Appendix
LAX Master Plan Final EIS/EIR

F-E. Biological Opinion from United States Fish and Wildlife Service (USFWS)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

In Reply Refer To:
FWS-OR-1012.5

David Kessler, AICP
Acting Supervisor, Planning Section
U.S. Department of Transportation
Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009

Re: Biological Opinion for Los Angeles International Airport Master Plan, City of Los Angeles, Los Angeles County, California.

Dear Mr. Kessler:

This document transmits our biological opinion based on our review of Alternative D of the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) for Los Angeles World Airports' (LAWA) Master Plan for the Los Angeles International Airport (LAX) in the City of Los Angeles, Los Angeles County, California and its effects on the federally endangered Riverside fairy shrimp (*Streptocephalus woottoni*, "RFS") and El Segundo blue butterfly (*Euphilotes battoides allyni*, "ESB") in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your request for formal consultation was received on June 29, 1999.

This biological opinion is based on information provided in the DEIS/EIR, the LAX Master Plan, the Biological Assessment of Proposed Master Plan Improvements to Los Angeles International Airport, Los Angeles County, California, (BA) and all amendments and addendums to these documents. The opinion is also based on site visits, correspondence, telephone conversations, emails, and meetings with the FAA and LAWA. A complete administrative record for this consultation is on file at the Carlsbad Fish and Wildlife Office (CFWO).

CONSULTATION HISTORY

On August 29, 1997, the CFWO sent a letter to the FAA regarding the potential occurrence of vernal pools on the LAX airfield. The FAA conducted biological surveys in 1997 and 1998 and it was determined that versatile fairy shrimp (*Branchinecta lindahli)* and the federally endangered RFS were present on LAX (RECON 1998). In March of 1999, the FAA and the CFWO met to discuss the management of RFS habitat on LAX. On June 29, 1999, the FAA initiated formal section 7 consultation with the CFWO for effects to endangered fairy shrimp on LAX.

The FAA determined routine maintenance of the airfield, required by the FAA, was causing adverse effects to RFS.

In June 2000, LAWA wrote a letter to the FAA regarding the creation and maintenance of habitat for fairy shrimp onsite. The FAA responded in a letter dated June 30, 2000, stating they will not accept any standing water on LAX. The FAA recommended that the RFS be moved to an offsite location because the activities associated with the current Wildlife Hazard Management Plan (WHMP) and LAWA's obligation to comply with 14 CFR Part 139 does not allow RFS to complete its life cycle at LAX.

On September 5, 2000, the FAA submitted a draft BA to the CFWO and a letter abandoning the consultation on the operations and maintenance of LAX and initiating consultation on the DEIS/EIR. The CFWO requested additional information and larger scale maps. On December 19, 2000, the FAA submitted a revised BA. In January of 2001, LAWA released a draft Master Plan and DEIS/EIR for LAX. These documents addressed three alternatives (A, B, and C) and a "no action" alternative for improvements to LAX. On October 1, 2001, the mayor of Los Angeles, in response to concerns elevated by the terrorist attacks of September 11, 2001, directed LAWA and the FAA to create the "Enhanced Safety and Security Plan" (Alternative D). After several months of planning and development, Alternative D was released in July of 2003.

On February 27, 2003, the U.S. Transportation Secretary, Norman Mineta announced a list of six transportation construction projects that would receive accelerated environmental review under President Bush's Executive Order 13274. On August 20, 2003, the CFWO responded with a letter to the FAA making a commitment to streamline the environmental review of the section 7 consultation for this project. On November 6, 2003, the Department of Interior sent its comments, which included comments from the CFWO, to the FAA regarding the DEIR/EIR.

On January 15, 2004, the CFWO met with the FAA and LAWA to discuss the state of the DEIS/EIR including the new alternative. At this meeting the FAA provided the CFWO with a letter designating LAWA as an applicant to the consultation process. On February 11, 2003, a site visit was conducted on the airfield at LAX and in the ESB preserve. On March 9, 2004, the CFWO and FAA agreed to complete consultation on Alternative D. Based on several phone conferences with LAWA and FAA from November 2003 to April 2004, and Alternative D as described in the supplement to the draft Master Plan and DEIS/EIR for LAX, a draft project description was submitted to the FAA and LAWA on April 2, 2004.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The FAA proposes to approve revisions to the Airport Layout Plan (ALP), as proposed in Alternative D of the DEIS/EIR. The primary focus of Alternative D, the Enhanced Safety and Security Plan, is to improve the overall safety of LAX, particularly as it pertains to the threat of terrorism, while expanding air passenger service to accommodate approximately 79 million passengers per year and expanding cargo facilities to accommodate approximately 3 million tons of cargo per year. To accomplish this task, Alternative D moves passenger and staff parking facilities away from the passenger terminals, extends the north runways, realigns the south runways, and

widens all runway complexes for increased runway safety for newer and larger planes. The ALP includes the construction of a replacement concourse and reconfiguration of terminals 1, 2, 3, and the northern portion of the Tom Bradley International Terminal, a new Ground Transportation Center, and an Intermodal Transportation Center built east of Aviation Boulevard. A small expansion of the cargo facilities is proposed, and an employee parking structure would be built on the western end of LAX near Pershing Drive. Additional navigational aids for runway 6L/24R and 6R/24L are proposed in the El Segundo blue butterfly preserve.

The proposed north runway complex expansion will extend runway 6L/24R approximately 1,500 feet to the west. The centerline of runway 6R/24L would be moved approximately 340 feet to the south, and extended 135 feet west and 1,280 feet to the east. The runway realignment and expansion will create more room for a taxiway between the runways. The runway expansion will include runway safety areas surrounding the runway to accommodate planes in the event of a runway excursion (planes leaving the runway). The proposed runway project is expected to disturb or destroy some ephemerally wetted pools occupied by RFS adjacent to the location of the north runway complex.

The proposed employee parking structure will be located on the western end of LAX and accessed via Pershing Drive. The proposed parking structure will accommodate 12,400 parking stalls for employees. The proposed structure will be located in close proximity to several ephemerally wetted pools containing RFS cysts.

A new navigational aid system including a new ALSF-2 lighting system is proposed for installation in the El Segundo dune complex including the blue butterfly preserve. The proposed navigational aids will permanently convert 0.25 acres of the El Segundo sand dune complex to concrete to support the navigational lighting system. The proposed ALSF-2 lighting system will decrease the spacing between lights and increase number of lights used to aid pilots in identifying the airport. The number of lights in the El Segundo dunes complex will increase from 15 to 23 and the spacing between the lights will decrease from 200 feet to 100 feet. The lights from the ALSF-2 are directed up at approaching aircraft. The extra lighting will be used during low visibility Santa Ana conditions (strong easterly winds) and in the evenings when planes are approaching LAX from the west. During normal operations only one-half of the lights will be illuminated.

As part of the project, the following conservation measures are proposed to offset impacts to the RFS and ESB. LAWA and the FAA will:

1. Enhance 1.25 acres of existing southern foredune habitat with coast buckwheat (*Eriogonum parvifolium*) in sub-area 23. This includes salvaging and transplanting all coast buckwheat removed for navigational aid development to sub-area 23 and planting additional coast buckwheat plants in sub-area 23 from nursery stock grown on site (Figure 1-1). Coast buckwheat plants will be placed in clusters or groupings of plants based on microtopographic features present within sub-area 23 to better support the ESB, which is known to prefer large clusters of plants for nectaring and shelter. Transplantation efforts will take place after the onset of winter rains, which coincides with the normal period of dormancy of coast buckwheat. Each plant will be excavated with its entire root ball such that sand at the base of each plant is disturbed to the least extent possible. Prior to relocation of each plant, a qualified biologist will inspect the immediate area for ESB pupae

and will translocate these pupae with the plant. Each plant will be transported in a suitable container and planted in sub-area 23. The typical blooming period for coast buckwheat is predominantly during the summer, with some flowers present throughout the year. Gathering of coast buckwheat seed may take place from September 15 through June 1 of each year. Propagation and planting methodologies successfully employed by Los Angeles World Airports (LAWA) during 1984 through 1994 restoration efforts will be employed for this current effort. The long-term mean plant density target will be approximately 130 plants per acre. The initial planting density will be 200 plants per acre to ensure the long-term planting density target. An existing irrigation system proximal to sub-area 23 will be used to increase the success of the restoration effort. Restoration activities will be implemented three years prior to construction of the navigational lighting system. Monitoring of the restoration plantings will be undertaken to ensure the successful establishment of coast buckwheat within sub-area 23.

2. Limit activities associated with navigational aid development to the existing roads and proposed impacts areas. Existing roads and proposed impact areas are depicted in Figure S4.14-1 and F4.14-1, *Location of Proposed Navigational Aids—Alternative D*, in Section 4.14, Coastal Zone Management and Coastal Barriers, of the Supplement to the Draft EIS/EIR and Final EIS/EIR, respectively.

   Submit a monitoring report after the navigational aid system is in place and during the first subsequent ESB flight period to document ESB behavior with respect to the lighting system. The details regarding the contents of this monitoring report and a monitoring plan will be submitted to CFWO within 75 days of the issuance of this biological opinion for review and concurrence.

3. Implement construction avoidance measures for the six ephemerally wetted pools within the airfield operations area that would not be directly removed as a result of the construction and operation of the Master Plan Alternative D: EW009, EW012, EW013, EW014, EW015, and EW016.

   EW*009, EW012, and EW013*
   Construction and operations personnel would be restricted to existing maintenance roads for non-emergency activities. A buffer area of 7.1 acres of undeveloped land surrounding and including EW009, EW012, and EW013 (Figure 3-2) will be designated as an off-limits area in the construction drawings for each phase of construction described in Section 2 of the EIS/EIR. In addition, LAX operations personnel with vehicular access to the airfield operations area will be apprised of these off-limits areas annually.

   Prior to the initiation of construction, LAWA will review the plans and specifications for construction of the employee parking facility to ensure that adequate best management practices (BMPs), such as a berm, swale, or comparable measures, have been incorporated into the plans and specification to prevent construction runoff from affecting the designated buffer area for EW009, EW012, and EW013. The construction avoidance measures will be periodically inspected by LAWA throughout construction to ensure the efficacy of the BMPs, and corrective action will be undertaken as necessary to ensure that construction and

operation of the employee parking facilities do not result in adverse impacts to surface water quality in EW009, EW012, and EW013.

EW014
Construction and operations personnel would be restricted to existing roadways for non-emergency activities. A buffer area of 9.3 acres of undeveloped land surrounding and including EW014 (Figure 3-2) will be designated as an off-limits area in the construction drawings for each phase of construction described in Section 2 of the EIS/EIR. In addition, LAX operations personnel with vehicular access to the airfield operations area will be apprised of these off-limits areas annually.

Prior to the initiation of each phase, LAWA will review the plans and specifications for construction to ensure that adequate BMPs have been incorporated into the plans and specification to prevent a significant increase in pollutants above baseline condition from reaching EW014. The construction avoidance measures will be periodically inspected by LAWA throughout construction to ensure the efficacy of the BMPs, and corrective action will be undertaken as necessary to ensure that construction and operation master plan improvements do not result in significant increases to pollutant loads in surface water in EW014.

EW015
Construction and operations personnel would be restricted to existing maintenance roads for non-emergency activities. A buffer area of 2.5 acres of undeveloped land surrounding and including EW015 (Figure 3-2) will be designated as an off-limits area in the construction drawings for each phase of construction described in Chapter 2 of the EIS/EIR. In addition, LAX operations personnel with vehicular access to the airfield operations area will be apprised of these off-limits areas annually.

Prior to the initiation of each phase, LAWA will review the plans and specifications for construction to ensure that adequate BMPs have been incorporated into the plans and specification to prevent a significant increase in pollutants above baseline condition from reaching EW015. The construction avoidance measures will be periodically inspected by LAWA throughout construction to ensure the efficacy of the BMPs, and corrective action will be undertaken as necessary to ensure that construction and operation master plan improvements do not result in significant increases to pollutant loads in surface water in EW015.

EW016
Construction and operations personnel would be restricted to existing roadways for non-emergency activities. A buffer area of 3.9 acres of undeveloped land surrounding and including EW016 (Figure 3-2) will be designated as an off-limits area in the construction drawings for each phase of construction described in Section 2 of the EIS/EIR. In addition, LAX operations personnel with vehicular access to the airfield operations area will be apprised of these off-limits areas annually.

Prior to the initiation of each phase, LAWA will review the plans and specifications for construction to ensure that adequate BMPs have been incorporated into the plans and

specification to prevent a significant increase in pollutants above baseline condition from reaching EW016. The construction avoidance measures will be periodically inspected by LAWA throughout construction to ensure the efficacy of the BMPs, and corrective action will be undertaken as necessary to ensure that construction and operation master plan improvements do not result in significant increases to pollutant loads in surface water in EW016.

EW001, EW002, and EW006
Three ephemerally wetted pools occupied with RFS cysts (EW001, EW002, and EW006) are proposed to be removed as a result of direct impacts (Figures 2-1and 2-2). Construction avoidance measures would be employed at these pools until soils containing embedded cysts of Riverside fairy shrimp are salvaged. Upon satisfactory completion of salvage of the soils containing embedded cysts of the Riverside fairy shrimp, construction avoidance measures would no longer be required to treat those areas.

4. Design and implement a Standard Urban Storm Water Mitigation Plan (SUSMP), as specified in Section 4.7 of the EIS/EIR. The SUSMP requires the implementation of BMPs. These source control BMPs will be incorporated into the LAX Storm Water Pollution Prevention Plan (SWPPP). The SUSMP and SWPPP will specifically incorporate sufficient measures to ensure that there is no substantial decrease in surface water quality or quantity beyond the baseline condition for the four ephemerally wetted pools located west of the proposed employee parking facility: EW009, EW012, EW013, and EW014.

   LAWA and FAA will also review the plans and specifications for construction of the employee parking facility to ensure that adequate BMPs, such as a berm, swale, or comparable measures, have been incorporated into the plans and specification to prevent construction runoff from affecting the designated buffer area for EW009, EW012, EW013, EW014, prior to the initiation of construction. The construction avoidance measures will be periodically inspected by LAWA throughout construction to ensure the efficacy of the BMPs, and corrective action will be undertaken as necessary to ensure that construction and operation of the employee parking facilities do not result in adverse impacts to surface water quality in EW009, EW012, EW013, and EW014.

5. Avoid permanent loss of soils bearing embedded cysts of the Riverside fairy shrimp in ephemerally wetted pools EW001, EW002, and EW006 by salvaging and translocating embedded cysts to created vernal pool habitat on property owned by the FAA and designated as a habitat preserve at the former Marine Corps Air Station at El Toro (El Toro), or another site as approved by CFWO. The created vernal pool(s) will contain a minimum of 5,559 square feet of vernal pool surface area (a 3:1 vernal pool creation to impact ratio). Soils bearing embedded cysts of the Riverside fairy shrimp from EW001 and EW002 will not be salvaged and translocated from LAX until the created vernal pool(s) is established and has met certain success criteria specified below. Soils bearing embedded cysts of the Riverside fairy shrimp from EW006 will be salvaged and stored prior to implementation of Alternative D and will be translocated to the created vernal pool(s) with EW001 and EW002 once the success criteria are met. As a contingency measure, if the specified success criteria for the created vernal pools have not been attained within six

years of project authorization, in spite of a good faith effort on the part of LAWA, soils bearing embedded cysts of the Riverside fairy shrimp will be salvaged from EW001 and EW002 and placed in appropriate storage at the San Diego Zoological Society's Center for the Reproduction of Endangered Species until CFWO determines that success criteria have been met and the created habitat is suitable for relocation of the soils.

6. Meet success criteria for the created vernal pool(s), including holding water for a minimum of 60 days, having less than 10 percent absolute cover of exotic herbaceous species in the pool(s), having less than 20 percent absolute cover of exotic herbaceous species within 300 feet of the area from limits of the pool, and provide suitable water quality for Riverside fairy shrimp. The duration of inundation will be determined by filling the pool(s) artificially and monitoring water depth at the same location(s) within pool(s) for a period of at least 60 days. Exotic plant species removal will be undertaken in accordance with methods approved by CFWO. All non-herbaceous plant species will be removed annually from within the pool and within 300 ft from the pool. The performance criteria for percent absolute cover of exotic herbaceous species within 300 feet of the area from the limits of the pool may be redesignated by mutual agreement of FAA, LAWA, and CFWO. Water quality will be analyzed to determine that appropriate conditions (e.g., alkalinity, total dissolved solids, pH) exist for Riverside fairy shrimp survival. Every effort will be made by LAWA and FAA to meet the 60-day minimum duration of inundation, meet appropriate water quality conditions, and successfully remove exotic plant species within the first year after vernal pool creation. Upon meeting success criteria and approval from CFWO, soils embedded with cysts of the Riverside fairy shrimp will be salvaged and translocated from EW001 and EW002, and stored soils from EW006 will be brought to the pool(s).

Vernal Pool Creation, Maintenance, and Monitoring Plan

A "Vernal Pool Creation, Maintenance, and Monitoring Plan," containing a complete list of success criteria for vernal pool creation will be generated by LAWA and the FAA and submitted to CFWO within 75 days of issuing this Biological Opinion for review and approval. The report will include a time line approved by CFWO describing when the creation of vernal pool(s) will be completed and when the vernal pool habitat is to meet each success criteria. This report will also include a detailed cost estimate for meeting the success criteria related to offsite relocation of soils bearing embedded cysts of the Riverside fairy shrimp, including entitlement for use and designation for long-term conservation, site preparation, habitat creation, monitoring, and maintenance and will be submitted to CFWO for review and concurrence.

7. Develop and provide the CFWO with vernal pool creation plans that will contain detailed descriptions of the vernal pool creation methods including information regarding reconstruction topography, maintenance activities, hydrology studies, and protection measures for the created vernal pools. The plan will be provided to the CFWO within 75 days of the issuance of this biological opinion for review and approval.

8. Be responsible for all costs identified in the Vernal Pool Creation, Maintenance, and Monitoring Plan and any additional costs, if any, identified in number 7 above as agreed to by FAA, LAWA, and CFWO. FAA will require, as a condition of the Record of Decision

and all related Grant-in-Aid Assurances that LAWA will be responsible for all reasonable costs identified in the Vernal Pool Creation, Maintenance, and Monitoring Plan related to offsite relocation of soils bearing embedded cysts of the Riverside fairy shrimp, including entitlement for use and designation for long-term conservation, site preparation, monitoring, and maintenance.

Relocation Site
LAWA will be responsible for all costs related to the lease or acquisition of lands, as appropriate, to support off-site relocation of soils bearing embedded cysts of the Riverside fairy shrimp from the airfield operations area. LAWA will be responsible for securing the appropriate land entitlement to ensure that the relocation will be dedicated to long-term conservation of the Riverside fairy shrimp and compatible land uses.

Site Preparation
LAWA has undertaken sufficient research to demonstrate the feasibility of the off-site relocation as an effective conservation alternative. LAWA will be responsible for all costs associated with planning, design, construction, testing, and modification of relocation sites to meet the specifications articulated in the Vernal Pool Creation, Maintenance, and Monitoring Plan.

Monitoring
LAWA will be responsible for funding implementation of a monitoring and reporting program to demonstrate successful achievement of the performance standards for off-site relocation over a 25-year period:

> Monthly during the first year, following relocation of soils bearing embedded cysts of the Riverside fairy shrimp
>
> Quarterly in the second, third, and fourth years, following relocation of soils bearing embedded cysts of the Riverside fairy shrimp
>
> Biannually in the fifth, seventh, and ninth years, following relocation of soils bearing embedded cysts of the Riverside fairy shrimp
>
> Annually in the tenth, fifteenth, twentieth, and twenty-fifth years, following relocation of soils bearing embedded cysts of the Riverside fairy shrimp

Maintenance
LAWA will be responsible for all associated annual operation and maintenance cost required to achieve the performance standards specified in the Vernal Pool Creation Maintenance, and Monitoring Plan. Operations and maintenance cost will be the responsibility of LAWA throughout the operation and maintenance of the Los Angeles International Airport.

9. Make every effort to collect all cysts (cyst bearing soil) from the entire pool surface area of EW001, EW002, and EW006 with a hand trowel when the ephemerally wetted areas at LAX are dry. However, it is expected that some small number of undetected individual

cysts will remain in the soil. The soil will be removed in chunks and kept out of direct sunlight to ensure the viability of the harvested cysts. The cysts will be stored in labeled bags or boxes that are adequately ventilated. The cysts will be kept out of direct sunlight to prevent excessive heating of the soil. The RFS cysts will be taken directly to the created vernal pool site. The inoculum will be placed in the created vernal pool(s) in a manner that preserves the orientation of the cysts within the surface layer of soil. The inoculum will be shallowly distributed within the vernal pools so that the cysts have the potential to be brought into solution upon inundation.

10. Provide the CFWO with annual monitoring reports as specified in the Vernal Pool Creation, Maintenance, and Monitoring Plan. The monitoring report, will be due on September 1, of each specified monitoring year. LAWA will submit the report to the FAA not less than 30-days prior to the September 1 due date for review and approval. The FAA will submit the approved report to the CFWO prior to the September 1, due date. The report will also discuss the effectiveness of the project as it pertains to the existing condition of the created vernal pool(s) and Riverside fairy shrimp population. To measure the effectiveness of the created vernal pool(s), the FAA and LAWA will work with the CFWO to develop long-term goals and objectives as part of their Vernal Pool Creation, Maintenance, and Monitoring Plan within 75 days of the issuance of this biological opinion. The annual monitoring reports will be submitted to the CFWO, Recovery Permit Coordinator and the Chief of the Los Angeles/Orange County Division.

11. Avoid habitat-altering activities associated with Alternative D in ephemerally wetted pools EW001, EW002, and EW006 until soils bearing embedded cysts of the Riverside fairy shrimp have been appropriately salvaged and stored, or vernal pool creation has been completed and embedded cysts have been appropriately salvaged and translocated to the created vernal pool(s).

12. Work with the CFWO to create educational materials on the ESB and RFS for integration into LAWA's public outreach programs. Educational opportunities regarding federally endangered Riverside fairy shrimp include public outreach in the form of an educational brochure made available through the LAWA Public Affairs Department; information provided on LAWA's Web site describing the ephemeral habitat required to support the species; and LAWA's outreach to local schools.

STATUS OF THE SPECIES

Riverside fairy shrimp (*Streptocephalus woottoni*)

Listing Status

The U.S. Fish and Wildlife Service listed the Riverside fairy shrimp (*Streptocephalus woottoni*) as endangered on August 3, 1993 (58 FR: 41391). A vernal pool recovery plan which includes Riverside fairy shrimp was published in September 1998 (U.S. Fish and Wildlife Service 1998). Critical habitat was designated for the species on May 30, 2001 (66 FR 29384); however, this designation was vacated on October 30, 2002, by order of the Federal District Court for the District of Columbia.

Species Description

The Riverside fairy shrimp is a small freshwater crustacean in the Family *Streptocephalidae* of the Order *Anostraca*. The species was first collected in 1979 by Dr. Clyde Eriksen and formally described as a new species in 1990 (Eng *et al.* 1990). The Riverside fairy shrimp is distinguished from similar species by its red-colored cercopods (anterior appendages), which occur on all of the ninth and 30 to 40 percent of the eighth abdominal segments (Eng *et al.* 1990). Adult fairy shrimp may grow to a length of 13 to 25 mm (0.5 to 1.0 inches) (Eng *et al.* 1990). Like other fairy shrimps, Riverside fairy shrimp swim upside down throughout their life cycle.

Habitat Affinities

Fairy shrimp are restricted to vernal pools and vernal pool-like ephemeral basins. Vernal pools are a type of ephemeral wetland that occur from southern Oregon through California into northern Baja California, Mexico (U. S. Fish and Wildlife Service 1998). They require a unique combination of climatic, topographic, geologic, and evolutionary factors for their formation and persistence. They form in regions with Mediterranean climates where shallow depressions fill with water during fall and winter rains and then dry up when the water evaporates in the spring (Collie and Lathrop 1976; Holland 1976; Holland and Jain 1977, 1988; Thorne 1984).

Downward percolation of water within the pools is prevented by an impervious subsurface layer consisting of claypan, hardpan, or volcanic stratum (Holland 1976, 1988). Seasonal inundation makes vernal pools too wet for adjacent upland plant species adapted to drier soil conditions, while rapid drying during late spring makes pool basins unsuitable for typical marsh or aquatic species that require a more persistent source of water. Upland vegetation communities associated with vernal pools include needlegrass grassland, annual grassland, coastal sage scrub, maritime succulent scrub and chaparral (U. S. Fish and Wildlife Service 1998).

Riverside fairy shrimp prefer deep (greater than 25 centimeters in depth) vernal pools that range in temperature from 10 to 25 degrees Celsius and remain filled for extended periods of time (Eng *et al.* 1990; Eriksen and Belk 1999; U. S. Fish and Wildlife Service 1993). Water within pools supporting fairy shrimp may be clear, but more commonly it is moderately turbid (Eriksen and Belk 1999). Typically, pools supporting this species have low total dissolved solids and alkalinity (means of 77 and 65 parts per million, respectively), in association with pH at neutral or just below (7.1-6.4) (Eng *et al.* 1990; Gonzalez *et al.* 1996; Eriksen and Belk 1999). Riverside fairy shrimp may also be found in disturbed vernal pool habitats where basins have been compacted or artificially deepened and therefore hold water for longer periods of time. Although basins supporting populations often appear to be artificially created or enhanced, such basins are located within soils that are capable of seasonal ponding and are often surrounded by naturally occurring vernal pool complexes. These "artificial basins" function in the same manner as naturally occurring vernal pools by filling with late fall, winter and/or spring rains that gradually dry up during the spring and/or summer (U. S. Fish and Wildlife Service 1998).

Life History

Riverside fairy shrimp are non-selective filter-feeders that filter suspended solids from the water column (Eriksen and Belk 1999). Detritus, bacteria, algal cells, and other items between 0.3 to 100

microns may be filtered and ingested (Eriksen and Belk 1999). Riverside fairy shrimp are preyed upon by a wide variety of wildlife, including beetles, dragonfly larvae, other arthropods, frogs, salamanders, toad tadpoles, shorebirds, ducks and other migratory birds, and even other fairy shrimp.

Freshwater crustaceans, including the Riverside fairy shrimp, have a multi-stage life cycle and spend the majority of their life cycle in the cyst stage (Templeton and Levin 1979; Schaal and Leverich 1981). After hatching, Riverside fairy shrimp require 48 to 56 days to reach sexual maturity in contrast with other fairy shrimp that can reach maturity in less than 2 weeks (Hathaway and Simovich 1996). Fairy shrimp mate upon reaching maturity, and female Riverside fairy shrimp produce between 17 and 427 cysts (eggs) over their lifetime (Simovich and Hathaway 1997). The cysts are either dropped by the females to settle into the mud at the bottom of the pool, or they remain in the brood sac until the female dies and sinks to the bottom (Eriksen and Belk 1999). Fairy shrimp cysts may persist in the soil for several years until conditions are favorable for successful reproduction (U. S. Fish and Wildlife 2001). The cysts will hatch in 7 to 12 days when water temperatures are between 10 and 20 degrees Celsius (Hathaway and Simovich 1996). A small percentage of cysts are likely to hatch in a season, thus providing a mechanism for survival if the inundation period is too short in a given year (Simovich and Hathaway 1997).

Status and Distribution

Prior to the discovery of the Santa Rosa Plateau fairy shrimp, the Riverside fairy shrimp was believed to have the most restricted distribution of an endemic California fairy shrimp (Eng *et al.* 1990; Simovich and Fugate 1992). Its limited range includes Ventura, Los Angeles, Orange, San Diego, and Riverside counties in southern California, and Bajamar in Baja California, Mexico (U. S. Fish and Wildlife Service 1998; Brown *et al.* 1993). With the exception of the Riverside populations and the population at Cruzan Mesa in Los Angeles County, all populations are within 10 miles of the coast over a north-south distance of approximately 125 miles.

In Ventura County, Riverside fairy shrimp are known from a single large pool in a grassland area at Carlsberg Ranch. Recent urban development adjacent to this pool appears to have affected the pool's hydrology (Rick Ferris, U. S. Fish and Wildlife Service, pers. comm. to J. Snapp-Cook, U. S. Fish and Wildlife Service, October 20, 2003).

In Los Angeles County, the species occurs at two locations: LAX and Cruzan Mesa. The CFWO has recently been informed that the pools at Cruzan Mesa may have been recently disced (J. Snapp Cook pers. comm 2004). There is unsurveyed vernal pool habitat at a polluted industrial site in Torrance and pools at Madrona Marsh where an extremely small number of cysts were found, however these cysts have not been conclusively identified to species (J. Snapp-Cook 2004). Habitat at LAX has been heavily impacted by regular scraping and draining of ponding areas; however, Riverside fairy shrimp cysts persist in the soil. The RFS habitat at LAX is found on approximately 198 acres (80 ha) of open space on the LAX airfield. This landscape historically included the federally endangered California Orcutt grass (*Orcuttia californica*) and San Diego button-celery (*Eryngium aristulatum* var. *parishii*) (Mattoni and Longcore 1997). This unit also supports versatile fairy shrimp (*Branchinecta lindahli*) and western spadefoot toad (*Scaphiopus hammondii*). Riverside fairy shrimp cysts were first collected east of Pershing Drive in 1997. Considering the extensive habitat once available, populations of Riverside fairy shrimp in this

region were likely robust and formed the core population between the limited Cruzan Mesa and Carlsberg Ranch pools, at the northern end of the range of the species, and the pool groups in central and southern Orange County (Mattoni and Longcore 1997). This area is biologically unique because it represents the last remaining remnants of a large historical vernal pool complex in the Los Angeles Basin.

Research on the San Diego fairy shrimp (*Branchinecta sandieonensis*) has shown that geographically distinct populations are genetically distinct (Bohonak 2003). It is likely that isolated populations of Riverside fairy shrimp have unique genetic differences as well. Genetic diversity is important to small populations because diversity decreases inbreeding and outbreeding depression and increases the populations ability to adapt to varying environmental conditions, including climate changes and disease outbreaks. The preservation of genetic diversity can also provide insight into the evolutionary history of a species that can be helpful for its future preservation. At Cruzan Mesa, upland vegetation associated with the two occupied pools has recently been removed, which may result in siltation of the pools (Rick Ferris, U. S. Fish and Wildlife Service, pers. comm. to J. Snapp-Cook, U. S. Fish and Wildlife Service, October 20, 2003).

In Orange County, RFS occur at El Toro, Edison Viejo Conservation Bank, Saddleback Meadows, O'Neill Regional Park, Live Oak Plaza, Tijeras Creek, Chiquita Ridge, and Radio Tower Road. These pools are generally formed by depressions in slumping earth or impounded ephemeral streams (Riefner and Pryor 1996). Many of these pools have been degraded by grazing and urban development. The Orange County pools create a string of RFS habitat along the Orange County foothills. The northernmost end of the string is the small degraded pool at El Toro. Site visits during the winter of 2004 indicate that this pool has been degraded and will not retain water to support RFS.

In north coastal San Diego County, the Riverside fairy shrimp occurs in vernal pools on Marine Corps Base Camp Pendleton and in a pool in the City of Carlsbad (Recon 2001). The pools on Marine Corps Base Camp Pendleton are affected by training exercises; the pool in Carlsbad is conserved but is surrounded by urban development. In central San Diego County there is a single occupied pool on Marine Corps Air Station Miramar that was burned during the 2003 wildfires. In southern San Diego County the species occurs in pools on Otay Mesa near the U. S./Mexico border. There has been significant work done to restore and enhance vernal pools for listed species including the Riverside fairy shrimp at two sites on Otay Mesa. Some occupied pools on Otay Mesa are threatened by off-road vehicle activity and urban development (The Environmental Trust 2003).

In western Riverside County, there are seven naturally occurring populations, one created population, and one proposed population of Riverside fairy shrimp. The pools in Riverside County are significant since they represent the most inland extent of the species range (Eriksen and Belk 1999). Also, the type locality for the species, which is of taxonomic significance, was located within the County (Eriksen 1988). Habitat within Riverside County is ideal for the species. Riverside County harbors large vernal pools with relatively warm water that persist for long periods of time, allowing this slow-maturing species to reproduce. One of these pools, the Skunk Hollow Pool, is the largest valley vernal pool remaining in all of southern California (Eriksen and Belk 1999).

Threats

Threats to the Riverside fairy shrimp can be divided into three major categories: 1) direct destruction of vernal pools as a result of construction, vehicle traffic, domestic animal grazing, dumping, and deep plowing; 2) indirect threats which degrade or destroy vernal pools over time such as alteration of hydrology (*e.g.*, damming, draining), invasion of alien species, habitat fragmentation, and deleterious effects resulting from adjoining urban land uses; and 3) long-term threats including the effect of isolation on genetic diversity and locally-adapted genotypes, air and water pollution, drastic climatic variations, and changes in nutrient availability (Bauder 1986; U. S. Fish and Wildlife Service 1993).

Conservation Needs

Conservation efforts for the Riverside fairy shrimp should address habitat loss and degradation resulting from both direct and indirect impacts to vernal pools, which are the major causes of decline for the species. Existing vernal pools, ephemeral basins, and their watersheds should be secured from further loss and degradation in a configuration that maintains habitat function and species viability (U. S. Fish and Wildlife Service 1998).

El Segundo Blue Butterfly (*Euphilotes battoides allyni*)

Listing Status

The U. S. Fish and Wildlife Service listed the El Segundo blue butterfly (*Euphilotes battoides allyni*) as endangered throughout its entire range on June 1, 1976 (41 FR: 22041). A recovery plan for ESB was published in September 1998 (U. S. Fish and Wildlife Service 1998). Critical habitat was proposed for the species on February 8, 1977 (42 FR 7972); however, the designation was not finalized by the Service.

Species Description

The ESB is one of five subspecies of the square-spotted blue butterfly (*Euphilotes battoides*) and is endemic to southern California. The adults have a wingspan of 0.75 to 1.25 inches. The wings of the males are a bright blue color with an orange border on the rear of the upper hindwings. The females are a dull brown color with an orange border on the upper distal surface of the hindwings.

Life History

The ESB exclusively inhabits the El Segundo sand dunes and is intimately tied to the coast buckwheat (*Eriogonum parvifolium*) throughout its life cycle. The ESB undergoes four major phases of maturation (complete metamorphosis), egg, larvae, pupae, and adult. The life span of the ESB is about one year, however, some pupae will remain in diapause for two years or more. Adult ESB are active from mid-June through the beginning of September. Coast buckwheat is the food source, breeding site, and incubation site for the ESB. Adults emerge from their pupae and fly directly to flowering heads of the coastal buckwheat. ESB are described as sedentary, but formal and informal mark/recapture studies indicate that adult dispersal can occur infrequently. Upon arrival at the flower heads, females begin mating with males that are moving constantly from

flower head to flower head. Immediately after mating, the females begin laying eggs that hatch in three to five days and larvae will undergo four instars prior to pupation in 18 to 25 days. ESB larvae have a symbiotic relationship with ants. During the third instar, ESB larvae develop an eversible tube and glands that secrete a fluid that attracts ants. The attracted ants tend to the larvae, protecting them from predators and parasites. Each larvae will require 2-3 flower heads during its development. In September the ESB pupates when inflorescence become senescent and the pupae winter either underground or within the leaf litter.

Little is known about the predators of the ESB. It is assumed that crab and lynx spiders capture mature ESB. Braconid wasps and tachinid flies parasitize ESB eggs on flower heads in the dunes (Arnold 1986).

Status and distribution

ESB are currently found exclusively within the El Segundo sand dunes. The El Segundo dunes complex historically covered an area of about 4.5 square miles, stretching from the mouth of Ballona Creek south to the Palos Verdes Peninsula. The dunes were bordered on the west by the Pacific Ocean and continued inland approximately one-half mile. Museum specimens of ESB were collected in El Segundo, Redondo Beach, Manhattan Beach, and on the Palos Verdes Peninsula (Donahue 1975). Recently, ESB have been found at the Ballona Wetlands, LAX Dunes, Chevron butterfly preserve, and Malaga Cove. Each of these areas represents a recovery unit within the ESB Recovery Plan (U. S. Fish and Wildlife Service 1997).

The Ballona recovery unit is the northern most unit and extends south to Westchester Boulevard. It contains two sites with suitable habitat for ESB. Ballona Lagoon has a degraded dune with seven acres of degraded habitat. A small portion of the seven acres was planted with native vegetation and coastal buckwheat plants, but was later altered by a lagoon restoration project. Another privately owned six-acre site in the Ballona Wetlands is where one male was observed in 1987 (Mattoni 1992).

The LAX recovery unit is the largest remaining undeveloped coastal sand dune system in southern California (U. S. Fish and Wildlife Service 1997). It also contains what is believed to be the largest remaining population of ESB. Population estimates for ESB vary greatly from year to year and there is disagreement regarding the survey methods employed to estimate the ESB population. The 2002 survey at the LAX dunes estimated the population to be between 52,000 and 54,000 ESB (Arnold 2002a). The 2003 population estimate was between 105,000 and 109,000 (Arnold 2003a). It is quite possible that the current population estimate model used by LAX has significantly overestimated the size of the ESB population (Longcore and Rich 2001). The 2002 survey also noted the coast buckwheat population is declining and showed that the current rate of recruitment would not be sufficient to replace the growing number of senescent plants. The size of the population and the status of the LAX dunes as a preserve for ESB and other coastal dune dependent species makes this recovery unit the cornerstone for the survival and recovery of ESB (U. S. Fish and Wildlife Service 1997).

The El Segundo recovery unit is immediately south of the LAX Dunes unit. The unit contains a 1.6-acre site owned and managed by the Chevron Corporation. The estimated number of ESB and host plants in 2002 was between 9,500 and 9,900 ESB and 907 coast buckwheat host plants

(Arnold 2002b). The population estimates for ESB on the Chevron reserve use the same method as the LAX dunes reserve, and may overestimate the number of butterflies on the site. The host plant population had declined 23 percent from the previous year (Arnold 2002b). There is also a 30-acre site east of the Hyperion sewage treatment plant that lies between the LAX dunes and the Chevron site. There was one butterfly observed on this site in the1980's (Mattoni 1992). The Hyperion site may serve as a movement corridor between the LAX dunes and the Chevron site.

The Torrance recovery unit is the southern most unit extending south to the Palos Verdes Peninsula. There are several scattered areas along the beach bluffs that support coast buckwheat and ESB. These areas are scattered and located primarily on private property. A "Safe Harbors Agreement" has been implemented for this recovery unit. The agreement, administered by the Urban Wildlands Group, allows private landowners to carry out some low-impact shoreline development while maintaining and improving ESB habitat.

Threats

The major threat to the ESB is the loss of habitat to non-native, invasive, plant species and the isolation of small populations caused by the loss of habitat. In the last 25 years, there has been a significant amount of construction activity and manipulation of the LAX dunes, resulting in the invasion of exotic flora and fauna. Of the 20 native mammal species on the LAX dunes, all but three have been extirpated (U. S. Fish and Wildlife Service 1997), and of the 31 native butterfly species found on the LAX dunes, seven have been extirpated (Mattoni 1990a). Seven of 18 reptile and amphibian species have been extirpated, and all five scrub dependent birds have been extirpated from the LAX dunes (Mattoni 1990a).

The current age structure of the coast buckwheat population is shifting towards older decadent and senescent plants. Depending on the rates of recruitment and senescence, the population of coast buckwheat plants may not replace itself naturally, which could result in a catastrophic collapse of the ESB population. Small and isolated populations can be particularly sensitive to even the most mild habitat perturbations, disease outbreaks, natural catastrophes, and demographic stochasticity (Gilpin and Soule' 1986). This puts ESB at a high risk of population collapse because of the isolation of habitats, relatively small number of individuals, limited ability to disperse, and dependence on a specific habitat and host plant.

In addition to the loss of habitat there have been problems of recreational vehicle and pedestrian trespassing within the ESB preserve resulting in significant habitat degradation ®. Mattoni pers. obs, C. Nagano pers. obs.). Collecting and population sampling can also present a significant threat to small populations. In 1995 three poachers were convicted in the collection and trafficking of protected butterflies, including the ESB (Williams 1996).

Conservation needs

The future conservation of ESB depends on the maintenance of the relic El Segundo sand dunes and coast buckwheat habitat. The ESB's reliance on coast buckwheat necessitates an active habitat management and monitoring program that assures the long-term viability of a food source for ESB. A better understanding of the ESB's life history and ecosystem is necessary to assure the long-term conservation of the species in its natural habitat. The acquisition or long-term conservation of the

El Segundo sand dunes is necessary to reduce the isolation between ESB sub-populations and facilitate the movement of butterflies between sub-populations.

ENVIRONMENTAL BASELINE

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

According to 50 CFR § 402.02 pursuant to section 7 of the Act, the "action area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area as determined by our agency. Because the action area is a biological determination that must incorporate direct, indirect, and interrelated/interdependent effects to federally listed species and their habitats, it may differ from the scope of analysis used under the National Environmental Policy Act as defined in Paragraph 7(b) of Appendix B of 33 CFR 325. For the purpose of this consultation the action area will be defined as the El Segundo blue butterfly reserve, the RFS habitat and associated watersheds located on the western end of the LAX, and the 905 acres of FAA-owned land at El Toro.

LAX Airfield

The western two-thirds of LAX were once a part of the LA Coastal Prairie and El Segundo sand dunes (Mattoni and Longcore 1997; U. S. Fish and Wildlife Service 1997). The coastal prairie was approximately 95 square kilometers of rolling herbaceous grassland with an extensive system of vernal pools. The prairie started in the north at Ballona Creek and ran south to the Palos Verdes Peninsula. The vegetative composition of the prairie was dominated by annual grasses and forbs as well as plant species associated exclusively with vernal pools (Mattoni and Longcore 1997). The LA coastal prairie has become highly altered due to agricultural practices and development pressures. In the early 1920's the vast majority of LAX was an agricultural field. It was then leased by William M. Mines and used as an airfield. By the late 1920's the City of Los Angeles (City) leased the field and in 1930's the City purchased the airfield and commercial operations began. After World War II, the City renamed the airport to LAX. By the early 1960's the development and expansion of LAX to its current size was complete. In the late 1960's and early 1970's, the residences on the El Segundo sand dunes west of LAX were purchased and removed. Between 1988 and 1992, a prairie restoration effort was carried out on 12 hectares of the lee side of the El Segundo dunes. The active restoration effort has since been abandoned and the current condition of the area is uncertain.

Today the LAX airfield is located southwest of downtown Los Angeles, in the southwestern portion of Los Angeles County, California. LAX is 3,350 acres of which 900 acres are open space. Of the 900 acres of open space, 302 acres consist of the El Segundo sand dunes. LAX is bounded by Dockweiler State Beach to the west, Westchester Parkway to the north, Aviation Boulevard to the east, and Interstate 105 to the south.

A total of twenty potential vernal pool sites were surveyed by RECON (1998). RFS cysts were found in nine ephemerally wetted pools, covering 1.3 acres of the airfield (Figure 1 and 2). Two occupied ephemerally wetted pools EW001 and EW002 are located north of an existing paved maintenance road, east of Pershing Drive, and south of Westchester Parkway (Figure 2-1). The watershed for these two ephemerally wetted pools is defined by the landscaped berm located south of Westchester Parkway, and the paved maintenance road. The two pools have been highly altered due to cut and fill activities resulting in a non-native grass/ruderal plant community.

Three ephemerally wetted areas occupied by RFS, EW009, EW012, and EW013, are located north of an existing dirt road, east of Pershing Drive, south of World Way Drive, and west of the proposed employee parking facility (Figure 2-2). The watershed for these three ephemerally wetted areas is defined by a road that circumscribes the area on the north, west, and south. EW006, which is occupied by RFS, is located at the western edge of the proposed employee parking structure and appears to be used by U. S. Customs as a dog run (J. Snapp Cook, U. S. Fish and Wildlife Service pers. obs. 2004). Occupied pool EW014 is located south of EW009, EW012, and EW013 and is a retention basin that captures water from the airfield preventing flooding of Pershing Drive. EW015 and EW016 are located on the southwestern portion of the airfield (Figure 2) and are both occupied by RFS cysts.

RECON surveyed LAX for Federally threatened and endangered vernal pool species in 1997 and 1998. The results of the wet season survey were negative for listed vernal pool species. The dry season surveys revealed the presence of RFS cysts. The RECON report characterizes the ephemeral pool habitat on the western portion of LAX as "very poor quality," not supporting vernal pool anostracans, and having "no live samples" of RFS. In light of the poor habitat conditions on the airport and no mature RFS present during wet season surveys, RECON concluded that they "consider it likely that *S. woottoni* has been extirpated from the site (RECON 1998)."

Cysts and soil samples were later analyzed by Jones and Stokes Associates (1999). The samples were examined and the collected cysts were hatched and the nauplii were reared to adulthood revealing the cysts to be RFS. Additionally, RFS exuviae were found within the soil samples. Based on this information, Jones and Stokes Associates (1999) concluded that "a population of (RFS) occurs at the LAX project site."

Table 1. Results of 1997/1998 wet and dry season surveys for fairy shrimp on LAX (adapted from RECON 1998).

Pool number	Pool area (feet^2)	Wet Season Survey Result	Dry Season Survey Result
1	123	*Branchinecta lindahli*	*Branchinecta sp.* *Streptocephalus woottoni*
2	292	*Branchinecta lindahli*	*Branchinecta sp.* *Streptocephalus woottoni*
3	74	No water	
4	95	No water	
5	212	No water	
6	1,438	None	*Branchinecta sp.* *Streptocephalus woottoni*
7	275	None	None
8	5,760	*Branchinecta lindahli*	*Branchinecta lindahli*
9	577	*Branchinecta lindahli*	*Streptocephalus woottoni*
10	312	*Branchinecta lindahli*	
11	809	*Branchinecta lindahli*	
12	548	*Branchinecta lindahli*	*Streptocephalus woottoni*
13	4,808	*Branchinecta lindahli*	*Streptocephalus woottoni*
14	39,199	*Branchinecta lindahli*	*Branchinecta sp.* *Streptocephalus woottoni*
15	2,086	*Branchinecta lindahli*	*Branchinecta sp.* *Streptocephalus woottoni*
16	3,936	*Branchinecta lindahli*	*Branchinecta sp.* *Streptocephalus woottoni*
17	13,719	*Branchinecta lindahli*	Not Sampled
18	1,659	*Branchinecta lindahli*	Not Sampled
19	807	*Branchinecta lindahli*	Not Sampled
20	1,691	None	Not Sampled

In 1999, the Service observed mature versatile fairy shrimp in the ephemeral pools located on the western end of LAX indicating they contained water for two to three weeks (K. Clark and D. Zoutendyk, U. S. Fish and Wildlife Service, pers. comm. 2003). The LAX airfield currently possesses plant species and physical site conditions that indicate water can pond in these areas (J. Snapp-Cook U. S. Fish and Wildlife Service pers. com 2004).

El Segundo Dune Complex

Historically, the El Segundo dunes system was dominated by coastal dune scrub. The dunes were covered by coast buckwheat (*Eriogonum parvifolium*), dunes goldenbrush (*Haplopappus eriocoides*), dunes wall flower (*Erysumum suffrutesecens*), dunes sun-cup (*Camissonia cheiranthifolia*), dunes burr-brush (*Ambrosia chamissonis*) and California croton (*Croton californica*) along with several other rare and endemic plant species (U. S. Fish and Wildlife Service 1998). In 1987, 1990, and 1992 the California Coastal Commission approved three interim ecological restoration plans. Through these efforts, the California buckwheat (*Eriogonum fasciculatum*) was removed from the restoration area. The restoration was carried out in response to a 1984 study by the California Department of Fish and Game (CDFG) that determined the ESB population was depressed due to competition with moths and butterflies which inhabit the California buckwheat plants. After removal of the California buckwheat was completed, coast buckwheat plants were established on the dunes. This large scale restoration effort provided a significant improvement in the habitat for ESB.

The ESB are currently in their highest concentrations on the lee side of the southern portion of the dunes. In recent years the ESB population has been relatively large. At the same time that the number of butterflies has increased, the total number of coast buckwheat plants has been declining (Arnold 2002a; 2003). It appears the age structure of the coast buckwheat population at LAX is shifting towards a more mature, decadent, and smaller population (Arnold 2003). The number of flower heads has been high in the last few years, but an increasing number of plants are becoming senescent and the number of juvenile recruits is not keeping up with the loss of reproductive plants. If this trend continues, a collapse of the buckwheat population on the LAX ESB preserve is likely. Arnold (2002a; 2003) recommends that LAX resume its active management of the ESB preserve and reinstate the coast buckwheat propagation and planting program.

In the northern portion of the preserve, where the specific impacts to the El Segundo dune complex are proposed, the past restoration efforts and coast buckwheat plantings have been largely unsuccessful. There are very few coast buckwheat plants in the approach lighting impact area (existing navigational aid system) and it is unlikely that further restoration within the approach lighting impact area would be successful (I. Mendez, Sapphos Environmental, pers. comm. 2004). Based on previous surveys for ESB in the existing and proposed navigational aid system areas on the El Segundo dune complex, densities for ESB are expected to be very low.

El Toro

The FAA owns approximately 905 acres of land east of Irvine Boulevard at El Toro. The site is comprised of coastal sage scrub, riparian scrub, annual and native grassland, and disturbed or tilled areas. In the northeastern corner there is a highly disturbed site known as the EOD range, where RFS cysts were found in an artificial pond created on the air station. Presently, the pond does not

appear to hold water (M. Bianchi and J. Snapp-Cook per. obs. 2004). There are areas in the grasslands that appear to pond water that could be enhanced to a condition that would support vernal pools and RFS.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Riverside fairy shrimp

Direct effects

Most of the RFS cysts located in two occupied pools (EW001 and EW002) on the northern portion of LAX and EW006 (dog run) will be removed from the soil for inoculation of created pools elsewhere prior to any Alternative D construction-related effects would occur. However, any remaining cysts in these three pools will be crushed or buried by grading and fill activities associated with the runway alignment and extension and parking structure development. The ground disturbance and re-contouring of the airfield where these pools occur, will permanently eliminate the habitat and likely bury the cysts to a depth at which they could not complete their life cycle. The amount of occupied RFS habitat expected to be permanently impacted totals approximately 1,825 square feet (.04 acres).

The proposed project includes harvest and translocation of RFS cysts from EW001, EW002, and EW006 to created vernal pools off site. Some cysts may be damaged in the harvesting process while removing them from the above mentioned pools with a hand trowel. In addition, some small number of cysts may be damaged in the translocation process.

Indirect effects

The SUSMP and SWPPP are expected to maintain the current baseline for quantity and quality of water within the avoided and occupied pools EW009, EW012, EW013, EW014, EW015, and EW 016. No indirect impacts specifically attributable to Alternative D are expected.

Conservation measures

LAWA and the FAA will avoid EW009 and EW012-016 with a total basin area of 1.2 acres, which represents approximately 97 percent of the total occupied pool area on LAX.

To address the loss of EW001, EW002, and EW006, LAWA will develop and fund the creation of an off-site vernal pool(s) that meets CWFO approved success criteria. The FAA and LAWA will harvest and translocate RFS from EW001, EW002, and EW006 to the created vernal pool(s) off-

site. The FAA and LAWA will also develop a vernal pool creation, management, and monitoring plan that will ensure the long-term conservation and viability of RFS in the vernal pool(s) created off-site.

El Segundo Blue Butterfly

Direct effects

It is estimated that a total of two coast buckwheat plants will be directly affected by the installation of the lighting system. The removal and relocation of the two coast buckwheat plants will likely result in the loss of any ESB larvae or pupae associated with that particular plant due to elimination of its food source. However, because of the poor quality of ESB habitat in the impact area, it is unlikely that these actions will directly impact more than a small number of ESB.

The removal and relocation of the buckwheat plants along with the loss of 0.25 acres of ESB habitat may have some small adverse effects to the ESB population's size and distribution, however these impacts will be minimal due to the poor habitat condition within the impacted area.

Indirect effects

Increased light and photo period has been shown to increase the growth and productivity of butterflies and moths, however, the production is typically off set by predation (Gotthard 2000). The increased lighting in the preserve, during evening hours, may increase the activity period of adult ESB. However, the new lighting system is proposed for an area of the El Segundo dune complex that contains very low densities of ESB and coast buckwheat. Further, the lights are designed to illuminate the sky rather than the ground.

Conservation measures

Restoration is planned for currently occupied areas where coast buckwheat densities are low. Sub-site 23 of the ESB preserve currently contains low densities of coast buckwheat and low numbers of ESB (Sapphos 2000) and is the proposed location for the restoration of 1.25 acres of sparsely populated ESB habitat. The improvements are expected to yield increases in butterfly numbers within three years. The restoration efforts will be completed approximately three years prior to the installation of the navigational lighting system. Therefore, the positive effects of the restoration effort are expected to be evident prior to the loss of the 0.25 acres of habitat from the installation of the lighting system. Also, FAA and LAWA will submit a monitoring report after the navigational aid system is in place and during the first subsequent ESB flight period to document ESB behavior with respect to the lighting system.

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 that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any future non-Federal actions that re reasonably certain to occur within the action area and may affect RFS.

CONCLUSION

After reviewing the current status of the RFS, ESB, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of RFS or ESB. Our conclusion is based on the following reasons:

1. The loss of EW001, EW002, and EW006 represents a small proportion of the ephemerally wet areas occupied by RFS on LAX.

2. LAWA and the FAA's commitment to create and conserve vernal pool habitat at El Toro will benefit the species by expanding the range of RFS to areas where they were historically present, increase the total amount of vernal pool habitat for RFS, and expand the limited body of knowledge regarding RFS habitat creation and restoration.

3. The FAA and LAWA's commitment to meeting success criteria for the created vernal pools prior to the inoculation will maximize the probability of RFS completing their life cycle at El Toro.

4. The harvesting and handling methods proposed by the FAA and LAWA will ensure that a minimum number of cysts are lost from the harvesting and translocation activities.

5. The 0.25 acres of habitat lost in the ESB reserve is of poor quality and will be offset by the restoration of 1.25 acres of high quality habitat in sub-area 23 on the southern area of the reserve.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to wildlife 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. 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), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary and must be undertaken by the FAA and/or LAWA as appropriate, in order for the exemption from section 7(o)(2) to apply. The FAA has a continuing duty to regulate the activity that is covered by this incidental take statement. If the FAA fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or fails to retain oversight to ensure

compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. To monitor the impacts of incidental take, the FAA and/or LAWA must report the progress of the action and its impact on the species to our agency as specified in the incidental take statement [50 CFR § 402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE

Riverside fairy shrimp

The Service anticipates that the majority of RFS cysts within EW001, EW002, and EW006 will be salvaged from these ponds and that a small portion of these cysts will be taken in the form of direct mortality and/or injury through the collection, translocation and use of these cysts in the created vernal pool(s) offsite as approved by the Service. In addition, the Service anticipates that the relatively few cysts remaining within EW001, EW002, and EW006 after harvesting will be taken in the form of direct mortality through filling of these pools by the proposed project.

El Segundo blue butterfly

A small but unquantifiable number of El Segundo blue butterfly pupae will be killed as a result of ground disturbance and the loss of their food source from the removal and translocation of two coast buckwheat plants for the installation of the navigational lighting system. The number of butterfly pupae that will be killed is expected to be small because the two coast buckwheat plants being removed are from an area that has contained only very low densities of ESB.

EFFECT OF THE TAKE

In the accompanying biological opinion, we have determined that this level of anticipated take is not likely to result in jeopardy to RFS or ESB.

REASONABLE AND PRUDENT MEASURES

We have not identified any additional reasonable and prudent measures beyond the minimization measures, committed to by the applicant and described in the project description of this biological opinion, that are necessary or appropriate to further minimize the incidental take of RFS or ESB during project implementation.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Corps must comply with terms and conditions which implement the reasonable and prudent measure described above. Since no further reasonable and prudent measures are identified, no terms and conditions are necessary.

Disposition of Sick, Injured or Dead Specimens

The CFWO is to be notified within three working days should any threatened or endangered species be found dead or injured during this project. Notification must include the date, time, and location of the carcass, and any other pertinent information. The CFWO contact person is Michael

Bianchi and may be contacted at the letterhead address or at (760) 431-9440.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit if endangered sand threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend FAA and LAWA resume active restoration and management within the El Segundo blue butterfly preserve. Activities should include weed removal, active planting of coast buckwheat plants to replace the decadent and senescent plants, and plan for further restoration activities.

2. We recommend FAA and LAWA review and, if necessary, revise the quantitative methods used to estimate the populations of ESB at LAX and Chevron preserves.

REINITIATION NOTICE

This concludes formal consultation for the LAX Master Plan as outlined in materials submitted to us. As provided in 50 CFR § 402.16 reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; and (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this 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 cease pending reinitiation. Any questions or comments should be directed to Michael Bianchi of my staff or me at (760) 431-9440.

Sincerely,

for Karen A. Goebel
Assistant Field Supervisor

cc:
Jim Ritchie (Los Angeles World Airports)

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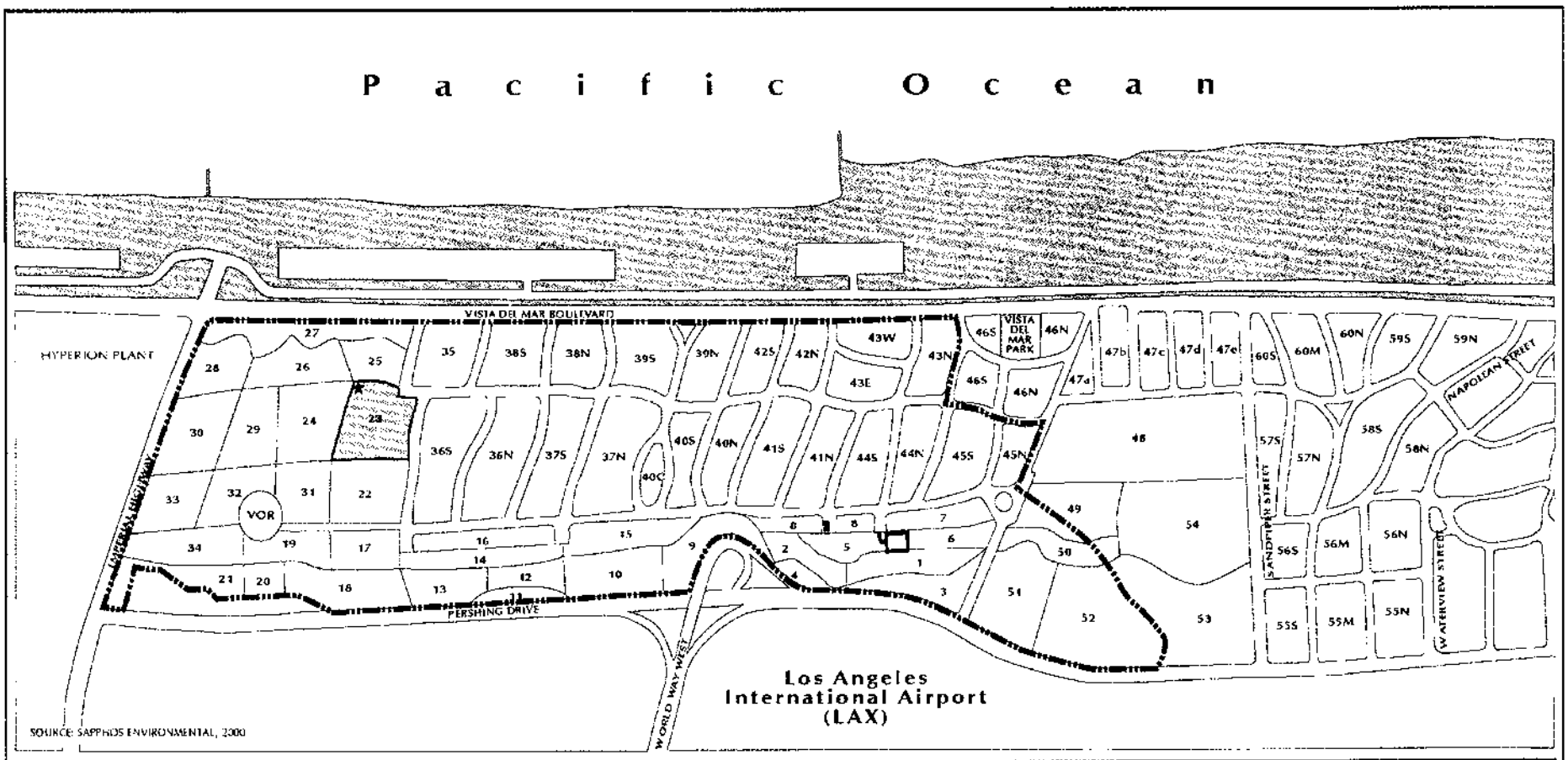

LAX Master Plan EIS/EIR	**Site for El Segundo Blue Butterfly Relocation**	Figure 1-1

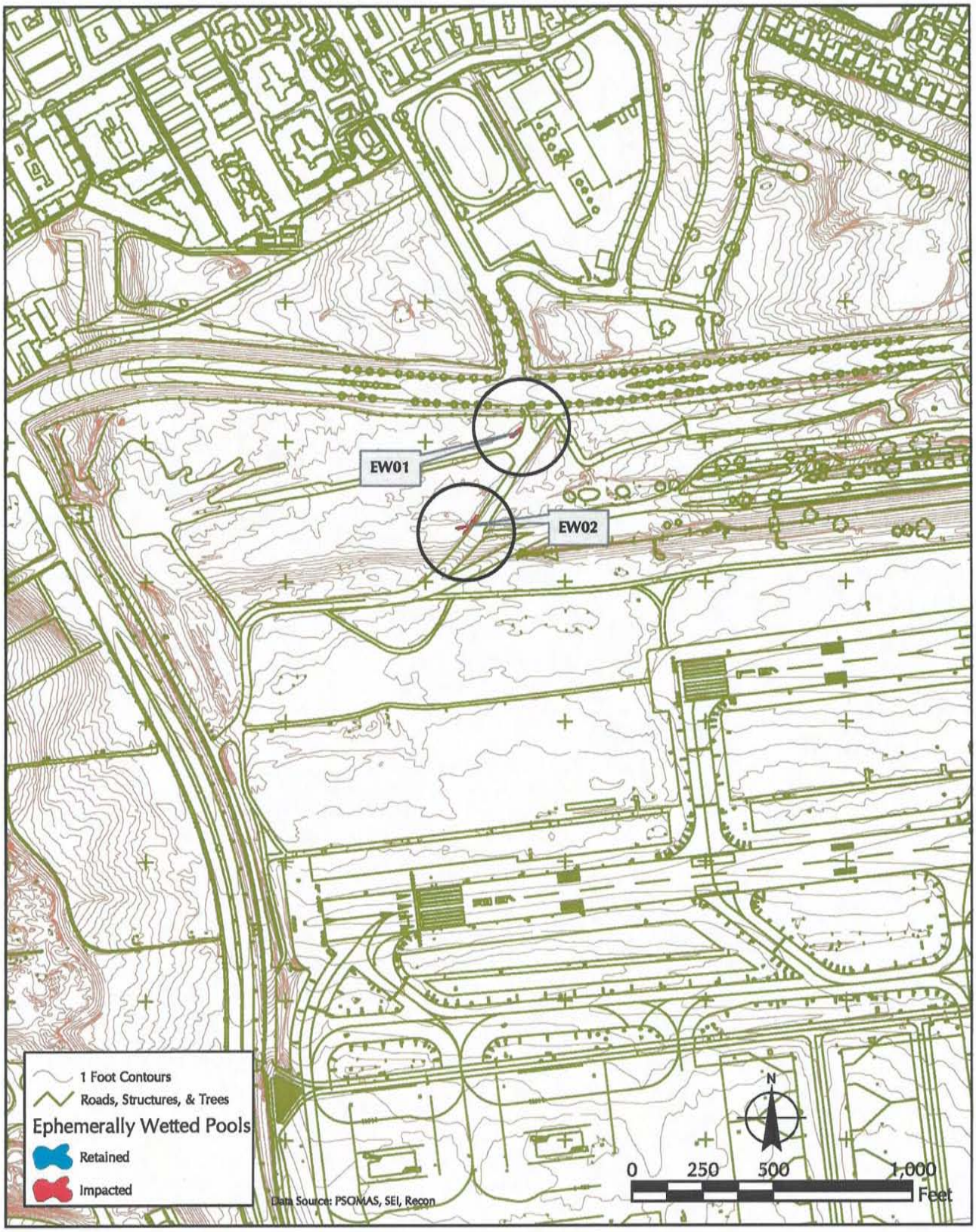

Figure 2-1
LAX Master Plan EIS/EIR Alternative D
North Area Ephemerally Wetted Pools Occupied by Riverside Fairy Shrimp

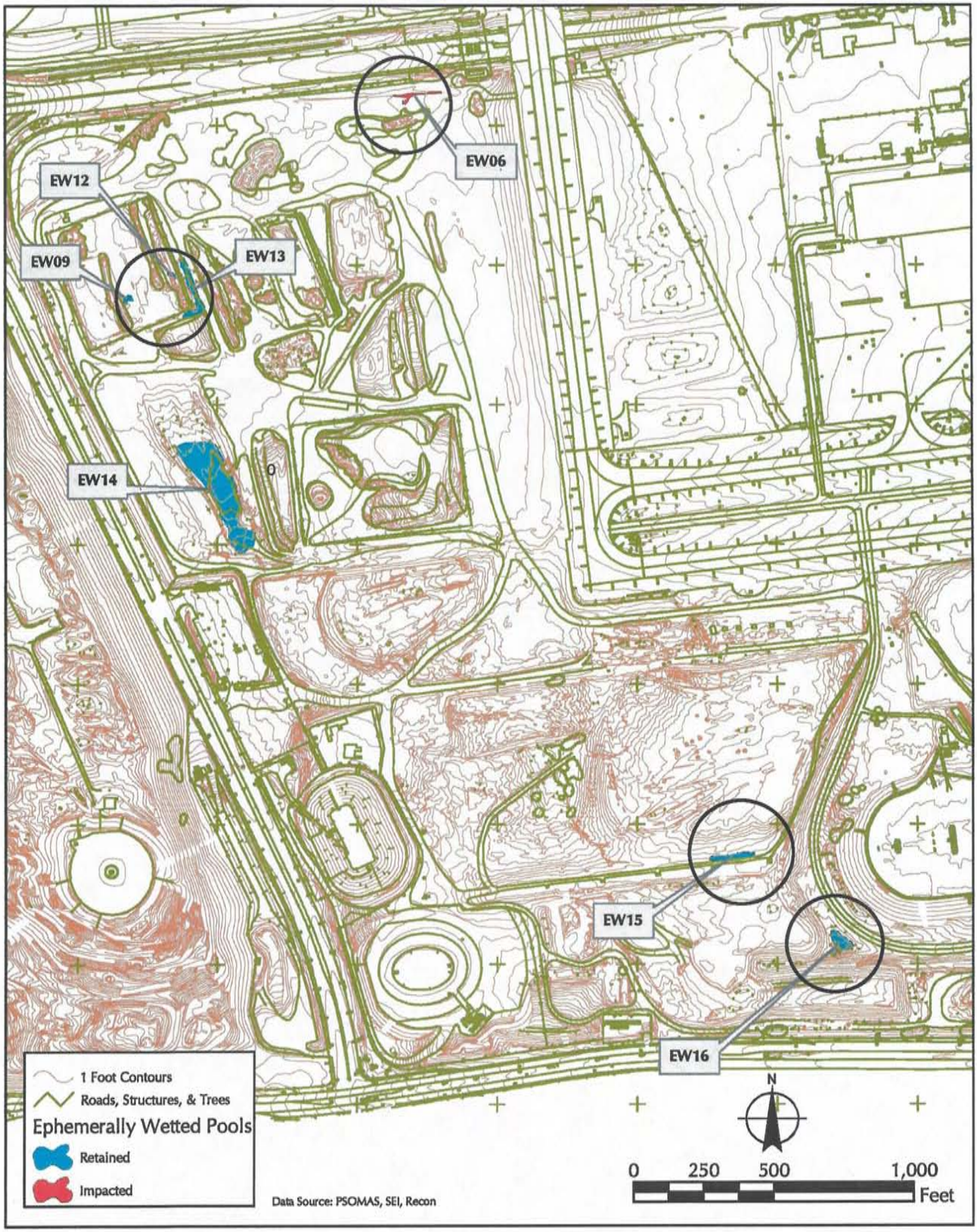

Figure 2-2
LAX Master Plan EIS/EIR Alternative D
South Area Ephemerally Wetted Pools Occupied by Riverside Fairy Shrimp

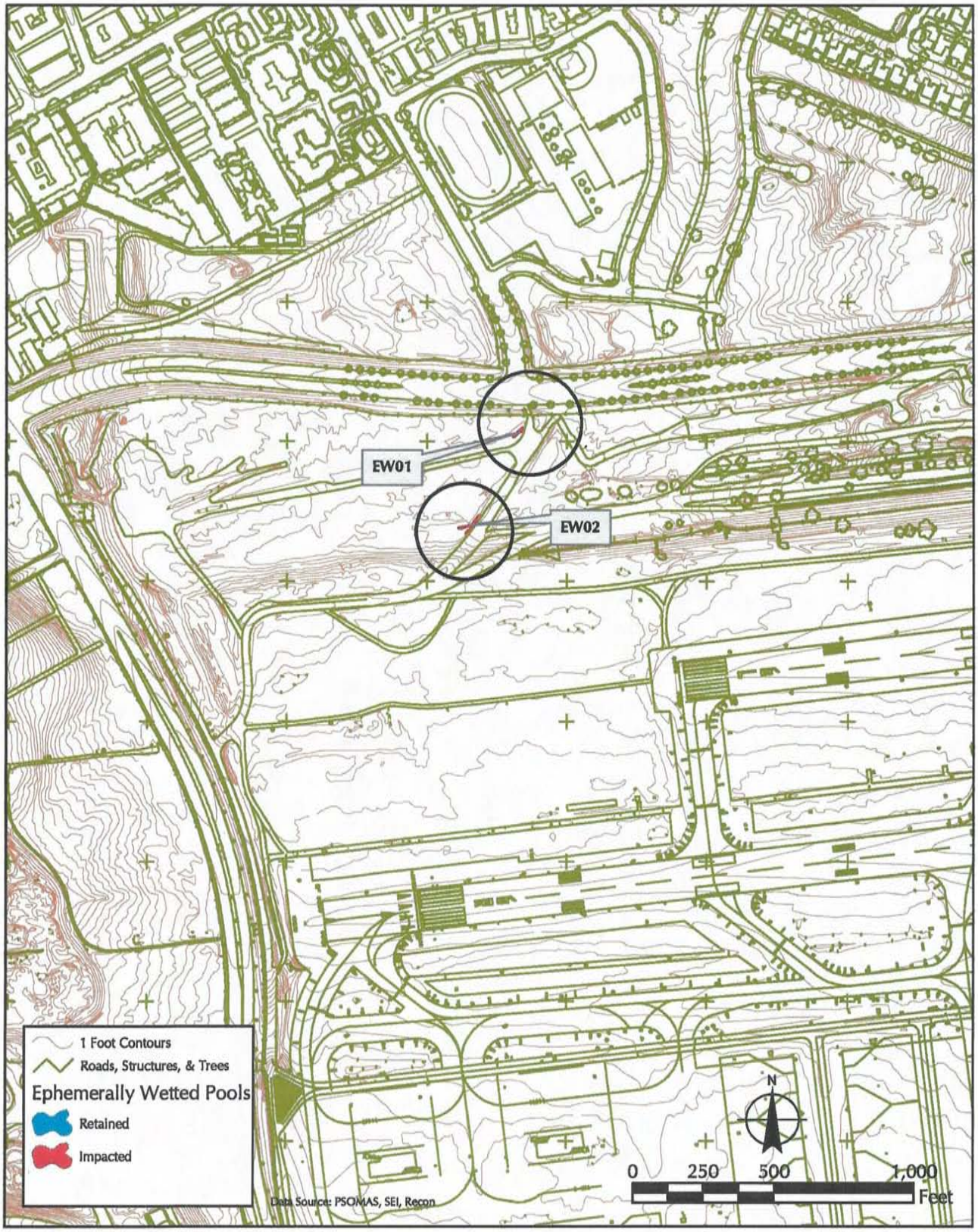

Figure 3-1
LAX Master Plan EIS/EIR Alternative D
North Area Ephemerally Wetted Pools Occupied by Riverside Fairy Shrimp

Figure 3-2
LAX Master Plan EIS/EIR Alternative D
South Area Ephemerally Wetted Pools Occupied by Riverside Fairy Shrimp and Watershed Buffer Areas