, Distribution and Habitat

Soft bird's beak is federally listed as endangered, state listed as rare, and is ranked by the CNPS as a List 1B.2 species (plants that are rare and endangered in California). The plant is an erect, summer-flowering hemiparasitic annual herb in the Scrophulariaceae family. The plant ranges in size from six inches to 24-inches in height at maturity, and is found in coastal salt marshes at elevations between 0-3 meters (relative to mean sea level). The inflorescence is a spike with each flower subtended by two bracts. The flowers are bi-lobed and whitish in color. The entire

plant is densely hairy giving it a “soft” feeling when handled. Flowering begins in early July and may continue into November (CNPS, 2010).

Historically, soft bird’s-beak occurred in the salt marshes and swamps in the San Francisco Bay Delta region and San Pablo Bay from Contra Costa, Solano, Napa, Sonoma, Sacramento, and Marin counties. Soft bird’s beak has been extirpated in three of the six counties where it formerly occurred and is seriously threatened in the remaining fifteen known occurrences in the remaining three counties. Primary threats include soil erosion, sediment deposition and associated encroachment of non-native upland plants and alterations of drainage regimes in marshlands.

Methods

On July 21st, August 18th, and September 16, 2010 a Foothill Associates’ biologist, Ryan Brown (**Attachment A**), conducted focused plant surveys in effort to determine the presence or absence of soft bird’s beak in the study area.

Prior to the survey, soil data describing types of soils occurring on the site (**Figure 2**) was reviewed, CNDDDB (2010) records search for soft bird’s beak (**Figure 3**), a previously conducted rare plant survey conducted by Kleinfelder in 2008, and a focused soft bird’s beak survey conducted in 2009.

Survey methodology at the site specifically included walking transects approximately 25 feet apart in areas where transects could be walked (i.e. parallel to the runway, in open areas north of the existing facility). In areas where topography or drainages precluded straight line inspection, meandering transects or zigzagging routes were utilized to ensure good coverage of the site (i.e. areas in the southern portions of the airport and within the ditched areas around the runway and facilities). More time was spent in areas containing water and wetland areas, as these transitional areas were perceived to have a higher potential of supporting soft bird’s beak. Each of the three surveys was completed in 5 to 6 hours at the site. A Trimble Geo XT was loaded with a map of the survey area and background file of wetlands occurring on the site to aid in navigation over the more remote sections of the site and to ensure complete coverage.

The 2010 focused soft bird’s beak surveys were conducted during the species’ flowering period (July – November) for optimal identification potential. In accordance with the CNPS Botanical Survey Guidelines, the survey was conducted by personnel with the following qualifications: experience with conducting floristic surveys; intimate knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area, including special-status and locally significant plants; familiarity with the appropriate state and federal statutes related to plants and plant collecting, and experience with analyzing impacts of project activities on native plants and plant communities.

The site was surveyed on foot to provide 100 percent search coverage with special attention given to the vegetation communities that represent potential habitat for this species. A species

list of plants observed on site during the survey was also recorded and is provided as **Attachment B**.

The following available information pertaining to the natural resources of the region was reviewed for the survey and preparation of this report.

- California Department of Fish and Game (CDFG). 2010. *California Natural Diversity Database*. Sacramento, CA;
- California Native Plant Society Inventory of Rare and Endangered Plants (website). 2010. <http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi>;
- Google Earth. 2010. <http://www.google.com/earth/index.html>;
- Kleinfelder. 2008. Preliminary Botanical Assessment for the Proposed Gness Field Airport Runway Expansion Project, Marin County, California;
- Kleinfelder. 2009. Focused Soft Bird's Beak Survey for the Proposed Gness Field Airport Runway Expansion Project, Marin County, California;
- Natural Resources Conservation Service. 1985. *Soil Survey of Marin County, California*. U.S. Department of Agriculture;
- R.C. Fuller Associates. 2001. Levee Reconstruction Project, Marin County Airport, Initial Study;
- U.S. Fish and Wildlife Service. 2008. Federal Endangered and Threatened Species that may be affected by Projects in the Petaluma River 7.5 minute series quadrangle. Sacramento, California; and
- U.S. Geological Survey (USGS). 1954. Photorevised 1980. *Petaluma River, California*. 7.5-minute series topographic quadrangle. United States Department of Interior.
- Hickman, James C. (Ed). 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley California; and,
- Natural Resources Conservation Service. 1985. *Soil Survey of Marin County, California*. U.S. Department of Agriculture;

Results

Two major biological communities occur within the Gness Field study area including annual grassland and high brackish marsh. Within these two primary communities are also some additional wetland communities including depressional seasonal wetland, riverine seasonal wetland, perennial drainage, ditch, as well as the developed portions of the property comprising the airport runways and infrastructure. The high brackish marsh habitat influences the major plant community within the study area outside of the developed airfield. It is dominated by a combination of saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and saltbush (*Atriplex* sp.). Other minor plant species within this community include pickleweed (*Salicornia* sp.), bristly ox-tongue (*Picris echioides*), brass buttons (*Cotula coronopifolia*), and cocklebur

(*Xanthium strumarium*). Since this vegetation community is dominated by a grass species, it can generally be considered as a grassland habitat. However, this is a wetland vegetation community as opposed to an upland annual grassland habitat. For a complete plant list see **Attachment B**.

The Natural Resources Conservation Service (NRCS) has mapped three soil units on the study area (**Figure 2**). The soil units that occur onsite include: Reyes clay; Urban land-Xerorthents complex, 0 to 9 percent slopes; and Xerorthents, fill.

Though known to occur within 5 miles of the proposed project site, the target species, soft bird's beak, was not found in the survey area. In general, habitat within the study area is marginal and compromised ecologically by the diking and annual draining of the site by the localized land owners/managers. Once water is drained from the site, it is grazed by cattle. Optimal habitat for the species does not occur onsite and soft bird's beak was not found during the 2009 and 2010 surveys conducted during the plant's flowering period.

Please feel free to contact me if you have any questions at (530) 893-6700 or via e-mail at ryan.brown@foothill.com.

Sincerely,



Ryan Brown
Biologist

Enclosures:

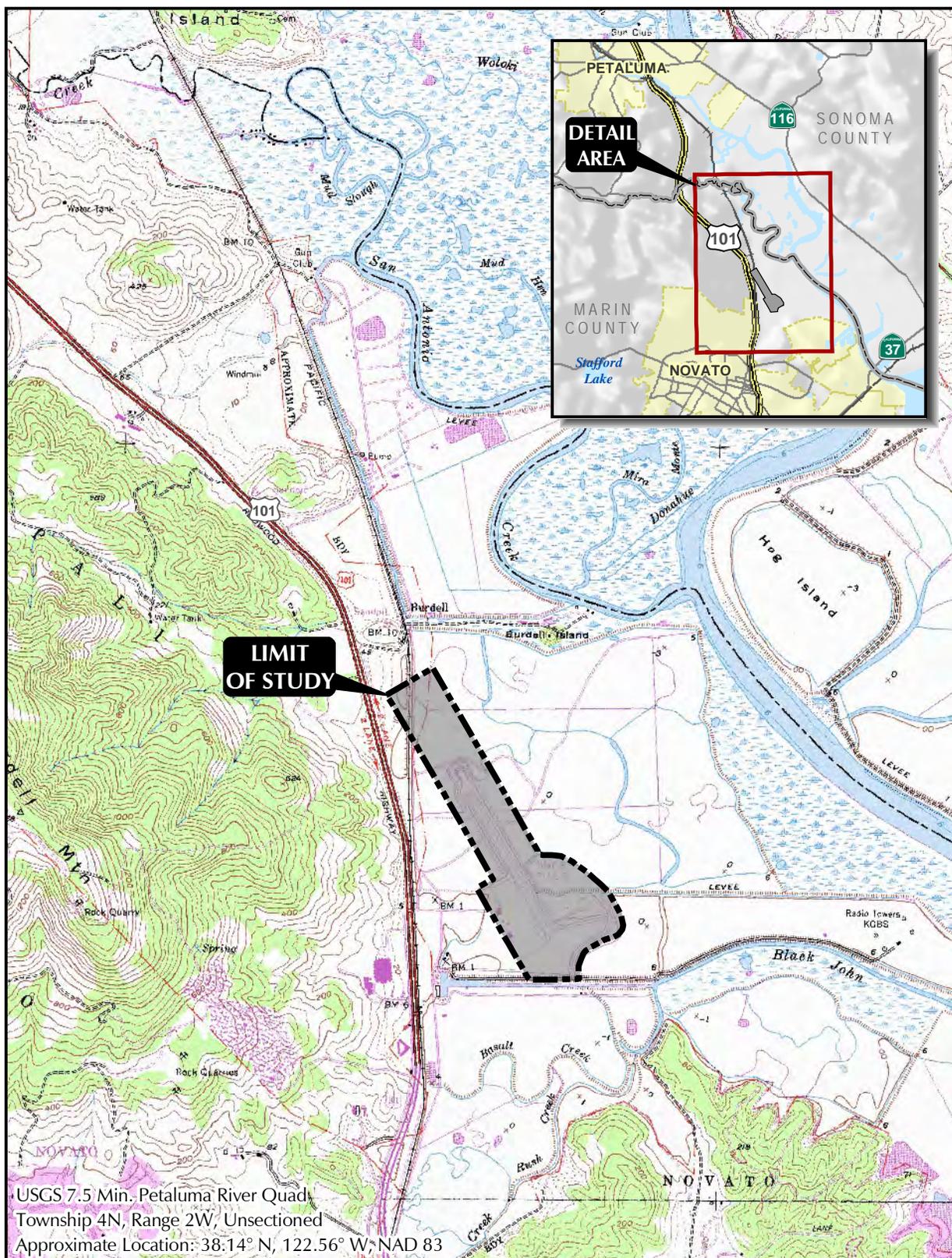
Figure 1 — Site and Vicinity

Figure 2 — Soils

Figure 3 — CNDDB

Attachment A — Surveyor Qualifications

Attachment B — Botanical Survey Species List



SITE AND VICINITY

FOOTHILL ASSOCIATES
 ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE

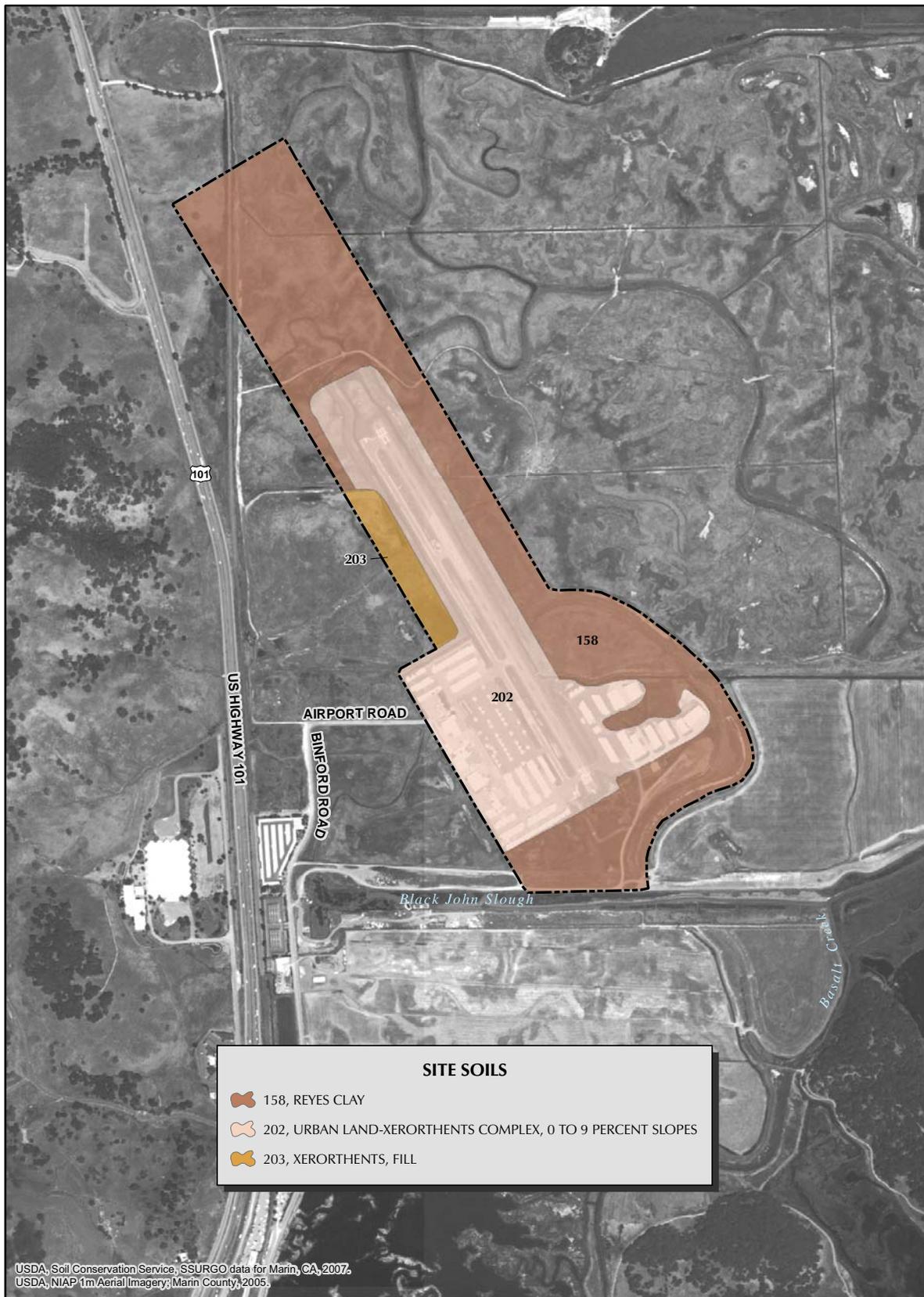
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Drawn By: MJ
 Date: 04/29/08

FIGURE 1

GNOSS FIELD AIRPORT

site_and_vicinity.mxd
 © 2010



USDA, Soil Conservation Service, SSURGO data for Marin, CA, 2007.
 USDA, NIAP 1m Aerial Imagery; Marin County, 2005.

SOILS		 0 800 1600 SCALE IN FEET	Drawn By: BF/PDL Date: 03/10/09	FIGURE 2
 FOOTHILL ASSOCIATES <small>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE</small>				

GNOSS FIELD AIRPORT

soils_11x17.mxd
 © 2010

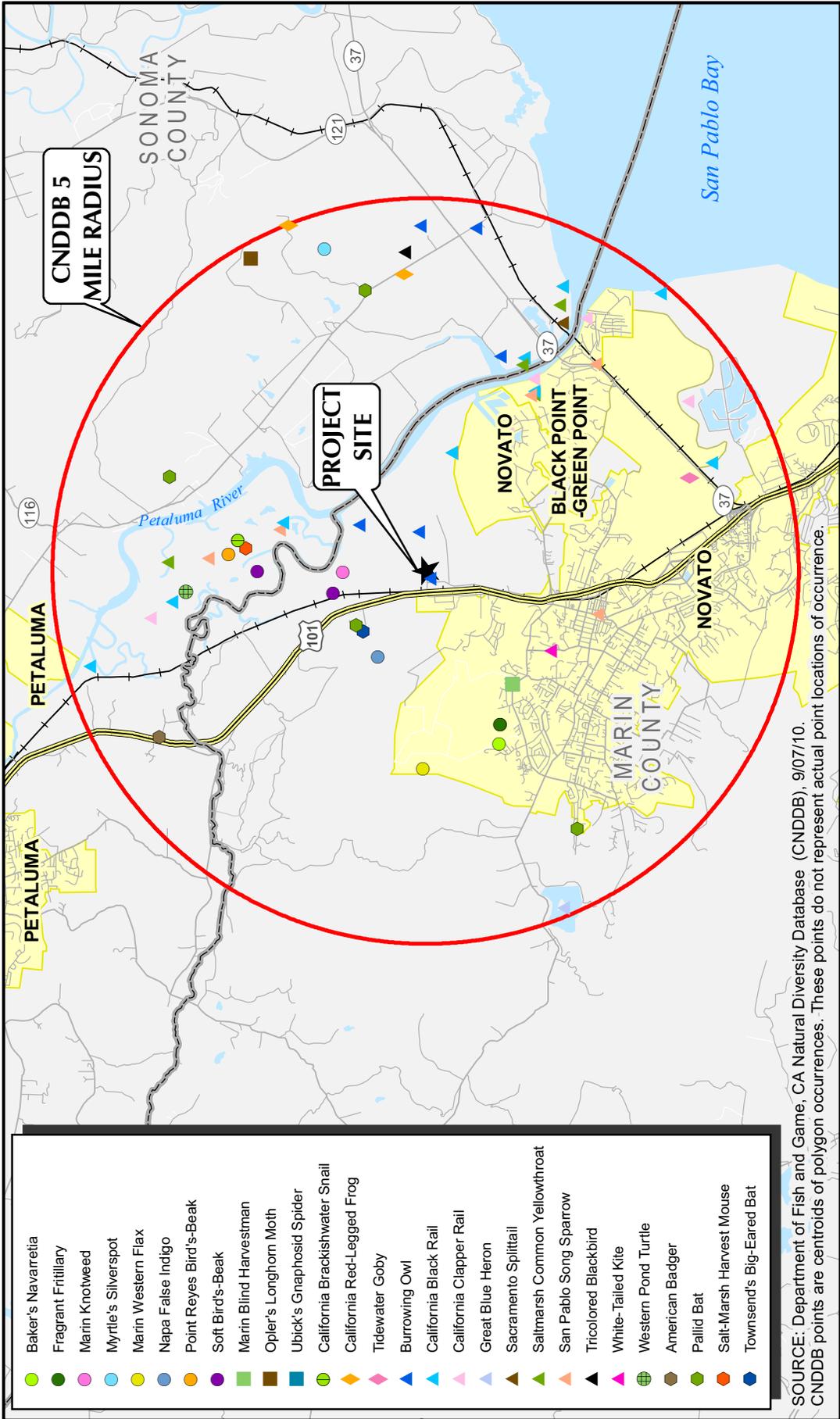


FIGURE 3

Drawn By: RJM
Date: 09/21/10

Attachment A – Surveyor Qualifications



Ryan Brown

Regulatory Biologist/ISA Certified Arborist

Education

Bachelor of Science, Biological Sciences, CSU, Chico, 2001

Certifications

ISA Certified Arborist, WE-7377A

ESA Section 10(a)(1)(A) Permittee for Vernal Pool Shrimp

Experience

Owner, Blossomland Arborist Service

Biologist/ISA Certified Arborist, Gallaway Consulting, Inc.

Fish and Wildlife Technician, Thomas R. Payne and Associates

Fish and Wildlife Scientific Aid, California Department of Fish and Game

Research Assistant, Chico Research Foundation, CSU, Chico

Student Assistant, Department of Water Resources

Publications

Light-trapping of Larval and Juvenile Northern Pike, *Esox lucius*, From Lake Davis, California, Spring 2003. CA Fish and Game 92(1): 149-155.

Training

CEQA Step-by-Step, UC Davis Extension

Biology and Management of the Red Legged Frog, Alameda County Conservation Partnership Workshop

Ryan Brown is a Regulatory Biologist with ten years of experience working in the natural resources field. He currently manages projects for Foothill Associates utilizing a broad skillset in biological assessment and regulatory permitting for support and incorporation into NEPA and/or CEQA documentation. The experience gained performing biological assessments and wetland delineations, writing the technical documents detailing survey results, assessing environmental impacts, and preparation of permitting packages for the USACE, RWQCB, and CDFG, has given him the wherewithal to manage a wide array of project types. Ryan has quickly gained experience in agency consultation, communicates effectively, and is a proficient negotiator. Ryan routinely works with construction contractors to perform construction monitoring and reporting for environmental compliance. He is USFWS permitted to survey for vernal pool shrimp, is an ISA certified arborist, and has studied all life stages of Central Valley Chinook salmon and steelhead.

Representative Experience

Project Management - Plans, organizes, and manages personnel and resources to accomplish environmental review and regulatory compliance as required for construction projects within a well-defined schedule and budget.

Biological Assessments - Performs botanical, wildlife and habitat surveys on Project sites ranging from under 1 acre to over 1000-acres. Utilizing survey results Ryan writes detailed reports for NEPA and CEQA support for a wide array of public and private projects. Documentation routinely produced includes Biological Resource Assessments for CEQA and ESA Section 7 Biological Assessments for NEPA and formal USFWS consultation.

Regulatory Permitting - Reviews documentation, consolidates information, and produces complete permit packages for local, state and federal regulatory agencies. Has successfully obtained nationwide permits (USACE), streambed alteration agreements (CDFG), water quality certifications (RWQCB), biological opinions (USFWS), and letters of technical support (USFWS) for construction projects.

Rare Plant Surveys - Performs rare plant surveys for CNPS, CDFG, and USFWS listed plant species. Conducts surveys following CNPS, CDFG, and USFWS survey guidelines / protocols for rare plants in Butte, Tehama, Sacramento, Placer, Marin, and Napa Counties.

Construction Coordination and Monitoring - Coordinates with construction superintendents and foremen to assure environmental compliance relating to local, state, and federal permit regulations in various habitat types. Monitors all stages of on-the-ground construction.

Wetland Delineation - Ryan has conducted wetland delineations on numerous small and large project and mitigation sites within Butte, Shasta, Tehama, Placer, Marin, and Sacramento counties.



USFWS/CDFG/USFS Protocol Survey Experience - Ryan has performed protocol surveys for vernal pool crustaceans, red-legged frog, foothill and mountain yellow-legged frog, leopard frog, northern goshawk, northern pond turtle, butte county meadowfoam, soft birds beak, Baker's navarretia, fox sedge, adobe lily, and red bluff dwarf rush.

Oak Woodland Restoration - Ryan is a certified arborist. He performs tree inventories and develops site-specific mitigation/re-planting measures to compensate for small- and large-scale oak tree impacts.

Representative Experience

Canyon Knolls/ Tuscan Village, Tehama Deer Herd Migration Corridor Study, Butte County. - In coordination with the County CDFG biologist and a localized land owner, Ryan developed a methodology to conduct day and night field surveys to determine Tehama deer herd migratory deer use of 2 parcels totaling 280 acres in Butte Creek Canyon. Site evaluation looked at movement versus migration routes, and attempted to estimate deer counts, sex ratios, and age class of deer.

All Nations Church, Los Angeles County. Ryan helped prepare a Biota Report pursuant to County of Los Angeles Department of Regional Planning guidelines. The report evaluates the proposed environmental impacts proposed by the Project and incorporates recommendations from the Sensitive Environmental Area Technical Advisory Committee (SEATAC) and the Regional Planning Biologist along with mitigations and thresholds of significance. Ryan has met with Los Angeles County Planning Staff and SEATAC to evaluate Project alternatives and avoidance and mitigation measures to preserve habitat qualities of a parcel zoned a Sensitive Environmental Area by LA County.

Beale Air force Base Floristic Monitoring, Yuba County. Ryan performed vernal pool floristic monitoring on Beale Air force Base and has an existing Base Pass until 26 APR 11.

Chico Water Pollution Control Plant, Butte County. Ryan worked with the prime contractor Gateway Pacific to install and implement environmental protection measures as directed by the Projects EIR, Biological Opinion, and CDFG consistency determination for this project which increased the City's WPCP capacity and relocated the outfall on the Sacramento River bank. Species potentially affected included Central Valley salmonids, green sturgeon, bank swallow, and VELB. Ryan also wrote a Re-vegetation and Monitoring Plan for bank impacts to the Sacramento River which was reviewed and approved by the CDFG and NMFS. Ryan oversaw and coordinated with other Foothill Associates staff to monitor and provide environmental oversight for this \$4.2 million Capital Improvement project.

Creekview Professional Center Biological Studies, Sacramento County. Ryan assisted with the biological constraints analysis and arborist survey, for this 7.75-acre site; formerly a gravel mining operation and proposed for commercial infill. Studies supported regulatory permits, including Clean Water Act Section 401 Water Quality Certification, Nationwide Permit #39 Pre-construction Notification, and Section 1602 Streambed Alteration Agreement. Ryan negotiated terms for ESA Section 7 Consultation for California red-legged frog and received a Biological Opinion from the USFWS.

Gross Field Airport Runway Extension EIS/EIR, Marin County. Ryan was part of the Foothill team conducting a biological resources assessment and a wetland delineation on the 213-acre site in support of a preliminary site assessments and EIS/EIR analyses and documentation associated with the proposed runway and taxiway extensions, as well as drainage realignments and the construction of levees to protect the runway extension from flooding. Ryan is currently performed focused surveys for the federally listed endangered soft birds beak and salt marsh harvest mouse habitat.

Gridley Boat Ramp Improvement, Butte County. Ryan was project manager for a biological resources assessment on the 5.45-acre City of Gridley boat ramp and public river access area improvement project along the Feather River. The assessment report summarizes the general biological resources on the site, assesses the suitability of the site to support special-status species and sensitive habitat types, and provides recommendations for regulatory permitting or further analysis that may be required. Ryan wrote the ESA Section 7 Biological Assessment for USFWS/NOAA consultation regarding Central Valley steelhead, spring-run Chinook salmon, green sturgeon, Essential Fish Habitat and critical habitat for salmonids, and valley elderberry longhorn beetle.

Pope Valley, Persephone Ranch Regulatory Permitting, Napa County. Ryan conducted a biological resources reconnaissance survey and wetland delineation on this 345-acre active vineyard, including native oak woodland, riparian and annual grassland habitats. Ryan wrote the biological reporting document to support CEQA analysis of the Project, a Vegetation and Monitoring Plan as required by the CDFG for a streambed alteration agreement and performed a rare plant survey on the property.

Sycamore Pool/ 1-mile Dam, Butte County. Ryan assisted with the biological evaluation and permitting efforts, including a Nationwide 3, streambed alteration agreement and water quality certification for this City of Chico Project. Ryan also assisted with ESA Section 7 consultation for federally listed salmonids with potential to occur in Big Chico Creek.



Attachment B – 2010 Botanical Surveys Species List

Scientific Name	Common Name
Plants	
<i>Avena fatua</i>	Wild oats
<i>Baccharis pilularis</i>	Coyotebush
<i>Brassica nigra</i>	Black mustard
<i>Centaurea solstitialis</i>	Yellow star-thistle
<i>Cirsium</i> sp.	Thistle
<i>Convolvulus arvensis</i>	Bindweed
<i>Cotula coronopifolia</i>	Brass buttons
<i>Cuscuta howelliana</i>	Dodder
<i>Cynara scolymus</i>	Artichoke
<i>Cynodon dactylon</i>	Bermudagrass
<i>Cyperus eragrostis</i>	nutsedge
<i>Deschampsia danthonioides</i>	Annual hair grass
<i>Distichlis spicata</i>	Saltgrass
<i>Eleocharis macrostachya</i>	spikerush
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus</i> sp.	Eucalyptus
<i>Frankenia salinia</i>	Alkali-heath
<i>Hemizonia fitchii</i>	Fitch's spike weed
<i>Hordeum marinum</i>	Barley
<i>Juncus acutus</i>	Spiny rush
<i>Juncus mexicanus</i>	Mexican rush
<i>Juncus xiphioides</i>	Iris-leaved rush
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lolium perenne</i>	Perennial ryegrass
<i>Madia sativa</i>	Coast tarweed
<i>Mentha pelugium</i>	Pennyroyal
<i>Plantago major</i>	English plantain
<i>Picris echioides</i>	Bristly ox-tongue
<i>Phalaris canariensis</i>	Canary grass
<i>Pimpinella anisum</i>	Anise
<i>Polygonum arenastrum</i>	Knotweed

Scientific Name	Common Name
<i>Polypogon monseliensis</i>	Rabbitsfoot grass
<i>Raphanus sativa</i>	Field radish
<i>Rubus discolor</i>	Himalayan blackberry
<i>Rumex crispis</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle dock
<i>Salicornia</i> sp.	Pickleweed
<i>Solanum</i> sp.	Nightshade
<i>Spurgularia</i> sp.	Sand spurry
<i>Trifolium</i> sp.	Clover
<i>Typha latifolia</i>	Cattail
<i>Verbascum thapsis</i>	Wooly mullein
<i>Vivia villosa</i>	vetch
<i>Xanthium strumarium</i>	Cocklebur
<i>Xanthium spinosum</i>	Spiny cocklebur

**Appendix E — National Marine Fisheries Service
Letter, March 5, 2010**



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

March 5, 2010

In response, refer to:
SWR/F/SWR3:GS

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Douglas Pomeroy
Federal Aviation Administration
831 Mitten Road, Suite 210
Burlingame, California 94010-1300

Dear Mr. Pomeroy:

Thank you for your letter of February 22, 2010, regarding the Gness Field Airport Runway Extension Project in Marin County, California. The Federal Aviation Administration (FAA) has requested information regarding the presence of federally listed (or proposed for listing) threatened or endangered species or critical habitat that may be affected by proposed 1,100-foot runway extension at Gness Field Airport. Your letter also requests information regarding the presence of Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

NOAA's National Marine Fisheries Service (NMFS) has reviewed the information provided with your February 22, 2010, letter, including the mapped areas of the four potential project alternatives. Available information indicates that no Endangered Species Act listed species, proposed species, or designated critical habitat occur in the project area. Therefore, the four project alternatives currently under consideration by FAA do not have potential to affect listed species or critical habitat.

Regarding EFH under the MSA, available information indicates the project site is not located within an area identified as essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The U.S. Fish and Wildlife Service (USFWS) may have listed species or critical habitat under its jurisdiction in the project area. Please contact Mr. Harry Mossman at USFWS, 2800 Cottage Way, W-2605, Sacramento, California 95825, or (916) 414-6600; regarding the presence of listed species or critical habitat under USFWS jurisdiction that might be affected by your project.

Please contact Gary Stern at 707-575-6060, if you have any questions concerning this species list or require additional information.

Sincerely,

Dick Butler
Santa Rosa Area Office Supervisor
Protected Resources Division

cc: Korie Schaeffer, NMFS Santa Rosa, CA
Copy to ARN file #151422SWR2010SR00074



**Endangered Species Act, Section 7, Biological
Assessment, Prepared December 2012 (Submitted
to the U.S. Fish and Wildlife Service January 2013)**

An earlier Biological Assessment was prepared and submitted to the U.S. Fish and Wildlife Service in November 2011. This earlier Biological Assessment was replaced by the December 2012 Biological Assessment, which provided additional detail regarding habitat compensation measures for the Sponsor's Proposed Project (Alternative B).

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

San Francisco Airports District Office
1000 Marina Boulevard, Suite 220
Brisbane, CA 94005-1853

January 22, 2013

Mr. Joseph Terry
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

Subject: Revised Biological Assessment for the Formal Endangered Species Act, Section 7, Consultation, for the Proposed Extension of Runway 13/31, Marin County Airport – Gness Field, Marin County, California.

Dear Mr. Terry:

The County of Marin is proposing an 1,100 foot extension to Runway 13/31 at Marin County Airport – Gness Field, Marin County, California. The Federal Aviation Administration (FAA) previously submitted a Biological Assessment (BA) dated November 2011 for this project to the U.S. Fish and Wildlife Service (USFWS) by letter dated November 16, 2011. The proposed project is anticipated to have adverse effects on Salt Marsh Harvest Mouse and California Clapper Rail habitat.

After submittal of the November 2011 BA, the FAA and Marin County representatives met with you on July 13, 2012 regarding potential conservation measures and habitat compensation ratios for the proposed Gness Field Airport Runway Extension Project. As a result of that meeting, the FAA decided to prepare a revised BA. The revised BA, dated December 2012, is enclosed with this letter. The revised BA includes more specific information on project phasing and how those phases relate to temporary and permanent habitat impacts to listed species. The revised BA also proposes specific habitat compensation ratios for temporary and permanent habitat impacts to federally endangered and threatened species habitat resulting from the proposed project.

The changes in the December 2012 BA as compared to the November 2011 BA include:

- Rewording of the portion of Section 4.0 *Project Description* associated with navigational aids to state that the proposed project includes installation, relocation, and reprogramming of navigational aids, not just the reprogramming of navigational aids.
- An addition to Section 4.0 *Project Description* to clarify that providing a 240-foot long Runway Safety Area at the south end of Runway 13/31 will require a property lot line adjustment for Marin County to gain exclusive use of 0.1 acre of land south of the existing airport property boundary.

- Rearranging the order in which development items are described in Section 4.1, *Project Description* for Alternative B.
- Addition of BA Section 4.2 *Construction Phasing and Access*
- Additions to Figure 8 to show construction access routes.
- Addition to Section 6.0 *History of Consultation*, to include July 13, 2012 meeting between Joseph Terry of USFWS, the FAA, and Marin County.
- Changed Table 1 to reduce acreage of Open Water Ditch/Channel permanently impacts from 2.38 acres to 2.31 acres to reflect updated calculations. This change was previously provided to the USFWS at the July 13, 2012 meeting as an errata sheet to the BA dated July 12, 2012.
- Expanded Section 11.0 *Compensatory Mitigation Alternatives* including adding a new section 11.1 *Habitat Mitigation Ratios* to document our discussions of July 13, 2012, providing more detail regarding habitat compensation ratios. Added statement that the FAA proposes to require Marin County, prior to initiating construction or otherwise taking actions associated with this project that result in adverse effects to the Salt Marsh Harvest Mouse or California Clapper Rail, to develop and submit to the USFWS for its review and approval a revegetation plan and habitat compensation plan based on the habitat compensation ratios in Table 2 of this BA.
- Added Table 2 in the new section 11.1 describing USFWS recommended Habitat Compensation Ratios for Salt Marsh Harvest Mouse and California Clapper Rail Habitat for the Gness Field Airport Runway Extension Project.
- Added Section 11.2.4 *San Pablo Bay Recovery Unit*, discussing the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California*, including alternatives for habitat compensation for listed species

The FAA's Federal actions regarding this project include:

- Federal environmental approval necessary to proceed with processing of Federal funding for those development items qualifying under the Airport and Airway Improvement Act as amended;
- Unconditional Federal approval of the Airport Layout Plan (ALP) to depict the proposed improvements pursuant to 49 U.S.C. 40103 (b) and 47107 (a)(16); and
- Development of air traffic control and airspace management procedures designed to affect the safe and efficient movement of air traffic to and from the proposed runway development. Such actions would include, but are not limited to, the establishment or modification of flight procedures and the installation and/or relocation of Navigational Aids (NAVAIDs) associated with the proposed runway and taxiway extension.

As discussed in the BA, the USFWS considers the proposed project site to be potential habitat for the Salt Marsh Harvest Mouse (SMHM) and the California Clapper Rail (CCR), and a potential dispersal site for the California Red-legged Frog (CRLF).

The proposed project will eliminate 6.88 acres of high brackish marsh habitat, which is considered by the USFWS as suitable habitat for the SMHM and CCR. The area is now surrounded by levees, drained with pumps, and no longer receives tidal action. These 6.88 acres of habitat to be eliminated include both aquatic areas containing pickleweed and adjacent upland grassland areas. An area of 16.05 acres of habitat considered suitable for the SMHM and CCR by the USFWS, and composed primarily of uplands during annual dry periods, will be temporarily impacted by the construction of the project for an estimated two years. These project impacts are considered to be adverse effects on the SMHM and the CCR.

The BA concludes that the project may affect, but is not likely to adversely affect, the CRLF. Although there is a potential that the CRLF could disperse onto the project site from adjoining off-site freshwater areas, the habitat on the project site does not provide habitat for the CRLF to breed or persist.

This BA considers both the upland and wetland habitat being disturbed by the proposed project to be habitat for the SMHM and CCR, even though some of the habitat is of limited value. Therefore, for purposes of evaluating impacts on endangered and threatened species, all habitat that is temporarily disturbed will still be considered to be endangered and threatened species habitat when it is revegetated at completion of the project, even though some of the habitat is anticipated to be converted from wetland to upland habitat.

The BA identifies measures to minimize adverse effects of the proposed project on the SMHM and CCR. As potential SMHM and CCR habitat occurs at both ends of the runway, the project cannot be constructed without some adverse effects on these species. The BA identifies several possible sites where habitat compensation measures to address these adverse impacts could occur. The BA identifies that Marin County would be responsible for preparing specific revegetation plans for areas of temporary impacts for USFWS review and approval prior to project construction. The BA also identifies that Marin County would be responsible for preparing habitat compensation plan for permanent impacts for USFWS review and approval prior to project construction.

The FAA is also preparing an Environmental Impact Statement (EIS) for this proposed project. The EIS will address all wetland losses, whether or not those losses are considered to result in impacts to threatened or endangered species. The FAA released the Draft EIS for public review in December 2011. The FAA anticipates that the Final EIS will be issued approximately 60 days after we receive the USFWS Biological Opinion for this project. This BA and the USFWS Biological Opinion will be included as an Appendix to the Final EIS. The USFWS will receive a copy of the entire Final EIS.

As Marin County cannot proceed with this project without FAA approval, the County meets the definition of an applicant for this formal consultation in accordance with 50 Code of Federal Regulations Part 402, *Interagency Cooperation – Endangered Species Act of 1973, As Amended*, Section 402.02. In accordance with 50 CFR Part 402.14 (e), Endangered Species Act, Section 7 consultations extend for a period of 90 days, and consultations

involving an applicant cannot be extended for more than 60 days beyond that consultation period without the consent of the applicant. In accordance with 50 CFR 402.14 (e), the USFWS will deliver a biological opinion to the Federal agency and the applicant within 45 days of concluding formal consultation.

Please contact me at telephone 650-827-7612 or e-mail douglas.pomeroy@faa.gov if you have questions regarding this letter.

Sincerely,

original signed by

Douglas R. Pomeroy
FAA Environmental Protection Specialist/Biologist

Enclosure

cc: Greg Martinelli, California Department of Fish and Wildlife, Bay – Delta Region, Napa, CA (w/enclosure)

Reuel Brady, Marin County Department of Public Works, San Rafael, CA (w/o enclosure)

Section 7 Biological Assessment

Gross Field Airport
Marin County, California

Prepared for:
Federal Aviation Administration
San Francisco District Office
1000 Marina Boulevard, Room 220
Brisbane, CA 94005

Prepared by:
Landrum and Brown, Inc.
and Foothill Associates

Revised December 2012
November 2011

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Biological Assessment (BA) is to analyze the impacts to federally-listed species that may occur within the Gness Field Airport (Project) area as a result of the proposed 1,100-foot extension of Runway 13/31 at the airport. An Environmental Impact Statement (EIS) is being prepared for this project. This BA evaluates the effects of Marin County's Proposed Project, described as Alternative B in the EIS. This BA will be included as an appendix to the EIS. The Proposed Project is located immediately east of Highway 101 and approximately one mile north of the City of Novato, Marin County, California (**Figure 1**). The Project area includes the developed portions of the airfield and the acreage immediately surrounding the airfield and approximately 1,500 feet north of the existing runway. Marin County intends to make improvements to the airport facility by performing the following activities:

Extend Runway 13/31 by 1,100 feet to the north to increase runway total length from 3,300 feet to 4,400 feet while maintaining existing runway width of 75 feet with Runway Safety Areas (RSAs) that meet current Federal Aviation Administration (FAA) design standards

Extend the corresponding taxiway to the full length of the runway;

Extend existing FAA standard 120-foot wide RSAs centered on the runway centerline to match the length of the runway;

Construct FAA standard 240-foot RSAs at each end of the runway in addition to the 1,100 foot runway extension;

Corresponding realignment of drainage channels to drain the extended runway and taxiway;

Corresponding levee extension to protect the extended runway and taxiway from flooding;

Installation, relocation, and re-programming of navigational aids that pilots use to land at the Airport as needed to match the new runway length; and

Property lot line adjustment for the County to gain exclusive use of 0.1 acre of land south of the Airport necessary to provide for a 240 foot long RSA on the south end of Runway 13/31.

The purpose of this BA is to allow the FAA to determine if and how this action may affect federally-listed species pursuant to the federal Endangered Species Act (ESA).

In accordance with Section 7 of the ESA, the FAA is required to consult with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service to ensure that a federal action associated with the Proposed Project would not jeopardize the continued existence of any federally-listed species or result in adverse modification of designated critical habitat for federally-listed species. Formal consultation between the FAA and the USFWS is necessary for the issuance of any permit associated with a project that is likely to adversely affect a federally-listed species. This BA has been prepared to facilitate the federal consultation process by providing the USFWS with the best available information regarding potential Project related effects to federally-listed species. Please refer to **Appendix A** for a list of preparers for this BA.

1.2 Site Surveys

Prior to developing this BA several site surveys were conducted to evaluate the habitats onsite and the potential for federally-listed species to occur. Foothill Associates' biologists conducted field surveys on March 3, 4 and April 15, 2008 to evaluate biological resources and delineate waters of the U.S. Kleinfelders' botanists conducted a focused plant survey on the site in March 2008 and July 2009. In 2010, Foothill Associates' botanists conducted follow up focused survey for soft birds' beak on July 21, August 18, and September 16, 2010. The results of these surveys are incorporated into this BA. During the field surveys, biologists recorded plant and animal species observed, as well as characterized biological communities occurring onsite. Results of these surveys are the basis for determination of potential occurrence of federally-listed species and their associated habitat.

1.3 Species Covered in this Document

The Proposed Project may affect the following three species which are federally-listed under the Endangered Species Act: California red-legged frog (*Rana draytonii*) (CRLF) (federally-listed threatened), California clapper rail (*Rallus longirostis obsoletus*) (CCR) (federally-listed endangered), and the salt marsh harvest mouse (*Reithrodontomys raviventris*) (SMHM) (federally-listed endangered).

This BA describes potential effects to California red-legged frog, California clapper rail, and the salt marsh harvest mouse resulting from the Proposed Project. This analysis takes into consideration both the project-related impacts and conservation measures to be implemented to avoid, minimize, and offset these impacts.

1.4 Other Species Considered but not Addressed Further

Other species have been considered for inclusion in this BA including the following: California freshwater shrimp (*Syncaris pacifica*), Delta Smelt (*Hypomesus transpacificus*), Coho Salmon – Central California Coast (*Oncorhynchus kisutch*), Central California Coastal Steelhead (*Oncorhynchus mykiss*), Central Valley Steelhead (*O. mykiss*), Central Valley (CV) Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*), Winter-run Chinook Salmon, Sacramento River (*O. tshawytscha*), Western Snowy Plover (*Charadrius alexandrinus nivosus*), California Least Tern (*Sternula antillarum browni*), Northern Spotted Owl (*Strix occidentalis caurina*), Soft Bird's Beak (*Cordylanthus mollis* ssp. *mollis*), Marin dwarf-flax (*Hesperolinon congestum*), and Contra Costa Goldfields (*Lasthenia conjugens*). These species will not be analyzed further in this document because the Proposed Project is not expected to affect these species. A brief analysis of each species is included in **Appendix B** of this document which addresses the rationale that leads to the “no effect” determination. A California Natural Diversity Database (CNDDDB) records search of special-status species known to occur within 5-miles of the Project Site was performed and a graphic depiction of the results is included in **Figure 2**.

1.5 Critical Habitat and Essential Fish Habitat

Under Section 7(a) of the ESA, federal agencies must ensure that any action they authorize, fund, or carry out, is not likely to result in destruction or adverse modification of formally designated

critical habitat for federally-listed species. Critical habitat is formally designated by the Service in the Code of Federal Regulations if prudent and determinable.

No federally designated Critical Habitat or Essential Fish Habitat (EFH) occurs within the site for any federally-listed species or fish species associated with a federal fisheries management plan. Designated Critical Habitat for the California Red-legged frog is located on the southwest edge of the City of Petaluma, a number of miles from the project site (Figure 7) and outside the action area. The Proposed Project will not result in the destruction or adverse modification of Critical Habitat or EFH.

2.0 ACTION AREA

The Action Area as defined by 50 CFR Part 402.02 (**Figure 3**) is comprised of approximately 213 acres and includes all areas in which listed species would be directly and indirectly affected by the Sponsor's Proposed Action (**Figure 4**). For the purpose of this analysis, the Action Area can be defined as all land on the Proposed Project Site and general vicinity. Based on the Project Description (**Section 4.0** of this BA), and as described in the Effects Section (**Section 8.0**). The Proposed Project has the potential to result in effects to California red-legged frog and will affect California clapper rail and salt marsh harvest mouse habitat.

3.0 EXISTING SETTING

3.1 Project Location and Setting

The Project area is located in Marin County immediately east of Highway 101 and approximately one mile north of the City of Novato. Habitats surrounding the Project include annual grassland and brackish marsh to the north and east, salt marsh to the south, and annual grassland and Highway 101 to the west. The Project is located within an un-numbered section, Township 4 North, Range 7 West, of the USGS 7.5-minute series Petaluma River quadrangle (**Figure 1**).

The Project area consists of ± 54 acres of land that is currently composed of developed areas associated with the airfield and ± 29 acres of annual grassland and wetland communities on the perimeters of the field. Several ground-level photographs are included as **Appendix C** depicting several locations associated with the Project area habitats and existing conditions (**Figure 5**).

3.2 Land Use

Land use within the Action Area is comprised of the airport and agriculture/open space. There is also vacant undeveloped land immediately west of the Airport. Other land uses within the vicinity surrounding the airport include residential, recreational, industrial, and commercial uses. Areas directly surrounding the Action Area are used to graze cattle and are largely comprised of open space associated with the Burdell Unit of the Petaluma Marsh Wildlife Area, which is managed by the California Department of Fish and Game (CDFG). Between the Burdell Unit and the dike separating the land area from the Petaluma River is the Burdell Ranch Wetland Conservation Bank.

3.3 Soils

The Natural Resources Conservation Service (NRCS) has mapped three soil units within the Action Area (**Figure 6**). The soil units that occur onsite include: **Reyes clay**; **Urban land-Xerorthents complex, 0 to 9 percent slopes** and **Xerorthents, fill**. General characteristics associated with these soils types are described below.

Reyes clay: This soil type is very deep and somewhat poorly drained. It is found on reclaimed tidelands between 0 and 10 feet above MSL. It formed in alluvium derived from various rock sources. Slopes are generally between 0 and 2 percent. Permeability is slow and runoff is slow. Native vegetation is generally composed of wetland plant communities.

Urban land-Xerorthents complex, 0 to 9 percent slopes: This soil type is found on valley floors, toes of cut slopes, and tidelands covered with fill between 0 and 500 feet above MSL. The soil is composed of 70 percent urban land and 20 percent Xerorthents. The Urban land component consists of areas covered by roads and developed structures. Runoff within this component is rapid. Xerorthents consist of cut or fill areas. The original soils are often graded and contain mixed soil horizons. The characteristics of Xerorthents are highly variable.

Xerorthents, fill: This soil type consists of soil material that has been moved mechanically and mixed. Most of this unit is contained in urban areas. Xerorthents are loamy and well-drained. Permeability and runoff characteristics vary.

3.4 Topography, Drainage and Hydrology

The site has been repeatedly graded, filled, ditched, and levees have been constructed. The roads, buildings, and airfield have been constructed on fill. The base level of the site occurs at approximately 0 feet above MSL.

The site lies within the original flood plain of the Petaluma River at sea level. Since levees were constructed, the site is not subject to the ebb and flow of the tides. The area north of the site is drained by San Antonio Creek and Black John Slough is located immediately south of the site. Both of these features are tributary to the Petaluma River, which flows into San Pablo Bay at the north end of San Francisco Bay.

Surface waters on the site are fed by precipitation, overland flow, and seeps. The seeps occur primarily in the northwestern corner of the Action Area, and are fed by shallow subsurface flow from the foothills of Burdell Mountain which is located to the west.

Water flows off of the site via a system of ditches, canals, and sloughs and is pumped over the levee into the Petaluma River.

Because the site is protected by levees, the water level fluctuations on the site are more similar to a reservoir than to a typically estuary. There is virtually no influence of tidal action on the hydrologic regime.

3.5 Vegetation Communities

Two major vegetation communities occur within the Gness Field Action Area - annual grassland and high brackish marsh - with most of the remainder of the Action Area developed with the existing Gness Field Airport facilities (**Figure 5**). Within these two primary communities are also some additional wetland communities including, depressional seasonal wetland, riverine seasonal wetland, slope seep, perennial drainage, and ditches. These communities provide habitat to a number of common species of wildlife and may provide suitable habitat for special-status species. Each of the biological communities, including associated common plant and wildlife species observed or that are expected to occur within these communities, are described below.

3.5.1 Annual Grassland

Annual grassland is the dominant upland plant community within the Action Area and covers **85.91** acres of the Action Area. Along with high brackish marsh, described below, these two vegetation communities comprise the majority of natural vegetation within the Action Area. Annual grassland is characterized primarily by an assemblage of non-native grasses and forbs. Dominant grass species consists of soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and wild oat (*Avena fatua*). Common herbaceous non-natives include yellow star thistle (*Centaurea solstitialis*), wild radish (*Raphanus sativa*), sweetclover (*Melilotus alba*) and

thistle (*Carduus* sp.). Minor plant species include coyotebrush (*Baccharis pilularis*), valley oak (*Quercus lobata*), bindweed (*Convolvulus discolor*), California poppy (*Eschscholzia californica*) and Himalayan blackberry (*Rubus discolor*). This grassland would be considered an upland grassland community as opposed to the grass-dominated high brackish marsh described below, which is considered a wetland community.

Annual grassland habitat supports breeding, foraging, and shelter habitat for several species of wildlife. Species observed or expected to occur in this habitat include savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), white-tailed kite (*Elanus leucurus*), western burrowing owl (*Athene cunicularia hypugaea*), northern harrier (*Circus cyaneus*), black-tailed jackrabbit (*Lepus californicus*), and gopher snake (*Pituophis melanoleucus*).

3.5.2 High Brackish Marsh

A total of **58.96** acres of high brackish marsh wetlands were delineated and verified within the Action Area. This wetland community is the major plant community within the Action Area outside of the developed airfield. It is dominated by a combination of saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*) and saltbush (*Atriplex* sp.). Other minor plant species within this community include pickleweed (*Salicornia* sp.), bristly ox-tongue (*Picris echioides*), and cocklebur (*Xanthium strumarium*). Since this vegetation community is dominated by a grass species, it can generally be considered as a grassland habitat. However, this is a wetland vegetation community as opposed to the upland annual grassland habitat described previously.

Brackish marsh supports breeding and foraging habitat for a variety of wildlife. Species observed within this community during the biological assessment include northern harrier (*Circus cyaneus*), red-winged blackbird (*Agelaius phoeniceus*), short-eared owl (*Asio flammeus*), black-necked stilt (*Himantopus mexicanus*), killdeer (*Charadrius vociferus*), marsh wren (*Cistothorus palustris*), and San Pablo song sparrow (*Melospiza melodia samuelis*).

3.5.3 Other Wetlands and Waters of the United States

Depressional Seasonal Wetland

A total of **3.59** acres of depressional seasonal wetlands have been delineated and verified within the Action Area. Depressional seasonal wetlands exhibit a hydrologic regime dominated by saturation, rather than inundation. Depressional seasonal wetlands were identified on the site as depressions within the topography with a hydrologic regime dominated by saturation and capable of supporting hydrophytic plant species and hydric soils. Plant species in depressional seasonal wetlands are adapted to withstand short periods of saturation or saturated soils conditions but will not withstand prolonged periods of inundation, as is common in vernal pools.

Riverine Seasonal Wetland

A total of **0.52** acre of riverine seasonal wetlands has been delineated and verified within the Action Area. Riverine seasonal wetlands are defined by a hydrologic regime dominated by unidirectional flow of water. Riverine seasonal wetlands typically occur in topographic folds or swales and represent natural drainages that convey sufficient water to support wetland

vegetation. Riverine seasonal wetlands typically convey water during and shortly after storm events. Riverine seasonal wetlands may have a moderately defined bed and bank and often exhibit sufficient gradient to convey water off of the site. As in depressional seasonal wetlands, plant species found within riverine seasonal wetlands are typically adapted to a hydrologic regime dominated by saturation rather than inundation.

Slope Seep

A total of **2.95** acres of seep have been delineated and verified within the Action Area. Seeps are characterized as areas where groundwater intersects with the soil surface. Typically, flow from seeps continues for some period after the rainy season and may continue all year. Seeps can support isolated wetland vegetation (such as on a hillside) or they may form the headwaters of a riverine seasonal wetland or other jurisdictional drainage feature. Vegetation in seeps often consists of plant species associated with seasonal and perennial marsh habitats. When seeps flow for only short periods beyond the rainy season and into the warm season, herbaceous perennial wetland species typically dominate. Seeps that persist for longer periods may support woody, perennial, obligate species.

Perennial Drainage

A total of **2.48** acres of perennial drainage have been delineated and verified within the Action Area. Perennial drainages are features that may not meet the three-parameter criteria for vegetation, hydrology and soils but do convey water and exhibit an “ordinary high water mark.” Perennial drainages generally convey unidirectional water flows throughout the entire year. Perennial drainages typically consist of a channel, bed and bank and are devoid of vegetation due to the scouring effect of flowing water. Perennial drainages are often bordered by wetland vegetation communities of various composition and cover depending on flow rates, duration of flows and soil types.

Ditches

A total of **6.20** acres of ditches have been delineated and verified within the Action Area. Ditches excavated in upland areas and draining entirely uplands are typically considered non-jurisdictional features by the Corps. However, the ditches on the site typically drain at least some wetland areas and often connect to wetland features. Therefore, the ditches on the site are considered jurisdictional features.

4.0 PROJECT DESCRIPTION

4.1 Proposed Development

Marin County (Sponsor) developed the Sponsor's Proposed Project through the Master Plan for Marin County Airport¹ and the Preliminary Design Report Runway Extension Gness Field.² The primary elements of the Sponsor's Proposed Project are shown on **Figure 4**. The Sponsor's proposed development includes the following activities:

Alternative B- Sponsor's Proposed Action

Alternative B (Alternative) consists of extending the existing runway to the northwest by 1,100 feet and is the Sponsor's Proposed Action. Alternative B meets the need of the project and is the Sponsor's Proposed Project. This alternative is evaluated in this BA.

Alternative B will include:

- Extend Runway 13/31 from 3,300 feet to a total length of 4,400 feet while maintaining the 75-foot width of the existing runway;

- Extend the corresponding taxiway to the full length of the runway;

- Extend the existing Federal Aviation Administration (FAA) standard 120-foot wide Runway Safety Area (RSA) along the sides of Runway 13/31 to maintain the existing RSA within of 120 feet centered on the runway centerline;

- Construct FAA standard 240-foot RSA at each end of the runway in addition to the 1,100 foot runway extension;

- Corresponding realignment of drainage channels to drain the extended runway and taxiway;

- Corresponding levee extension to protect the extended runway and taxiway from flooding;

- Installation, relocation, and reprogramming of navigational aids that pilots use to land at the Airport to reflect the extended runway;

- Property lot line adjustment for the County to gain exclusive use of 0.1 acre of land south of the Airport necessary to provide for a 240-foot long RSA on the south end of Runway 13/31;

4.2 Project Construction Phasing and Access

Project construction will require the import of fill material for the perimeter levee extension, as well as, the extension of the runway, taxiway and RSAs. The Biological Assessment identifies areas of permanent and temporary project impact (See Figure 8). The area of temporary impact is that area that will be disturbed during the initial project construction phase that is estimated at six months.

¹ Master Plan for Marin County Airport (Gness Field), Adopted by County Board of Supervisors, June 27, 1989.

² Preliminary Design Report Runway Extension Gness Field Marin County, California, December 20, 2002.

4.2.1 Construction Phase 1

Phase 1 includes the construction of the perimeter levees and the placement of some fill material for the runway, taxiway and RSAs. Perimeter levee construction would require temporary site disturbance outside the area of permanent impact. Phase 1 construction is estimated to be completed in approximately six months and undertaken during the drier period of the year (April through October).

It is anticipated that construction equipment, materials and imported fill for Phase 1 construction would be hauled to the site along the existing unpaved road that traverses east-west across the site. The route is depicted in Figure 8 as a pink line. The access road would be elevated at the point where it enters the construction site to access the top of the levee. This modification to the roadway would remain after the project is complete, but would be located on the site of the current roadway.

At the end of the Phase I construction, which would last approximately six months, the temporary disturbance area would be restored to its previous condition. Some of the vegetation and soil removed during site preparation would be stored within the area of temporary disturbance and used to replant the area after levee construction is complete.

4.2.2 Construction Phase 2

Phase 2 includes the construction of all site work including the runway, taxiway, and RSAs.

Additional finished grading and paving for the runway extension, within the area of permanent impact, would be accessed via existing paved roadways and through the existing airport, as depicted on Figure 8 as a purple line.

5.0 PROPOSED PROJECT AND ALTERNATIVES CONSIDERED

In addition to the Sponsor's Proposed Project, two other project alternatives (**Appendix D**) were evaluated in detail in the associated Draft Environmental Impact Statement (EIS) and Draft Environmental Impact Report (EIR) for the proposed runway extension at Gness Field Airport issued in December 2011. Aside from the No Action Alternative, these other "non-preferred" alternatives would create greater localized impacts to higher quality wildlife habitat, namely Black John Slough on the south of the site, and would also entail making land acquisitions. The "non-preferred" alternatives are included here for completeness. This BA only addresses the impacts of the Sponsor's Proposed Project, Alternative B, in detail, as that is the project for which consultation is requested.

Alternative A

Alternative A consisted of No Action. Alternative A does not meet the Purpose and Need for the project. National Environmental Policy Act (NEPA) guidelines required a No-Action alternative be included in the evaluation of environmental consequences in the EIS for the project.

Alternative D

Alternative D consisted of extending the existing runway to the southeast by 240 feet and to the northwest by 860 feet. Alternative D meets the need of the project. Therefore alternative was evaluated in detail in the EIS for the project. As Alternative D had more extensive environmental impacts than Alternative B, the preferred Alternative of the County of Marin, the FAA is consulting with the USFWS on implementation of Alternative B. This Biological Assessment only evaluates the impacts of Alternative B.

6.0 HISTORY OF CONSULTATION

To date, informal consultations with the U.S. Fish and Wildlife Service (USFWS or Service) for this project have taken place including a field visit in June 2010 and a meeting with participants detailed below. The FAA also previously submitted a Biological Assessment to the Service by letter of November 16, 2011. This Biological Assessment replaces the prior document.

June 10, 2010 — meeting on the Gness Field Airport site with Doug Pomeroy (FAA), Joseph Terry (USFWS), Tom Huffman and Karen Taylor (CDFG), Ken Robbins and John Roberto (Marin County) to discuss the potential for federally and state listed special-status species to occur within the site.

September 9, 2010 — teleconference with Ryan Olah and Joseph Terry (USFWS), Greg Martinelli, Karen Taylor, and Tom Huffman (CDFG), Eric Steger, Ken Robbins, John Roberto (Marin County), Doug Pomeroy (FAA), Rob Adams and Sara Hassert (Landrum and Brown), Brian Mayerle and Ryan Brown (Foothill Associates), and Brian Pittman (ESA). Teleconference served as an informal consultation with the USFWS and CDFG to begin a determination of potential effects on state and federally-listed species with the potential to occur within the site. Also, minimization and avoidance measures were discussed for species and potential mitigation strategies.

November 16, 2011 – FAA letter transmitting Biological Assessment and Initiation of Formal Endangered Species Act, Section 7, Consultation, for the Proposed Extension of Runway 13/31, Marin County Airport, Gness Field, Marin County, California.

July 13, 2012 — Meeting with Joseph Terry (USFWS), Doug Pomeroy (FAA), and Reuel Brady, John Roberto, Pat Echols, Liz Lewis, and Dan Jensen (Marin County) regarding potential conservation measures and habitat compensation ratios for the proposed Gness Field Airport Runway Extension Project. The meeting resulted in the decision to prepare this revised Biological Assessment.

7.0 SPECIES ACCOUNTS AND STATUS OF SPECIES IN THE ACTION AREA

7.1 Species Accounts

This section describes any listed species or critical habitat that may be affected by the Proposed Gness Field Airport Project.

7.1.1 California Red-Legged Frog

The California red-legged frog (CRLF) is the largest native frog in the Western United States. It is genetically distinct from the Northern red-legged frog (*Rana aurora aurora*) and the California red-legged frog receives federal protection, while the other subspecies (*R. a. aurora*) or intergrades do not. The California red-legged frog is a relatively large frog (1.75-5.25 in. SVL), has a light jaw stripe ending in front of the shoulder, and possesses two unique and well defined dorsal-lateral folds on its back, which begin just behind the eyes and extend towards its posterior end.

Listing Status: The California red-legged frog was federally-listed as threatened on May 23, 1996. Critical Habitat was designated for the species in March 17, 2010 and a Final Recovery Plan was published for the frog on September 12, 2002.

Habitat: This species has been observed at elevations between sea level and 8,000 feet. California red-legged frog adults are most likely found in deep pools of fresh water, such as ponds, marshes, springs, reservoirs and streams with abundant overhanging vegetation. Juveniles, frog eggs, and adults have also been seen in ephemeral creeks, ponds, and drainages that lack riparian vegetation. This species spends most of the year underground, where members seek refuge from desiccating weather by constructing and residing in small burrows. These frogs often breed in fresh water ponds and drainages between the months of November and March.

Rangewide Distribution: The California red-legged frog was historically present in the central valley of California, however its current range extends from the southern border of California up to the southern portion of Mendocino County, extends northeast in a swath from San Mateo and Sonoma Counties across to Plumas and Placer Counties, and south along the foothills of the Sierra-Nevada's from Plumas County to the northeast portion of Madera County; possibly also Mono County.

Local Distribution: There are two records in the CNDDDB for this species within five miles of the site and these occurrences are east of the Petaluma River.

Population Dynamics Distribution: Disappearing from seventy percent of its historical range, the California red-legged frog has suffered huge declines due to over harvesting, habitat loss, non-native species introductions, and urban encroachment.

Detectability: Researchers have tracked radio-collared frogs into extremely small, vegetation-choked drainages, where they can be found only with radio-tracking devices, and are otherwise invisible to standard surveys. Frogs hid in heavy vegetation and under banks, in holes, in cracks,

and under objects. A researcher may be able to locate a collared frog by radio to within one square meter and still not be able to see it.

Frogs foraging, resting, or dispersing in upland areas also may not be detected in surveys. A great deal of experience, especially with nighttime surveys, is necessary for good sampling for frogs.

Status in the Action Area: The frog was not observed on the site during the field assessment. Due to the fact the site is primarily high brackish marsh and the frog requires fresh open water habitats to persist, it is unlikely the frog would occur within the project site. However, during the winter months, the California red-legged frog would have low potential to occur within the Action Area as a result of dispersing from adjacent localized freshwater habitat areas. If the species migrates into the site outside of the winter months (i.e. during the region's dry period), it is not anticipated to survive.

7.1.2 California Clapper Rail

Listing Status: The California clapper rail (CCR) was federally-listed as endangered on October 13, 1970. No critical habitat has been designated for the species. In February 2010 the Service issued a draft recovery plan that addresses the California clapper rail entitled "Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California, November 2009" for public review and comment. To date a final version of this recovery plan has not been approved by the Service.

Species Description: The California clapper rail (*Rallus longirostris obsoletus*) is one of the largest rails (family Rallidae), measuring 32-47 centimeters (13-19 inches) from bill to tail. It is characterized by its hen-like appearance, a long slightly downward-curving bill, olive-brown upper parts, a cinnamon-buff colored breast, dark flanks crossed by white bars and white undertail coverts which are often exposed when the bird is agitated. Male and female rails differ only in size. In general, males are slightly larger. Juveniles have a paler bill and darker plumage, with a gray body, black flanks and sides, and indistinct light streaking on flanks and undertail coverts.

The breeding season of California clapper rails begins by February. Nesting starts in mid-March and extends into August. The end of the breeding season is typically defined as the end of August, which corresponds with the time when eggs laid during re-nesting attempts have hatched and young are mobile. Clutch sizes range from 5 to 14 eggs. Both parents share in incubation and rearing.

Clapper rails are most active in early morning and late evening, when they forage in marsh vegetation in and along creeks and mudflat edges. They often roost at high tide during the day.

Habitat: Throughout their distribution, California clapper rails occur within a range of salt and brackish marshes. In south and central San Francisco Bay and along the perimeter of San Pablo Bay, rails typically inhabit salt marshes dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*). Pacific cordgrass dominates the middle marsh zone throughout the south and central Bay.

In the north Bay (Petaluma Marsh, Napa-Sonoma marshes, Suisun Marsh), clapper rails also live in tidal brackish marshes which vary significantly in vegetation structure and composition. Use of brackish marshes by clapper rails is largely restricted to major sloughs and rivers of San Pablo Bay and Suisun Marsh, and along Coyote Creek in south San Francisco Bay. Clapper rails have rarely been recorded in nontidal marsh areas.

Rangewide Distribution: California clapper rails are now restricted almost entirely to the marshes of San Francisco estuary, where the only known breeding populations occur. In south San Francisco Bay, there are populations in all of the larger tidal marshes.

Distribution in the North Bay is patchy and discontinuous, primarily in small, isolated habitat fragments. Small populations are widely distributed throughout San Pablo Bay. They are present sporadically and in low numbers at various locations throughout the Suisun Marsh Area (Carquinez Strait to Browns Island, including tidal marshes adjacent to Suisun, Honker, and Grizzly Bays).

Local Distribution: The species is not known to occur within the Action Area or in the immediate vicinity. Suitable habitat occurs associated with the Petaluma River, and although not documented as occurring in this location, there is potential the species occurs or utilizes the tidal marsh areas associated with the Petaluma River.

Population Dynamics/ Dispersal: The suitability of many marshes for clapper rails is limited by their small size, fragmentation, lack of tidal channel systems and other habitat features. In addition, the difference between high and low tides is much greater in the south Bay than in San Pablo or Suisun bays. Many marshes are completely submerged during high tides and lack sufficient escape habitat. This probably results in nesting failures and high rates of predation. Larger tracts of habitat are needed to maintain stable populations.

Detectability: Clapper rails are secretive and difficult to observe in dense vegetation but once flushed, they can frequently be approached. When evading discovery, they typically freeze, hide in small sloughs or under overhangs, or run rapidly through vegetation or along slough bottoms. They prefer to walk or run over other forms of locomotion, and generally walk upright. When flushed, they normally fly only a short distance before landing. They can swim well, although swimming is only used to cross sloughs or escape immediate threats at high tide.

Status in the Action Area: Although there is limited marginal habitat within the site for the majority of the year, during winter months, when water inundates historical high marsh areas comprising portions of the survey area, there is a low potential for the species to utilize the site (Pers. Comm. USFWS/CDFG 2010) for foraging or dispersal. There is no suitable nesting habitat within the Action Area and very little cover for this secretive species.

7.1.3 Salt Marsh Harvest Mouse

Listing Status: The salt marsh harvest mouse (SMHM) was federally-listed as endangered on October 13, 1970. No critical habitat has been designated for the species. In February 2010 the Service issued a draft recovery plan that addresses the salt marsh harvest mouse entitled “Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California, November 2009”

for public review and comment. To date a final version of this recovery plan has not been approved by the Service.

Species Description: The salt marsh harvest mouse (*Reithrodontomys raviventris*), also known as the "red-bellied harvest mouse," is a small native rodent in the Cricetidae family. There are two subspecies: the northern (*R. r. halicoetes*) and southern (*R. r. raviventris*). The scientific name *Reithrodontomys raviventris* means "grooved-toothed mouse with a red belly." Both subspecies do have grooved upper front teeth but generally only the southern subspecies has a cinnamon- or rufous-colored belly.

Although salt marsh harvest mice are active mainly at night, they are sometimes active during daylight hours. They swim very well, in contrast to the western harvest mouse, which is a poor swimmer. Breeding goes on from spring through autumn. However, each female usually has only one or two litters per year. The average litter size is about four. Nests are quite minimal, often built over old birds' nests. Members of the southern group often do not make a nest at all.

Habitat: Salt marsh harvest mice are critically dependent on dense cover and their preferred habitat is pickleweed (*Salicornia virginica*). Harvest mice are seldom found in cordgrass or alkali bulrush. In marshes with an upper zone of peripheral halophytes (salt-tolerant plants), mice use this vegetation to escape the higher tides, and may even spend a considerable portion of their lives there. Mice also move into the adjoining grasslands during the highest winter tides. The mice probably live on leaves, seeds and stems of plants. In winter, they seem to prefer fresh green grasses. The rest of the year, they tend toward pickleweed and saltgrass. They have longer intestines than the western harvest mouse, which is a seed eater. The northern subspecies of the salt marsh mouse can drink sea water for long periods but prefers fresh water. The southern subspecies cannot subsist on sea water but it actually prefers moderately salty water over fresh.

Rangewide Distribution: The northern subspecies lives in the marshes of the San Pablo and Suisun bays, the southern in the marshes of Corte Madera, Richmond and South San Francisco Bay.

Local Distribution: There is one documented occurrence of the salt marsh harvest mouse associated with suitable habitat adjacent to the Petaluma River to the north of the Action Area (CNDDDB 2010).

Population Dynamics/ Dispersal: The mouse is dependent on well vegetated tidal marsh habitat typically dominated by pickleweed. Dispersal of the species is limited by habitat availability and connectivity to other suitable habitat areas.

Detectability: Mice usually live in dense vegetation associated with tidal marsh and are difficult to detect without live trapping.

Status in the Action Area: The mouse is not known to occur in the Action Area. Suitable habitat areas associated with the Petaluma River occur northeast of the site. Gness Field borders the Petaluma River Marshes of the San Pablo Bay Tidal Marsh Ecosystem Recovery Unit as defined by the Service (USFWS, 2010A).

Connected to these suitable habitat areas offsite are two man-made ditches that are used to convey seasonal accumulated precipitation away from the airport. These ditches lead to pumps which discharge the water over the levees protecting the site from tidal actions and flooding, into the Petaluma River. This activity effectively drains the Gness Field Airport property, and CDFG Burdell Unit. The CDFG Burdell Unit is a wildlife area situated between the Airport and the levee. The levee separates these two diked areas from natural tidal marsh associated with the Petaluma River.

Man-made ditches utilized to convey waters and drain annual precipitation from the site, are considered “narrow bands of connectivity” with areas of the Petaluma River that are known to provide suitable habitat for SMHM. Even though habitats on site are highly compromised as tidal marsh habitat, drained and grazed by cattle, and there are only sparse stands of disconnected pickleweed within the Action Area, it had been determined through informal consultation with the Service (Pers. Comm. USFWS/CDFG 2010) that there is suitable habitat associated with the Action Area and potential for the mouse to utilize these ditches to gain access to the Action area. The determination to consider the airport expansion area habitat for SMHM was made by the Service through informal consultation; although no evidence of occurrence is known from the Gness Field Airport site, or the CDFG Burdell Unit adjacent to the property.

7.2 Critical Habitat and Essential Fish Habitat

No Critical Habitat or Essential Fish Habitat (EFH) for any federally-listed species occurs within the Action Area (**Figure 7**).

8.0 EFFECTS

8.1 Direct Effects

8.1.1 *California Red-Legged Frog*

By constructing the Project outside the winter dispersal window for the CRLF, the Project will have no direct effect on the frog. Habitat within the site is not freshwater habitat and would not provide areas for the frog to persist through dry or summer months due to salinity levels and lack of open water habitat respectively. During the winter period, dispersal into the site from adjacent areas is considered possible by the Service.

8.1.2 *California Clapper Rail*

Timing of the project will avoid direct take of the rail. Construction of the Project will eliminate 6.88 acres of high brackish marsh habitat viewed as marginal foraging and dispersal habitat for the rail (**Figure 8**). An area of 16.05 acres of rail habitat will be temporarily impacted by the Project activities for a period estimated at two years. Upon completion of the Project and removal of the SMHM exclusion fencing the temporarily impacted areas of the Project will be allowed to re-vegetate and will again be foraging and dispersal habitat.

8.1.3 *Salt Marsh Harvest Mouse*

Though potential for the mouse to occur within the planned Project area is considered low, conservation measures outlined in the document (**Section 10.4**) will be incorporated in the construction methodology. By instituting minimization and avoidance measures, direct take of the mouse will be avoided.

The Project as planned will eliminate 6.88 acres of high brackish marsh habitat, which is viewed by the Service as suitable habitat for the mouse (**Figure 8**). These 6.88 acres include areas containing pickleweed and adjacent upland grassland areas. An area of 16.05 acres considered suitable SMHM habitat and comprised primarily of uplands during annual dry periods, will be temporarily impacted by the Project activities for a period estimated at two years. Upon completion of the Project and removal of the SMHM exclusion fencing the temporarily impacted areas of the Project will be allowed to re-vegetate and will again be suitable habitat for the mouse.

8.2 Indirect Effects

8.2.1 *California Red-Legged Frog*

The Project will have no indirect effect on the California red-legged frog. Though it has been proposed the site may represent dispersal habitat for the frog, the area is comprised of high brackish marsh, and frogs dispersing into the site would have no potential for long-term survival; the site is comprised of brackish water habitat which is unsuitable habitat to sustain the frog.

8.2.2 California Clapper Rail

Construction of the Project will eliminate 6.88 acres of marginal foraging and dispersal habitat potentially indirectly affecting the rail.

8.2.3 Salt Marsh Harvest Mouse

Construction of the Project will result in the loss of 6.88 acres of suitable habitat for the mouse. As part of Project construction, the open water ditch/channel surrounding the existing runway will be re-routed and extended a greater linear length. In **Table 1**, a calculation of acreage lost is depicted. The project will result in a net decrease in acreage of open water ditch/channel, but an increase in the linear distance of open water ditch/channel. This is because the overall linear distance of open water ditches/channels will increase, but the channels will be narrower than the channels that currently exist. Since pickleweed growing on the margins of the channel areas is the most suitable habitat within the Gness Field site for the mouse, this habitat niche will actually increase with the completion of the Project because the amount of channel margins will increase when the open water ditch/channels are re-routed around the new extended runway.

Table 1 below summarizes the acreage that will be temporarily and permanently impacted by the Project.

Table 1 — Summary of Habitat Impact Acres

	Permanent Habitat Impacts to SMHM and CCR	Temporary Impacts to Habitat for SMHM and CCR	Acres of Open Water Ditch/Channel Permanently Impacted¹	Acres of Open Water Ditch/Channel Habitat Created¹
North End (13 End) of Runway	6.50 acres	16.05 acres	2.31 acres	0.77 acre
South End (31 End) of Runway	0.38 acre	0.00 acres	0 acre	0 acre
Total	6.88 acres	16.05 acres	2.31 acres	0.77 acres

1. Open Water Ditch/Channel impacts are not considered endangered species habitat and as such will not be mitigated as part of the endangered species mitigation. However, mitigation for open water impacts will be included as part of the Clean Water Act, Section 404 permitting process.

8.3 Interrelated and Interdependent

Construction of the Project will rearrange the internal levee and ditch configuration around the airport runway and increase non-permeable ground within the Airport footprint. By altering the configuration of ditches and drainages associated with the Airport, the localized hydrology on the site will be altered creating greater areas of consolidation of precipitation and altered overland flows coming downslope from the west. The physical alteration of the landscape would predicate the need to increase ditch capacity or increase pumping duration times during winter periods when precipitation is removed from the site; although construction of the new ditch line will elongate the ditch, it has been designed with less water capacity. These physical changes to the site would have no effect on the frog, and minimal positive effects on habitat for the mouse and rail within the site.

9.0 CUMMULATIVE EFFECTS

Cumulative effects as defined under the ESA include the effects of future State, local or private actions that are reasonably certain to occur in the Action Area. Future Federal actions that are not related to the Proposed Project are not addressed as cumulative effects under Section 7 of the ESA, because they require separate Section 7 consultation.

9.1 California Red-Legged Frog

California red-legged frog is associated with aquatic habitat including wetlands, ponds, and/or streams considered waters of the U.S.; therefore, many of the activities affecting the species would be reviewed under Section 7 of the ESA as a result of the federal nexus provided through Section 404 of the Clean Water Act. However, an undetermined number of future projects that would alter the habitat for this species could go forward without a 404 permit because impacts are either limited to upland habitat adjacent to wetlands, or to aquatic habitat that does not qualify as Corps jurisdictional waters. Activities that would potentially affect the frog in the Action Area include, but are not limited to: development associated with airport facilities expansion, water, flood control, highway/roadway and utility projects; and potential application of herbicides/pesticides. Most of the land surrounding the Project Site is open space and utilized for grazing and is already managed by CDFG as a wildlife area. Therefore, impacts to these areas does not seem possible from a land use perspective. In addition, a Federal review is being conducted through the on-going EIS process for compliance with NEPA, and the project is being reviewed and analyzed to comply with CEQA.

9.2 California Clapper Rail

California clapper rail is associated with tidal salt marsh habitat which consists of habitat components typically comprised of waters of the U.S. or tidal areas regulated by Section 10 of the Rivers and Harbors Act; therefore, many, if not all, of the activities affecting the species would be reviewed under Section 7 of the ESA as a result of the federal nexus provided through Section 404 of the Clean Water Act and/or the Rivers and Harbors Act. However, an undetermined number of future projects that would alter the habitat for this species could go forward without a 404 permit because impacts are either limited to upland habitat adjacent to tidal marsh, or to aquatic habitat that does not qualify as Corps jurisdictional waters. Activities that would potentially affect the rail in the Action Area include, but are not limited to: development associated with airport facilities expansion, water, flood control, grazing, highway/roadway and utility projects; and potential application of herbicides/pesticides. Most of the land surrounding the Project Site is open space and utilized for grazing and is already managed by CDFG as a wildlife area. Therefore, impacts to these areas does not seem possible from a land use perspective. In addition, a Federal review is being conducted through the on-going EIS process for compliance with NEPA, and the project is being reviewed and analyzed to comply with CEQA.

9.3 Salt Mouse Harvest Mouse

The Salt marsh harvest mouse is associated with tidal salt marsh habitat which consists of habitat components typically comprised of waters of the U.S. or tidal areas regulated by Section 10 of the Rivers and Harbors Act; therefore, many, if not all, of the activities affecting the species would be reviewed under Section 7 of the ESA as a result of the federal nexus provided through Section 404 of the Clean Water Act and/or the Rivers and Harbors Act. However, an undetermined number of future projects that would alter the habitat for this species could go forward without a 404 permit because impacts are either limited to upland habitat adjacent to tidal marsh, or to aquatic habitat that does not qualify as Corps jurisdictional waters. Activities that would potentially affect the mouse in the Action Area include, but are not limited to: development associated with airport facilities expansion, water, flood control, over-grazing, highway/roadway and utility projects; and potential application of herbicides/pesticides. Most of the land surrounding the Project Site is open space and utilized for grazing and is already managed by CDFG as a wildlife area. Therefore, impacts to these areas does not seem possible from a land use perspective. In addition, a Federal review is being conducted through the on-going EIS process for compliance with NEPA, and the project is being reviewed and analyzed to comply with CEQA.

10.0 CONSERVATION MEASURES

10.1 Construction Stormwater Pollution Prevention Plan

The proposed Project will be designed to minimize off-site stormwater runoff that might otherwise impact surrounding habitat and water quality. Measures will be implemented during the project construction to avoid adverse impacts to adjacent properties. Standard construction Best Management Practices (BMPs) will be incorporated into construction designs, plans and specifications, and will be required of contractors during construction. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the Proposed Project, with the following objectives: (a) to identify pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from the construction of the project; (b) to identify BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction; (c) to outline and provide guidance for BMPs and stormwater monitoring; (d) to identify project discharge points and receiving waters; (e) to address post-construction BMP implementation and monitoring; and (f) to address sediment / siltation / turbidity and non-visually detectable pollutant monitoring, and outline a sampling and analysis strategy.

10.2 California Red-Legged Frog

Although there are no localized occurrences of the CRLF documented west of the Petaluma River and the site consist primarily of high brackish marsh, it was determined by the USFWS there is a low potential that dispersing frogs could occur on the site during the winter season. Access from areas containing suitable freshwater habitat for CRLF to the site is possible through a culvert placed beneath the adjacent railroad bed. This culvert allows seasonal precipitation to flow onto the site from uplands between State Highway 101 and the aforementioned railroad bed. CRLF could potentially disperse onto the site during the winter season when rainfall and cooler weather prevail as frogs emerge from their over-summering burrows and look for suitable freshwater breeding pools (which do not occur within the site).

Work activities associated with initial clearing and grading of the site would preferably occur during the dry season from 15 May to 15 October. However, as described in section 10.4 below, CRLF access to the site will generally be precluded by fencing placed to keep the SMHM from entering the construction site. No take of the frog is expected due to the fact an exclusion fence for the SMHM will be installed around the work area, precluding the CRLF from entering the area of disturbance associated with the Project.

10.3 California Clapper Rail

Through informal consultation with the USFWS during pre-project planning, a determination was made by the USFWS that the proposed Project contains low quality foraging and dispersal habitat for the California clapper rail. Therefore, the rail has the potential to forage or disperse within the airport expansion area. Due to the Mediterranean climate of this region of California, wet areas providing the rail potential for foraging are present only after localized winter/ spring period precipitation and consolidation of localized rainfall. The site was determined not to

contain suitable breeding or nesting habitat. However, suitable California clapper rail breeding and nesting habitat occurs approximately 2,000 feet from the Action Area adjacent to the Petaluma River. For this reason, there is potential for California clapper rails to access the airport for foraging or dispersal by moving over the Petaluma River dike from east to west towards Gness Field.

To avoid potential impacts to the species, initial excavation and grading associated with the Project will be scheduled during annual summer and fall dry periods when standing water and seasonally available foraging areas are not present. Once that work is complete the runway extension area would no longer be suitable habitat for California clapper rail and no further seasonal restriction for California clapper rail would be required. Following rainfall events, consolidated precipitation is pumped off the site and into the Petaluma River (which happens during the winter and spring of every year). Due to the absence of suitable foraging habitat during the summer and fall dry period, the rail will not occur within the airport expansion area during that period, and would not be negatively affected by summer/fall (dry period) construction.

The FAA will require Marin County to submit a California clapper rail and SMHM habitat compensation plan for approval by the Service to mitigate for the loss of rail habitat within the airport expansion area. Refer to Section 11.0 of this document for a discussion of compensatory mitigation alternatives that have been preliminarily identified. Habitat mitigation for the California clapper rail will occur in tandem with habitat mitigation for the SMHM, as they are both associated with high brackish marsh habitat. Creating functioning habitat for the species in a suitable location approved by the Service will contribute to the long-term survival needs of the California clapper rail.

10.4 Salt Marsh Harvest Mouse

Through informal consultation with the Service during pre-project planning, a determination was made by the Service that suitable habitat occurs within the proposed Project site for the SMHM. The mouse has the potential to use vegetation adjacent to drainage channels connecting the site to the Petaluma River to access the site. The vegetation areas adjacent to these drainage channels are considered narrow bands of connectivity to tidal marsh habitat associated with the Petaluma River, which is located approximately 2,000 feet east of the Action Area. Although, the drainages are not directly connected to the Petaluma River and water is pumped over a dike to the River, there is potential for the mouse to pass over the dike and utilize vegetation adjacent to these drainage channels to access the Project area.

To minimize effects to the SMHM, the perimeter of the construction area will be fenced to exclude the SMHM. The design and location of the SMHM exclusion fencing will be submitted to the USFWS for final approval. During installation of SMHM exclusion fencing, a Service-approved biologist will monitor the construction site to insure consistency of work with the Service-approved fencing enclosure plan.

When conducting land clearing activities, including grubbing and vegetation removal, it may be necessary to remove vegetation utilizing hand tools or removal with small construction equipment (i.e. Bobcat or similar) acceptable to the USFWS. A USFWS-approved biologist will be onsite during initial ground disturbance and vegetation removal to monitor for SMHM.

Installation of exclusion fencing will occur in progression with land clearing activities. Vegetation clearing will occur from south to north and exclusion fencing will remain open on the northern end of the temporary impact area to provide an “escape route” for any SMHM present during initial clearing and excavation. Upon completion of vegetation removal in the impact area the SMHM exclusion fencing will be closed to preclude SMHM from potentially re-entering the temporary impact area.

Upon completion of vegetation removal/ground clearing activities and installation of the SMHM exclusion fencing, the construction area will no longer be considered habitat for SMHM and the biological monitor will no longer be required onsite.

The Service-approved biologist will train the construction crew on approved avoidance measures and on the life history of SMHM and train Marin County and/or construction contractor staff in appropriate monitoring techniques and methods for SMHM protection so that these individuals can conduct daily monitoring on their own for the duration of the project work. The Service-approved biologist will be available on an “on-call” basis for the duration of the Project.

If a SMHM is observed on the project site, work will stop and the Service-approved biologist will be notified. If this species vacates the work area on its own volition, then work can proceed. If this species does not vacate the project site, then no work will be re-started until the Service has been notified and additional avoidance measures, if any, are discussed and implemented.

The FAA will require Marin County to submit a SMHM habitat compensation plan for approval by the Service to mitigate for loss of SMHM habitat within the airport expansion area. Refer to Section 11.0 of this document for a discussion of compensatory mitigation alternatives that have been preliminarily identified. Habitat mitigation for the SMHM will occur in tandem with habitat mitigation for the California clapper rail, as they are both associated with high brackish marsh habitat. Creating functioning habitat for the species in a suitable location approved by the Service will contribute to the long-term survival needs of the species.

During formal ESA Section 7 consultation with the Service for SMHM habitat impacts, we anticipate an incidental “take” authorization will be included as a part of the Biological Opinion in association with permanent habitat impacts necessary to complete the Project. The Project’s implemented avoidance and minimization measures will avoid direct “take” of the species.

11.0 COMPENSATORY MITIGATION ALTERNATIVES

11.1 Habitat Mitigation Ratios for the Mitigation of Temporary and Permanent Impacts of the Proposed Project

As discussed with the USFWS on July 13, 2012, the USFWS has identified the habitat compensation ratios in Table 2 as typical for compensation for temporary and permanent habitat impacts to threatened and endangered species habitat for the SMHM and CCR. These compensation ratios may be adjusted by the USFWS based on the quality of the habitat being removed and the quality of the habitat to be created or enhanced to replace it. The USFWS would likely increase these compensation ratios if the proposed off-site restoration area was outside of the San Pablo Bay endangered species recovery unit identified in the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS, 2010A), which extends from Gallinas Creek in Marin County (at the southern end of the recovery unit) around San Pablo Bay north and east to Mare Island.

The FAA proposes to require Marin County, prior to initiating construction or otherwise taking actions associated with this project that result in adverse effects to the SMHM or CCR, to develop and submit to the USFWS for their review and approval a revegetation plan and habitat compensation plan based on the habitat compensation ratios in Table 2 of this BA. If after review of a habitat compensation plan, the USFWS determines that adequate high quality habitat acceptable to the Service can be provided at a lower compensation ratio, the FAA proposes to accept a lower habitat compensation ratio if such a ratio is acceptable to the USFWS.

Table 2 — USFWS Recommended Habitat Compensation Ratios for Salt March Harvest Mouse (SMHM) and California Clapper Rail (CCR) Habitat for the Gness Field Airport Runway Extension Project³

	SMHM/CCR Temporary Habitat Impacts of < 1 year	SMHM/CCR Temporary Habitat Impacts of 1 to 2 years	SMHM/CCR Permanent Impacts (Temporary impacts over 2 years are considered permanent impacts)
On-site SMHM/CCR Habitat Acreage Replacement Ratio (Replaced:Impacted)	1:1	1:1	Not Applicable – Permanent Impacts
Off-site SMHM/CCR Habitat Acreage Replacement Ratio (Replaced:Impacted)	1.1:1	2:1	3:1
Total Habitat Replacement Ratio	2.1:1	3:1	3:1

³ July 13, 2012 meeting with Joseph Terry of the USFWS

11.2 Potential Habitat Mitigation Options

11.2.1 San Francisco Bay National Wildlife Refuge

Several San Francisco Bay National Wildlife Refuge (Refuge) projects needing funding are potential mitigation alternatives. Initial contact has been made with Mendel Stewart, Manager of the San Francisco Bay National Refuge and Don Brubaker, North Bay Refuges Manager within the San Francisco Bay National Wildlife Refuge. Several projects associated with the restoration of tidal marsh habitat areas were discussed. These projects, in general, are relatively large with multi-million dollar costs. As mitigation for impacts to tidal marsh habitat, the County may contribute towards a larger effort that would be built in the appropriate timeframe.

Potential sites for the tidal marsh creation/restoration include:

- The Cullinan Ranch Restoration Project which is a 1,549 acre tidal marsh restoration project near Vallejo. The U.S. Fish and Wildlife Service and the California Department of Fish and Game issued a Final Environmental Impact Statement/Environmental Impact Report in May 2009, and the U.S. Fish and Wildlife Service issued a Record of Decision for this project on April 9, 2010. Construction of the site appears imminent and may begin in time to allow participation associated with this project;
- The Sonoma Creek Enhancement Project, which is a 500 acre project associated with the San Pablo Bay National Wildlife Refuge (NWR). The project will be implemented at the mouth of the Sonoma Creek where it enters the bay on the western bank. The project is being funded jointly by the NWR, Audubon Society, and the local mosquito abatement district. Engineering and design of the project is complete, but permitting has yet to be completed. Contribution to this project may be a viable alternative; and
- Other alternatives are possible within the San Francisco Refuge complex, but timing and quantification of creation/restoration to complete mitigation are factors that will require continued coordination.

11.2.2 Offsite Restoration by Private Entity

A private individual was contacted regarding a parcel of land they indicated they owned that is approximately 7,500 feet from the airport. The individual indicated their interest in developing salt marsh habitat to sell for mitigation credits or develop a project-specific agreement with Marin County for mitigation. There is the potential to fund a project on this or other private sites, or purchase mitigation credits from such a site if the private landowner develops the site as a mitigation banks and endangered species mitigation credits are approved for sale by the USFWS. By working with a private landowner, it may be easier to negotiate terms and conditions to suit the Project mitigation requirements.

11.2.3 Offsite Restoration by Conservation Group or Public Entity

The San Francisco Bay Joint Venture (SFBJV) is one of eighteen Joint Ventures established under The Migratory Bird Treaty Act and funded under the annual Interior Appropriations Act. It brings together public and private agencies, conservation groups, development interests, and

others to restore wetlands and wildlife habitat in San Francisco Bay watersheds and along the Pacific coasts of San Mateo, Marin and Sonoma counties.

The Sonoma Land Trust's 2,327-acre Sears Point Wetlands and Watershed Restoration Project is one example of a potential off-site restoration site in which participation by Marin County might be considered appropriate compensation by the Service for California clapper rail and SMHM habitat impacts. The project is located in southern Sonoma County on the edge of San Pablo Bay between the Petaluma River and Tolay Creek. The project includes diked agricultural baylands, alluvial fans, hillslopes reaching up 400' above sea level, and numerous small drainages.

11.2.4 San Pablo Bay Recovery Unit

Another mitigation option is that the project sponsor could prepare a specialized endangered species mitigation plan. The plan elements would be consistent with the latest draft of the USFWS *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS, 2010A). The ultimate goal of the draft recovery plan is to recover all listed species so they can be delisted (removed from listing under the Endangered Species Act). The interim goal is to recover all endangered species to the point that they can be downlisted from endangered to threatened status. To achieve these goals, the following objectives were identified:

1. Secure self-sustaining wild *populations* of each covered species throughout their full ecological, geographical, and *genetic* range.
2. Ameliorate or eliminate, to the extent possible, the threats that caused the species to be listed or of concern and any future threats.
3. Restore and conserve a healthy ecosystem function supportive of *tidal marsh* species. If these objectives are met for the covered species, the recovery and conservation goals will be reached.

For most species covered in the draft recovery plan, *recovery units* have been designated. A recovery unit is a special unit of a listed species' range that is geographically or otherwise identifiable and is important to the recovery of the listed species. For the species potentially impacted by this project, the SMHM and California clapper rail, the draft recovery plan identifies the San Pablo Bay Recovery Unit in Marin County as a recovery unit. The San Pablo Bay Recovery Unit is located near Gness Field Airport and portions are owned by Marin County. A proposed habitat compensation site for this project is located within the San Pablo Bay recovery unit near the mouth of the Novato Creek watershed that is located adjacent to the Hamilton Field wetland restoration project. The proposed habitat compensation site is currently identified as *potential restoration area* in the San Pablo Bay Recovery Unit.

Under this alternative the sponsor would have a detailed Endangered Species Mitigation and Enhancement Plan (ESMEP) prepared by a qualified endangered species biologist to mitigate for both permanent and temporary project impacts to endangered species habitat. The ESMEP shall be reviewed and approved by the USFWS prior to the initiation of any project construction.

The ESMEP shall include the following provisions and information:

- The total area of "in kind" mitigation for temporary and permanent impacts to endangered species habitat shall meet the habitat compensation ratios identified in Table

2 of this BA for temporary and permanent impacts, unless lower ratios are approved by the USFWS because the replacement habitat is of higher quality than the habitat being removed.

- The “in kind” type of endangered species of habitat to be mitigated is categorized as foraging and dispersal habitat for the SMHM and the CCR.
- The compensation habitat shall be created or enhanced either before or in conjunction with the project construction. Endangered species “in kind” habitat created prior to the start of project construction may qualify for lower replacement ratios than shown in Table 2. The project sponsor may incorporate benefits from on-going environmental enhancement work/projects to qualify as compensation.
- Any functional performance criteria for the ESMEP shall be approved by the Service.
- Monitoring of mitigation areas shall be conducted by a consulting endangered species specialist for five years or until functional performance is achieved. The monitoring will be documented in an annual monitoring report that will be submitted to the USFWS.

12.0 CONCLUSIONS AND DETERMINATIONS

The Proposed Project is *not likely to adversely affect* the California red-legged frog as the project does not occur in habitat that is suitable for breeding or permanent occupancy by the frog. The Proposed Project *will adversely affect* the California clapper rail and the salt marsh harvest mouse as implementation of the project will permanently remove vegetation considered by the USFWS to be habitat for these species. The proposed avoidance, minimization, and habitat compensation measures will reduce these adverse effects and are intended to avoid direct take of individual California clapper rails and salt marsh harvest mice. Avoidance and minimization measures will contribute to the long-term survival of these species and offsite habitat compensation, in the form of habitat restoration or creation at a USFWS-approved area, will create higher quality habitat contiguous with areas known to support these species. Through avoidance, minimization, and habitat compensation, this Project will result in an increase in suitable habitat for these species.

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<http://wildequity.org>

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Personal Communications

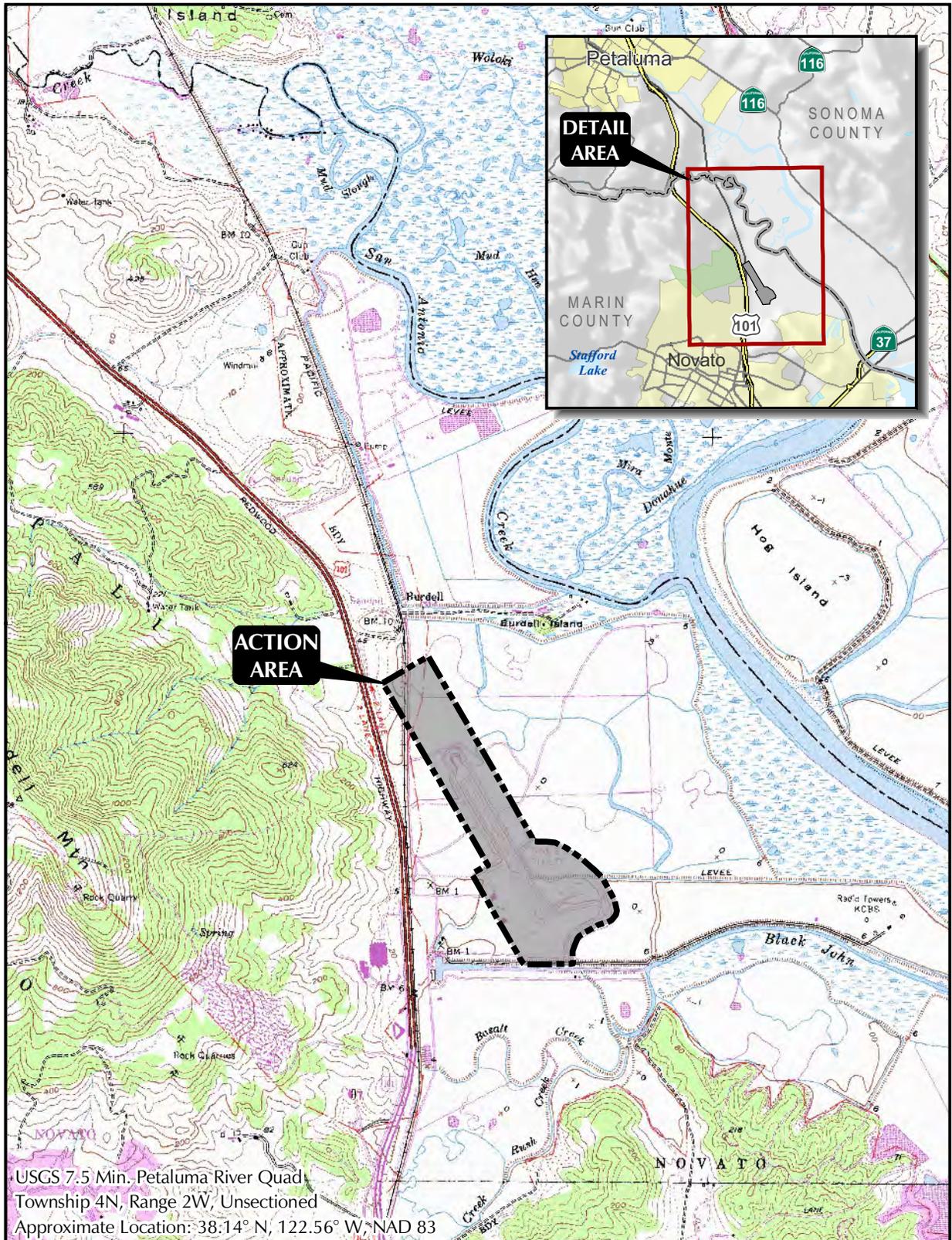
CDFG. 2011. On May 6, 2011 Ryan Brown had a telephone conversation with Greg Martinelli regarding the requirements CDFG would have in regard to mitigation for take of state listed species.

Hamm, Trevor. 2011. On May 10, 2011 Ryan Brown with Foothill Associates had a telephone conversation with Mr. Trevor Hamm who owns approximately 30 acres of land within 7500 feet of Gness Field and desires to convert the land to a tidal marsh mitigation bank.

USFWS/CDFG. 2010. Conference call with USFWS (Ryan Olah and Joseph Terry), Marin County (Eric Stager, Ken Robbins, and John Roberto), Federal Aviation Administration (Douglas Pomeroy), Department of Fish and Game (Greg Martinelli, Karen Taylor, and Tom Huffman), Landrum and Brown (Rob Adams and Sara Hassert), Foothill Associates (Brian Mayerle and Ryan Brown), and ESA (Brian Pittman).

USFWS. 2011. On May 11, 2011 Ryan Brown had a telephone conversation with Mendel Stewart, Manager of the San Francisco Wildlife Refuge Complex, in regard to determining the potential to mitigate at a USFWS in regional proximity to the Gness Field site.

USFWS. 2011. On May 6, 2011 Ryan Brown with Foothill Associates had a telephone conversation with Don Brubaker, Manager of San Pablo Bay National Wildlife Refuge, regarding the potential to mitigate with the Refuge for Project impacts.

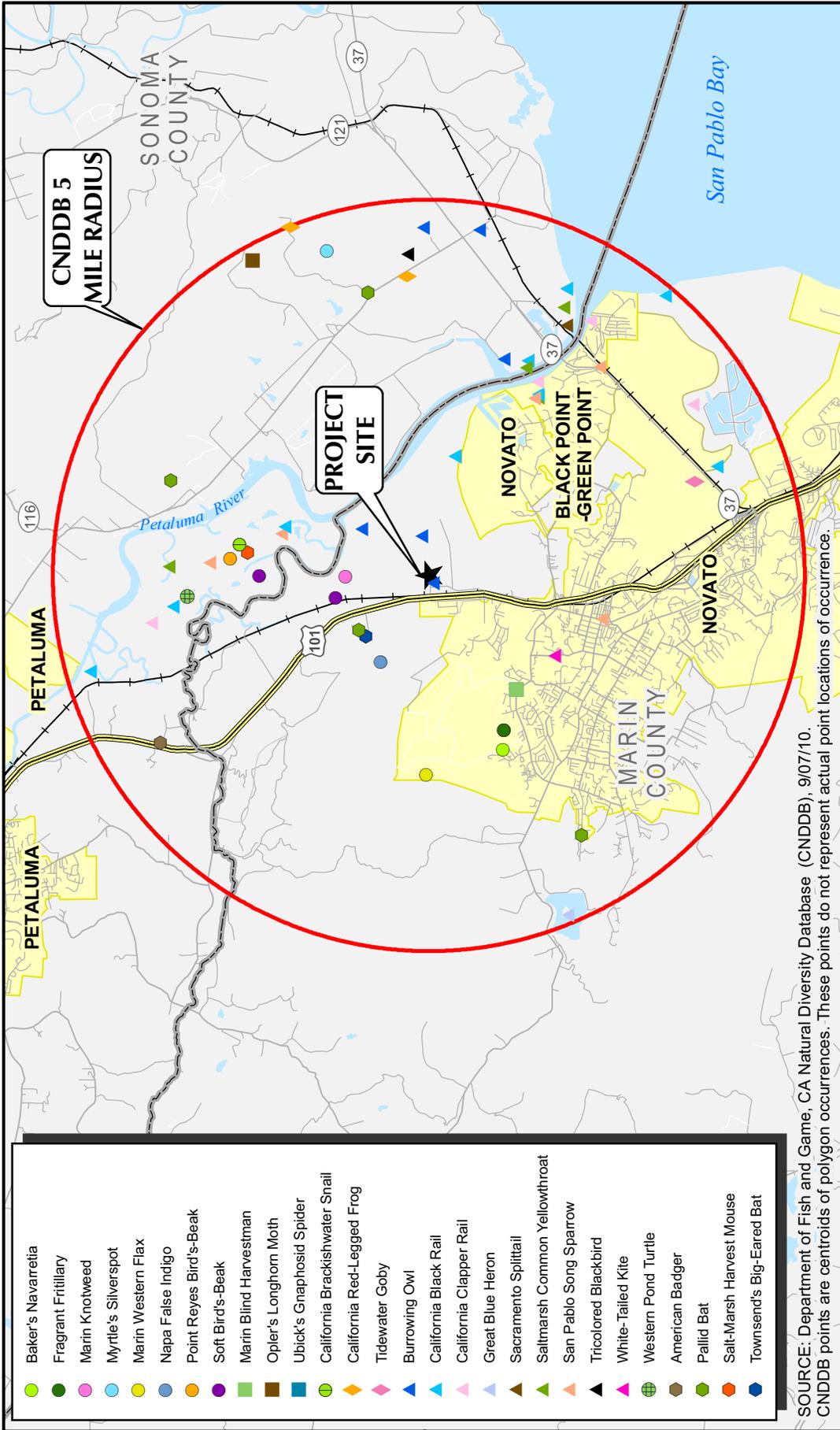


SITE AND VICINITY

 <p>FOOTHILL ASSOCIATES <small>ENVIRONMENTAL CONSULTING • PLANNING • LANDSCAPE ARCHITECTURE</small></p>	<p>N</p> 	<p>0 1500 3000</p>  <p>SCALE IN FEET</p>	<p>Drawn By: MJ Date: 04/29/08</p>	<p>FIGURE 1</p>
--	--	---	---	------------------------

GNOSS FIELD

site_and_vicinity.mxd
 © 2008



- Baker's Navarretia
- Fragrant Fritillary
- Marin Knotweed
- Myrtle's Silverspot
- Marin Western Flax
- Napa False Indigo
- Point Reyes Bird's-Beak
- Soft Bird's-Beak
- Marin Blind Harvestman
- Opler's Longhorn Moth
- Ubick's Gnaphosid Spider
- California Brackishwater Snail
- ◆ California Red-Legged Frog
- ◆ Tidewater Goby
- ▲ Burrowing Owl
- ▲ California Black Rail
- ▲ California Clapper Rail
- ▲ Great Blue Heron
- ▲ Sacramento Splittail
- ▲ Saltmarsh Common Yellowthroat
- ▲ San Pablo Song Sparrow
- ▲ Tricolored Blackbird
- ▲ White-Tailed Kite
- ▲ Western Pond Turtle
- ▲ American Badger
- ▲ Pallid Bat
- ▲ Salt-Marsh Harvest Mouse
- ▲ Townsend's Big-Eared Bat

SOURCE: Department of Fish and Game, CA Natural Diversity Database (CNDDDB), 9/07/10.
 CNDDDB points are centroids of polygon occurrences. These points do not represent actual point locations of occurrence.

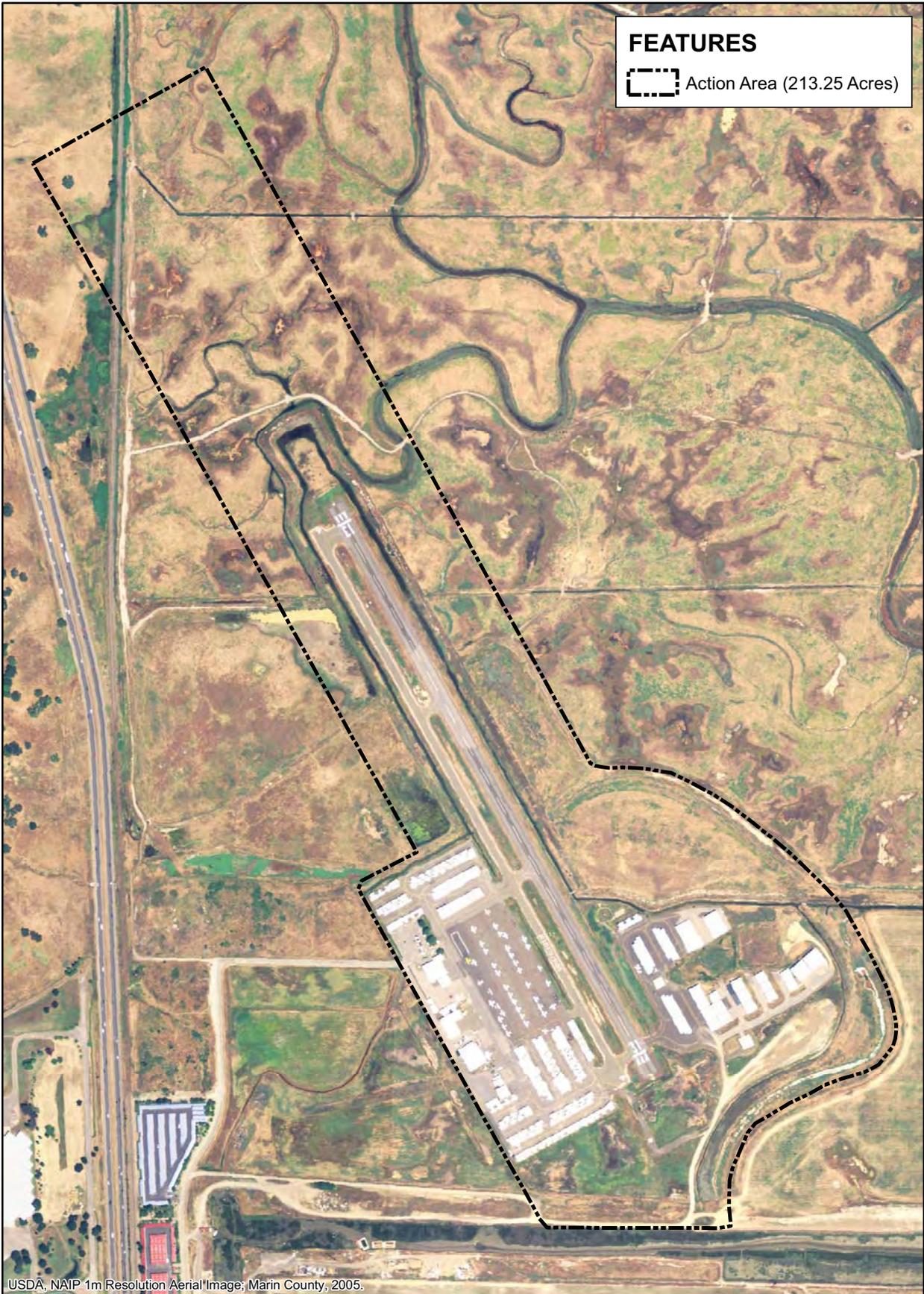
CNDDDB



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Drawn By: RJM
 Date: 09/21/10

FIGURE 2



FEATURES
 [Dashed Line] Action Area (213.25 Acres)

USDA, NAIP 1m Resolution Aerial Image; Marin County, 2005.

ACTION AREA

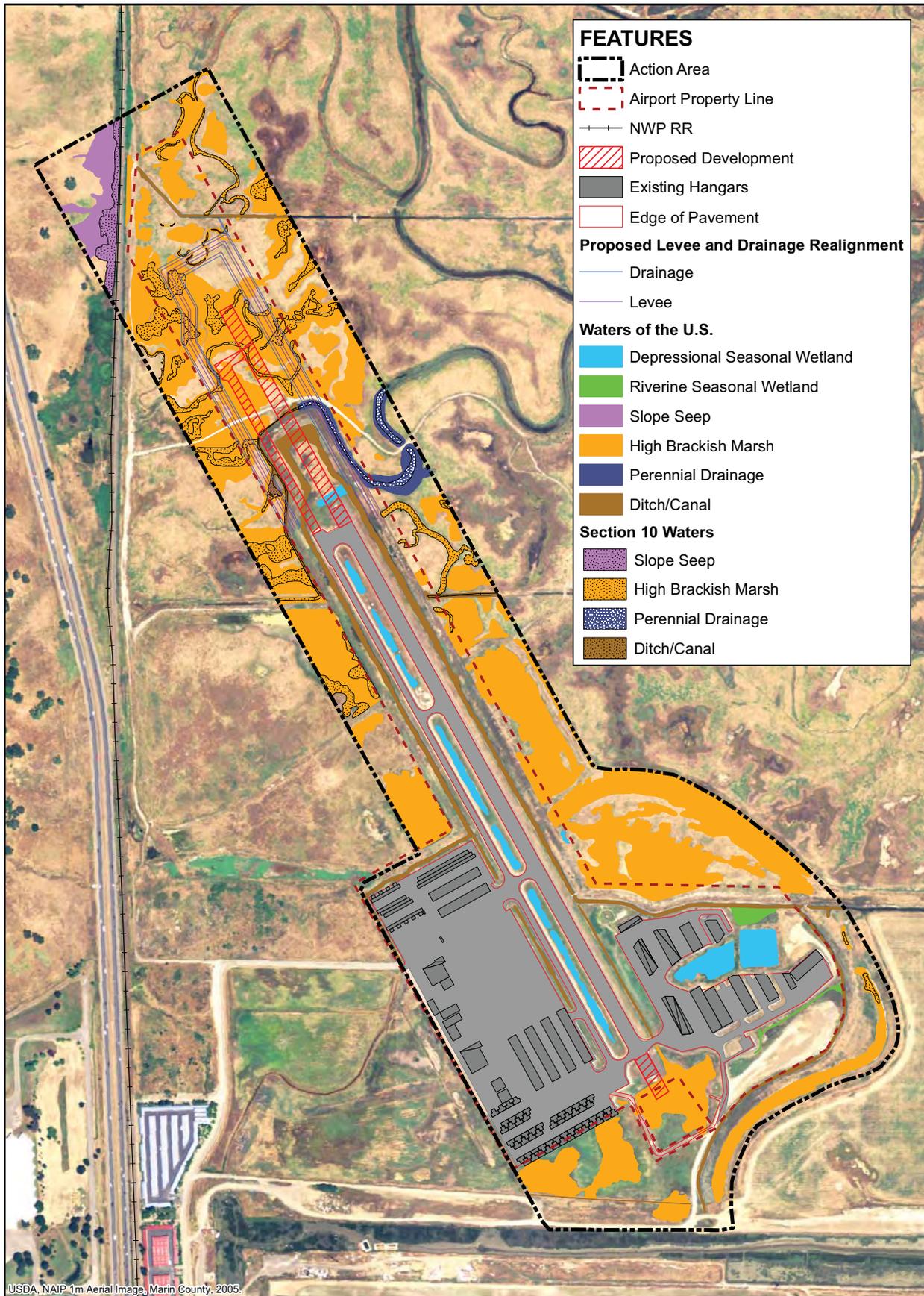
FOOTHILL ASSOCIATES
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0 250 500
 SCALE IN FEET

Drawn By: RJM
 Date: 03/24/11

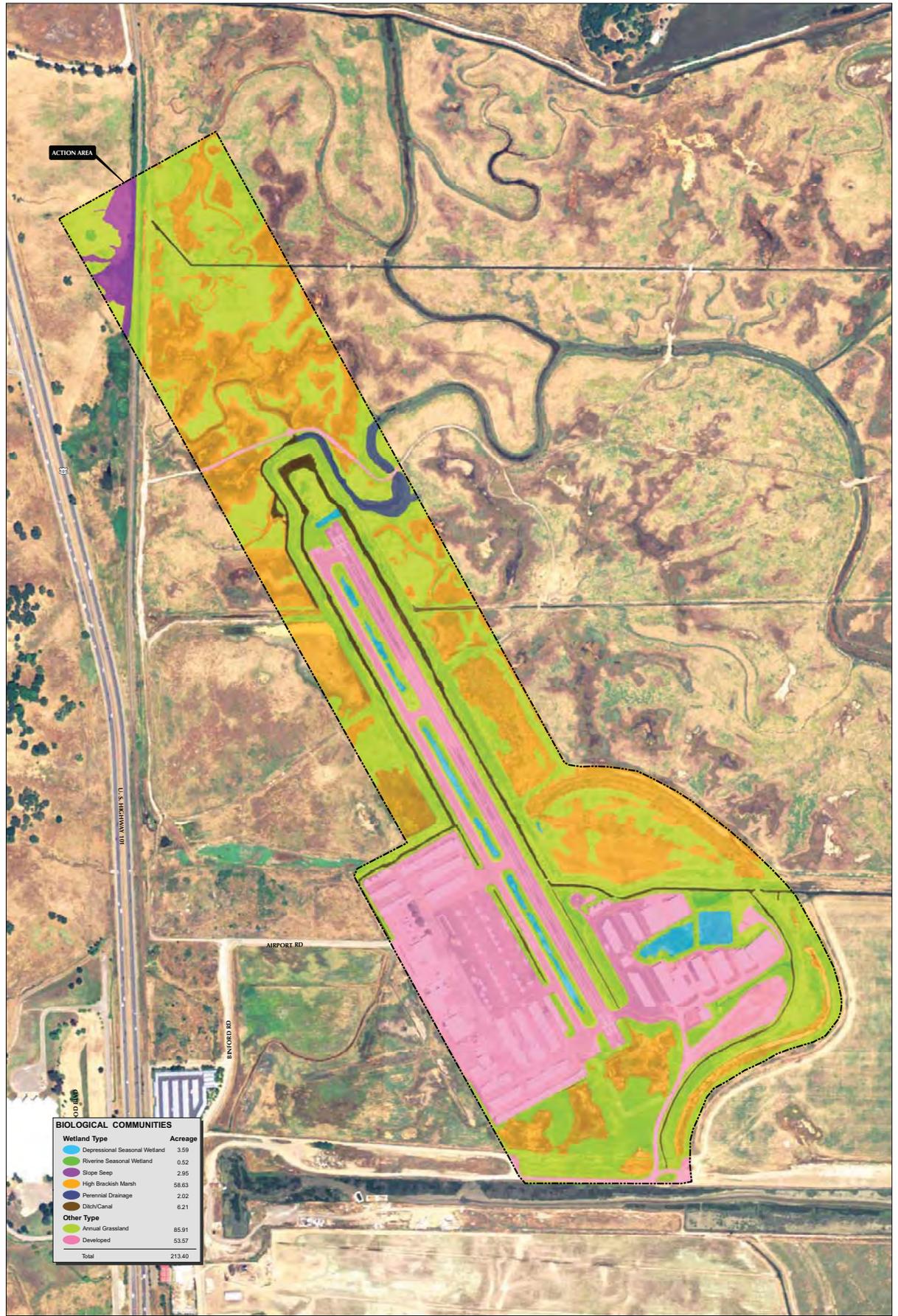
FIGURE 3



USDA, NAIP 1m Aerial Image, Marin County, 2005.

SPONSOR'S PROPOSED ACTION





BIOLOGICAL COMMUNITIES	
Wetland Type	Acreage
Depressional Seasonal Wetland	3.59
Riveline Seasonal Wetland	0.52
Slope Seep	2.95
High Brackish Marsh	58.63
Perennial Drainage	2.02
Ditch/Canal	6.21
Other Type	
Annual Grassland	85.91
Developed	53.57
Total	213.40

BIOLOGICAL COMMUNITIES - EXISTING CONDITIONS

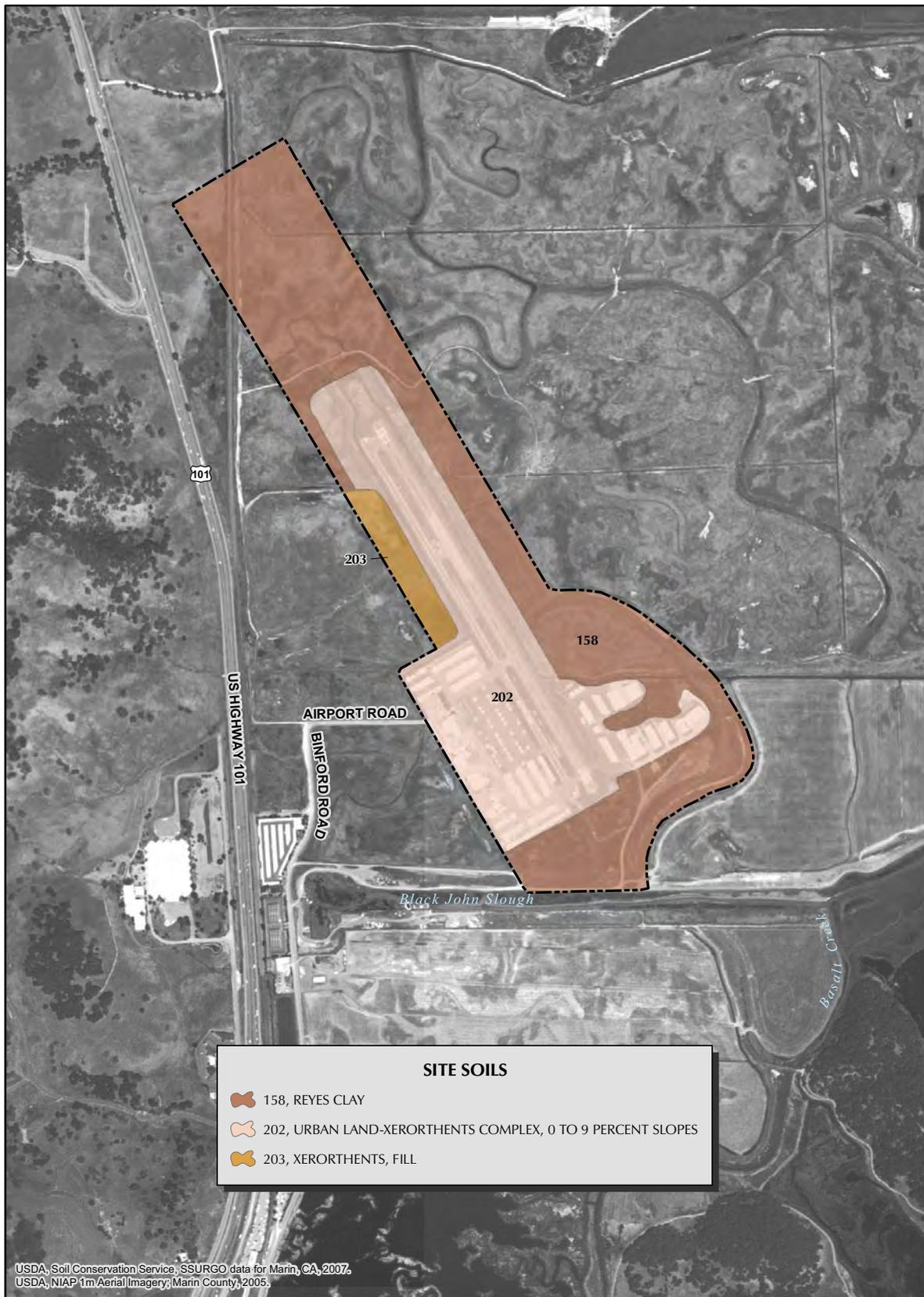
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NOTES:
 Waters of the U.S. are preliminary and subject to U.S. Army Corps of Engineers Verification.
 USDA, NAPP 1m Aerial Imagery, Marin County, 2005.
 Limit of Study is Approximate.



Drawn By: MJ
 Date: 04/27/08

FIGURE 5



USDA, Soil Conservation Service, SSURGO data for Marin, CA, 2007.
 USDA, NIAP 1m Aerial Imagery; Marin County, 2005.

SITE SOILS

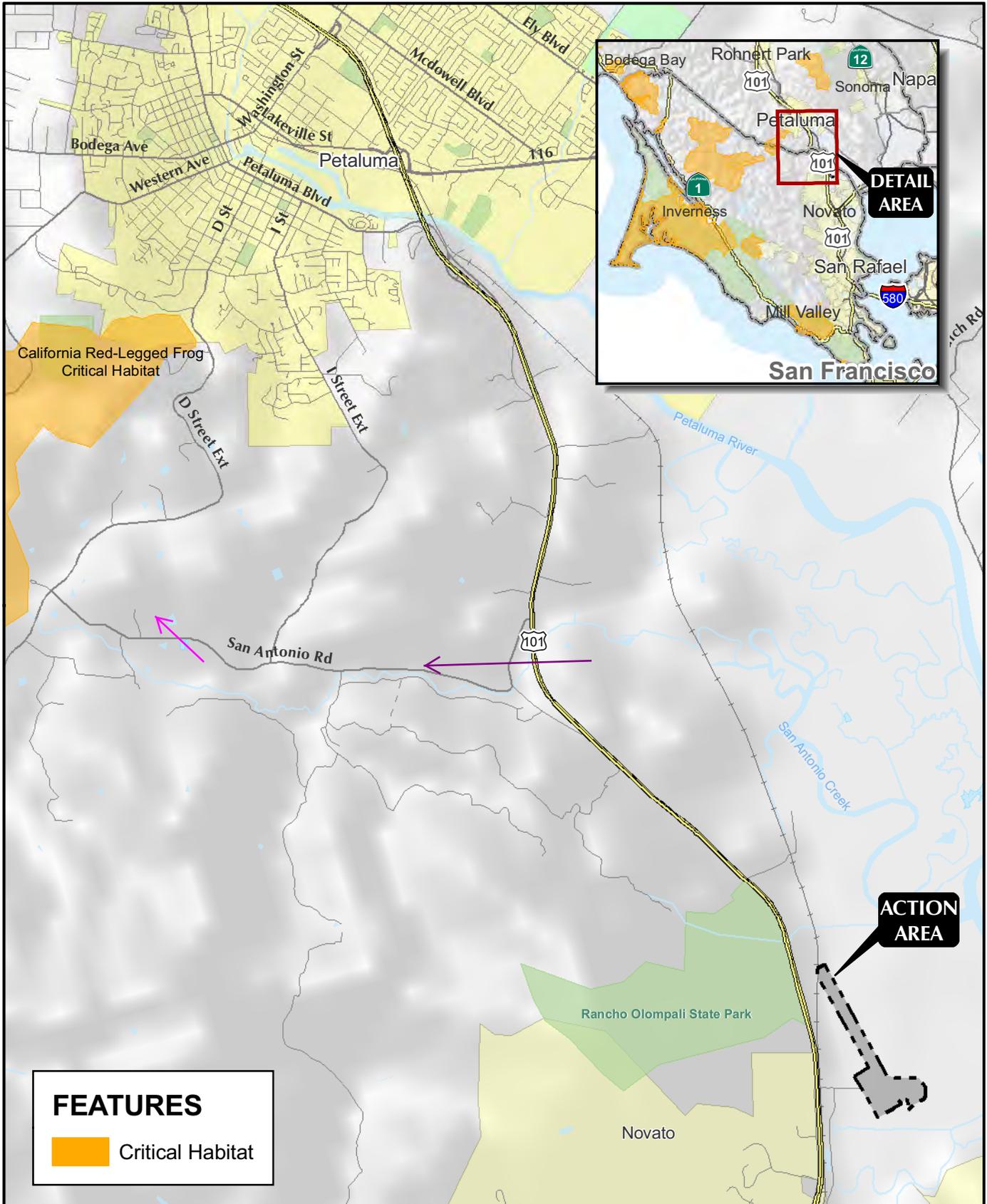
-  158, REYES CLAY
-  202, URBAN LAND-XERORTHENTS COMPLEX, 0 TO 9 PERCENT SLOPES
-  203, XERORTHENTS, FILL

SOILS



Drawn By: BF/PDL
 Date: 03/10/09

FIGURE 6



FEATURES

- Critical Habitat

CRITICAL HABITAT

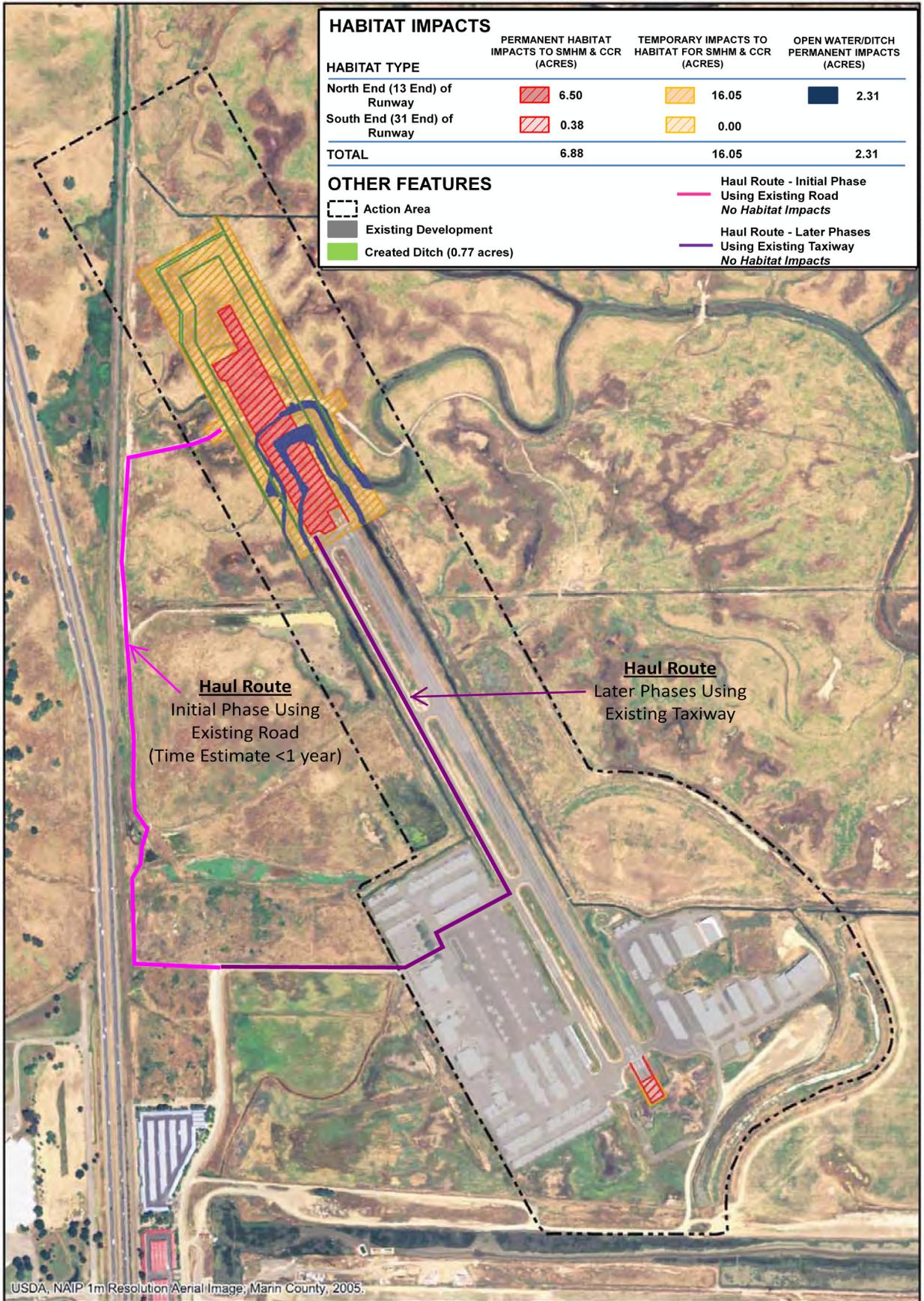
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0 2500 5000
 SCALE IN FEET

Drawn By: RJM
 Date: 11/03/10

FIGURE 7



HABITAT IMPACTS

HABITAT TYPE

HABITAT TYPE	PERMANENT HABITAT IMPACTS TO SMHM & CCR (ACRES)	TEMPORARY IMPACTS TO HABITAT FOR SMHM & CCR (ACRES)	OPEN WATER/DITCH PERMANENT IMPACTS (ACRES)
North End (13 End) of Runway	6.50	16.05	2.31
South End (31 End) of Runway	0.38	0.00	
TOTAL	6.88	16.05	2.31

OTHER FEATURES

- Action Area
- Existing Development
- Created Ditch (0.77 acres)
- Haul Route - Initial Phase Using Existing Road *No Habitat Impacts*
- Haul Route - Later Phases Using Existing Taxiway *No Habitat Impacts*

USDA, NAIP 1m Resolution Aerial Image, Marin County, 2005.

HABITAT IMPACTS



Appendix A — List of Preparers

Ryan Brown, Regulatory Biologist, Foothill Associates

Brian Mayerle, Biologist/ Vice President, Foothill Associates

Ryan McAdler, GIS Specialist/ Network Administrator, Foothill Associates

Candice Guider, Regulatory Specialist/ Executive Assistant, Foothill Associates

Douglas Pomeroy Biological Assessment Reviewer, Environmental Protection Specialist
Federal Aviation Administration

Appendix B — Other Species Considered but not Addressed

Invertebrates

California Freshwater Shrimp (*Syncaris pacifica*) (E)

The California freshwater shrimp (*Syncaris pacifica*) is a 10-legged crustacean of the family Atyidae. Shrimps from this family can be distinguished from others by the length of their pincer-like claws (*chela*) and presence of terminal bristles (*setae*) at the tips of the first and second chelae. The presence of a short spine above the eye and the angled articulation of the second chelae with the *carpus* ("wrist") separate the California freshwater shrimp from other shrimp found in California.

The California freshwater shrimp was formally listed as endangered on October 30, 1988. Critical Habitat for the species has not been defined. A Recovery Plan was issued for the shrimp on August 28, 1988. The species is currently undergoing a five year review to evaluate the current status of the species (USFWS, 2011).

California freshwater shrimp have evolved to survive a broad range of stream and water temperature conditions characteristic of small, perennial coastal streams. They have been found only in low-elevation (less than 380-foot) and low-gradient (generally less than 1 percent) streams. Excellent habitat conditions include:

Streams of 12 to 36 inches in depth;

With exposed live roots of trees such as alder and willow;

Along undercut banks greater than 6 inches; and

With overhanging woody debris or stream vegetation and vines such as stinging nettles, grasses, vine maple and mint.

Such areas may provide refuges from swift currents as well as some protection from high sediment concentrations associated with high stream flows. During the winter, the shrimp is found in undercut banks with exposed fine root systems or dense, overhanging vegetation.

No suitable habitat occurs within the Action Area for this species because the site contains no freshwater streams with a depth of 12 to 36 inches and aquatic habitat within the site is largely influenced by salt and brackish water. Therefore, the Project will have *no effect* on the species.

Fish

Delta Smelt (*Hypomesus transpacificus*) (T) (NMFS)

Delta smelt (*Hypomesus transpacificus*) are slender-bodied fish, about 2 to 3 inches long. They are in the Osmeridae family (smelts). They have a steely blue sheen on the sides and seem almost translucent. Smelts live together in schools and feed on zooplankton (small fishes and invertebrates).

The delta smelt was federally-listed as threatened on March 5, 1993. Critical habitat for the smelt was designated on December 19, 1994 and the species was integrated into the National Marine Fisheries Service's (NMFS) *Recovery Plan for the Sacramento- San Joaquin Delta Native Fishes* dated November 26, 1996. On March 24, 2009 the NMFS initiated a five year status review on the species.

Delta smelt are a euryhaline species (tolerant of a wide salinity range). They have been collected from estuarine waters up to 14 ppt (parts per thousand) salinity. For a large part of their one-year life span, delta smelt live along the freshwater edge of the mixing zone (saltwater-freshwater interface), where the salinity is approximately 2 ppt.

Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse widely into river channels and tidally influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone.

Most spawning happens in tidally influenced backwater sloughs and channel edgewater. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, tules, tree roots and submerged branches.

Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Their historic range is thought to have extended from Suisun Bay upstream to at least the city of Sacramento on the Sacramento River and Mossdale on the San Joaquin River. They used to be one of the most common pelagic (living in open water away from the bottom) fish in the upper Sacramento-San Joaquin Estuary.

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, delta smelt cannot enter the channels in the project area. Therefore, the Project will have *no effect* on the species.

Coho Salmon – Central CA Coast (*Oncorhynchus kisutch*) (E) (NMFS)

Coho salmon (*aka* silver salmon or salmon trout, among other names) have dark blue or green backs and silver sides that turn a deep red when it is time to spawn. They typically weigh about six to 12 pounds, and generally live three to four years. Like most other salmon, they are anadromous (they return from the ocean to their native streams to mate), and semelparous (they spawn only once and then die).

Coho salmon have a complex lifecycle that spans a variety of fresh and saltwater habitats. Salmon are born in inland streams and rivers, migrate to coastal estuaries, and then disperse into ocean waters to grow. Once mature, they reverse their course, returning through the estuaries, fighting their way back upriver to the very streams where they were born, to reproduce, die and begin the cycle again.

The Central California Coast Coho salmon ESU was declared threatened in 1996, and critical habitat was designated in 1999. In 2005, the Central California Coast ESU was formally listed as endangered (<http://wildequity.org/species/29>).

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, Central California Coast Coho salmon ESU cannot enter the channels in the project area. Therefore the Project will have *no effect* on the species.

Central California Coastal Steelhead (*Oncorhynchus mykiss*) (T) (NMFS)

Steelhead are a unique type of salmonid. Unlike most other salmonids, steelhead are iteroparous, which means they can spawn more than once during their lifetime. Furthermore, individuals develop differently depending on their environment. While all *O. mykiss* hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams, some stay in fresh water all their lives. These fish are called rainbow trout. The Steelhead that migrate to the ocean develop a much more pointed head, become more silvery in color, and typically grow much larger than the rainbow trout that remain in fresh water.

Steelhead can live for as long as 11 years and grow as large as 55 pounds. They may spend as long as seven years in fresh water before migrating downstream to the estuaries as smolts and then into the ocean to feed and mature. Their coloring is quite distinctive: from dark olive green on their backs shading to silvery-white underneath, they sport a pink racing stripe down the side. They are able to tolerate a greater range of water temperatures than other salmon, which may explain their longevity.

Although steelhead is believed to be more tolerant than other salmonids to fluctuations in habitat conditions, Steelhead populations suffered major declines when large dams were built throughout California, destroying Steelhead spawning habitats.

The Central California Coast steelhead DPS includes all naturally spawned populations of Steelhead from the Russian River in Sonoma County through and including Soquel Creek in Santa Cruz County. This includes all Steelhead in San Pablo and San Francisco Bays.

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, Central California Coast steelhead DPS cannot enter the channels in the project area. Therefore the Project will have *no effect* on the species.

Central Valley Steelhead (*O. mykiss*) (T) (NMFS)

The California Central Valley steelhead DPS includes all naturally spawned populations of Steelhead in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries.

This population was protected as threatened under the Endangered Species Act in 1998, and this decision was affirmed in 2006 (<http://wildequity.org/species/30>).

Life history requirements for the Central Valley steelhead are identical to the Central California Coastal steelhead outlined above.

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, California Central

Valley steelhead DPS cannot enter the channels in the project area. Therefore the Project will have *no effect* on the species.

Central Valley (CV) Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*) (T) (NMFS)

The largest of all salmon, Chinook— or King — Salmon routinely weigh more than 40 pounds and can reach upwards of 120. Not surprisingly, Chinook prefer to spawn in bigger streams and rivers than other species, making their redds (a salmon "nest") in larger gravel and tolerating swifter flows than their smaller relatives.

In 1999, this ESU was protected as a threatened species under the Endangered Species Act. This decision was affirmed in 2005 (<http://wildequity.org/species/33>).

Chinook salmon are anadromous, which means they live part of their lives in saltwater, but begin and end their lives in fresh water streams. Chinook fry (a juvenile that is still developing in a stream) will spend anywhere between three months to two years in fresh water. Likewise, they will remain at sea from one to six years before making the run back to their home rivers to spawn.

The Central Valley Spring-Run Chinook Salmon ESU once numbered more than 700,000 individuals. But by the late 1980s, the population declined to a handful of runs containing only a few hundred individuals. The remaining runs are only on small tributaries to the Sacramento River.

The Spring-Run Chinook salmon require cool freshwater while they mature over the summer. In the hot Central Valley, summer water temperatures are only suitable above 150-500 m elevations. Unfortunately, most of this habitat is now upstream of impassable dams.

Because of its location in the Central Valley, pesticides are also a major concern for this ESU. Pesticides can affect the entire ecosystem that the salmon need to survive and as a result can cause alterations in the male's fecundity.

Moreover, biologists are concerned that the Feather River Hatchery specifically, has cross-bred distinct salmon populations, and as a result, these hatchery fish are considered a major threat to the genetic integrity of the Central Valley Spring-Run Chinook Salmon ESU.

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, Central Valley Spring-Run Chinook Salmon ESU cannot enter the channels in the project area. Therefore the Project will have *no effect* on the species.

Winter-run Chinook Salmon, Sacramento River (*O. tshawytscha*) (E) (NMFS)

The Sacramento River winter-run Chinook Salmon was once abundant in California, with spawning populations in the Upper Sacramento River and several of its tributaries. Scientists believe that there may have been up to 200,000 fish in this population alone. However, construction of Shasta Dam blocked access to the ESU's entire historic spawning habitat. When the dam was completed, it was not expected that this ESU would survive.

The Sacramento River Winter-Run Chinook Salmon ESU were protected as threatened in 1990 and subsequently upgraded to endangered in 1994. Its endangered status was reaffirmed in 2005 (<http://wildequity.org/species/33>).

For many years after the Shasta Dam was constructed, these artificial (stream) conditions did not seem sufficient to maintain the ESU. The population declined from 100,000 in the 1960s to approximately several hundred individuals in the 1990s. Fortunately, cold-water releases from Shasta Dam created suitable spawning conditions for the ESU in an approximate 100 km downstream section of the Sacramento River. The Sacramento River Winter-run Chinook salmon are now entirely dependent on these artificially created conditions for their survival.

Winter-run Chinook salmon have a complex life-cycle that spans a variety of fresh and saltwater habitats. Salmon are born in inland streams and rivers, migrate to coastal estuaries, and then disperse into ocean waters to grow. Once mature, they reverse their course, returning through the estuaries, fighting their way back upriver to the very streams where they were born, to reproduce, die and begin the cycle again.

No suitable habitat occurs within the Action Area for this species because the Gness Field site is diked and contains no natural hydrologic connection to offsite waterways, allowing Chinook salmon to enter the channels in the project area; therefore the Project will have *no effect* on the species.

Birds

Western Snowy Plover (*Charadrius alexandrinus nivosus*) (T)

The western snowy plover is a small shorebird, about 6 inches long, with a thin dark bill, pale brown to gray upper parts, white or buff colored belly, and darker patches on its shoulders and head, white forehead and supercilium (eyebrow line). Snowy plovers also have black patches above their white forehead and behind the eye. Juvenile and basic (winter) plumages are similar to adult, but the black patches are absent. Some breeding males, especially in the southern portion of the species' range, may exhibit a rusty or tawny cap. Their dark gray to black legs is a useful characteristic when comparing them to other plover species (Page *et al.* 1995).

The Pacific coast population of the western snowy plover was listed as threatened on March 5, 1993. On September 29, 2005, the Service published a final rule to re-designate critical habitat along the coasts of California, Oregon, and Washington. A recovery plan was published in 2007. Since that time critical habitat was re-defined and results published in the Federal Register in May 2011.

The Pacific coast population of the snowy plover is defined as those individuals that nest adjacent to tidal waters of the Pacific Ocean, and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers (USDI Fish and Wildlife Service 2004).

Pacific coast plovers typically forage for small invertebrates in wet or dry beach-sand, among tide-cast kelp, and within low foredune vegetation (USDI Fish and Wildlife Service 2004). Some plovers use dry salt ponds and river gravel bars.

The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. The population breeds above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries (U.S. Fish and Wildlife Service 2001). Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (U.S. Fish and Wildlife Service 2001). Suitable nesting habitat is distributed throughout the listed range, but may be widely separated by areas of rocky shoreline.

No suitable habitat occurs within the Action Area for this species because Pacific coast plovers typically forage for small invertebrates in wet or dry beach-sand, among tide-cast kelp, and within low foredune vegetation, the species nests on coastal beaches, bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars; therefore, the Project will have *no effect* on the species.

California Least Tern (*Sternula antillarum browni*) (E)

The California Least Tern has a distinctive black cap and black stripes running from the cap across the eyes to the beak, these contrasts with a white forehead. Other dorsal areas are gray, while the ventral surface is white. Least terns have short, forked tails and their bills and legs are orange. In flight, a black wedge on the end of its wings is visible.

The California least tern was federally-listed as endangered on October 13, 1970, but has more recently been recommended for downlisting to threatened status. The species' population has increased from 600 in 1973 to roughly 7100 pairs in 2005. The number of California least tern sites has nearly doubled since the time of listing. Critical habitat has not been defined for the bird. The Revised California Least Tern Recovery Plan was issued September 27, 1985, but is now outdated.

The least tern is the smallest of North American terns, measuring 21-23 cm (around 8¼ to 9 inches) long, with a wingspan of 48-53 cm (around 19 to 21 inches). They mainly eat small fishes, but also shrimp and sometimes other invertebrates.

Least terns begin breeding in their third year and mating begins in April or May. Males perform elaborate aerial displays and later offer fish to the female. Nesting starts shortly afterwards in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action.

California least terns live along the coast. The species occurs along the Pacific Coast of California, from San Francisco to Baja California. They prefer to nest on open beaches kept free of vegetation by the tide. Most of the terns rely on degraded habitat on the beaches of densely populated southern California. Nesting habitat is often separated from the ocean by recreational beach use. The typical least tern colony size is 25 pair.

No suitable habitat occurs within the Action Area for this species because the species nests on beaches in colonies typically with 25 pairs of birds. Cattle grazing within the Action Area also would deter the bird from using the site and it is not known to occur within the vicinity; therefore, the Project will have *no effect* on the species.

Northern Spotted Owl (*Strix occidentalis caurina*) (T)

The northern spotted owl is a medium-sized, dark brown owl with a barred tail, white spots on the head and breast, and dark brown eyes surrounded by prominent facial disks. The northern spotted owl is one of three spotted owl subspecies: northern, California (*Strix occidentalis occidentalis*), and Mexican (*Strix occidentalis lucida*). The distribution of the northern subspecies includes southwestern British Columbia, western Washington and Oregon, and northwestern California south to Marin County.

The northern spotted owl is federally-listed under the Endangered Species Act as a threatened species in Washington, Oregon, and California. The 2008 Recovery Plan and critical habitat designation are currently being implemented by the Service. However, the Service is in discussions regarding potential revisions of the Recovery Plan and the critical habitat designation in the near future. On August 13, 2008 the Service published a revised designation of critical habitat for the owl. On September 8, 2010, the Fish and Wildlife Service published the *2010 Draft Revised Recovery Plan for the Northern Spotted Owl*. Through this document, the Service proposes to revise the May 2008 Recovery Plan. Public comments on the draft revised plan were accepted until November 15, 2010.

Northern spotted owls generally inhabit older forested habitats because they contain the structural characteristics required for nesting, roosting, and foraging. Specifically, northern spotted owls require a multi-layered, multi-species canopy with moderate to high canopy closure. The stands typically contain a high incidence of trees with large cavities and other types of deformities; large snags (standing dead trees); an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly. Recent landscape-level analyses suggest that in some parts of the subspecies' range a mosaic of older forest habitat interspersed with other vegetation types may benefit northern spotted owls more than large, homogeneous expanses of older forests. In redwood (*Sequoia sempervirens*) forests along the coast range of California, northern spotted owls may be found in younger forest stands that contain structural characteristics of older forests.

No suitable habitat occurs within the Action Area for this species because no old growth forests occur within the site. The species requires a multi-layered, multi-species tree canopy with moderate to high canopy closure. Suitable tree stands typically contain a high incidence of trees with large cavities and other types of deformities; large snags (standing dead trees); an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly, none of which occur within the Gness Field site or in the vicinity; therefore, the Project will have *no effect* on the species.

Plants

Soft Bird's Beak (*Cordylanthus mollis ssp. mollis*) (E)

Soft bird's beak is federally-listed as endangered; state listed as rare, and is ranked by the CNPS as a List 1B.2 species (plants that are rare and endangered in California). The plant is an erect, summer-flowering hemiparasitic annual herb in the Scrophulariaceae family. The plant ranges in size from six inches to 24-inches in height at maturity, and is found in coastal salt marshes at elevations between 0-3 meters (relative to mean sea level). The inflorescence is a spike with each flower subtended by two bracts. The flowers are bi-lobed and whitish in color. The entire

plant is densely hairy and flowering begins in early July and may continue into November (CNPS, 2010).

Soft bird's beak was federally-listed as endangered on November 20, 1997. Critical habitat was designated for the species on April 12, 2007 and a recovery plan for the species is integrated into *the Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California*, recently released by the Service on February 10, 2010.

Historically, soft bird's-beak occurred in the salt marshes and swamps in the San Francisco Bay Delta region and San Pablo Bay from Contra Costa, Solano, Napa, Sonoma, Sacramento, and Marin counties. Soft bird's beak has been extirpated in three of the six counties where it formerly occurred and is seriously threatened in the remaining fifteen known occurrences located in Contra Costa, Solano, and Napa Counties. The species is not known to occur in Marin County. Primary threats include soil erosion, sediment deposition and associated encroachment of non-native upland plants and alterations of drainage regimes in marshlands.

There are two records for this species in the CNDDDB within five miles of the action area (CNDDDB 2008). On July 21st, August 18th, and September 16, 2010 a Foothill Associates' botanist conducted focused plant surveys in effort to determine the presence or absence of soft bird's beak in the action area. Prior to the survey, soil data describing types of soils occurring on the site (**Figure 6**) was reviewed, CNDDDB (2010) records search for soft bird's beak (**Figure 2**), a previously conducted rare plant survey conducted by Kleinfelder in 2008, and a focused soft bird's beak survey conducted in 2009 by Kleinfelder (2009).

In general, habitat within the action area is marginal and compromised ecologically by the diking and annual draining of the site by the localized land owners/managers. Once water is drained from the site, it is grazed by cattle. Optimal habitat for the species does not occur onsite and soft bird's beak was not found during 2009 and 2010 focused botanical surveys conducted during the plant's flowering period by Kleinfelder and Foothill Associates botanists respectively.

Although marginal habitat occurs within the Action Area for this species, it was absent from the site when conducting focused presence/absence surveys; therefore, the Project will have *no effect* on the species.

Marin dwarf-flax (*Hesperolinon congestum*) (T)

Marin dwarf-flax, (*Hesperolinon congestum*), also known as Marin western flax, is a herbaceous annual of the flax family (Linaceae). It has slender, threadlike stems, 10-40 cm (4-16 inches) tall and leaves are linear. Flowers bloom from May to July. They are borne in congested clusters. Pedicels are 1 to 8 mm (0.04 to 3.2 inches) long. Sepals are hairy and the five petals are rose to whitish, while anthers are deep pink to purple. This helps distinguish Marin dwarf-flax from California dwarf-flax (*H. californicum*), found in the same geographic area, which has white to rose anthers, as well as hairless sepals. Two other species that are found in the same region are small-flower dwarf-flax (*H. micranthum*) and slender dwarf-flax (*H. spergulinum*).

Marin dwarf flax was listed as federally threatened on February 3, 1995. Critical habitat for the plant has not been designated. A recovery plan for the species is integrated into the Service's

Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area; September 30, 1998.
A five year review of the species is currently being conducted and began on March 25, 2009.

Marin dwarf-flax is found on serpentine soils from Marin County south to San Mateo County, a range of 80 kilometers (50 miles). Known populations occur between approximately 30 and 370 meters (100 to 1,200 feet) altitude.

There are no serpentine soils/suitable habitat within the Action Area; therefore, the Project will have *no effect* on the species.

Contra Costa Goldfields (*Lasthenia conjugens*) (E)

Contra Costa (*Lasthenia conjugens*) goldfields is a showy, spring annual herb in the aster family (Asteraceae). It grows to a height of 4-12 inches and usually has an infrequently branched stem. The leaves are opposite, light green, and have a feather-like arrangement, with narrow clefts extending more than halfway toward the stem.

Contra Costa goldfields was federally-listed endangered on October 22, 1997. Critical habitat for the plant was originally designated on August 6, 2003 and was revised on August 11, 2005. The species is included in the Service's *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* published December 15, 2005. A five year review of the species was conducted and completed in September of 2008. No change in status was recommended for the species.

Yellow flowers bloom from March to June. Contra Costa goldfields can be distinguished from similar goldfields by examining the flowers. The partially fused phyllaries (floral bracts, which are reduced leaf-like structures at the base of a flower) and the lack of a pappus (a seed appendage in some species that aids dispersal by acting like a small parachute) distinguish this species from Fremont's goldfields (*L. fremontii*) and Burke's goldfields (*L. burkei*), which it otherwise closely resembles.

Contra Costa goldfields grows in vernal pools within open grassy areas in woodlands and valley grasslands from sea level to 1,500 feet. Currently, 22 populations are believed to be extant in Mendocino, Napa, Marin, Contra Costa, Alameda, Solano and Monterey counties.

No suitable habitat occurs within the Action Area for this species because no vernal pools occur within the site and the area is a brackish habitat which would also preclude the species from occurring; therefore, the Project will have *no effect* on the species.

Appendix C — Ground-Level Photographs

Appendix D — Runway Development Alternatives Evaluation Matrix

Alternative	Description	Does it Meet the Airport's Need to provide sufficient runway length?	Preliminary Impacts			Preliminary Determination
			Environmental	Operational	Cost	
A	No-Action	no	<ul style="list-style-type: none"> Results in no physical environmental impacts (wetlands or cultural resources) 	<ul style="list-style-type: none"> Would not address the need for more runway length to accommodate current aircraft operators. Would continue the use of non-standard Runway Safety Areas and would not address the need for more runway length to accommodate current aircraft operators 	<ul style="list-style-type: none"> No direct costs Indirect costs would occur as a result of not meeting FAA standards and not providing the runway length to accommodate the current aircraft. Indirect costs include the loss of revenue to the Airport due to the fact that some pilots would choose not to use DVO, therefore depriving the County of revenues associated with the sale of fuel to these aircraft. 	Alternative does not meet the Purpose and Need for the project. NEPA guidelines require a No-Action alternative be included in the evaluation of environmental consequences, therefore this alternative will be carried forward for detailed analysis.
B	Extend Runway to the Northwest by 1,100 Feet (Sponsor's Proposed Project)	yes	<ul style="list-style-type: none"> Would require the relocation of the levee and drainage ditch around the runway. The area where the runway extension and northern RSA would be located is almost entirely wetlands that would require filling. There are potential cultural resources and habitat impacts due to the alternative. Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the airport, which would potentially decrease aircraft departure noise levels in those communities. 	<ul style="list-style-type: none"> The runway would be extended closer to the landfill northeast of the airport, which is a potential bird-attractant. This alternative could be inconsistent with FAA bird-aircraft strike hazard guidance. Would require re-programming of the navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway. Would address the need for additional runway length. 	<ul style="list-style-type: none"> Lot-line adjustment costs for the County to gain exclusive use of 0.1 acres of land to the south of the airport that would be required for the associated RSA extension. 	Alternative meets the need of the project and is the Sponsor's Proposed Project. Therefore this alternative will be carried forward for detailed analysis.
D	Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet	yes	<ul style="list-style-type: none"> Would require the relocation of the levee and drainage ditch around the runway; The area where the runway extension would be located is almost entirely wetlands that would require filling. Relative to the Clean Water Act Section 404 (b)(1) guidelines, the U.S. Army Corps of Engineers would only permit the least damaging practicable alternative. Would require relocation of a portion of the access road between west and east areas of the airport at the south end of Runway 31 There are potential cultural resources and habitat impacts due to the alternative. <p>Would move the runway closer to protected wildlife areas to the southeast of the airport;</p> <ul style="list-style-type: none"> Because the landing threshold for Runway 13 would be closer to the residential areas to the south of the airport, aircraft approaching to land at DVO from the south, would be at a lower altitude on approach than is experienced with the existing runway when passing near the residential areas to the south of the airport; this could potentially increase aircraft approach noise levels in those communities. 	<ul style="list-style-type: none"> Moves the runway closer to the landfill northeast of the airport Addresses the need for additional runway length The Precision Approach Path Indicator (PAPI), which provides visual approach guidance for aircraft landing at the Airport, would be relocated with the extended runway closer to the residential areas to the south of the Airport. This would require a steeper angle of approach than is experienced with the existing runway threshold, which is already set at 4.0 degrees (3.0 degrees is the standard). If the approach angle is steepened, aircraft could potentially approach at faster speeds, particularly when crosswinds are present. This condition exacerbates the need for additional runway length by potentially needing more than 4,400 feet. 	<ul style="list-style-type: none"> Would require additional costs for acquisition of 3.72 acres of land (currently privately owned) 	Alternative meets the need of the project. Therefore this alternative will be carried forward for detailed analysis.

**U.S. Fish and Wildlife Service Biological Opinion for
the Gness Field Airport Runway Extension Project
April 3, 2013**

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
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In Reply Refer To:
81420-2010-F-0755-1

APR 03 2013

Douglas R. Pomeroy
U.S. Department of Transportation
Federal Aviation Administration
San Francisco Airports District Office
1000 Marina Boulevard, Suite 220
Brisbane, California 94005-1853

Subject: Biological Opinion on the Proposed Extension of Runway 13/31 at Marin County Airport-Gnoss Field Project near the City of Novato, Marin County, California

Dear Mr. Pomeroy:

This letter is in response to the U.S. Department of Transportation Federal Aviation Administration's (FAA) November 16, 2011, request for the initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) for the proposed Extension of Runway 13/31 at Marin County Airport-Gnoss Field Project (proposed project) near the City of Novato, Marin County, California. Your request for consultation was received in our office on November 18, 2011. The County of Marin proposes a 1,100-foot extension to Runway 13/31 at Marin County Airport-Gnoss Field. At issue are the potential effects of the proposed project on the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), endangered California clapper rail (*Rallus longirostris obsoletus*), and threatened California red-legged frog (*Rana draytonii*). This document is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The Service concurs with your determination that the proposed project is not likely to adversely affect the California red-legged frog because of the following: (1) the salt marsh habitat within the project area is not suitable for California red-legged frogs; and (2) no suitable freshwater habitat would be disturbed by the proposed project.

This document represents the Service's biological opinion on the effects of the proposed project on the salt marsh harvest mouse and the California clapper rail. This document is based on: (1) your letter requesting consultation on the proposed project dated November 16, 2011; (2) the December 2012 *Section 7 Biological Assessment: Gnoss Field Airport, Marin County, California* prepared by Landrum and Brown, Inc. and Foothill Associates; (3) the December 2011 *Draft Environmental Impact Statement for the Gnoss Field Project Extension of Runway 13/31, Marin*

County, California prepared by FAA; (4) electronic mail and conversations among FAA, the County of Marin, Landrum and Brown, and the Service; (5) a site visit conducted on June 10, 2010; and (6) other information available to the Service.

CONSULTATION HISTORY

- June 4, 2010: The Service received the Notice of Intent/Notice of Preparation of the Environmental Impact Statement/Environmental Impact Report for the proposed project.
- June 10, 2010: The Service visited the Gness Field Airport site along with staff from FAA, the County of Marin, and California Department of Fish and Wildlife (CDFW).
- September 9, 2010: The Service participated in a conference call with staff from FAA, the County of Marin, Landrum and Brown, Foothill Associates, and ESA to discuss the potential effects of the proposed project on federally-listed species.
- November 18, 2011: The Service received FAA's request for initiation of formal consultation and the Biological Assessment for the proposed project.
- December 2, 2011: The Service received FAA's Draft Environmental Impact Statement for the proposed project.
- December 13, 2011: The Service requested from FAA more information on how the proposed project would be constructed and whether a revegetation and monitoring plan would be implemented.
- December 19, 2011: The Service met with FAA to discuss the proposed conservation measures for the proposed project.
- July 13, 2012: The Service met with FAA and the County of Marin to discuss compensation for the proposed project.
- January 22, 2013: The Service received from FAA the December 2012 revised Biological Assessment for the proposed project.

BIOLOGICAL OPINION

Description of the Proposed Project

The proposed project is located in Marin County, California, immediately east of Highway 101 and about 1 mile north of the City of Novato. It is located adjacent to the Burdell Unit of the Petaluma Marsh Wildlife Area, which is managed by CDFW. The County of Marin proposes to make improvements to the airport facility by performing the following activities:

1. Extend asphalt Runway 13/31 from 3,300 feet to a total length of 4,400 feet while maintaining the existing runway width of 75 feet;
2. Extend the corresponding taxiway to the full length of the runway;
3. Extend the existing FAA standard 120-foot wide Runway Safety Area (RSA) along the sides of Runway 13/31;
4. Construct a FAA standard 240-foot RSA at the north and south ends of the extended runway;
5. Extend the corresponding drainage channels to drain the extended runway and taxiway;
6. Extend the corresponding levee to protect the extended runway and taxiway from flooding;
7. Install, relocate, and reprogram the navigational aids that pilots use to land at the airport to reflect the extended runway; and
8. Adjust the property lot line for the County to gain exclusive use of 0.1 acre of land south of the airport necessary to provide for a 240-foot-long RSA on the south end of Runway 13/31.

Project Construction Phasing and Access

Project construction will require the import of fill material for the perimeter levee extension, as well as the extension of the runway, taxiway, and RSAs.

Construction Phase 1

Phase 1 includes the construction of the perimeter levee and the placement of some fill material for the runway, taxiway, and RSAs. Perimeter levee construction would require temporary site disturbance outside the area of permanent impact. Phase 1 construction is estimated to be completed in approximately 6 months and undertaken during the drier period of the year (April through October).

It is anticipated that construction equipment, materials, and imported fill for Phase 1 construction would be hauled to the site along the existing unpaved road that traverses east-west across the site. The access road would be elevated at the point where it enters the construction site to access the top of the levee. This modification to the roadway would remain after the project is complete, but would be located on the site of the current roadway.

At the end of the Phase 1 construction, the temporary disturbance area would be restored to its previous condition. Some of the vegetation and soil removed during site preparation would be stored within the area of temporary disturbance and used to replant the area after levee construction is complete.

Construction Phase 2

Phase 2 includes the construction of all site work including the runway, taxiway, and RSAs. Additional finish grading and paving for the runway extension, within the area of permanent impact, would be accessed via existing paved roadways and through the existing airport.

Conservation Measures

The County of Marin proposes to implement the following conservation measures during the construction of the proposed project to avoid and minimize the effects on the salt marsh harvest mouse and California clapper rail.

Conservation Measure 1: Construction Stormwater Pollution Prevention Plan

The proposed project will be designed to minimize off-site stormwater runoff that might otherwise impact surrounding habitat and water quality. Measures will be implemented during the project construction to avoid adverse impacts to adjacent properties. Standard construction best management practices (BMPs) will be incorporated into construction designs, plans and specifications, and will be required of contractors during construction. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the proposed project, with the following objectives: (a) to identify pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from the construction of the project; (b) to identify BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction; (c) to outline and provide guidance for BMPs and stormwater monitoring; (d) to identify project discharge points and receiving waters; (e) to address post-construction BMP implementation and monitoring; and (f) to address sediment/siltation/turbidity and non-visually detectable pollutant monitoring, and outline a sampling and analysis strategy.

Conservation Measure 2: Hand Removal of Vegetation and Installation of Temporary Exclusion Fencing

To minimize effects to the salt marsh harvest mouse, the perimeter of the construction area will be fenced to exclude the salt marsh harvest mouse. The design and location of the exclusion fencing will be submitted to the Service for final approval. During installation of the exclusion fencing, a Service-approved biologist will monitor the construction site to ensure consistency with the Service-approved fencing enclosure plan.

When conducting land clearing activities, including grubbing and vegetation removal, it may be necessary to utilize hand tools or small construction equipment (*i.e.*, Bobcat or similar) acceptable to the Service. A Service-approved biologist will be on-site during initial ground disturbance and vegetation removal to monitor for salt marsh harvest mice. Installation of exclusion fencing will occur in progression with land clearing activities. Vegetation clearing will occur from south to north, and exclusion fencing will remain open on the northern end of the temporary impact area to provide an “escape route” for any salt marsh harvest mice present during initial clearing and excavation. Upon completion of vegetation removal in the impact area the salt marsh harvest mouse exclusion fencing will be closed to preclude salt marsh harvest mice from potentially re-entering the temporary impact area.

Upon completion of vegetation removal/ground clearing activities and installation of the salt marsh harvest mouse exclusion fencing, the construction area will no longer be considered habitat for salt marsh harvest mouse, and the biological monitor will no longer be required on-site.

Conservation Measure 3: Provide Environmental Awareness Training

The Service-approved biologist will train the construction crew on approved avoidance measures and on the life history of salt marsh harvest mice and California clapper rails and train the County of Marin and/or construction contractor staff in appropriate monitoring techniques and methods for salt marsh harvest mouse and California clapper rail protection so that these individuals can conduct daily monitoring on their own for the duration of the project work. The Service-approved biologist will be available on an “on-call” basis for the duration of the proposed project.

Conservation Measure 4: Halting Work if Federally-Listed Species Observed

If a salt marsh harvest mouse or California clapper rail is observed on the project site, work will stop and the Service-permitted or approved biologist will be notified. If the mouse or rail vacates the work area of its own volition, then work can proceed. If the mouse or rail does not vacate the project site, then no work will be re-started until the Service has been notified and additional avoidance measures, if any, are discussed and implemented.

Conservation Measure 5: Off-site Tidal Marsh Restoration

The FAA proposes to require the County of Marin, prior to initiating construction or otherwise taking actions associated with this project that result in adverse effects to the salt marsh harvest mice or California clapper rails, to develop and submit to the Service for their review and approval a revegetation plan and habitat compensation plan based on the habitat compensation ratios in Table 1 below. Short-term temporary impacts to salt marsh harvest mouse and California clapper rail habitat (impacts lasting for less than 1 year) will be compensated by restoring on-site the temporarily disturbed habitat (1:1 ratio on-site) and restoring additional suitable habitat off-site (1.1:1 ratio). Long-term temporary impacts to salt marsh harvest mouse and California clapper rail habitat (impacts lasting for between 1 and 2 years) will be compensated by restoring on-site the temporarily disturbed habitat (1:1 ratio on-site) and restoring additional suitable habitat off-site (2:1 ratio). Permanent impacts to salt marsh harvest mouse and California clapper rail habitat (impacts lasting for more than 2 years) will be compensated by restoring suitable habitat off-site at a 3:1 replacement ratio.

Table 1. Habitat Compensation Ratios for Salt Marsh Harvest Mouse and California Clapper Rail Habitat for the Marin County Airport-Gnoss Field Runway Extension Project.

	Short-term Temporary Habitat Impacts (< 1 year)	Long-term Temporary Habitat Impacts (1-2 years)	Permanent Impacts (Impacts > 2 years)
On-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	1:1	1:1	Not Applicable – Permanent Impacts
Off-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	1.1:1	2:1	3:1
Total Habitat Replacement Ratio	2.1:1	3:1	3:1

These compensation ratios may be adjusted by the Service based on the quality of the habitat being removed and the quality of the habitat to be created or enhanced to replace it. If after review of a habitat compensation plan, the Service determines that adequate high quality habitat acceptable to the Service can be provided at a lower compensation ratio, the FAA proposes to utilize a lower habitat compensation ratio if such a ratio is acceptable to the Service. The Service would likely increase these compensation ratios if the proposed off-site restoration area was outside of the San Pablo Bay Recovery Unit identified in the *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Draft Recovery Plan; Service 2010a), which extends from Gallinas Creek in Marin County (at the southwestern end of the recovery unit) around San Pablo Bay north and east to Mare Island in Solano County.

Potential Locations for Off-site Tidal Marsh Restoration

San Pablo Bay National Wildlife Refuge

Several San Pablo Bay National Wildlife Refuge tidal marsh restoration projects needing funding are potential compensation alternatives. These projects, in general, are relatively large with multi-million dollar costs. As compensation for impacts to tidal marsh habitat, the County of Marin may contribute towards a larger effort that would be built in the appropriate timeframe. One potential tidal marsh restoration project at the San Pablo Bay National Wildlife Refuge that the County could contribute funding to is the Sonoma Creek Marsh Enhancement Project (Wetlands and Water Resources, Inc. 2009). This tidal marsh enhancement project will involve the excavation of an approximately 5,200-foot long by 50-foot wide main channel, with small excavated side channels, that will improve hydrology and restore healthy ecological function to approximately 400 acres of tidal marsh southwest of the mouth of Sonoma Creek.

Approximately 24,000 cubic yards of excavated material will be used to create a 10-acre transition berm with a 20:1 slope from a section of the existing levee out into the marsh. Engineering and design of the project is complete, but permitting has yet to be completed. Construction is expected to commence in either fall of 2013 or fall of 2014 (permitting pending). The project is being funded jointly by the San Pablo Bay National Wildlife Refuge, Audubon Society, and the Marin/Sonoma Mosquito & Vector Control District. The Service is working with the San Pablo Bay National Wildlife Refuge to complete an intra-Service biological opinion to cover the effects of the Sonoma Creek Marsh Enhancement Project on listed species. Other alternatives are possible within the San Pablo Bay National Wildlife Refuge, but timing and quantification of creation/restoration to complete compensation are factors that will require continued coordination.

Off-site Restoration by Private Entity

A private individual was contacted regarding a parcel of land they indicated they owned that is approximately 7,500 feet from the Marin County Airport-Gross Field. The individual indicated their interest in developing salt marsh habitat to sell for mitigation credits or developing a project-specific agreement with the County of Marin for mitigation. There is the potential to fund a project on this or other private sites, or to purchase mitigation credits from such a site if the private landowner develops the site as a mitigation bank and salt marsh harvest mouse and California clapper rail compensation credits are approved for sale by the Service. By working with a private landowner, it may be easier to negotiate terms and conditions to suit the proposed project's compensation requirements.

Off-site Restoration by Conservation Group or Public Entity

The San Francisco Bay Joint Venture is one of 18 Joint Ventures established under the Migratory Bird Treaty Act and funded under the annual Interior Appropriations Act. It brings together public and private agencies, conservation groups, development interests, and others to restore

wetlands and wildlife habitat in San Francisco Bay watersheds and along the Pacific coasts of San Mateo, Marin, and Sonoma Counties. The Sonoma Land Trust's 955-acre Sears Point Wetlands and Watershed Restoration Project (Sonoma Land Trust *et al.* 2012) is one example of a potential off-site restoration project in which participation by the County of Marin might be considered appropriate compensation by the Service for salt marsh harvest mouse and California clapper rail habitat impacts. The project is located in southern Sonoma County on the edge of San Pablo Bay between the Petaluma River and Tolay Creek. The project includes breaching and lowering a levee to restore 955 acres of diked agricultural baylands to tidal marsh. The Service completed the biological opinion for the Sears Point Wetlands and Watershed Restoration Project in January 2013 (Service file number 81420-2008-F-0296-1, Service 2013).

Lower Novato Creek Watershed

Another compensation option is that the project sponsor could prepare a specialized salt marsh harvest mouse and California clapper rail compensation plan. The plan elements would be consistent with the Service's Draft Recovery Plan (Service 2010a). A proposed habitat compensation site for implementation of this plan is located within the San Pablo Bay Recovery Unit near the mouth of the Novato Creek watershed adjacent to the Hamilton Field wetland restoration project. The proposed habitat compensation site is currently identified in the Draft Recovery Plan as a potential tidal marsh restoration area in the San Pablo Bay Recovery Unit (Service 2010a).

Under this alternative the sponsor would have a detailed Endangered Species Mitigation and Enhancement Plan (ESMEP) prepared by a qualified salt marsh harvest mouse and California clapper rail biologist to compensate for both permanent and temporary project impacts to salt marsh harvest mouse and California clapper rail habitat. The ESMEP shall be reviewed and approved by the Service prior to the initiation of any construction.

The ESMEP shall include the following provisions and information:

1. The total area of "in kind" mitigation for temporary and permanent impacts to endangered species habitat shall meet the habitat compensation ratios identified in Table 1 for temporary and permanent impacts, unless lower ratios are approved by the Service because the replacement habitat is of higher quality than the habitat being removed.
2. The "in kind" type of endangered species habitat to be compensated is categorized as foraging and dispersal habitat for the salt marsh harvest mouse and California clapper rail.
3. The compensation habitat shall be created or enhanced either before or in conjunction with the proposed project construction. Endangered species "in kind" habitat created prior to the start of project construction may qualify for lower replacement ratios than

shown in Table 1. The project sponsor may incorporate benefits from on-going environmental enhancement work/projects to qualify as compensation.

4. Any functional performance criteria for the ESMEP shall be approved by the Service.
5. Monitoring of mitigation areas shall be conducted by consulting a Service-approved salt marsh harvest mouse and California clapper rail specialist for 5 years or until functional performance is achieved. The monitoring shall be documented in an annual monitoring report that will be submitted to the Service.

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the salt marsh harvest mouse's and California clapper rail's range-wide conditions, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of these listed species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these listed species; (3) the *Effects of the Proposed Project*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on these species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on them.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the salt marsh harvest mouse's and California clapper rail's current status, taking into account any cumulative effects, to determine if implementation of the proposed project is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these listed species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the salt marsh harvest mouse and California clapper rail and the role of the action area in the survival and recovery of these listed species as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The Service defines the action area as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations [CFR] 402.02 and 402.14(h)(2)). For the purposes of the effects assessment, the 213-acre action area includes the land that is currently composed of developed areas associated with the airfield and the areas of high brackish marsh and annual grassland along the perimeters

of the airfield within the construction footprint. The action area also includes the drainage channel that will be re-routed around the perimeter of the extended runway.

Status of the Species

Salt Marsh Harvest Mouse

There are two subspecies of the salt marsh harvest mouse: the northern subspecies (*R. r. halicoetes*) and the southern subspecies (*R. r. raviventris*). Both subspecies are listed as endangered. The status of the salt marsh harvest mouse and information about its biology, ecology, distribution, and current threats is available in the Draft Recovery Plan (Service 2010a). Supplemental or updated information is provided in the Service's February 2010 5-year review for the salt marsh harvest mouse (http://www.fws.gov/ecos/ajax/docs/five_year_review/doc3221.pdf; Service 2010b). The 5-year review recommended the salt marsh harvest mouse remain listed as endangered due to the continuation of threats from tidal marsh habitat loss due to filling, diking, subsidence, changes in water salinity, non-native species invasions, sea level rise associated with global climate change, and contamination. Habitat suitability of many marshes is further limited by small size, fragmentation, and lack of other vital features such as sufficient refugial habitat. None of the recovery units have met the Draft Recovery Plan's downlisting criteria for the protection, management, and restoration of suitable tidal marsh habitat. Critical habitat has not been designated for this species.

California Clapper Rail

Listing Status: The California clapper rail was listed as endangered on October 13, 1970 (35 FR 16047). Critical habitat has not been designated for this species.

Description: This subspecies is one of three clapper rail subspecies in California listed as endangered under the Act. The other subspecies include the light-footed clapper rail (*R. l. levipes*), which is found in tidal marshes in southern California and northwestern Baja California, and the Yuma clapper rail (*R. l. yumanensis*), which is restricted to the Colorado River Basin. The California clapper rail is distinguishable from other clapper rails by its large body size of 13-19 inches from bill to tail, and weighs approximately 8.8-12.3 ounces. It has an orange bill, a rufous breast, black and white barred flanks, and white undertail coverts (Albertson and Evens 2000). Clapper rails are sexually dimorphic; the males are slightly larger than females (Garcia 1995). Juveniles have a pale bill and dark plumage. Clapper rails are capable of producing several vocalizations, most common of which are a series of keks or claps (Massey and Zembal 1987).

Natural History and Distribution: The California clapper rail is endemic to tidally influenced salt and brackish marshes of California. Historically, the California clapper rail occurred in tidal marshes along California's coast from Morro Bay, San Luis Obispo County, to Humboldt Bay, Humboldt County. Currently, California clapper rails are known to occur in tidal marshes in the

San Francisco Bay Estuary (Estuary) (San Francisco, San Pablo, Grizzly, Suisun and Honker Bays) (Olofson Environmental, Inc. 2011a, 2011b; CDFW 2012). California clapper rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass, *Grindelia*, saltgrass, jaumea, and adjacent upland refugia. They may also occupy habitats with other vegetative components, which include, but are not limited to, bulrush, cattails, and Baltic rush.

In northern San Francisco Bay, California clapper rails also occur in tidal brackish marshes that vary significantly in vegetation structure and composition, ranging from salt-brackish marsh to fresh-brackish marsh transitions (Service 2010a). Use of brackish marshes by California clapper rails is largely restricted to major sloughs and rivers of San Pablo Bay and western Suisun Marsh, and along portions of Coyote Creek in southern San Francisco Bay (South Bay) (Service 2010a). California clapper rails were also found in nearly pure stands of alkali bulrush along Guadalupe Slough in 1990 and 1991 (H.T. Harvey & Associates 1990a, 1990b, 1991). On rare occasions, California clapper rails have been recorded even further upstream, in brackish/freshwater transition marshes, particularly during the non-breeding season. Although it has been suggested that habitat quality may be lower in brackish marshes than in salt marshes (Shuford 1993), further studies comparing reproductive success in different marsh types are necessary to determine the value of brackish marshes to California clapper rails.

The breeding period of the California clapper rail is prolonged. Pair bonding and nest building are generally initiated by mid-February. Nesting may begin as early as late February or early March (Evens and Page 1983), and extend through July in the South Bay, and into August in northern San Francisco Bay (North Bay) (DeGroot 1927; Service, unpubl. data). The end of the breeding season is typically defined as the end of August, which corresponds with the time when eggs laid during re-nesting attempts have hatched and young are mobile.

California clapper rails require an intricate network of sloughs to provide abundant invertebrate populations (Grinnell *et al.* 1918, DeGroot 1927, Harvey 1988, Collins *et al.* 1994) and escape routes from predators, particularly for vulnerable flightless young (Taylor 1894, Adams 1900, DeGroot 1927, Evens and Page 1983, Foerster *et al.* 1990, Evens and Collins 1992). In addition, the small natural berms along tidal channels with relatively tall vegetation, such as *Grindelia stricta*, provide elevated nesting substrate. Harvey (1988) and Foerster *et al.* (1990) reported mean clutch sizes of 7.27 and 7.47 eggs for California clapper rails, respectively. The California clapper rail builds a bowl shaped platform nest of marsh vegetation and detritus (DeGroot 1927, Harvey 1988, Foerster *et al.* 1990). The California clapper rail typically feeds on benthic invertebrates, but its diet is wide ranging, and includes seeds, and occasionally small mammals such as the salt marsh harvest mouse.

Dispersal or movements by clapper rails in California occurs between and outside of marshes (Orr 1939, Zembal *et al.* 1985, San Francisco Bay Bird Observatory 1986, Page and Evens 1987, Albertson 1995). Post-breeding dispersal has been documented during the fall and early winter (Lindsdale 1936; Orr 1939; Service, unpubl. data; Albertson 1995). There is no clear evidence of

migratory behavior in the California clapper rail. However, infrequent long distance dispersal does occur.

Threats: An estimated 40,191 acres of tidal marshes remained in 1988 of the 189,931 acres of tidal marsh that historically occurred in the Estuary; this represents a 79 percent reduction from historical conditions (Goals Project 1999). The suitability of many remaining marshes for California clapper rails is limited, and in some cases precluded, by their small size, fragmentation, and lack of tidal channel systems and other micro-habitat features. These limitations render much of the remaining tidal marsh acreage unsuitable or of low value for the species. Habitat loss has dramatically slowed since the California clapper rail was listed in 1970, but ongoing disturbance and degradation precludes or reduces occupation of much of the remaining potential habitat by California clapper rails. Remaining habitat has been fragmented by levee systems that reduce and isolate patches of habitat, reduce/eliminate high marsh and refugial habitat, and make habitat accessible to predators and human disturbance. Habitat has been filled, subjected to many contaminants, converted to less suitable vegetation conditions by fresh wastewater discharges, and submerged by land subsidence caused by agricultural practices and groundwater overexploitation.

Loss of upper marsh vegetation has greatly reduced available habitat throughout the range of the California clapper rail. Most marshes in the South Bay are adjacent to steep earthen levees that have all but eliminated upper marsh vegetation and reduced available cover for California clapper rails during winter flood tides. In Suisun Marsh, high marsh vegetation has been eliminated by diking and livestock grazing. In addition to the problems associated with landscape alteration caused by development, California coastal wetlands are expected to be subject to the effects of global sea level rise and climate change due to global warming. The effects of past subsidence of marsh plain relative to mean tidal level, particularly in the South Bay (Atwater *et al.* 1979), are likely to be amplified by rising tidal levels.

Other than outright habitat loss due to marsh reclamation, significant historic degradation to California clapper rail habitat quality in remaining tidal marshes is caused by numerous human-caused physical and biological changes in the San Francisco Bay Estuary tidal marshes, including: construction and maintenance of dikes in tidal wetlands; replacement of tidal refugia along landward marsh edges with unbuffered urban edges; conversion of salt marsh to brackish-fresh marsh by urban fresh wastewater discharges; structural habitat change caused by non-native plant invasions (such as perennial pepperweed (*Lepidium latifolium*), ice plant, and mustard in high marsh); increased predation by avian and mammalian predators attracted by the availability of man-made structures (*e.g.*, electrical towers, buildings, and boardwalks); increased disturbance from recreational access, including humans and dogs; reduced habitat quality and increased predation pressure from litter and debris; and contamination of marsh sediments, which may impact California clapper rails directly or indirectly (potential direct effects include toxicity to adults, chicks, or embryos, and potential indirect effects include reduced prey quality, quantity, and availability, and altered vegetation structure/composition for nesting and sheltering). Few of

these causes of habitat degradation are independent of one another; they interact and mutually amplify (Service 2010a).

Wastewater discharges that alter natural salinity levels in tidal waters can adversely affect California clapper rail populations and other species. Since about 1970, freshwater discharges on the order of 120 million gallons/day from the San Jose Water Pollution Treatment Plant, have led to the conversion of approximately 300 acres of former salt marsh to fresh and brackish marsh at the southern end of San Francisco Bay along Coyote Creek and adjoining sloughs of the Santa Clara Valley (H.T. Harvey and Associates 1997). Marsh conversion may lower the habitat quality and carrying capacity of tidal marshes to support California clapper rails, as evidenced by lower population and nesting densities recorded in brackish marshes than salt marshes (H.T. Harvey and Associates 1989).

California clapper rails vary in their sensitivity to human disturbance, both individually and between marshes. California clapper rails have been documented nesting in areas with high levels of disturbance, including areas adjacent to trails, dikes, and roads heavily used by pedestrian and vehicular traffic (J. DiDonato, East Bay Regional Park District, pers. comm.; P. Baye, *in litt.* 2008). In contrast, Albertson (1995) documented a California clapper rail abandoning its territory in the Laumeister Tract, shortly after a repair crew worked on a nearby transmission tower.

California clapper rail reactions to disturbance may vary with season; however, both breeding and non-breeding seasons are critical times. California clapper rail mortality is greatest during the winter, primarily due to predation during extreme winter high tides (Eddleman 1989, Albertson 1995). Human-related disturbance may increase the California clapper rail's vulnerability to predators. During high tides, California clapper rails and other wildlife hide within any available cover in the transition zone and high marsh. As people approach, the birds may flush and attract predators. The presence of people and their pets in or near the high marsh plain or upland areas during marsh inundation may even prevent California clapper rails from leaving the lower marsh plain to seek cover, which also leaves them vulnerable to predation (Evens and Page 1983, 1986). Public trails that run along a narrow marsh transition zone may be particularly hazardous to California clapper rails that depend on this habitat for refuge during high tides.

Throughout the Estuary, the remaining California clapper rail population is impacted by a suite of mammalian and avian predators. At least 12 native and 3 non-native predator species are known to prey on various life stages of the California clapper rail (Albertson 1995). Artificially high local populations of native predators, especially raccoons, skunks, and common ravens occur due to the presence of landfills and other sources of human food waste adjacent to marshes. Feral cats also represent another predation threat on adult and young California clapper rails near residential areas and landfills (Albertson 1995). Non-native Norway rats have long been known to be effective predators of California clapper rail nests (DeGroot 1927, Harvey 1988, Foerster *et al.* 1990). According to Harvey (1988) and Foerster *et al.* (1990), predators, especially rats,

accounted for California clapper rail nest losses of 24-29 percent in certain South Bay marshes. Placement of shoreline riprap, levees, buildings, and landfills favor rat populations, which results in greater predation pressure on California clapper rails in certain marshes. Encroaching development displaces lower order predators from their natural habitat and adversely affects higher order predators, such as coyotes, which will normally limit population levels of lower order native and non-native predators, especially red foxes (Albertson 1995).

These predation impacts are exacerbated by a lack of high marsh and natural high tide cover in most remaining marshes. DeGroot (1927) noted that clapper rails were extremely vulnerable to predation by raptors during high tide events when they were forced to seek refuge in exposed locations. Similarly, Johnston (1956, 1957) and Fisler (1965) observed heightened predator activity in marshes coinciding with extreme high tides. Evens and Page (1986) also documented the susceptibility of California black rails (*Laterallus jamaicensis coturniculus*) to predation during extreme high tides. More recently, California clapper rail predation was noted in west Marin during extreme high tides in 2005 (G. Block, Service, pers. comm., 2005). There is an abundance of falcons, raptors, egrets, and herons during high tides that opportunistically take advantage of prey during this vulnerable period.

The proliferation of non-native red foxes into tidal marshes of the South Bay since 1986 has had a profound effect on California clapper rail populations. As a result of the rapid decline and almost complete elimination of California clapper rail populations in certain marshes, the Don Edwards San Francisco Bay National Wildlife Refuge implemented a predator management plan in 1991 (Foerster and Takekawa 1991) with an ultimate goal of increasing California clapper rail population levels and nesting success through management of red fox predation. This program was successful in increasing the South Bay California clapper rail populations from an all-time low.

Mercury accumulation in eggs is perhaps the most significant contaminant problem affecting California clapper rails in the Estuary, with the South Bay containing the highest mercury levels. Mercury is extremely toxic to embryos and has a long biological half-life. Schwarzbach *et al.* (2006) found high mercury levels and low hatching success (due both to predation and, presumably, mercury) in California clapper rail eggs throughout the Estuary. California clapper rail habitat is also at risk of contamination due to oil spills (Baker *et al.* 2009).

A population viability analysis for California clapper rails identified changes in adult survivorship as the factor with the largest influence on population growth rates (M. Johnson, University of California, pers. comm.). Another model also indicates that adult survivorship of California clapper rails is the primary demographic variable for maintaining a stable population or causing the population to either increase or decline (Foin *et al.* 1997). These models indicate that survival of adult birds has the strongest effect on the perpetuation or extinction of the overall population.

Population Status and Trends: The California clapper rail population was first estimated at 4,200-6,000 birds between 1971 and 1975, of which 55 percent occurred in the South Bay and 38 percent in the Napa Marshes (Gill 1979). Although the population was estimated at only 1,500 between 1981 and 1987 (Harvey 1988), the difference between these two estimates is believed to be partially due to survey intensity. Breeding season density data indicate that populations remained stable during the 1970s (Gill 1979, Harvey 1980), but reached an estimated all-time historical low of about 500 birds in 1991, with about 300 California clapper rails in the South Bay (Harding *et al.* 1998). California clapper rail numbers have rebounded between the 1990s and 2007. However, substantial increases in population size may be difficult to achieve due to the current disjunct distribution of their habitat (Albertson and Evens 2000).

Bay-wide California clapper rail numbers have been declining overall since 2007, and the decline is highly correlated with efforts to eradicate invasive *Spartina* in the San Francisco Estuary. U.S. Geological Survey data suggest that Bay-wide California clapper rail call count numbers declined by as much as 50 percent between 2007 and 2011. PRBO Conservation Science (2009a, 2009b, 2011) conducted Estuary-wide surveys of the San Francisco Bay for California clapper rail between 2005 and 2010. Between 2005 and 2008, the estimated Estuary-wide total population of California clapper rails decreased by about 21 percent (PRBO Conservation Science 2009a). The South Bay population of California clapper rails decreased by 54 percent between 2007 and 2008 (PRBO Conservation Science 2009a). Results of the 2008 survey documented only 543 rails, compared to 938 rails detected in 2007 (PRBO Conservation Science 2009a). In both years, the South Bay accounted for the majority of California clapper rails. Invasive *Spartina* Project (ISP) California clapper rail survey data collected at 30 sites from 2004 to 2010 also show an overall decline in California clapper rails. The population increased by 25 percent between 2005 and 2006 and by 25 percent again between 2006 and 2007. Then count numbers decreased by 35 percent between 2007 and 2008, by 32 percent from 2008 to 2009, and by 13 percent from 2009 to 2010.

Data collected by ISP from 2004 to 2010 at 30 sites within the San Leandro Bay, the Hayward region, the San Francisco Peninsula, and the Newark region, showed a decline in California clapper rail numbers from 519 in 2007 to 202 in 2010. U.S. Geological Survey data suggests that, Estuary-wide California clapper rail call count numbers declined by approximately 50 percent between 2007 and 2011 (U.S. Geological Survey, unpubl. data). According to the *California Clapper Rail Population Monitoring Report: 2005-2008*, the Estuary-wide California clapper rail population showed an overall negative trend (-20.6 percent, $P < 0.0001$) from 2005 to 2008, which can be mostly attributed to the 57 percent decline in the South Bay from 2007 to 2008 (PRBO Conservation Science 2009b). This decrease in the population of California clapper rails in 2008 was highly correlated with large scale *Spartina* eradication during this period which resulted in the loss of cover. No new cover was created or enhanced for California clapper rail to offset this loss. In 2010, PRBO Conservation Science detected an increase of California clapper rails in San Pablo Bay and South San Francisco Bay, while ISP detected a decline at other locations. This difference suggests that mature marshes (surveyed by PRBO Conservation Science) which received a high degree of hybrid *Spartina* control still provided enough native

habitat to support stable California clapper rail populations, while young marshes (surveyed by ISP), where hybrid *Spartina* was a more significant component of marsh vegetation cover, no longer provided habitat for California clapper rails because California clapper rails in these marshes were dependent on the hybrid *Spartina* for cover. It is unknown if the increased number of California clapper rails detected at some locations is due to high breeding success or is a result of immigration from marshes where *Spartina* treatment resulted in a loss of high tide refugia habitat. In addition, high tide surveys conducted by the East Bay Regional Park District showed decreases in California clapper rail numbers in San Leandro Bay since 2007 (Olofson Environmental, Inc. 2011a, 2011b; U.S. Geological Survey, unpubl. data). An extreme decline on East Bay Regional Park District land occurred at Arrowhead Marsh which decreased from 112 California clapper rails in 2007 to 35 in 2010 (Olofson Environmental, Inc. 2011a, 2011b; U.S. Geological Survey, unpubl. data).

Recovery Actions: The Draft Recovery Plan (Service 2010a) identifies high priority areas for tidal marsh and ecotone restoration including restoring tidal action to many of the salt ponds and other diked baylands along San Francisco Bay. Thousands of acres of former salt ponds and other diked baylands along San Francisco Bay have been restored or are proposed to be restored to tidal action (Service file number 81420-2008-F-0621; Service 2008); however, it may take decades before many of the heavily subsided areas within the former salt ponds accumulate enough sediment to become suitable tidal marsh habitat for California clapper rails. The Don Edwards San Francisco Bay National Wildlife Refuge with assistance from the U.S. Department of Agriculture Wildlife Services currently manages mammalian predators within California clapper rail habitat on its refuge lands in the South Bay and nearby CDFW lands; however, the Predator Management Program is underfunded. The Don Edwards San Francisco Bay National Wildlife Refuge is currently developing a program to manage avian predators within California clapper rail habitat on its refuge lands in the South Bay and nearby CDFW lands.

Environmental Baseline

The action area is located within diked baylands of the original floodplain of the Petaluma River. Since levees were constructed, the site is not subject to the ebb and flow of the tides. Surface waters on the site are fed by precipitation, overland flow, and seeps. Water flows off the site via a system of ditches, canals, and sloughs and is pumped over the levee into the Petaluma River.

Habitats

Land uses surrounding the action area include annual grassland and brackish marsh to the north and east, salt marsh to the south, and annual grassland and Highway 101 to the west. Land uses within the action area are comprised of the airport and agriculture/open space. There is also vacant undeveloped land immediately west of the airport. Areas directly surrounding the action area are used to graze cattle and are largely comprised of open space associated with the Burdell Unit of the Petaluma Marsh Wildlife Area, which is managed by CDFW. Between the Burdell

Unit and the dike separating the land area from the Petaluma River is the Burdell Ranch Wetland Conservation Bank.

The action area consists of land that is currently composed of developed areas associated with the airfield and annual grassland and high brackish marsh on the perimeters of the airfield. The annual grassland is characterized by an assemblage of non-native grasses and forbs including soft chess, ripgut brome, wild oat, yellow star thistle, wild radish, sweetclover, and thistle. The high brackish marsh is dominated by a combination of saltgrass, alkali heath, and saltbush. Other minor plant species within the high brackish marsh include pickleweed, bristly ox-tongue, and cocklebur. Other wetland features within the action area include a depressional seasonal wetland, riverine seasonal wetland, slope seep, perennial drainages, and ditches. Low-growing pickleweed occurs in a fragmented distribution along the margins of the aquatic features within the action area.

Annual Grassland

Annual grassland is the dominant upland plant community within the action area and covers about 85.9 acres of the action area. Along with high brackish marsh, described below, these two vegetation communities comprise the majority of natural vegetation within the action area. Annual grassland is characterized primarily by an assemblage of non-native grasses and forbs. Dominant grass species consist of soft chess, ripgut brome, and wild oat. Common herbaceous non-natives include yellow star thistle, wild radish, sweetclover and thistle. Minor plant species include coyote brush, valley oak, bindweed, California poppy, and Himalayan blackberry. This grassland would be considered an upland grassland community as opposed to the grass-dominated high brackish marsh described below, which is considered a wetland community. Annual grassland within the action area provides foraging and dispersal habitat and upland refugia cover for salt marsh harvest mice. California clapper rails are unlikely to occur within the annual grassland within the action area.

High Brackish Marsh Wetlands

A total of about 59 acres of high brackish marsh wetlands were delineated and verified within the action area. This wetland community is the major plant community within the action area outside of the developed airfield. It is dominated by a combination of saltgrass, alkali heath, and saltbush. Other minor plant species within this community include pickleweed, bristly ox-tongue, and cocklebur. Since this vegetation community is dominated by a grass species, it can generally be considered as a grassland habitat. However, this is a wetland vegetation community as opposed to the upland annual grassland habitat described previously. The high brackish marsh wetlands within the action area provide foraging and dispersal habitat and marginal quality breeding habitat for salt marsh harvest mice. California clapper rails are unlikely to breed in the high brackish marsh wetlands due to the lack of suitable cover and the lack of tidal influence; however, California clapper rails may occasionally forage and disperse through the high brackish marsh wetlands within the action area.

Depressional Seasonal Wetland

A total of 3.6 acres of depressional seasonal wetlands have been delineated and verified within the action area. Depressional seasonal wetlands exhibit a hydrologic regime dominated by saturation, rather than inundation. Depressional seasonal wetlands were identified on the site as depressions within the topography with a hydrologic regime dominated by saturation and capable of supporting hydrophytic plant species and hydric soils. Plant species in depressional seasonal wetlands are adapted to withstand short periods of saturation or saturated soils conditions but will not withstand prolonged periods of inundation, as is common in vernal pools. Salt marsh harvest mice and California clapper rails may forage and disperse through the depressional seasonal wetlands within the action area.

Riverine Seasonal Wetlands

A total of about 0.52 acre of riverine seasonal wetlands has been delineated and verified within the action area. Riverine seasonal wetlands are defined by a hydrologic regime dominated by unidirectional flow of water. Riverine seasonal wetlands typically occur in topographic folds or swales and represent natural drainages that convey sufficient water to support wetland vegetation. Riverine seasonal wetlands typically convey water during and shortly after storm events. Riverine seasonal wetlands may have a moderately defined bed and bank and often exhibit sufficient gradient to convey water off of the site. As in depressional seasonal wetlands, plant species found within riverine seasonal wetlands are typically adapted to a hydrologic regime dominated by saturation rather than inundation. Salt marsh harvest mice and California clapper rails may forage and disperse through the riverine seasonal wetlands within the action area.

Slope Seeps

A total of 2.95 acres of slope seeps have been delineated and verified within the action area. Seeps are characterized as areas where groundwater intersects with the soil surface. Typically, flow from seeps continues for some period after the rainy season and may continue all year. Seeps can support isolated wetland vegetation (such as on a hillside) or they may form the headwaters of a riverine seasonal wetland or other jurisdictional drainage feature. Vegetation in seeps often consists of plant species associated with seasonal and perennial marsh habitats. When seeps flow for only short periods beyond the rainy season and into the warm season, herbaceous perennial wetland species typically dominate. Seeps that persist for longer periods may support woody, perennial, obligate species. Salt marsh harvest mice and California clapper rails may forage and disperse through the seeps within the action area.

Perennial Drainages

A total of 2.48 acres of perennial drainage have been delineated and verified within the action area. Perennial drainages are features that may not meet the three-parameter wetland criteria for vegetation, hydrology, and soils but do convey water and exhibit an "ordinary high water mark."

Perennial drainages generally convey unidirectional water flows throughout the entire year. Perennial drainages typically consist of a channel, bed, and bank and are devoid of vegetation due to the scouring effect of flowing water. Perennial drainages are often bordered by wetland vegetation communities of various composition and cover depending on flow rates, duration of flows, and soil types. Salt marsh harvest mice may disperse through the perennial drainages within the action area, and California clapper rails may forage and disperse through the perennial drainages within the action area.

Ditches

A total of 6.2 acres of ditches have been delineated and verified within the action area. Ditches excavated in upland areas and draining entirely uplands are typically considered non-jurisdictional features by the U.S. Army Corps of Engineers. However, the ditches on the site typically drain at least some wetland areas and often connect to wetland features. Therefore, the ditches on the site are considered jurisdictional features. Salt marsh harvest mice may disperse through the ditches within the action area, and California clapper rails may forage and disperse through the ditches within the action area.

Salt Marsh Harvest Mouse

The action area occurs along the edge of the Draft Recovery Plan's San Pablo Bay Recovery Unit (Service 2010a). This recovery unit includes tideland habitats from Point San Pablo on the Contra Costa County coast and Point San Pedro, Marin County, to the Carquinez Strait at the Carquinez Bridge (Interstate 80). The diked baylands immediately to the southeast of the action area are identified as a high priority area for tidal marsh restoration in the Draft Recovery Plan. Limited populations of salt marsh harvest mouse exist within the San Pablo Bay Recovery Unit. This recovery unit is less altered by development at higher elevations than the Central/South San Francisco Bay Recovery Unit, so accommodation of rising sea level can be more readily achieved here, and accompanying increased salinity may enhance habitat conditions for the salt marsh harvest mouse. Population dynamics of salt marsh harvest mice in this recovery unit are likely decoupled from adjacent recovery units because of low dispersal relative to local recruitment (Service 2010a).

The fringing salt marshes along northern San Pablo Bay (Petaluma River to Mare Island Strait) support what is considered to be the largest population of the northern subspecies of salt marsh harvest mouse (*R. r. halicoetes*) in San Pablo Bay (Service, unpubl. report). Outside of the Highway 37 and Mare Island marsh areas, there are other major centers of stable or large populations, including some parts of the Contra Costa County coastline (Duke *et al.* 1990, Duke *et al.* 1991), Petaluma Marshes, and the Calaveras Point Marsh in the South Bay (Duke *et al.* 1990). The northern subspecies is more widespread and patchy in distribution in both diked and tidal marshes than the southern subspecies (*R. r. raviventris*), although its densities may be very low outside of the Highway 37 and Mare Island marshes and the marshes of the Contra Costa County shoreline (Duke *et al.* 1990, Duke *et al.* 1991).

There are no available salt marsh harvest mouse survey data within the action area for the proposed project; however, there are several reports of salt marsh harvest mice occurring near the action area. According to the California Natural Diversity Database (CNDDDB), there is a documented occurrence of the salt marsh harvest mouse associated with suitable tidal marsh habitat along the western bank of the Petaluma River about 0.8 mile north and 1.0 mile east of the action area (CNDDDB occurrence number 18, CDFW 2012). The San Francisco Estuary Institute (<http://legacy.sfei.org/ecoatlas/smhm/>) reports the following salt marsh harvest mouse survey data near the action area for the proposed project:

1. Thirteen salt marsh harvest mice captured in diked marsh habitat at Bahia near Black John Slough about 1.0 mile southeast of the action area during 100 trapping nights in 1996 (capture efficiency (CE) = 13) (site number 250; H.T. Harvey and Associates, unpubl. data, 1996);
2. Twenty-seven salt marsh harvest mice captured in diked marsh habitat at Bahia near Black John Slough about 1.1 miles southeast of the action area during 930 trapping nights in 1984 (CE = 2.9) (site number 297; Western Ecological Services, unpubl. data, 1984); and
3. Seven salt marsh harvest mice captured in tidal marsh habitat west of the Petaluma River and east of Neil's Island about 2.7 miles north of the action area during 100 trapping nights in 1971 (CE = 7) (site number 12; D. Schaub, CDFW, unpubl. data, 1971).

There have been no recent salt marsh harvest mouse surveys near the action area. The salt marsh harvest mouse has the potential to access the project area utilizing the drainage channels connecting the action area to known occurrences of the mouse in the marshes along the western bank of the Petaluma River. These drainage channels provide narrow bands of connectivity to more optimal functioning tidal marsh habitat associated with the Petaluma River, which occurs within 2,000 feet of the action area. Although, the drainages are not directly connected to the Petaluma River and water is pumped over a dike to the river, there is potential for the salt marsh harvest mouse to pass over the dike and utilize these drainage channels to access the project area.

Due to the occurrence of suitable habitat within the action area and the proximity to known occurrences of the species, the Service believes the salt marsh harvest mouse to be present within all suitable high brackish marsh, annual grassland, and other wetland habitats within the action area. The quality of the habitat within the action area is considered to be low due to the fragmented distribution of low-growing pickleweed.

California Clapper Rail

The action area for the proposed project occurs along the edge of the Draft Recovery Plan's San Pablo Bay Recovery Unit (Service 2010a). The diked baylands immediately to the southeast of the action area are identified as a high priority area for tidal marsh restoration in the Draft

Recovery Plan. Estuary-wide surveys conducted between 2005 and 2008 show that the San Pablo Bay recovery unit contains 33 percent of the total range-wide California clapper rail population, with the highest densities at Gallinas Creek (western San Pablo Bay in Marin County) (PRBO Conservation Science 2009a). This recovery unit is less altered by development at higher elevations than the Central/South San Francisco Bay Recovery Unit, so accommodation of rising sea level can be more readily achieved here, and accompanying increased salinity may enhance habitat conditions for the California clapper rail. Population dynamics of California clapper rails in this recovery unit are likely decoupled from adjacent recovery units because of low dispersal relative to local recruitment.

Small populations of California clapper rails are patchy and discontinuously distributed throughout San Pablo Bay in small isolated tidal marsh habitat fragments (Collins *et al.* 1994). Population densities of California clapper rails within tidal marsh of San Pablo Bay are generally considered low relative to other locations within the Estuary although populations of western San Pablo Bay have been increasing (Block 2010). California clapper rail breeding densities in the San Pablo Bay region in 1993 were 0.64 rail per acre in the Petaluma River marshes, 0.44 rail per acre at Sonoma Creek, and 0.57 rail per acre at the Napa River marshes (Collins *et al.* 1994). Highest numbers of California clapper rails in the San Pablo Bay region currently occur in South Gallinas and Hamilton Army Airfield marshes and at the mouth of Gallinas Creek in Marin County (Herzog *et al.* 2006). California clapper rails also occur along the Petaluma River (as far north as Schultz Creek), Strip Marsh West, Tolay Creek, Lower Tubbs Island, Sonoma Creek area, and along most major tidal sloughs that empty into the Napa River (Collins and Evens 1992; Evens 2000a, 2000b; Block 2010; U.S. Geological Survey, unpubl. data). In 2004 there were between 84 and a few hundred pairs of California clapper rails in the San Pablo Bay region (Avocet Research Associates 2004). PRBO Conservation Science detected 313 California clapper rails within the San Pablo Bay region during surveys conducted in 2010 (PRBO Conservation Science 2011).

There are no available California clapper rail survey data within the action area for the proposed project; however, there are several reports of California clapper rails occurring near the action area. California clapper rails were observed during the following breeding season surveys conducted in the lower Petaluma River marshes in 2010 within 1.0-2.8 miles of the action area (PRBO Conservation Science 2011):

1. Between 16 and 17 California clapper rails observed north of Black John Slough about 1.0 mile east of the action area (number 71);
2. Between 7 and 11 California clapper rails observed at Black John Slough A about 1.7 miles east-southeast of the action area (number 2);
3. Between 4 and 5 California clapper rails observed at the Bahia Channel about 1.7 miles southeast of the action area (number 76);

4. Between 19 and 21 California clapper rails observed in the Green Point area marshes about 2.3 miles southeast of the action area (numbers 37, 87, and 129);
5. Between 8 and 10 California clapper rails observed at Carl's Marsh about 2.8 miles southeast of the action area (number 50); and
6. Four California clapper rails observed east of the Petaluma River about 2.2 miles east-southeast of the action area (number 89).

The marsh within the action area is not suitable breeding habitat for California clapper rails because of the lack of suitable vegetative cover, and the marsh is not tidally influenced. However, the action area contains suitable foraging and dispersal habitat for California clapper rails due to the presence of the brackish marsh channel and its location near known breeding populations of California clapper rails in the lower Petaluma River marshes. Thus, due to the occurrence of suitable foraging habitat within the action area and the proximity to known breeding populations, the Service believes the California clapper rail may be present within all suitable high brackish marsh wetlands and drainages within the action area.

Effects of the Proposed Project

Salt Marsh Harvest Mouse and California Clapper Rail

Direct and Indirect Effects

Table 2 below summarizes the acres of habitat for the salt marsh harvest mouse and California clapper rail that will be permanently lost or temporarily disturbed by the proposed project and the amount of habitat that will be restored on-site and off-site. Construction of the proposed project will result in the permanent loss of 6.88 acres of marginal quality high brackish marsh/annual grassland habitat for the salt marsh harvest mouse and California clapper rail and 2.31 acres of open water ditch/channel foraging habitat for the California clapper rail. An additional 16.05 acres of marginal quality brackish marsh/annual grassland habitat for the salt marsh harvest mouse and California clapper rail will be temporarily disturbed for a period of up to two years. Upon completion of the proposed project and removal of the salt marsh harvest mouse exclusion fencing the temporarily impacted areas of the proposed project will be allowed to re-vegetate and will again be suitable habitat for the salt marsh harvest mouse. However, without a revegetation and monitoring plan, all areas temporarily disturbed by the proposed project may become dominated by non-native invasive plant species (*e.g.*, perennial pepperweed). Perennial pepperweed provides poor quality cover for the salt marsh harvest mouse and California clapper rail because it is leafless during the winter. Any reduction in suitable cover within the action area may increase the susceptibility of the salt marsh harvest mouse and California clapper rail to predation.

Table 2. Acres of Salt Marsh Harvest Mouse and California Clapper Rail Habitat Disturbed and Restored by the Proposed Project.

Habitat Type	Permanent Impacts ¹ (acres)	Temporary Impacts ² (acres)	On-site Restoration ³ (acres)	Off-site Restoration ⁴ (acres)
High Brackish Marsh/ Annual Grassland	6.88	16.05	16.05	38.3-52.7
Open Water Ditch/Channel	2.31	0.00	0.77	0.00

¹ Permanent impacts = effects to habitat lasting for more than 2 years.

² Temporary impacts = includes short-term temporary effects (lasting for less than 1 year) and long-term temporary effects (lasting for more than 1 year but less than 2 years).

³ The proposed project will result in a net loss of 1.54 acres of open water ditch/channel habitat.

⁴ The total amount of off-site restoration depends on how quickly the areas of high brackish marsh/annual grassland habitat will be restored on-site.

The County of Marin will compensate off-site for the disturbance of high brackish marsh and annual grassland habitat through a Service-approved compensation plan at the following compensation ratios: 1:1:1 ratio for short-term temporary effects (lasting for less than 1 year); 2:1 ratio for long-term temporary effects (lasting for more than 1 year but less than 2 years); and 3:1 ratio for permanent effects (lasting for more than 2 years). Thus, the total amount of off-site restoration will be between 38.3 and 52.7 acres depending on how quickly the areas of high brackish marsh and annual grassland habitat temporarily disturbed are restored on-site. The restored tidal marsh habitat will provide breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the effects from the construction of the proposed project. These lands will help maintain the geographic distribution of these species and will contribute to the recovery of these species. The County of Marin is not proposing any off-site compensation for the permanent loss of 2.31 acres of open water ditch/channel California clapper rail foraging habitat, but 0.77 acre of open water ditch/channel habitat will be created on-site by re-routing the channel around the extended runway. Although there will be a net loss of 1.54 acres of open water ditch/channel habitat within the action area, a greater linear distance of open channel/ditch habitat will result from the proposed project due to the re-routing of the drainages around the extended runway. The increase in the linear distance of open channel/ditch habitat within the action area may result in an increase in the amount of pickleweed growing along the margins of the channel which may provide some benefits to the salt marsh harvest mouse and the California clapper rail.

Individual salt marsh harvest mice and California clapper rails may be harassed by noise and vibrations associated with construction activities and the operation of heavy equipment within and adjacent to the salt marsh. The most likely effect of the proposed project would be to displace salt marsh harvest mice and California clapper rails as they move farther from these activities to avoid disturbance. The level of harassment of individual salt marsh harvest mice and

California clapper rails may vary depending on the type of equipment being used; different pieces of equipment have different noise levels and, thus, cause more or less disturbance. Noise and vibrations may result in displacement of salt marsh harvest mice and California clapper rails from protective cover and their territories. These disturbances are likely to disrupt normal behavior patterns of breeding, foraging, sheltering, and dispersal. Displaced salt marsh harvest mice and California clapper rails may have to compete for resources in occupied habitat, and may be more vulnerable to predators. Disturbance to female salt marsh harvest mice from March to November may cause abandonment or failure of the current litter. Thus, displaced salt marsh harvest mice may suffer from increased predation, competition, mortality, and reduced reproductive success. No nesting California clapper rails will be disturbed by the proposed project because the action area does not contain suitable breeding habitat for the California clapper rail.

Construction activities could attract predators of the salt marsh harvest mouse and California clapper rail to the action area if trash and food waste are left on the ground. Also salt marsh harvest mice and California clapper rails may also become more susceptible to predation due to the temporary loss of cover.

Individual salt marsh harvest mice could be injured or killed during the operation of heavy equipment within the salt marsh. The County of Marin will minimize the potential for injury or mortality of salt marsh harvest mice during construction activities within the salt marsh by having a Service-approved biological monitor on-site supervise the removal of vegetation and installation of temporary exclusion fencing prior to the initiation of construction activities within the marsh. The Service-approved biological monitor will also provide environmental training for the construction crew in the implementation of the avoidance and minimization measures and identifying the salt marsh harvest mouse, California clapper rail, and their habitats. If a salt marsh harvest mouse or California clapper rail is observed on the project site, work will stop and the Service-permitted or approved biologist will be notified. If the mouse or rail vacates the work area on its own volition, then work can proceed. If the mouse or rail does not vacate the project site, then no work will be re-started until the Service has been notified and additional avoidance measures, if any, are discussed and implemented.

Salt marsh harvest mice and their young could be injured or killed if motorized equipment (including the Bobcat as proposed) is used to remove the marsh vegetation. Although adult salt marsh harvest mice may be able to escape injury if the mice are flushed out of the vegetation prior to removal, less mobile salt marsh harvest mice (*e.g.*, young salt marsh harvest mice before they have been weaned) would not be able to escape injury and may be killed if a nest were crushed by vegetation removal activities conducted during the salt marsh harvest mouse's breeding season (March 1 – November 30). The County of Marin will minimize the potential for crushing any salt marsh harvest mice and their nests by having a Service-approved biologist supervise the removal of marsh vegetation and by stopping all work if a salt marsh harvest mouse or its nest is observed within the work area. Work would not resume until the salt marsh harvest mouse has moved out of the work area of its own volition. If a salt marsh harvest mouse nest is

observed, work would not resume near the nest until the Service-approved biologist has determined that the young salt marsh harvest mice have been weaned and left the nest (typically at about 25 days old).

The use of lighting during nighttime work could result in the disturbance of salt marsh harvest mice and California clapper rail activities by disrupting activity cycles and the internal circadian system (Rich and Longcore 2006). Disruption of the circadian clock from artificial night lighting can result in changes to foraging efficiency, risk of predation, and parental care, which could have adverse effects on the salt marsh harvest mouse and California clapper rail. These individuals would be out of sync with their neighbors living in a natural light-dark cycle, and it could affect mating success (Rich and Longcore 2006). Artificial night lighting has been shown to affect nocturnal rodents. Several species of small rodents harvested an average of 21 percent less seed in response to a single fluorescent or gasoline camping lantern. Although small mammals can respond to bright moonlight by shifting foraging activities to darker conditions, this is not an option for animals subjected to artificially increased illumination throughout the night. Unless they leave the lighted area, they are either at greater risk of predation from foraging in the lighted area, or reduce their food consumption to avoid increased predation risk (Rich and Longcore 2006).

The high brackish marsh and annual grassland habitat within the action area could become degraded if construction activities result in a spill of fuel or other hazardous materials or an increase in sedimentation in the marsh. The County of Marin will minimize the potential for contamination of the marsh during construction by implementing erosion control BMPs, water quality BMPs, and a SWPPP.

Interrelated and Interdependent Effects

Construction of the proposed project will rearrange the internal levee and ditch setup around the airport runway and increase non-permeable ground within the airport footprint. By altering the set-up of ditches and drainages associated with the airport, the localized hydrology on the site will be altered creating greater areas of consolidation of precipitation and altered overland flows coming downslope from the west. This physical situation will presumably result in longer standing wetlands from the cut-off of localized downslope hydrology. The physical alteration of the landscape would predicate the need to increase ditch capacity or increase pumping duration times during winter periods when precipitation is removed from the site; although construction of the new ditch line will elongate the ditch, it has been designed with less water capacity. These physical changes to the hydrology of the site may have minimal positive effects on marsh habitat for the salt marsh harvest mouse and California clapper rail within the site.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future

Federal actions unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act.

The global average temperature has risen by approximately 0.6 degree Centigrade during the 20th Century (International Panel on Climate Change [IPCC] 2001, 2007a, 2007b; Adger *et al.* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007a, 2007b; Adger *et al.* 2007), and that it is "very likely" that it is largely due to man-made emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004, Adger *et al.* 2007, Kanter 2007) likely imperils the salt marsh harvest mouse and California clapper rail and the resources necessary for their survival, since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, diseases, and non-native competitors. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat. Rising sea levels are likely to inundate much of the remaining salt marsh habitat available for the salt marsh harvest mouse and California clapper rail. Without upland habitat buffers available for the landward transgression of the marsh, the amount of suitable salt marsh habitat is likely to decrease with rising sea levels.

Conclusion

After reviewing the current status of the salt marsh harvest mouse and the California clapper rail, the environmental baseline for these species within the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of these species. We based this determination on the following: (1) successful implementation of the BMPs and conservation measures described in this biological opinion will minimize the adverse effects on individual salt marsh harvest mice and California clapper rails; (2) the marginal quality of the habitat that will be disturbed; (3) no suitable California clapper rail breeding habitat will be disturbed; and (4) the restoration off-site of suitable tidal marsh habitat for these species within the same recovery unit.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and Federal regulations pursuant to section 4(d) of the Act, prohibit take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. The Service defines harassment as an intentional or negligent act or omission that creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. The Service defines harm to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful

activity. Under the terms of section 7(b)(4) and section 7(o)(2), take that is incidental to and not intended as part of the agency action is not considered to be prohibited, provided such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be implemented by FAA so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption under section 7(o)(2) to apply. FAA has a continuing duty to regulate the activity that is covered by this incidental take statement. If FAA: (1) fails to require the applicant or any of its contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

Salt Marsh Harvest Mouse and California Clapper Rail

The Service anticipates incidental take of individual salt marsh harvest mice and California clapper rails will be difficult to detect or quantify because of the variable, unknown size of any resident population over time, their elusive and cryptic behavior, and the difficulty of finding killed or injured animals. Due to the difficulty in quantifying the number of salt marsh harvest mice and California clapper rails that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. The harassment and harm of all salt marsh harvest mice within the 22.93 acres of marginal quality high brackish marsh/annual grassland habitat disturbed during construction of the proposed project.
2. The harassment of all California clapper rails within the 25.24 acres of marginal quality non-breeding high brackish marsh/annual grassland and open water ditch/channel habitats disturbed during construction of the proposed project.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the salt marsh harvest mouse or California clapper rail.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measures are necessary and appropriate to minimize the effects of the proposed project on the salt marsh harvest mouse and California clapper rail:

1. FAA through the applicant will implement the Conservation Measures in the *Description of the Proposed Project* in this biological opinion.
2. FAA through the applicant will minimize the effects of the proposed project on the salt marsh harvest mouse, California clapper rail, and their habitats.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, FAA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure Number One (1):
 - a. FAA shall ensure that the salt marsh harvest mouse exclusion fencing is made of a heavy plastic sheeting material that does not allow salt marsh harvest mice to pass through or climb, and the bottom shall be buried to a depth of at least 4 inches so that the listed mouse cannot crawl under the fence. Fence height shall be at least 12 inches higher than the highest adjacent vegetation with a maximum height of 4 feet. All supports for the exclusion fencing shall be placed on the inside of the work area. FAA shall ensure that the exclusion fencing is inspected and secured before the start of each work day and that no salt marsh harvest mice are able to enter the work area.
 - b. FAA shall ensure that a compensation plan is finalized and approved by the Service prior to the initiation of construction of the proposed project. FAA shall ensure that the funding for the compensation plan is provided prior to the initiation of construction of the proposed project and that any required tidal marsh restoration is initiated within 1 year of the initiation of construction of the proposed project.
2. The following Terms and Conditions implement Reasonable and Prudent Measure Number Two (1):
 - a. FAA shall ensure that in order to avoid the potential for disturbing any salt marsh harvest mice nests and injuring or killing any young salt marsh harvest mice before they have weaned that the contractor uses only non-motorized hand tools to remove salt marsh vegetation during the mouse's breeding season (March 1 through November 30) under the supervision of a Service-approved biological monitor. If a salt marsh harvest mouse nest is observed, all work shall cease within 100 feet of the nest until the Service-approved biological monitor has determined that the young salt marsh harvest mice have been weaned and left the nest. Vegetation removal occurring outside of the salt marsh harvest mouse's breeding season (December 1 – February 28) may utilize mechanized or motorized equipment. The Service-approved

biological monitor shall supervise the vegetation removal, walk ahead of the vegetation removal equipment, and flush any salt marsh harvest mice out of the way.

- b. FAA shall ensure that all salt marsh and upland refugia habitat temporarily disturbed during construction of the proposed project is replanted or reseeded with appropriate local native plant species. The applicant shall install native salt marsh plant species including saltgrass, dwarf spikerush, alkali heath, gumplant, and pickleweed as appropriate for the location of the disturbed area and per a Service-approved revegetation and monitoring plan with success criteria. The revegetation and monitoring plan shall be submitted to and approved by the Service prior to the initiation of construction of the proposed project. The revegetation and monitoring plan shall include photographs and annual reporting documenting the site conditions pre- and post-project. Any areas temporarily disturbed that do not meet the success criteria in the revegetation and monitoring plan within 2 years will be considered a permanent effect and shall be compensated off-site at Service-approved location at a 3:1 ratio.
- c. FAA shall ensure that in addition to compensating for the temporary disturbance and permanent loss of high brackish marsh and annual grassland habitat for the salt marsh harvest mouse and California clapper rail, that the County of Marin also compensates at a 3:1 ratio for the permanent loss of 1.54 acres of open water ditch/channel foraging habitat for the California clapper rail.
- d. FAA shall ensure that the applicant develops and implements a Service-approved invasive plant species control plan. The invasive plant species control shall include measures to minimize the introduction and spread of perennial pepperweed and other invasive plant species.
- e. FAA shall ensure that the applicant implements the following BMPs:
 - (1) All food and food-related trash items shall be enclosed in sealed trash containers and removed completely from the site at the end of each day.
 - (2) Construction and project personnel shall not bring any pets anywhere in the proposed project work area.
 - (3) All equipment shall be maintained in order to prevent leaks of automotive fluids such as gasoline, oils, or solvents. A Spill Response Plan shall be prepared. Hazardous materials such as fuels, oils, solvents, etc. shall be stored in sealable containers and designated locations at least 100 feet from wetlands and aquatic habitats.

- (4) Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance shall occur at least 100 feet from any aquatic habitat, unless the activities are separated by a topographic or drainage barrier. Staging areas may occur closer to the proposed project activities as required.
- (5) If nighttime work is required, FAA shall ensure that the lighting is directed away from the marsh and shielded to prevent spillover into the marsh.

Reporting Requirements

The Service must be notified within 24 hours of the finding of any injured or dead salt marsh harvest mouse or California clapper rail, or any unanticipated damage to their habitats associated with the proposed project. Injured salt marsh harvest mice and California clapper rails shall be cared for by a licensed veterinarian or other qualified person, such as the Service-approved biologist for the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the animal should be frozen in a freezer in a secure location. The Service contact persons are Coast Bay/Forest Foothills Division Chief, Endangered Species Program, at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600 and Resident Agent-in-Charge of the Service's Law Enforcement Division at telephone (916) 569-8444.

The applicant shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting the avoidance and minimization measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the salt marsh harvest mouse and California clapper rail, if any; (v) occurrences of incidental take of these listed species, if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and databases. For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations. We propose the following conservation recommendations to FAA:

1. Assist the Service in implementing recovery actions identified within the Draft Recovery Plan for the salt marsh harvest mouse and California clapper rail.
2. Encourage or require the use of appropriate California native species in revegetation and habitat enhancement efforts associated with projects authorized by FAA.
3. Develop and implement measures to minimize the spread of non-native perennial pepperweed and other highly invasive plants that threaten upland refugia and tidal marsh habitat for the salt marsh harvest mouse and California clapper rail.
4. Restore upland refugia habitat for the salt marsh harvest mouse and California clapper rail near suitable tidal marsh habitat for these species.
5. Assist in the management of predators within tidal marsh habitat occupied by the salt marsh harvest mouse and California clapper rail.
6. Report sightings of any listed or sensitive animal species to the CNDDDB of the CDFW. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Extension of Runway 13/31 at Marin County Airport-Gnoss Field Project in Marin County, California. As provided in 50 CFR 402.16, reinitiating of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must immediately cease, pending reinitiating.

Mr. Douglas R. Pomeroy

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If you have any questions regarding this biological opinion on the Extension of Runway 13/31 at Marin County Airport-Gross Field Project, please contact Joseph Terry, Senior Biologist, or Ryan Olah, Coast Bay/Forest Foothills Division Chief, at the letterhead address, electronic mail (Joseph_Terry@fws.gov; Ryan_Olah@fws.gov), or at telephone (916) 414-6600.

Sincerely,



for Jan C. Knight
Acting Field Supervisor

cc:

Tim Dodson, California Department of Fish and Wildlife, Napa, California
Reuel Brady, Marin County Department of Public Works, San Rafael, California

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**Endangered Species Habitat Compensation Tables
based on the U.S. Fish and Wildlife Service
Biological Opinion for the Gness Field Airport
Runway Extension Project, April 3, 2013**

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**Table I-1
HABITAT COMPENSATION RATIO TABLE¹
Gross Field Airport**

	Short-term Temporary Habitat Impacts (<1 year)	Long-term Temporary Habitat Impacts (1-2 years)	Permanent Habitat Impacts (>2 years)
On-site Habitat Acreage Replacement Ratio (Replaced: Impacted)	1:1	1:1	Not Applicable - Permanent Impacts
Off-site Habitat Acreage Replacement Ratio (Replaced: Impacted)	1.1:1	2:1	3:1
Total Habitat Replacement Ratio	2.1:1	3:1	3:1

¹ Habitat compensation ratios based on April 3, 2013 U.S. Fish and Wildlife Service Biological Opinion for the Gross Field Airport Runway Extension Project - Table 1

**Table I-2
ENDANGERED SPECIES HABITAT COMPENSATION FOR TEMPORARY AND PERMANENT HABITAT IMPACTS OF
ALTERNATIVE B ASSUMING ALL TEMPORARY IMPACTS ARE SHORT-TERM (<1 YEAR)¹
Gross Field Airport**

	Habitat Acreage to be Replaced	On-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	On-site Habitat Acreage Replacement Requirement	Off-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	Off-site Habitat Acreage Replacement Requirement
Habitat Compensation Acreage Required for Temporary Endangered Species Habitat Impacts					
On-site Short-term Temporary Habitat Impacts (<1 year)	16.05	1:1	16.05 ²	1.1:1	17.7 ³
Long-term Temporary Habitat Impacts (1-2 years)	0.00	1:1	0.00	2:1	0.00
Total Endangered Species Habitat Compensation Required for Temporary Impacts			16.05		17.7
Habitat Compensation Acreage Required for Permanent Endangered Species Habitat Impacts					
Permanent High Brackish Marsh and Annual Grassland Habitat Impacts (>2 years)	6.88	N/A	N/A	3:1	20.6 ⁴
Permanent Open Water Ditch/Channel Habitat Impacts (>2 years)	1.54 ⁵	N/A	N/A	3:1	4.6 ⁶
Total Endangered Species Habitat Compensation Required for Permanent Impacts					25.2
Total Habitat Compensation Acreage Required for Endangered Species Habitat Impacts					
Total Endangered Species Habitat Compensation Required			16.05		42.9

1. All mitigation ratios based on U.S. Fish and Wildlife Service Biological Opinion of April 3, 2013
2. Habitat Acreage to be Replaced * On-site Habitat Replacement Ratio | 16.05*1=16.05
3. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 16.05*1.1=17.7
4. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 6.88*3 = 20.6
5. Habitat Acreage to be Replaced = 2.31 acres Permanent Impacts to Open Water Ditch/Channel – 0.77 acres On-site Open Water Ditch/Channel restoration = 1.54 acres Total Permanent Impacts to Open Water Ditch/Channel per USFWS Biological Opinion of April 3, 2013
6. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 1.54*3 = 4.6

**Table I-3
ENDANGERED SPECIES HABITAT COMPENSATION FOR TEMPORARY AND PERMANENT HABITAT IMPACTS
ALTERNATIVE B ASSUMING ALL TEMPORARY IMPACTS ARE LONG-TERM (1 – 2 YEARS)¹
Gross Field Airport**

	Habitat Acreage to be Replaced	On-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	On-site Habitat Acreage Replacement Requirement	Off-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	Off-site Habitat Acreage Replacement Requirement
Habitat Compensation Acreage Required for Temporary Endangered Species Habitat Impacts					
On-site Short-term Temporary Habitat Impacts (<1 year)	0.00	1:1	0.00	1.1:1	0.00
Long-term Temporary Habitat Impacts (1-2 years)	16.05	1:1	16.05 ²	2:1	32.1 ³
Total Endangered Species Habitat Compensation Required for Temporary Impacts			16.05		32.1
Habitat Compensation Acreage Required for Permanent Endangered Species Habitat Impacts					
Permanent High Brackish Marsh and Annual Grassland Habitat Impacts (>2 years)	6.88	N/A	N/A	3:1	20.6 ⁴
Permanent Open Water Ditch/Channel Habitat Impacts (>2 years)	1.54 ⁵	N/A	N/A	3:1	4.6 ⁶
Total Endangered Species Habitat Compensation Required for Permanent Impacts					25.2
Total Habitat Compensation Acreage Required for Endangered Species Habitat Impacts					
Total Endangered Species Habitat Compensation Required			16.05		57.3

1. All mitigation ratios based on U.S. Fish and Wildlife Service Biological Opinion of April 3, 2013
2. Habitat Acreage to be Replaced * On-site Habitat Replacement Ratio | 16.05*1=16.05
3. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 16.05*2=32.1
4. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 6.88*3 = 20.6
5. Habitat Acreage to be Replaced = 2.31 acres Permanent Impacts to Open Water Ditch/Channel – 0.77 acres On-site Open Water Ditch/Channel restoration = 1.54 acres Total Permanent Impacts to Open Water Ditch/Channel per USFWS Biological Opinion of April 3, 2013
6. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 1.54*3 = 4.6

**Table I-4
ENDANGERED SPECIES HABITAT COMPENSATION FOR TEMPORARY AND PERMANENT HABITAT IMPACTS OF
ALTERNATIVE D ASSUMING ALL TEMPORARY IMPACTS ARE SHORT-TERM (<1 YEAR)¹
Gross Field Airport**

	Habitat Acreage to be Replaced	On-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	On-site Habitat Acreage Replacement Requirement	Off-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	Off-site Habitat Acreage Replacement Requirement
Habitat Compensation Acreage Required for Temporary Endangered Species Habitat Impacts					
On-site Short-term Temporary Habitat Impacts (<1 year)	18.43	1:1	18.43 ²	1.1:1	20.3 ³
Long-term Temporary Habitat Impacts (1-2 years)	0.00	1:1	0.00	2:1	0.00
Total Endangered Species Habitat Compensation Required for Temporary Impacts			18.43		20.3
Habitat Compensation Acreage Required for Permanent Endangered Species Habitat Impacts					
Permanent High Brackish Marsh and Annual Grassland Habitat Impacts (>2 years)	8.24	N/A	N/A	3:1	24.7 ⁴
Permanent Open Water Ditch/Channel Habitat Impacts (>2 years)	1.62 ⁵	N/A	N/A	3:1	4.9 ⁶
Total Endangered Species Habitat Compensation Required for Permanent Impacts					29.6
Total Habitat Compensation Acreage Required for Endangered Species Habitat Impacts					
Total Endangered Species Habitat Compensation Required			18.43		49.9

1. All mitigation ratios are the same as the U.S. Fish and Wildlife Service provided for Alternative B in its Biological Opinion of April 3, 2013.
2. Habitat Acreage to be Replaced * On-site Habitat Replacement Ratio | 18.43*1=18.43
3. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 18.43*1.1=20.3
4. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 8.24*3 = 24.7
5. Habitat Acreage to be Replaced = 2.31 acres Permanent Impacts to Open Water Ditch/Channel – 0.69 acres On-site Open Water Ditch/Channel restoration = 1.62 acres Total Permanent Impacts to Open Water Ditch/Channel
6. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 1.62*3 = 4.9

**Table I-5
ENDANGERED SPECIES HABITAT COMPENSATION FOR TEMPORARY AND PERMANENT HABITAT IMPACTS
ALTERNATIVE D ASSUMING ALL TEMPORARY IMPACTS ARE LONG-TERM (1 – 2 YEARS)¹
Gross Field Airport**

	Habitat Acreage to be Replaced	On-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	On-site Habitat Acreage Replacement Requirement	Off-site Habitat Acreage Replacement Ratio (Replaced:Impacted)	Off-site Habitat Acreage Replacement Requirement
Habitat Compensation Acreage Required for Temporary Endangered Species Habitat Impacts					
On-site Short-term Temporary Habitat Impacts (<1 year)	0.00	1:1	0.00	1.1:1	0.00
Long-term Temporary Habitat Impacts (1-2 years)	18.43	1:1	18.43 ²	2:1	36.9 ³
Total Endangered Species Habitat Compensation Required for Temporary Impacts			18.43		36.9
Habitat Compensation Acreage Required for Permanent Endangered Species Habitat Impacts					
Permanent High Brackish Marsh and Annual Grassland Habitat Impacts (>2 years)	8.24	N/A	N/A	3:1	24.7 ⁴
Permanent Open Water Ditch/Channel Habitat Impacts (>2 years)	1.62 ⁵	N/A	N/A	3:1	4.9 ⁶
Total Endangered Species Habitat Compensation Required for Permanent Impacts					29.6
Total Habitat Compensation Acreage Required for Endangered Species Habitat Impacts					
Total Endangered Species Habitat Compensation Required			18.43		66.5

1. All mitigation ratios are the same as the U.S. Fish and Wildlife Service provided for Alternative B in its Biological Opinion of April 3, 2013.
2. Habitat Acreage to be Replaced * On-site Habitat Replacement Ratio | 18.43*1=18.43
3. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 18.43*2=36.9
4. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 8.24*3 = 24.7
5. Habitat Acreage to be Replaced = 2.31 acres Permanent Impacts to Open Water Ditch/Channel – 0.69 acres On-site Open Water Ditch/Channel restoration = 1.62 acres Total Permanent Impacts to Open Water Ditch/Channel
6. Habitat Acreage to be Replaced * Off-site Habitat Replacement Ratio | 1.62*3 = 4.9

**U.S. Fish and Wildlife Service Draft Recovery Plan
for Tidal Marsh Ecosystems of Northern and Central
California (2010a) Chapter III: Recovery Strategies
Figure III-10 Segment D, Figure III-11 Segment E,
Figure III-12 Segment F, Figure III-13 Segment G,
showing the boundaries of the San Pablo Bay
Recovery Unit**

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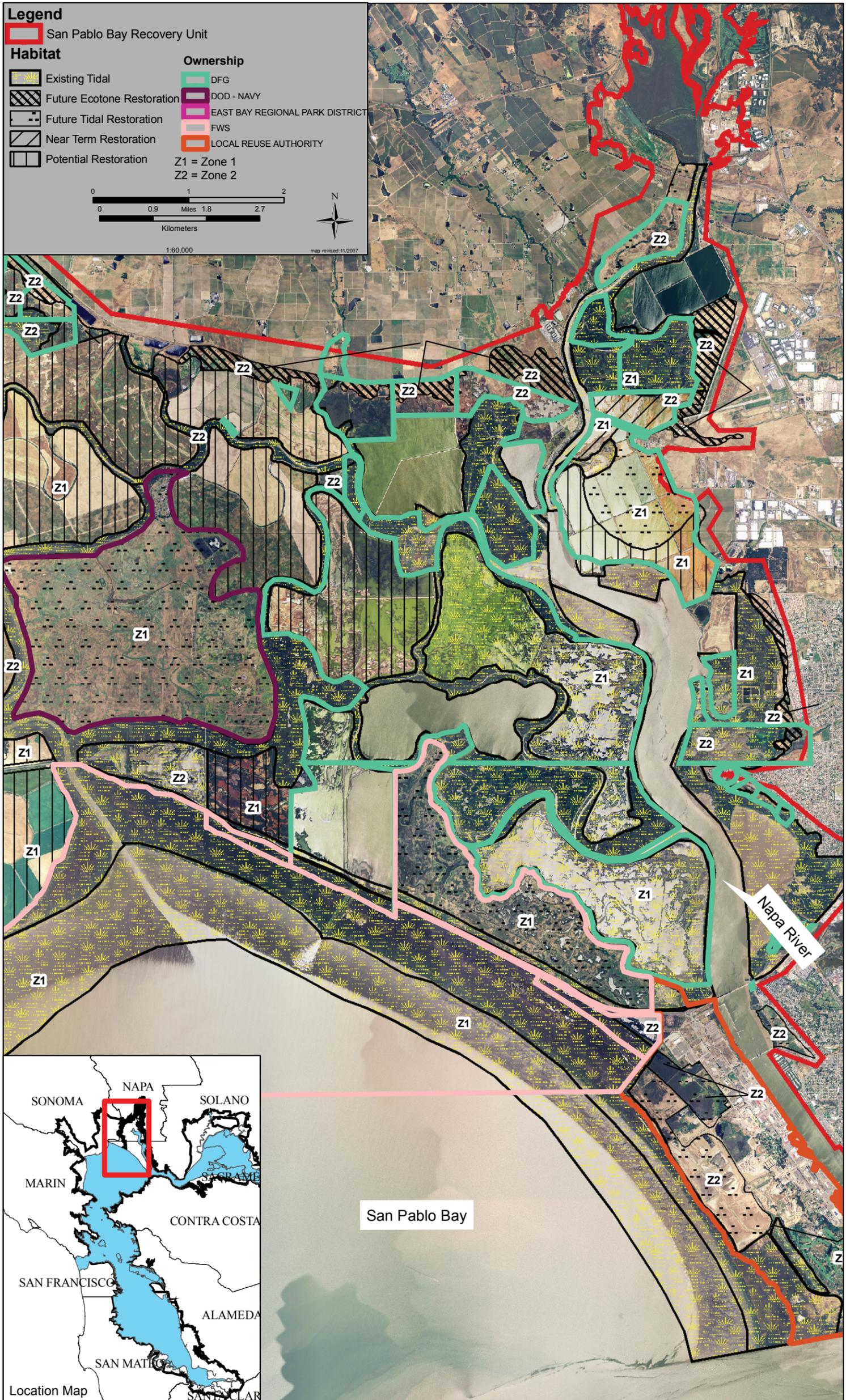


Figure III-10. Segment D

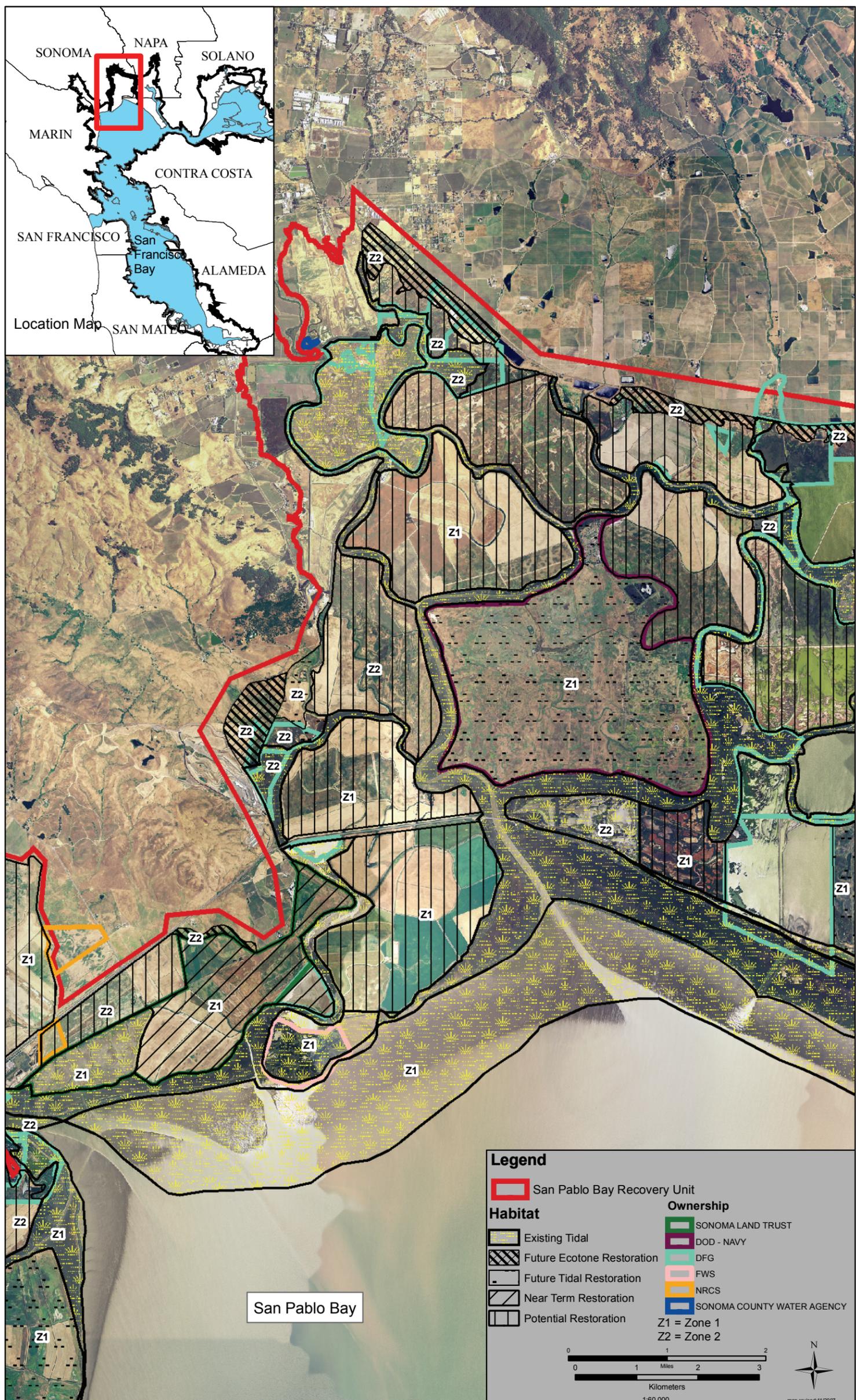


Figure III-11. Segment E

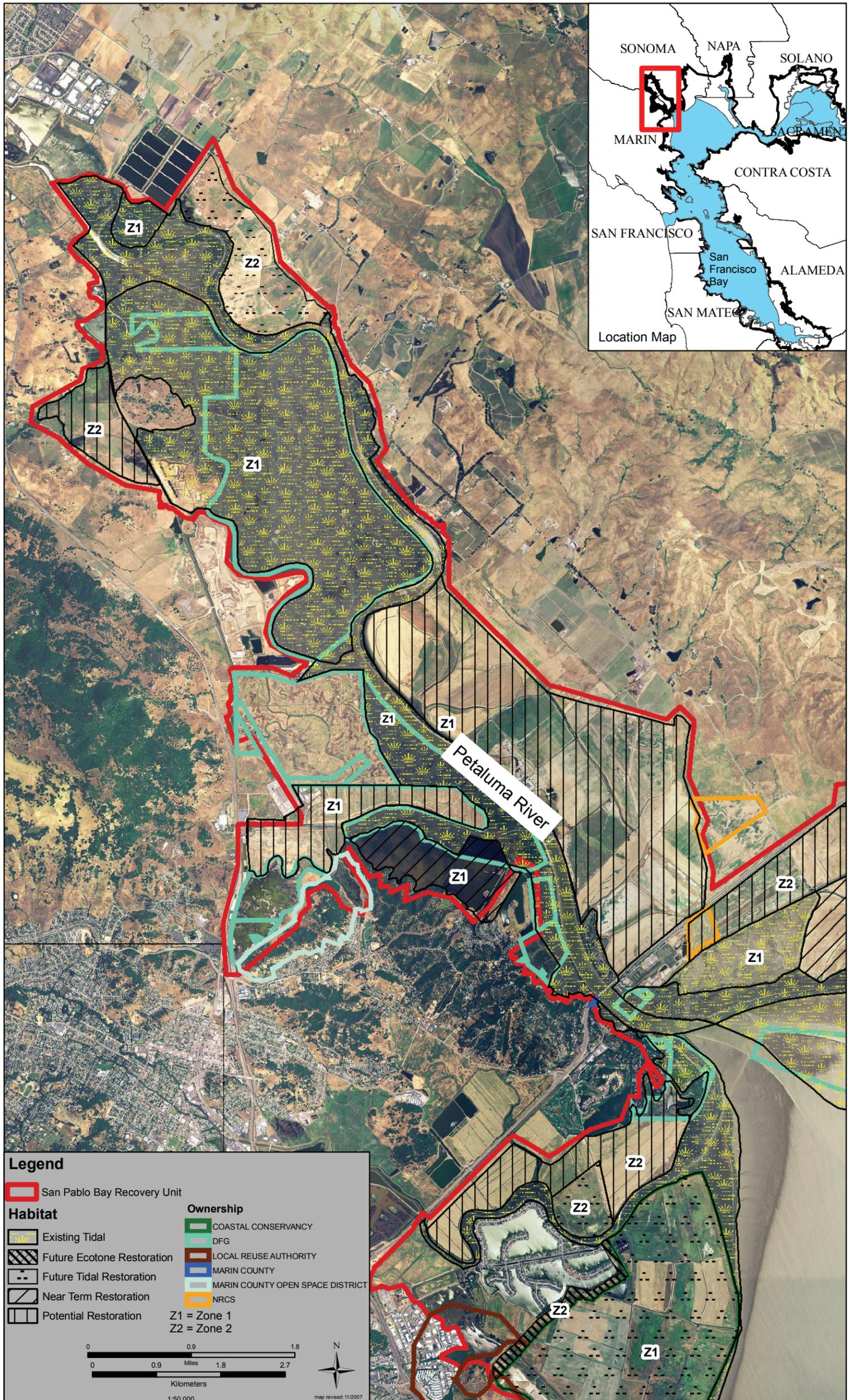


Figure III-12. Segment F

