



# Appendix M

## Biological Opinion



# 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-SDG-2296.5

Mr. Gene K. Fong  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
650 Capitol Mall, Suite 4-100  
Sacramento, California 95814

**JUL 1 2 2004**

Re: Biological Opinion for the State Route 905 Extension Project, San Diego County, California (1-6-04-F-2296.5, File #: 11-SD-905 KP 9.2 - 19.3, EA 093160)

Dear Mr. Fong:

This document transmits the Fish and Wildlife Service's (Service) biological opinion (Opinion) based on our review of the proposed State Route 905 (SR-905) Extension Project (Project) between Interstate 805 (I-805) and the Otay Mesa Port of Entry (POE) in San Diego County, California, and its effects on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher) and designated critical habitat for the gnatcatcher, and endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*), Riverside fairy shrimp (*Streptocephalus woottoni*), Quino checkerspot butterfly (*Euphydryas editha quino*; Quino), and San Diego button celery (*Eryngium aristulatum* var. *parishii*; button celery) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). In addition, your letter requests concurrence that the proposed Project may affect, but is not likely to adversely affect, the federally threatened Otay tarplant (*Deinandra conjugens*; tarplant) and spreading navarretia (*Navarretia fossalis*), and endangered California Orcutt grass (*Orcuttia californica*; Orcutt grass) and Otay Mesa mint (*Pogogyne nudiuscula*). Your May 21, 2004, request for formal consultation was received at our office on May 24, 2004.

Within the action area is designated or proposed critical habitat for Quino, tarplant, and Riverside and San Diego fairy shrimp. No primary constituent elements within proposed or designated critical habitat for these species will be impacted by the proposed Project, therefore, critical habitat for Quino, tarplant, and Riverside and San Diego fairy shrimp will not be discussed further. Provided the description of the proposed action and conservation measures described

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below are implemented, we concur that the proposed Project may affect, but is not likely to adversely affect Otay tarplant, spreading navarretia, California Orcutt grass, and Otay Mesa mint. Therefore, these species will not be addressed in this Opinion. Should Project plans change or if these plant species are detected on-site, this determination may be reconsidered and formal consultation may be required.

This Opinion is based on information provided in the *Biological Assessment (BA) State Route 905 Extension*, dated May, 2004 (Caltrans); discussions during site visits to the proposed Project site and Wall Hudson property conducted on February 6, 2003, and May 20, 2004; and the final project description with conservation measures developed in cooperation with Federal Highway Administration (FHWA) and Caltrans.

### **CONSULTATION HISTORY**

Planning for the SR-905 Extension has been ongoing since 1995. In a letter dated April 7, 1995, the Service responded to the February 28, 1995, Notice of Intent to prepare a joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Project. The FHWA letter, dated May 5, 1995, requested that the Service to be a cooperating Agency for the SR-905 EIR/EIS. Included with this letter was a Fact Sheet for the proposed Project, dated April 1995. On April 12, 1995, the Service provided Caltrans with a species list. The FHWA sent a May 10, 1995, letter to the City of San Diego (City), with a carbon copy to Nancy Gilbert of the Service, reiterating the need to analyze wildlife crossings to be consistent with the City's Multiple Species Conservation Program (MSCP). In our May 25, 1995, letter, we agreed to participate as a cooperating agency.

On May 11, 1995, the Service met with the City, Caltrans, U.S. Army Corps of Engineers (ACOE), California Department of Fish and Game (CDFG), Helix Environmental, Inc. (Helix), and Sweetwater Environmental Biologists, Inc (SEB) to discuss wildlife crossings and the City's preserve design. On June 7, 1995, Caltrans issued a letter discussing the results of the May 11, 1995, meeting. On June 10, 1995, the City sent a letter to Caltrans, with a carbon copy to the Service, discussing the Otay Mesa Wildlife Connection. On June 15, 1995, the Service met with Caltrans, the City, ACOE, U.S. Environmental Protection Agency (EPA), Helix, and SEB to discuss three Project alternatives (north, central and south) and the status of other development in the area. On June 20, 1995, the Service met with Caltrans, SEB and Helix to discuss the status and results of fairy shrimp and Quino surveys. On September 19, 1995, the Service met with the City, Caltrans, SEB, CDFG, ACOE, and Helix to continue discussions on the wildlife crossings and alternatives development. On March 4, 1997, Caltrans sent a letter to the Service regarding the establishment of the Cal Terraces Vernal Pool Preserve which lies within the alignment of the northern alternative. This letter also discussed the alignment of the southern alternative and the impacts the MSCP preserve around Spring Canyon. The alignment of the central alternative was suggested as the best vernal pool avoidance alternative based on technical studies (RECON 1994, Helix 1995). The figure attached to the letter presented three alignments for the central alternative and the impacts to vernal pools from each alignment.

On March 19, 1997, the Service met with Caltrans, FHWA, EPA, Helix, ACOE, SEB, and the City to further discuss alignments for the central alternative with regards to endangered species issues. In our May 14, 1997, letter, the Service concurred with moving forward with the three alternatives developed through early coordination. The Service's May 14, 1997, letter to the City concurred with the three alignments presented in the figures and data for the proposed central alternative provided by Helix. On February 10, 1998, the Service received the draft biological impact maps generated by Helix. The April 27, 1998, Caltrans letter to the Service initiated the National Environmental Policy Act and Clean Water Act Section 404 Integration Process (NEPA/404 Integration Process) and requested our concurrence with the basic Purpose and Need and criteria for alternative selection. Attached to this letter was a history of the collaborative effort to date. On July 15, 1998, we responded that we will continue to participate in the NEPA/404 Integration Process. In this letter, we concurred with the basic Purpose and Needs and we referenced the issues addressed in our May 14, 1997, letter regarding our position on the alternatives as it relates to the three alignment variations. However, we did not address the proposed alignment project designs. Instead, we stated that more information was needed to analyze the preferred alternative and alignments.

On May 18, 1999, the Service provided Caltrans with an updated species list. On November 16, 2000, the Service met with the ACOE, CDFG, Caltrans, the County of San Diego, EPA, FHWA, and City to discuss final issues before completing the draft EIR/EIS and circulating for public review. In a January 2, 2001, Memorandum to the Resource Agencies, Caltrans provided responses to Resource Agency comments discussed during the November 16, 2000, meeting. In their February 27, 2001, letter, Caltrans requested to withdraw from the NEPA/404 Integration Process since potential wetland impacts from the preferred alternative were below 0.5 acres and these impacts would potentially qualify for a Nationwide Permit from the ACOE. In our May 15, 2001, electronic mail message to Caltrans, we deferred to the ACOE and EPA for withdrawal from the NEPA/404 Integration Process. We also recommended that a variety of alignments be examined within the preferred alternative, a bridge be constructed over Spring Canyon, the need for the proposed interchange at Heritage Road be fully addressed, and the Project area be surveyed for Quino.

On September 26, 2001, the Service met with the City, Caltrans, FHWA, EPA, CDFG, and McMillan Biological consulting to review the Wall-Hudson property as a parcel to offset impacts from the proposed Project. On October 2, 2001, we submitted a letter to FHWA addressing our comments and concerns on the draft EIR/EIS for the proposed Project. During telephone discussions in August 2002, the Service iterated the need to revegetate the corridor with native species and to strictly avoid the use of non-native plant species, and particularly invasive exotic plant species, in areas adjacent to the MHPA. In response to a Caltrans January 30, 2003, request, the Service supplied an updated species list on March 6, 2003. On February 6, 2003, the Service met with Caltrans for a site review of both the proposed Project alignment and the Wall-Hudson property.

On October 1, 2003, the FHWA sent a letter to the Service stating that the wetland impacts exceeded the 5-acre threshold for implementing the NEPA/404 Integration Process. This was due to incorrectly defining jurisdictional wetlands as per the ACOE regulatory definitions. The

October 1, 2003, letter requested that the Project not be required to reenter the NEPA/404 Integration Process. The Service coordinated with the ACOE and EPA and we requested information from Caltrans on this issue. This information was never provided and we continued to defer to the ACOE and EPA on the status of the NEPA/404 Integration Process. On May 20, 2004, the Service met with Caltrans staff to conduct a field review of the conservation strategy for the proposed Project. In your May 21, 2004, letter, you requested initiation of formal consultation. On June 1, 2004, we concurred that the proposed State Route 905 (SR 905) Project does not need to be further reviewed through the NEPA/404 Integration Process.

## **BIOLOGICAL OPINION**

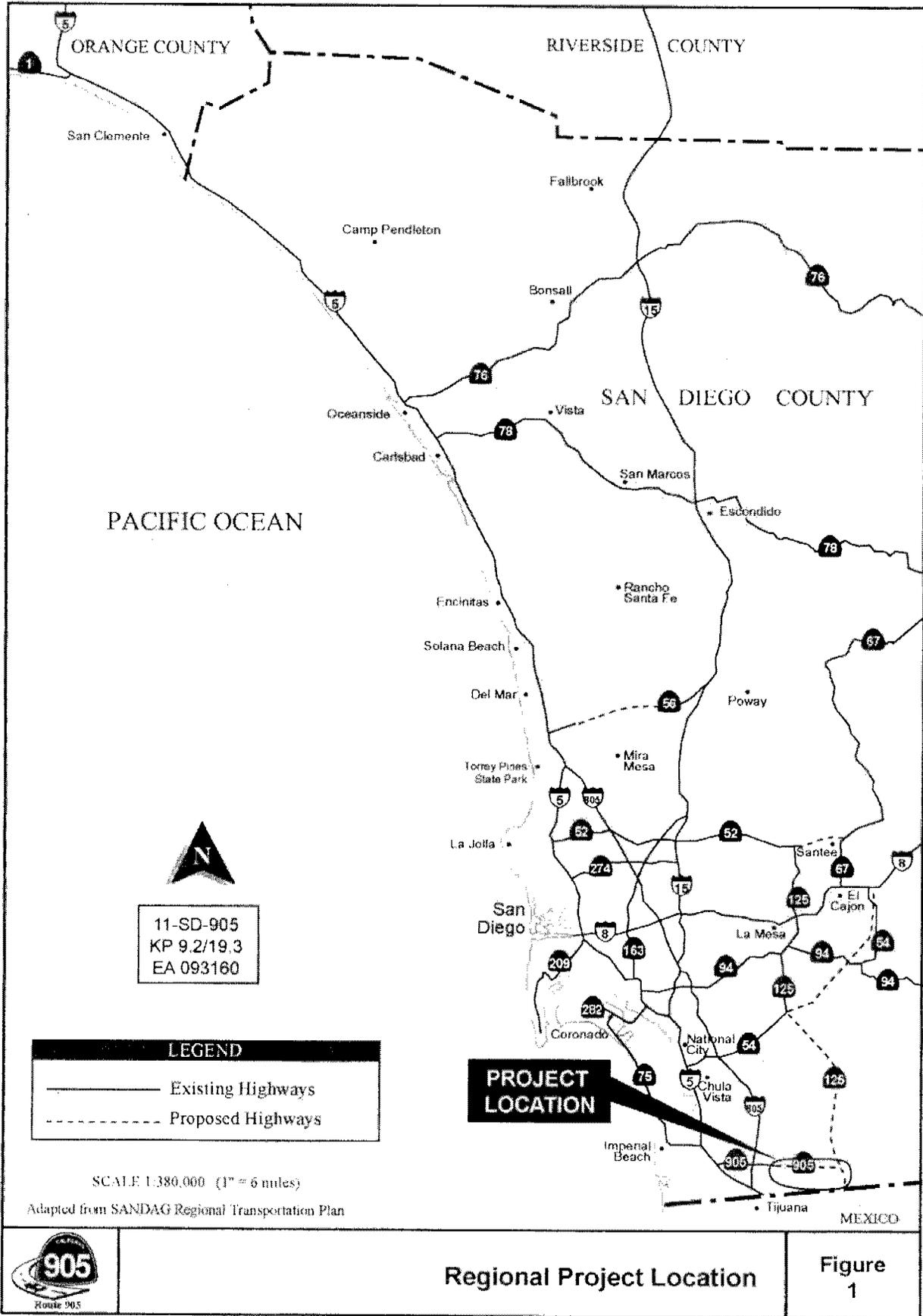
### **DESCRIPTION OF THE PROPOSED ACTION**

Caltrans and FHWA propose to construct the extension of SR-905 from approximately I-805 to the Otay Mesa Point-of-Entry (POE) in southern San Diego County, California (Figure 1). The past widening of Otay Mesa Road has increased roadway functioning; however, the corridor is projected to reach capacity by the year 2005. The primary purpose of the Project is to: reduce traffic congestion; provide for effective transportation of people, goods, and services; and improve the mobility of local, regional, interregional, and international traffic between I-805 and the Otay Mesa POE. Overall, the extension of SR-905 will offset congestion on Otay Mesa Road and allow direct access to I-805 and I-5. Inadequate transportation services currently exist in the Otay Mesa region of San Diego County and conditions will continue to deteriorate without proper improvements. In addition, the proposed Project will bypass all developments and Brown Field Airport along Otay Mesa Road, allowing for improved functioning of SR-905, and likely reducing the accident rate in Otay Mesa.

The proposed Project will construct a new six lane (three lanes in each direction) freeway, as well as sufficient right-of-way (ROW) to accommodate two, future HOV lanes in the median (Figure 2). The total roadway length will be approximately 6.2 miles, with a ROW area requirement of approximately 314 acres. The west end of the existing Otay Mesa Road will be terminated in a cul-de-sac approximately 1,150 feet west of the proposed intersection with Caliente Avenue. The Project boundaries will be fenced along the north and south ROW lines of the alignment. Local interchanges will be provided at Caliente Avenue, Heritage Road, Britannia Boulevard, and La Media Road, with additional improvements in the vicinity of Siempre Viva Road. A freeway-to-freeway interchange will be constructed at State Route 125 (SR-125). The current schedule indicates that project-related work will commence in the fiscal year 2004/2005 and require approximately five years for the completion of all roadway features.

The major roadway design elements of the proposed Project are as follows:

- A 2,400-foot long auxiliary lane that will be constructed along northbound I-805 between Palm Avenue and the westbound SR-905 to northbound I-805 connector to accommodate merging traffic from westbound SR-905.





- A total of four lanes in each direction along SR-905, immediately east of I-805 to provide connections to and from I-805. The southbound I-805 to eastbound SR-905 connector will remain as two lanes. SR-905 will transition to three lanes in each direction at the Caliente Avenue Interchange.
- Modification of the westbound SR-905 to northbound I-805 direct connector to allow for a two-lane exit and a two-lane entrance.
- A 1.2-mile long westbound truck climbing lane that will be constructed from the northbound I-805 to eastbound SR-905 connector ramp to just east of Caliente Avenue.
- Diamond-type interchanges that cross over the SR-905 facility will be constructed at Caliente Avenue and Britannia Boulevard.
- The future Heritage Road interchange will incorporate loop ramps on the eastbound exit and westbound entrance. All access will be from the east of Heritage Road to minimize impacts to Spring Canyon.
- A Park-and-Ride lot, with provisions for public bus service, will be constructed in the northwest quadrant of the Caliente Avenue interchange and provide approximately 210 parking spaces within a 2.2-acre lot.
- South of Otay Mesa Road, SR-905 will interrupt Cactus Road. North of the freeway, Cactus Road will terminate in a cul-de-sac. On the south side of SR-905, a two-lane frontage road will maintain existing circulation by connecting Gateway Park Drive to Cactus Road.
- All utilities will be relocated within the proposed Project's disturbance footprint in coordination with the responsible utility companies. There will be no utility relocations near sensitive biological resources (i.e., the I-805/SR-905 interchange, Spring Canyon, and La Media Road).
- All staging areas and access routes will be placed entirely within the proposed Project footprint.
- Two parallel bridge structures will traverse Spring Canyon, which serves as the primary MSCP wildlife corridor in the Otay Mesa area. Each bridge will be centrally supported by columns to minimize impacts to waters of the U.S. within the canyon. The westbound bridge will be 253 feet long, 62 feet wide, and 5 feet deep. The eastbound bridge will be approximately 180 feet long, 62 feet wide, and 8 feet deep. The minimum clearance from the canyon bottom to the base of each bridge will be 27 feet.
- A minimum 6-foot high fence will follow the length of the alignment on both sides to preclude human access into the adjacent habitat and prevent wildlife from traversing the freeway. The fence will be buried to a depth of approximately 1-foot (only near the wildlife crossing) to prevent animals from digging under the barrier.

- The Otay Corporate Center South (OCCS) vernal pool preserve will be connected to Spring Canyon (on the south side) by an approximately 300-foot long and 5-foot high culvert extending under the freeway. In addition, a fenced/protected wildlife corridor (consisting of a detention basin and native vegetation) will be maintained between the OCCS and Spring Canyon (to the west side), that will be approximately 164 feet wide and 984 feet long.
- Construction will include approximately 23,190 linear feet of fill slope, with the largest slope being approximately 5,900 feet long and 98 feet high near the SR-905/SR-125 Interchange. An estimated 16,300 linear feet of cut slope will be required, with maximum heights of approximately 65 feet.
- A two-quadrant clover leaf interchange will be built at La Media Road.
- Otay Mesa Road will be widened to six lanes plus the width required for double left turn lanes within the ROW for the SR-125 Interchange with Otay Mesa Road. In addition, the Otay Mesa Road undercrossings will be constructed to accommodate future installation of the light rail transit extension. East of the interchange, Otay Mesa Road will be widened to four lanes between the SR-125 ROW and Sanyo Avenue. The unfinished portion of Sanyo Avenue will be widened from two to four lanes, for approximately 1,900 feet, between Otay Mesa Road and Airway Road.
- A four-lane access ramp will extend approximately 1.2 miles east from the SR-905/SR-125 Interchange to Enrico Fermi Drive. To minimize impacts to existing, adjacent industries, retaining walls up to 21 feet high will be constructed adjacent to the road, extending from Sanyo Road east for approximately 1,300 feet. Grading for the proposed local access ramp will include an adjacent material site just west of the intersection with proposed Enrico Fermi Drive. Each side of the roadway will be inclined at a 1:6 (V:H) slope and contour graded to blend with the existing terrain. The operation will generate sufficient fill material to balance the earthwork for the alignment. A temporary construction easement will allow excavation of the area outside the ROW. Additionally, a connection is proposed for westbound traffic on the local access ramp to northbound SR-125.
- SR-125 has been scheduled for completion prior to the conclusion of SR-905. The plans for SR-125 anticipate an at-grade connection at Otay Mesa Road. The proposed SR-905 will include a multi-level SR-905/SR-125 Interchange, with connectors for southbound SR-125 to westbound SR-905, eastbound SR-905 to northbound SR-125, southbound SR-125 to eastbound SR-905, and westbound SR-905 to northbound SR-125. A number of bridge structures will be required for the various ramp and roadway crossings. The SR-905 to SR-125 Interchange will necessitate removal of some facilities, including the interim SR-905 between Airway Road and Otay Mesa Road.
- Relocation of overhead electric power lines will be required along the east side of Harvest Road.

- Harvest Road will be permanently closed between Otay Mesa Road and Airway Road, with local access from Otay Mesa Road for properties abutting Harvest Road north of the SR-905/SR-125 Interchange.
- Permanent low sodium lights will be installed at all interchanges. High pressure lighting will be used to illuminate overhead directional signs. The direction of the high pressure lighting will be focused up on the signs and away from all sensitive biological resources. No permanent lights will be installed adjacent to sensitive biological resources, except one low sodium light required by Caltrans safety standards approximately 65 feet north of the San Diego button-celery preserve along La Media Road.

Soil sampling and geotechnical borings will be required at various locations within the Project footprint. A mud-rotary drilling technique will be used to bore holes approximately 4 inches in diameter to a maximum depth of 150-200 feet. In addition, test pits will be excavated near/adjacent to the borings to acquire other soil information. An area approximately 10 feet by 10 feet will be sliced with a backhoe, the samples collected, and the site backfilled with the remaining soils. Work at each location could require a maximum of 2 months and will not be expected to involve any nighttime drilling/excavating. Equipment used in these operations will be stored or staged at a local Caltrans maintenance yard.

All impacts occurring within the proposed Project footprint have been assessed as permanent impacts, with the exception of the two bridge crossings at Spring Canyon. At the proposed Spring Canyon bridges, permanent impacts will be generated from pier construction and the effects of shading, and will be compensated with habitat creation/restoration. At Spring Canyon, temporary impacts will be generated from clearing within the project footprint, and all temporary impacts will be revegetated upon Project completion.

Through negotiations with the Service and other Resource Agencies, the proposed Project footprint was moved to the north of the J14 vernal pool complex on the mesa above Spring Canyon. Additional design features to avoid the J14 vernal pool complex include: placing the road surface below the existing topography as it approaches the Spring Canyon bridge; revegetating the cutslope and temporary disturbance areas with native plant species; recontouring the top of the cutslope to maintain surface water drainage patterns; and implementing best management practices (BMPs) to prevent soil from eroding and depositing in vernal pools within the J14 vernal pool complex.

The proposed Project will permanently impact 9.45 acres of maritime succulent scrub (MSS), 29.02 acres of Diegan coastal sage scrub (CSS), 134.1 acres of non-native grassland, 0.14 acre of vernal/road pool, 12.15 acres of wetlands and waters of the U.S./State of California, 0.31 acres of non-jurisdictional wetlands, 32.7 acres of agriculture, 9.3 acres of non-native vegetated communities, 309 acres of disturbed land, and 223.9 acres of developed land (Table 1). The proposed Project will permanently impact 31.67 acres of Multiple Habitat Planning Area (MHPA) of the MSCP. Proposed temporary impacts to 2.55 acres at the Spring Canyon bridges include 0.93 acre of MSS, 0.81 acre of CSS, 0.02 acre of southern willow scrub, 0.02 acre of

**Table 1.** Permanent impacts by habitat type for the proposed SR-905 Extension Project.

Habitat Type	Permanent Impacts (acres)*	Permanent Impacts w/in MHPA (acres)*	Mitigation Ratio	Total Compensation (acres)	Mitigation Location
Maritime Succulent Scrub	Direct: 3.2 Temporal/ Indirect: 6.25	Direct: 2.7 Temporal/ Indirect: 5.88	Direct: 2:1 Temporal/ Indirect: 1:1	Direct: 6.4 Temporal/ Indirect: 6.25	Wall-Hudson 12.65 acres
Coastal Sage Scrub	Direct: 12.3 Temporal/ Indirect: 16.72	Direct: 2.9 Temporal/ Indirect: 14.76	1:1	Direct: 12.3 Temporal/ Indirect: 16.72	Wall-Hudson 29.02 acres
Non-native grassland	134.1	5.3	0.5:1	67.1	Wall-Hudson 22.4 acres, Bonita Meadows 44.7 acres
Vernal Pool (VP) and Road Pool (RP) w/fairy shrimp, Watershed (WS)	VP: 0.11 RP: 0.03	VP: 0.05	VP: 3:1 RP: 2:1 WS: 10:1	VP: 0.33 RP: 0.06 WS: 3.90	Wall-Hudson 0.39 acre of VP surface area with 3.9 acres of contributing watershed for a total of 4.29 acres
Quino checkerspot butterfly habitat**				VP: 0.51 WS: 4.15	Wall-Hudson 0.51 acre of VP surface area with 4.15 acres of contributing watershed for a total of 4.66 acres
Freshwater Marsh	0.40		2:1	0.80	La Media Road and Bonita Meadows 0.80 acre
Southern Willow Scrub	3.10	0.03	2:1	6.20	La Media Road and Bonita Meadows 6.20 acres
Mulefat Scrub	1.98	0.05	2:1	3.96	La Media Road and Bonita Meadows 3.96 acres
Disturbed Wetlands	3.02		1:1	3.02	La Media Road and Bonita Meadows 3.02 acres
Seasonal pond/ linear streambed	3.96		1:1	3.96	Bonita Meadows 3.96 acres

\* Unless otherwise noted, all impacts are direct.

\*\* Unquantified impacts to Quino will be offset by restoring Quino habitat at Wall-Hudson.

seasonal pond/linear streambed, 0.52 acre of non-native grassland, and 0.25 acre of disturbed habitat.

Restoration activities (grading, planting, weeding) will occur at the Wall-Hudson property (Wall-Hudson), Bonita Meadows Open Space Preserve (Bonita Meadows), and the on-site La Media drainage (Figure 3). On Wall-Hudson, approximately 9.06 acres of mesa top, consisting of north and south fingers extending into Dennery Canyon currently support degraded vernal pools, non-native grasslands, and MSS. Grading to restore vernal pools will occur within and around the degraded vernal pools on the mesa top. In addition, seed of native threatened, endangered, and sensitive vernal pool/upland plant species will be collected from adjacent off-site areas, and dispersed throughout the enhanced pools and associated watersheds. Restoration grading at Bonita Meadows will occur in select areas along the un-named creek flowing through the property. Restoration at the La Media drainage will entail constructing a new drainage facility and planting/seeding with native species.

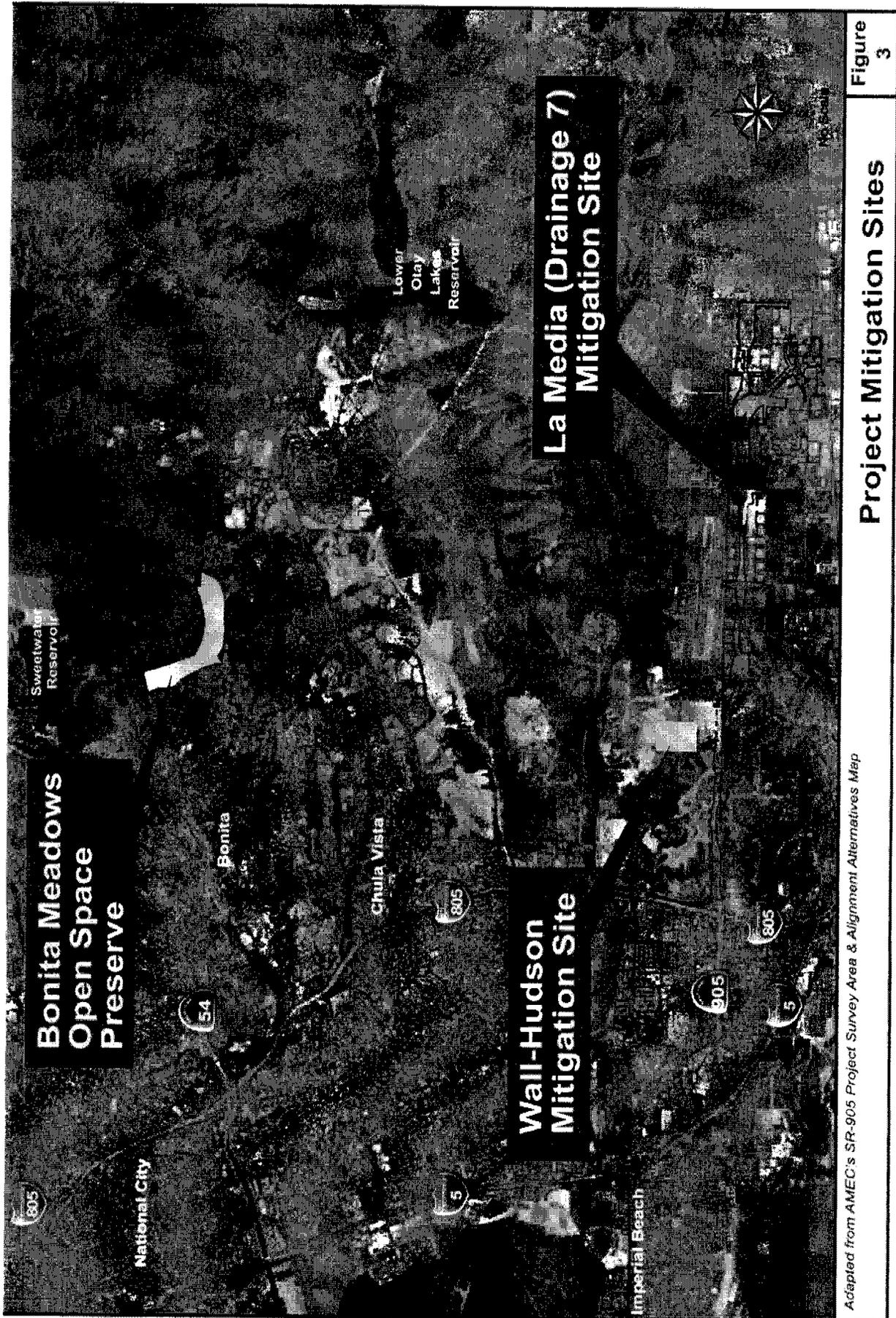
### **Action Area**

The Service describes the action area to include the general area surrounding Otay Mesa, and the Bonita Meadows Open Space Preserve immediately north of the City of Chula Vista Sub-area planning area within unincorporated San Diego County.

### **Conservation Measures**

The proposed action includes the following conservation measures which will be implemented to avoid or otherwise minimize potential adverse effects of the action on federally listed species:

1. To offset impacts from clearing 12.3 acres of CSS, 3.2 acres of MSS and 134.1 acres of non-native grassland, 12.3 acres of CSS (1:1 ratio), 6.4 acre of MSS (2:1 ratio), and 22.4 acres (0.5:1 ratio) of non-native grassland, respectively, will be preserved at Wall-Hudson. The remaining 44.7 acres of non-native grassland will also be preserved at Bonita Meadows. To offset impacts to 0.11 acre of vernal pool and 0.03 acre of road pool with fairy shrimp, 4.29 acres of habitat including 0.39 acre of vernal pool surface area and 3.9 acres of contributing watershed will be enhanced/restored at Wall-Hudson. Approximately 0.113 acre of existing vernal pool surface area will be enhanced and an additional 0.277 acre of vernal pool surface area will be restored.
2. To offset impacts to ACOE and CDFG regulated wetlands/waters, and non-jurisdictional wetlands, 0.80 acre of freshwater marsh, 6.2 acres of southern willow scrub, 3.96 acres of mulefat scrub, 3.02 acres of wetlands and 3.96 acres of seasonal pond/linear streambeds will be enhanced/restored at La Media Drainage and Bonita Meadows. A wetland enhancement/restoration plan will be approved by the Service and other Resource Agencies prior to the start of Project construction.



3. To offset impacts to Quino habitat, approximately 4.66 acres of vernal pool habitat, including 0.51 acres of vernal pool surface area and 4.15 acres of contributing watershed, on the Wall-Hudson property will be restored to provide habitat for Quino. These offsetting measures for Quino are separate and additional to the vernal pool restoration that will be used to offset impacts to listed vernal pool species. Also, appropriate Quino larval host plant species will be incorporated into the seed palette used in the upland restoration. All enhancement activities will be implemented following the Service approved Wall-Hudson restoration plan.
4. To offset indirect and temporal noise impacts to gnatcatchers occupying 6.25 acres of MSS and 16.72 acres of CSS within 500 feet of the Project footprint, 22.97 acres (1:1 ratio) of CSS/MSS will be preserved at Wall-Hudson.
5. A plan, outlining the details and implementation schedule of all enhancement/restoration of the MSS, CSS, grasslands, and vernal pools on Wall-Hudson and Bonita Meadows, will be prepared by Caltrans and approved by the Service and other Resource Agencies prior to the start of Project construction. All enhancement/restoration activities will commence the first summer/fall season prior to or concurrently with the start of Project construction. The following criteria will be included in the plan for enhancement/restoration of fairy shrimp pools and their contributing watersheds:
  - a. A hydrologic evaluation and map of the enhanced and restored vernal pools and contributing watersheds. The evaluation must demonstrate that the watersheds of newly restored pools will provide the appropriate amount of water for fairy shrimp without impacting the watersheds of existing vernal pools currently supporting San Diego fairy shrimp.
  - b. The grading for the enhanced and restored pools will be conducted under the direction of a qualified biologist with a minimum three years of vernal pool restoration experience approved by the Service.
  - c. Grading plans for the enhanced and restored pools with 0.5-foot topographic contours. The grading plans will specify the areas of existing habitat which are to remain unaffected by enhancement/restoration activities. Grading will be done using a bobcat or small tracked dozer with ripping tines and slopeboards, rubber-tired loaders and a sheeps-foot for mound construction. All grading within the upper margins of existing pools will be done with hand tools.
  - d. The number, location, and design of vernal pools to support Riverside fairy shrimp will be coordinated with the Service.
  - e. Measures will be incorporated to prevent the introduction of versatile fairy shrimp (*Branchinecta lindahli*) into enhancement/restoration areas.

- f. Enhancement/restoration success will be determined by measuring the ponding of water; and density of viable cysts, hatched fairy shrimp, and gravid females, within the enhanced/restored ponds. Water measurements will be taken in the enhanced/restored ponds to determine the depth, duration and quality (i.e., pH, temperature, total dissolved solids, and salinity) of ponding. Dry samples will be taken in the enhanced/restored pools to determine the density of viable cysts in the soils. Wet samples will also be taken in the enhanced and restored pools to determine the density of hatched fairy shrimp and gravid females. The enhanced and restored pools must pond for a period of time similarly to reference vernal pools during an average rainfall year and at an appropriate depth and quality to support fairy shrimp. The enhanced and restored pond's average viable cyst, hatched fairy shrimp, and gravid female density must not differ significantly ( $p < 0.05$ ) from reference pools for at least three wet seasons before a determination of success can be made.
- g. Native plants and animals will be restored within the enhanced and restored pools and their watersheds. This can be accomplished by redistributing topsoil containing seeds, spores, bulbs, eggs, and other propagules from adjacent vernal pool and upland habitats; by the translocation of propagules of individual species from off-site habitats; and by the use of commercially available native plant species. Topsoil and plant materials from the native habitats to be impacted on-site will be applied to the watersheds of the enhanced and restored pools to the maximum extent practicable. Exotic weed control will be implemented within the restoration areas to protect and enhance habitat remaining on-site. The Plan will include success criteria for restoring native plants and animals.
- h. A 6-year maintenance and monitoring program for the enhanced and restored pools and their contributing watersheds. The monitoring program will consist of quantitative hydrological, viable cyst, hatched fairy shrimp, and gravid female measurements as required in measure 5.f., complete floral and fauna inventories, quantitative vegetation transects, and photographic documentation.
- i. If a performance criterion as defined in 5.f. is not met for any of the enhanced and restored pools in any year, or if the final success criteria are not met, the Project proponent will prepare an analysis of the cause(s) of failure and, if deemed necessary by the Service, propose remedial actions for approval. If any of the enhanced/restored pools have not met a performance criterion during the initial 6-year period, the Project proponent's maintenance and monitoring obligations will continue until the Service deems the enhancement/restoration successful, or contingency measures must be implemented.
- j. Perimeter fencing on the west side of the mesa top at Wall-Hudson will be installed prior to Project construction.

- k. Annual reports will be submitted to the Service by August 1 of each year. These reports will assess both the attainment of yearly success criteria and progress toward the final success criteria. The reports will also summarize the Project's compliance with the conservation measures, reasonable and prudent measures, and terms and conditions of this Opinion.
6. All habitats to be restored, enhanced, and/or preserved, as stated above, will be managed and preserved in perpetuity. FHWA and Caltrans will place restrictive covenants and prohibited uses in the deed for Wall-Hudson, Bonita Meadows, and the La Media drainage, and these sites will be managed according to a Service approved Long-Term Management Plan. The draft deed and Long-Term Management Plan will be approved by the Service prior to the start of construction.
7. Protocol level surveys for Quino will be conducted in the project area prior to the start of construction. If adult Quino are detected, clearing and grading will be postponed until the Service gives approval to resume construction. Immediately following the detection of adult Quino, the Service will be contacted and the area where the adult Quino was detected will be surveyed for dot seed plantain (*Plantago erecta*), Quino larvae and cluster webbing for pre-diapause Quino larvae. If Quino larvae and/or cluster webbing is located, the salvage efforts will be implemented in coordination with the Service.
8. All contour grading conducted near vernal pools (within the Project alignment and restoration areas) supporting federally listed species will implement the following measures:
  - a. Grading activities within the watershed of the fairy shrimp and button celery pools will be done when the soil is dry and outside the rainy season (i.e., May 15 through November 15) to minimize potential impacts (e.g., siltation) to the avoided and enhanced/restored pools unless erosion control measures approved by the Service and Regional Water Quality Control Board (Regional Board) are in place.
  - b. Contour grading will occur around the remaining watershed of pool 57 to create an area of watershed equal to that lost through project construction. The final grading plans near vernal pools will be approved by the Service and other Resource Agencies and incorporated into the upland restoration plan.
  - c. The Project proponent will staff a qualified biologist with a minimum three years of vernal pool experience who will be responsible for overseeing compliance with protective measures for the fairy shrimp. The biologist will be approved by the Service and will have the authority to halt all associated Project activities, which may be in violation of the terms and conditions of this Opinion. The biologist will notify the Service within 24 hours of any observed violation.

9. Within the proposed Project footprint, the soil of all pools supporting San Diego or Riverside fairy shrimp will be salvaged and stored off-site. Vernal pool soil (inoculum) will be collected when dry to avoid damaging or destroying fairy shrimp cysts. A hand trowel or similar instrument will be used to collect the inoculum. Whenever possible, soil will be collected in chunks. The trowel will be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling.

The soil from each pond will be stored individually in labeled boxes that are adequately ventilated and kept out of direct sunlight in order to prevent the occurrence of fungus or excessive heating of the soil, and stored off-site at an appropriate facility for vernal pool inoculum. Soil will not be collected from any on-site ponds until approved by the Service. Soil collected from pools only containing San Diego fairy shrimp (pools 2, 55, and 58) will be stored off-site until an appropriate location on Otay Mesa near Spring Canyon is found to accept the inoculum from the proposed Project, as coordinated and approved by the Service.

The salvaged soil from pool 7 containing both Riverside and San Diego fairy shrimp cysts will be used to inoculate restored pools at Wall-Hudson. Following the Wall-Hudson restoration plan, the restored pools to be inoculated with Riverside fairy shrimp will be recontoured deep enough to pond water long enough to support Riverside fairy shrimp. Inoculum will not be introduced into the restored pools until after the restored ponds have been demonstrated to retain water for a minimum of 60 days, and will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts within the surface layer of soil (e.g., collected inoculum will be shallowly distributed within the pond so that cysts have the potential to be brought into solution upon inundation).

10. Prior to any disturbance to pool 56, all seed from button celery plants will be collected, placed in paper bags, and stored in a cool, dry location following Service recommended guidelines (e.g. Center for Plant Conservation). The topsoil from the vernal pool will be salvaged, stockpiled, and redistributed into enhanced pools on Wall-Hudson. The collected seed will be sown/broadcast in the same locations as the reapplied soil or onto other appropriate habitat. All plants will be removed with hand tools by digging up the root system and surrounding soil. These individuals and their associated soil will be placed in temporary containers and stored out of direct sunlight. All individuals will be replanted within the post-grading, upper pool margins at Wall-Hudson. Button celery propagules will not be introduced into the restored pools until after the pools have been demonstrated to retain water for a minimum of 60 days. Salvaged plants will be planted to the same rooting depth as existed in the original pool.

Button celery seed collected from pool 56 will be introduced along the upper margins of all enhanced and restored pools once these restored/enhanced pools meet first year hydrology success criteria as per the approved restoration plan. Some seed will be stored off-site and according to horticultural practices. This seed will be used to inoculate the enhanced and restored pools in the event that initial inoculation fails. If the initial

inoculation is successful, then the seed can be used for off-site restoration activities within the Dennery Canyon/Spring Canyon watersheds as approved by the Service. The final details of the restoration effort will be outlined in the Service approved restoration plan for Wall-Hudson.

11. Impacts from fugitive dust will be offset through implementation of Caltrans Standard Specifications, including Section 7-1.01F Air Pollution Control, Section 10 Dust Control, Section 17 Watering, and Section 18 Dust Palliative. The Project biologist will periodically monitor the work area to ensure that construction-related activities do not generate excessive amounts of dust or cause other disturbances. Erosion control measures will be regularly checked by Caltrans inspectors, the biologist, and/or Resident Engineer (RE).
12. During construction and operation, runoff generated by the proposed Project will be channeled to detention basins as a means of preventing contaminated discharge from potentially entering nearby sensitive habitat. BMPs to address erosion and excess sedimentation will be incorporated into the Project plans. Measures that could be implemented include silt fencing, gravel bags, hay bales, fiber rolls, native plantings, retaining walls or other slope stabilizing techniques, and protection/velocity dissipation at drainage outlet points. Vegetation filters, such as swales or biostrips may also be used to remove sediment and other contaminants from runoff prior to off-site flow.
13. BMPs employed during construction and operation will follow the applicable Caltrans guidelines and be detailed in the Project's Storm Water Management Plan, Storm Water Pollution Prevention Plan, and Water Pollution Control Program. Specific plans will be reviewed by a biologist and modified, if necessary, prior to implementation. The biologist will have the ability to suggest changes to reduce the probability of erosion/siltation or spills of chemicals/fuels that could potentially affect sensitive habitat areas, including, but not limited to, vernal pool basins and watersheds, and rare plant populations. Photographs of installed BMPs will be submitted to the Service at least seven days prior to initial grading and clearing.
14. No invasive, exotic plant species will be seeded or planted adjacent to or near sensitive vegetation communities or waters of the U.S. In compliance with Executive Order 13112, temporarily disturbed areas will be reseeded with plant species native to the local habitat types. Species identified on Lists A & B of the California Exotic Pest Plant Council's list of Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999 will be avoided to the extent practicable. Areas hydroseeded for temporary erosion control will use native plant species, as well.
15. Temporary disturbance to both upland and riparian habitat, within Spring Canyon, will be offset through native revegetation of the area upon completion of the two bridges. All seeding/planting will occur on-site within the disturbed habitat and involve replacement with in-kind/similar species, to the maximum extent practicable, or with appropriate native species, in locations where exotics were previously established. All revegetation

efforts in areas that drain directly into the MHPA or sensitive habitats will follow the Service approved restoration/mitigation plans for uplands and wetlands.

Any graded habitat (e.g., slopes, ROW) adjacent to the Spring Canyon corridor or within/near the MHPA (including the La Media drainage) will be revegetated with an appropriate native plant mix. The proposed seed palette and revegetation methods (e.g., hydroseeding, planting, duff, irrigation) will be developed in coordination with the Service and a Caltrans biologist, prior to the start of construction.

16. Revegetation with native plant species will follow grading (where applicable) and be accompanied with periodic monitoring and maintenance to ensure adequate coverage, and prevent erosion and siltation into adjacent biologically sensitive areas. Native seed will be incorporated into the Bonded-Fiber-Matrix mix and sprayed onto the exposed soils prior to the onset of the rainy season.
17. All plants used in revegetation within the ROW will comply with Federal, State, and county laws requiring inspection for disease or insect infestations. The vendor will provide certification of inspection from the County of San Diego Department of Agriculture. The plants will also be inspected by the Project Landscape Inspector before accepting delivery. In all areas where stormwater runoff from the proposed Project alignment enters drainage systems that drain into the MHPA or other sensitive habitats, landscaping plans will be developed in coordination with the Service prior to implementation.

All container plants will be checked for the presence of Argentine ants prior to delivery to the planting locations. The potential introduction of Argentine ants could lead to the displacement of native ant species and could lead to the demise of those species which subsist on ants (e.g. horned lizards). Any containers contaminated with Argentine ants will be immediately removed from the Project area.

18. All vegetation within the Project footprint will be cleared between September 1 and February 14 to avoid the gnatcatcher breeding season and minimize impacts to migratory birds and raptors. If clearing activities must occur during the gnatcatcher breeding season, then pre-construction surveys will be conducted to ensure that no breeding gnatcatchers or nesting birds are present within or immediately adjacent to the proposed clearing area. Should a breeding gnatcatcher or nest be located, then the Service will be contacted and discussions will commence to determine how to proceed.
19. Immediately prior to delineating Environmentally Sensitive Areas (ESAs) or clearing of CSS/MSS, the biologist will survey the Project area for gnatcatchers. If gnatcatchers are found within the Project footprint outside of the breeding season, the biologist will direct construction personnel to begin initial vegetation clearing/grubbing in an area away from the gnatcatchers. In addition, the biologist will walk ahead of the clearing/grubbing equipment to flush birds towards areas of CSS/MSS to be avoided. It will be the responsibility of the biologist to ensure that gnatcatchers will not be injured or killed by

initial vegetation clearing/grubbing. The biologist will also record the number and map the location of gnatcatchers disturbed by initial vegetation clearing/grubbing or project construction and report these numbers and locations to the Carlsbad Fish and Wildlife Office within 24 hours.

20. Sensitive habitat outside the proposed Project footprint will be designated an ESA and depicted as such on project maps. Sensitive vegetation types (e.g., vernal pools) or plant locations (Otay tarplant, spreading navarretia, California Orcutt grass, and Otay Mesa mint) will be marked and protected by temporary fencing (e.g., orange plastic snow fencing) or another appropriate method to prevent encroachment or unnecessary disturbance to the sites. Prior to and during construction, barriers will be established in key areas to deter public entry into the site. Additionally, fencing will be provided to restrict access to sensitive habitat adjoining the work limits. Photographs of the fencing will be submitted to the Service at least seven days prior to initiation of Project construction.

All sensitive vegetation within the ROW, but outside of the Project footprint will be delineated by the project biologist as ESAs in coordination with other appropriate Environmental Specialists. All parties in conjunction with the Project will strictly avoid these areas. No construction activities, materials, or equipment will be permitted in the ESAs. Work areas will be marked clearly in the field and confirmed by the biologist prior to habitat clearing, and the marked boundaries maintained throughout the construction period.

21. A Service approved biologist will oversee compliance with protective measures for the biological resources in the Project area during clearing and construction activities. The biologist will be familiar with the habitats, plants, and wildlife of Otay Mesa, and maintain communications with the RE, to ensure that issues relating to biological resources are appropriately and lawfully managed. The biologist will be made available for both the pre-construction and construction phases to review grading plans, address protection of sensitive biological resources and monitor ongoing work. The biologist will specifically monitor construction activities that may affect listed species, such as vegetation removal, and the installation of BMPs and ESA fencing to ensure that all avoidance and minimization measures are properly constructed and followed. The biologist will immediately notify the RE to halt all associated Project activities which may be in violation of this Opinion. In such an event, the RE will halt all construction activities and contact the Service within 24 hours. The biologist will submit weekly reports during initial grading and clearing, and when construction occurs near sensitive biological resources; and provide a final report documenting compliance with avoidance and minimization measures within 60 days of project completion.
22. A minimum 6-foot high fence will follow the length of the alignment on both sides to preclude human access into the adjacent habitat and prevent wildlife from traversing the freeway. Near the Spring Canyon wildlife crossing, the fence will be buried to a depth of approximately one (1) foot to prevent animals from digging under the barrier. The fence

will be installed prior to opening the new road to the public. Photographs of the installed fence will be submitted to the Service within two weeks of installation.

23. An approximately 164-foot wide and 984-foot long fenced and protected wildlife corridor (consisting of a detention basin and native vegetation) will be created and maintained between the OCCS preserve and Spring Canyon.
24. Each employee (including temporary, contractors, and subcontractors) will participate in a training/awareness program that will be presented by the biologist, prior to working on the proposed Project. At a minimum, the program will include the following topics: occurrence of the listed and sensitive species in the area, their general ecology, species sensitivity to human activities, legal protection afforded listed species, penalties for violations of Federal and State laws, reporting requirements, and Project features designed to reduce the impacts to these species and promote their persistence/ survival within the Project area. Included in this program will be a fact sheet that includes color photographs of the listed species, which will be shown to the employees. Following the education program, the fact sheet will be posted in the contractor and RE's office, where they will remain through the duration of the Project. Caltrans and the biologist will be responsible for ensuring that employees are aware of the listed species.
25. Pile driving associated with construction of the Spring Canyon crossing will be conducted between September 1 and February 14 to reduce noise affects to nesting/breeding birds within the Project vicinity, including the coastal California gnatcatcher.
26. The changing of oil, refueling, and other actions that could result in a release of a hazardous substance will be restricted to designated areas that are a minimum of 100 feet from any sensitive plant populations, sensitive habitats, or drainages. Such designated areas will be surrounded with berms, sandbags, or other barriers to further prevent the accidental spill of fuel, oil, or chemicals. Any accidental spills will be immediately contained, cleaned up, and properly disposed.
27. Storage and staging areas will be placed as far from sensitive areas as possible, and kept free from trash and other waste. Staging areas for construction work will be located within previously disturbed sites and not adjacent to or within sensitive habitat.
28. The Project site will be kept clear of debris to avoid attracting predators to listed wildlife. All trash and food will be placed in sealed containers and regularly removed from the site.
29. No pets will be permitted inside the Project boundaries at any time.
30. Vehicle speeds on unpaved access roads to the proposed Project area will be restricted to a maximum of 25 MPH.
31. Any night lighting for Project construction will be selectively placed, shielded, and directed away from all native vegetative communities.

32. Linne soil sites will be surveyed for sensitive plant species prior to construction. In areas where the species are located, the soil will be salvaged for subsequent redistribution onto other similar, temporarily impacted areas. Soils will be stockpiled for the shortest time practicable and no taller than four (4) feet high, to assure the viability of soil biota. All work will be overseen by a project biologist familiar with the sensitive plant species associated with Linne soils. Salvaging methods will be included in the Service approved upland restoration plan.
33. Salvaging and transplantation of San Diego barrel cactus (*Ferocactus viridescens*) and other sensitive plant species will be conducted to the maximum extent practicable. A qualified biologist/restoration ecologist will oversee any seed collection, plant removal, or transplantation to ensure proper management of the salvaged materials. Salvaging methods will be included in the Service approved upland restoration plan.
34. To ensure that the construction and operation of the Project does not adversely affect the J14 vernal pool complex and other vernal pools south of the alignment and west of Spring Canyon, monitoring will be conducted throughout the rainy season to determine whether surface runoff is causing erosion and sediment delivery to the J14 complex and other vernal pools south of the alignment. Monitoring will occur during the construction of the Project and for three years following the opening of the road to the public. A monitoring report will be submitted by August 1 following each monitoring season.
35. To ensure that the construction and operation of the Project does not adversely affect the button-celery population at La Media Road immediately south of the Project footprint, monitoring will be conducted throughout the rainy season to determine whether surface runoff is causing erosion and sediment delivery to the button-celery population. Monitoring will occur during the construction of the Project and for three years following the opening of the road to the public. A monitoring report will be submitted by August 1 following each monitoring season.
36. Pursuant to the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993) and the Staff Report on Burrowing Owl Mitigation (CDFG 1995), a preconstruction survey of the Project footprint will be conducted for burrowing owls prior to clearing and grading. During the nonbreeding season (September 1 to January 31), a qualified biologist will survey and excavate all potential owl burrows within and immediately beyond the impact zone to discourage any on-site occupancy. If owls are found nesting within the ROW between February 1 and August 31, the burrow will be designated an ESA and no activities will be allowed within a 246-foot radius of the site. Surveys will be performed regularly to monitor the behavior of the owls and determine when nesting is complete, so that construction can resume.
37. The Spring Canyon Bridge will maintain design features that will provide bats with potential sites for day/night roosting.

38. Seed of Otay tarplant, Otay mesa mint, spreading navarretia, and Orcutt grass will be collected from adjacent or nearby populations and distributed throughout the vernal pools and/or uplands as part of the restoration activities on Wall-Hudson in coordination with the Service in accordance with the following guidelines:
- a. Seed will be collected from areas where at least 20 individuals of each target species occur as a sub-population.
  - b. No more than five (5) percent of the projected annual seed production of any individual plant or discrete population of plants will be collected.
  - c. Collections will be made in a manner that captures the majority of the genetic variation found in the sampled populations. Different genotypes will not be intermingled during conservation activities.
  - d. All seed collected will be placed in brown paper bags and stored off-site at an appropriate seed storage facility.
  - e. Collection of seed will be conducted in a manner that will not significantly harm the reproductive potential of the population for that year.

39. The following measures will be implemented at the Wall-Hudson and Bonita Meadows restoration sites to avoid and minimize effects to gnatcatchers during the five-year restoration period:

- a. When maintenance and monitoring activities are conducted during the gnatcatcher breeding season, a qualified biologist will conduct surveys for nesting gnatcatchers no more than one week prior to the start of proposed activities.
- b. If nesting gnatcatchers are observed on-site, no maintenance activities will be conducted within 100 feet of a gnatcatcher nest (exclusion zone), except repairs to broken irrigation lines. If an irrigation line is broken and workers need to encroach into the 100-foot exclusion zone, then Caltrans and the Service will be notified immediately. Prior to maintenance workers accessing the 100-foot exclusion zone, Caltrans and the Service will determine the most appropriate timing and method of repair without causing harm to the nest and/or the nesting pair.

Herbicide application will occur outside of the 100-foot exclusion zone to avoid drift towards the nest. Only hand spraying downwind of the nest will be allowed.

An education program will be implemented to ensure that all maintenance workers know the location of all gnatcatcher nests and are aware of the above described conservation measures.

40. The following measures will be implemented at the Wall-Hudson restoration site to avoid and minimize affects to Quino. Conservation measures a. and b. below pertain only to initial implementation during the winter/spring. The remaining conservation measures listed below will be implemented during the entire five years of restoration:
- a. Prior to the start of grading activities, the perimeter, and access to, the Wall-Hudson restoration area will be delineated with flagging. No grading or other equipment work will occur outside of the flagged limits.
  - b. During initial implementation, locations where dot seed plantain occur will be monitored for post-diapause Quino caterpillars by an experienced Service approved biologist. If Quino caterpillars are detected, the biologist will assist weeders with caterpillar detection and weeders will look for Quino caterpillars while weeding, and will avoid stepping on caterpillars or dot seed plantain plants. Areas where caterpillars are detected will be flagged and only hand weeding will occur within 100 feet of the flagging.
  - c. Beginning the first spring following restoration implementation and occurring each consecutive year thereafter, protocol level surveys for adult Quino will be conducted on the mesa fingers at Wall-Hudson.
  - d. Beginning the first spring following restoration implementation and occurring each consecutive year thereafter, cluster webbing surveys for pre-diapause Quino larvae will be conducted at both the Quino and vernal pool restoration sites four weeks after the first reported adult is observed (as per the Service's website for Quino protocol level surveying). These pre-diapause surveys will be conducted once a week for four weeks. Areas where webbing is detected will be flagged and only hand weeding will occur within 30 feet of flagging.
  - e. Beginning the first spring following restoration implementation and occurring each consecutive year thereafter, the Quino and vernal pool restoration sites will be monitored for post-diapause Quino caterpillars by an experienced Service approved biologist. The monitoring will occur at the initiation of weeding during the post-diapause season. If Quino caterpillars are detected, the biologist will assist weeders with caterpillar detection and weeders will look for Quino caterpillars while weeding, and will avoid stepping on caterpillars or dot seed plantain plants. Areas where caterpillars are detected will be flagged and only hand weeding will occur within 100 feet of the flagging.
  - f. In areas where caterpillars or larval cluster webbing are not detected, mechanical weeding may occur.

- g. All personnel who will be conducting weeding activities will be trained by a qualified biologist to recognize Quino caterpillars. A qualified biologist will be on-site during all weeding operations to assist weeders with Quino caterpillar identification.
- h. Flagging installed to denote areas where Quino larvae have been observed will be left in place until deemed ready for removal by the approved biologist in coordination with the Service. All flagging installed to denote Quino larval stages will be marked with permanent markers with the following information: date of placement, type of Quino larvae detected, and the last name of the person marking the flagging. Flagging will provide direction for all weeding activities on-site.

## STATUS OF THE SPECIES

### Coastal California Gnatcatcher (*Polioptila californica californica*)

#### *Listing Status*

The Service listed the gnatcatcher as threatened on March 30, 1993 (*Federal Register* 58:16742-16757). As part of the Federal listing, the Service issued a special rule, pursuant to section 4(d) of the Act, defining the conditions under which take of the gnatcatcher would not be a violation of section 9 (*Federal Register* 58: 65088-65096). This special rule recognized the State's Natural Community Conservation Planning (NCCP) Program, and several local governments' ongoing multi-species conservation planning efforts (e.g., the Multiple Species Conservation Program (MSCP)) that intend to apply Act standards to activities affecting the gnatcatcher. An interim process was established whereby jurisdictions actively involved in NCCP planning would be allowed to take up to five percent of the remaining coastal sage habitat for projects that were consistent with the NCCP conservation guidelines (CDFG and California Resources Agency 1993).

#### *Species Description*

The gnatcatcher is a small (length: 11 centimeters; weight: 6 grams), long-tailed member of the old-world warbler and gnatcatcher family *Sylviidae* (American Ornithologists' Union 1998). The bird's plumage is dark blue-gray above and grayish-white below. The tail is mostly black above and below. The male has a distinctive black cap which is absent during the winter. Both sexes have a distinctive white eye-ring.

The coastal California gnatcatcher is one of three subspecies of the California gnatcatcher (*Polioptila californica*) (Atwood 1991). Prior to 1989, the California gnatcatcher was classified as a subspecies of the Black-tailed gnatcatcher (*Polioptila melanura*). Atwood (1980, 1988) concluded that the species was distinct from *P. melanura*, based on differences in ecology and behavior. Recent mitochondrial DNA sequencing confirmed the species-level recognition of the California gnatcatcher (Zink and Blackwell 1998).

### *Distribution*

Gnatcatchers occur on coastal slopes in southern California, ranging from southern Ventura southward through Palos Verdes Peninsula in Los Angeles County through Orange, Riverside, San Bernardino and San Diego Counties into Baja California to El Rosario, Mexico, at about 30 degrees north latitude (Atwood 1991). In 1990, Atwood reported that ninety-nine percent of all gnatcatcher locality records occurred at or below an elevation of 300 meters (m) (984 feet (ft)). In 1992, Atwood and Bolsinger reported that, of 324 sites of recent occurrence, 272 (84 percent) were located below 250 m (820 ft) in elevation, 315 (97 percent) were below 500 m (1,640 ft), and 324 (100 percent) were below 750 m (2,460 ft). Since that time, additional data collected at higher elevations shows that this species may occur as high as 912 m (3,000 ft) and that more than 99 percent of the known gnatcatcher locations occurred below 770 m (2,500 ft) (Service 2000a).

### *Habitat Affinities*

Gnatcatchers typically occur in or near coastal sage scrub habitat. Coastal sage scrub is patchily distributed throughout the range of the gnatcatcher, and the gnatcatcher is not uniformly distributed within the structurally and floristically variable coastal sage scrub community. Rather, the subspecies tends to occur most frequently within California sagebrush (*Artemisia californica*)-dominated stands on mesas, gently sloping areas, and along the lower slopes of the coast ranges (Atwood 1990). An analysis of the percent gap in shrub canopy supports the hypothesis that gnatcatchers prefer relatively open stands of coastal sage scrub (Weaver 1998). The gnatcatcher occurs in high frequencies and densities in scrub with an open or broken canopy while it is absent from scrub dominated by tall shrubs and occurs in low frequencies and densities in low scrub with a closed canopy (Weaver 1998). Territory size increases as vegetation density decreases and with distance from the coast, probably due to food resource availability.

Gnatcatchers also use chaparral, grassland, and riparian habitats where they occur adjacent to sage scrub (Campbell *et al.* 1998). The use of these habitats appears to be most frequent during late summer, autumn, and winter, with smaller numbers of birds using such areas during the breeding season. These non-sage scrub habitats are used for dispersal, but data on dispersal use are largely anecdotal (Campbell *et al.* 1998). Linkages of habitat along linear features such as highways and power-line corridors may be of significant value in linking populations of the gnatcatcher (Famolaro and Newman 1998). Although existing quantitative data may reveal relatively little about gnatcatcher use of these other habitats, these areas may be critical during certain times of year for dispersal or as foraging areas during drought conditions (Campbell *et al.* 1998). Breeding territories have also been documented in non-sage scrub habitat. Campbell *et al.* (1998) discuss likely scenarios explaining why habitats other than coastal sage scrub are used by gnatcatchers including food source availability, dispersal areas for juveniles, temperature extremes, fire avoidance, and lowered predation rate for fledglings.

### *Critical Habitat*

Final determination of critical habitat for the gnatcatcher was published in the *Federal Register* on October 24, 2000 (Service 2000a). On June 11, 2002, the U.S. District Court for the Central District of California remanded the critical habitat rule to the Service so that we may prepare a new economic analysis. Areas previously designated as critical habitat for the gnatcatcher in 2000, will remain in place until such time as a new, final designation becomes effective. On April 24, the Service re-proposed critical habitat for the gnatcatcher (*Federal Register* 68:20228-20312).

Critical habitat for the gnatcatcher includes 207,868 hectares (ha) (513,650 acres [ac]) of Federal, state, local, and private land in Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties (Service 2000a). Primary constituent elements for the gnatcatcher are those habitat components that are essential for the primary biological needs of foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering (Atwood 1990). Primary constituent elements are provided in (1) undeveloped areas, including agricultural lands, that support or have the potential to support, through natural successional processes, various types of sage scrub, or (2) undeveloped areas that support chaparral, grassland, or riparian habitats where they occur proximal to sage scrub and where they may be utilized for the biological needs of dispersal and foraging, and (3) undeveloped areas, including agricultural areas, that provide or could provide connectivity or linkage between or within larger core areas, including open space and disturbed areas that may receive only periodic use.

### *Life History*

The gnatcatcher is primarily insectivorous, nonmigratory, and exhibits strong site tenacity (Atwood 1990). Diet deduced from fecal samples resulted in leaf- and plant-hoppers and spiders predominating the samples. True bugs, wasps, bees, and ants were only minor components of the diet (Burger *et al.* 1999). Gnatcatcher adults selected prey to feed their young that was larger than expected given the distribution of arthropods available in their environment. Both adults and young consumed more sessile than active prey items (Burger *et al.* 1999).

The gnatcatcher seems to become highly territorial by late February or early March each year, as males become more vocal during this time period (Mock *et al.* 1990). In southwestern San Diego County the mean breeding season territory size ranged from 5 to 11 ha (12 to 27 ac) per pair and non-breeding season territory size ranged from 5 to 17 ha (12 to 42 ac) per pair (Preston *et al.* 1998). During the non-breeding season, gnatcatchers have been observed to wander in adjacent territories and unoccupied habitat increasing their home range size to approximately 78 percent larger than their breeding territory (Preston *et al.* 1998).

The breeding season of the gnatcatcher extends from mid-February through the end of August, with the peak of nesting activity occurring from mid-March through mid-May. The gnatcatcher's nest is a small, cup-shaped basket usually found 0.3 to 1 m (1 to 3 ft) above the ground in a small shrub or cactus. Clutch sizes range between three and five eggs, with the average being four. Juvenile birds associate with their parents for several weeks (sometimes months) after fledging

(Atwood 1990). Nest building begins in mid-March with the earliest recorded egg date of March 20 (Mock *et al.* 1990). Post-breeding dispersal of fledglings occurs between late May and late November. Nest predation is the most common cause of nest failure (Grishaver *et al.* 1998). Gnatcatchers are persistent nest builders and often attempt multiple broods, which is suggestive of a high reproductive potential. This is, however, typically offset by high rates of nest predation and brood parasitism (Atwood 1990). Nest site attendance by male gnatcatchers was determined to be equal to that of females for the first nest attempt and then decline to almost a third of female nest attendance for later nesting attempts (Sockman 1998).

Gnatcatchers typically live for two to three years, although ages of up to five years have been recorded for some banded birds (Dudek and Associates 2000). Observations indicate that gnatcatchers are highly vulnerable to extreme cold, wet weather (Mock *et al.* 1990). Predation occurs in greater proportion in the upper and lower third of the nest shrub. Predation is lower in nests with full clutch sizes (Sockman 1997). Potential nest predators are numerous, and include snakes, raccoons, and corvids (Grishaver *et al.* 1998). The California gnatcatcher also is known to be affected by nest parasitism of the brown-headed cowbird (*Molothrus ater*). Nest parasitism apparently has resulted in earlier nesting dates of the gnatcatcher which may help compensate for the negative effect of parasitism (Patten and Campbell 1998). However, the gains in nest success from decreased nest parasitism appear to be negated by increased nest abandonment due to predation before cowbirds have migrated into an area (Braden *et al.* 1997).

The natal dispersal, for a nonmigratory bird, such as the gnatcatcher, is an important aspect of the biology of the species (Galvin 1998). The mean dispersal distance of gnatcatchers banded in San Diego County is reported at less than 1.9 miles (Bailey and Mock 1998). Although the mean dispersal distances that have been documented above are relatively low, dispersal of juveniles is difficult to observe and to document without extensive banding studies. Therefore, it is likely that the few current studies underestimate the gnatcatcher's typical dispersal capacity (Bailey and Mock 1998). Juvenile gnatcatchers are apparently able to traverse highly man-modified landscapes for at least short distances (Bailey and Mock 1998). Natural and restored coastal sage scrub habitat along highway corridors is used for foraging and nesting by gnatcatchers and may serve important dispersal functions (Famolaro and Newman 1998). Typically, however, the dispersal of juveniles requires a corridor of native vegetation which provides foraging and cover opportunities to link larger patches of appropriate sage scrub vegetation (Soulé 1991). These dispersal corridors may facilitate the exchange of genetic material and provide a path for recolonization of areas from which the species has been extirpated (Soulé 1991, Galvin 1998).

#### *Population Trend*

The gnatcatcher was considered locally common in the mid-1940's, but by the 1960's this subspecies had declined substantially in the United States owing to widespread destruction of its habitat (Atwood 1990). By 1980, Atwood (1980) estimated that no more than 1,000 to 1,500 pairs remained in the United States. In 1993, at the time the gnatcatcher was listed as threatened, the Service estimated that approximately 2,562 pairs of gnatcatchers occurred in the United States. Of these, 30 pairs occurred in Los Angeles County, 757 pairs occurred in Orange County, 261 pairs occurred in Riverside County, and 1,514 pairs occurred in San Diego County (Service

1993a). In October 1996, the total number of gnatcatchers in the United States was estimated at 2,899 pairs with two-thirds occurring in San Diego County (Service 1996), after subtracting out all gnatcatcher pairs authorized for take under Habitat Loss Permits, approved Natural Community Conservation Plans, Habitat Conservation Plans, and section 7 consultations. These population estimates were intended to represent a coarse approximation of the number of gnatcatchers in southern California. Confidence intervals have not been calculated for these estimates and therefore, we can not be sure of their precision. Recent fires across southern California have significantly reduced quality gnatcatcher habitat which may result in a reduction in gnatcatcher populations, particularly in San Diego County where the Paradise, Cedar, and Otay fires consumed large areas of occupied gnatcatcher habitat. CSS is fire adapted and should recover over time. It is unknown what the long-term affect to the gnatcatcher population will be due to the unprecedented size of the fires.

### *Threats*

The loss, fragmentation, and adverse modification of habitat are the principal reasons for the gnatcatcher's federally threatened status (Service 1993a). The amount of coastal sage scrub available to gnatcatchers has continued to decrease during the period after the listing of the species. It is estimated that up to 90 percent of coastal sage scrub vegetation has been lost as a result of development and land conversion (Westman 1981a, 1981b, Barbour and Major 1977), and coastal sage scrub is considered to be one of the most depleted habitat-types in the United States (Kirkpatrick and Hutchinson 1977, O'Leary 1990). The fragmentation of habitat may artificially increase populations in adjacent preserved habitat; however, these population surpluses may be lost in subsequent years due to crowding and lack of resources (Scott 1993). In addition, agricultural use, such as grazing and field crops, urbanization, air pollution, and the introduction of non-native plants have all had an adverse impact on extant sage scrub habitat. A consequence of urbanization that is contributing to the loss, degradation, and fragmentation of coastal sage scrub is an increase in wildfires due to anthropogenic ignitions. High fire frequencies and the lag period associated with recovery of the vegetation may significantly reduce the viability of affected subpopulations (Dudek and Associates 2000). Furthermore, nest-parasitism by the brown-headed cowbird (Unitt 1984) and nest predation threaten the recovery of the gnatcatcher (Atwood 1980, Unitt 1984).

### **San Diego fairy shrimp (*Branchinecta sandiegonensis*)**

#### *Listing Status*

The San Diego fairy shrimp was federally listed as endangered on February 3, 1997 (62 FR 4925). A vernal pool recovery plan which included San Diego fairy shrimp was published in September 1998 (Service 1998a). Critical habitat was proposed for this species on April 23, 2003 (68 FR:19888).

### *Species Description*

*Branchinecta sandiegonensis*, is a small aquatic crustacean (Order: *Anostraca*) restricted to vernal pools. *B. sandiegonensis* was originally described by Fugate (1993) from samples collected on Del Mar Mesa, San Diego County. Mature individuals lack a carapace (hard outer covering of the head and thorax) and have a delicate elongate body, large stalked compound eyes, and 11 pairs of swimming legs (Service 2000b). Adult male San Diego fairy shrimp range in size from 9 to 16 millimeters (0.35 to 0.63 in); adult females are 8 to 14 millimeters (0.31 to 0.55 in) long. The second pair of antennae in males are greatly enlarged and specialized for clasping the females during copulation, while the second pair of antennae in the females are cylindrical and elongate. Refer to Fugate (1993) for a detailed description of the identifying characteristics of *B. sandiegonensis*.

### *Distribution*

San Diego fairy shrimp occur in vernal pools from Marine Corps Base Camp Pendleton, inland to Ramona and south through Del Mar Mesa, Proctor Valley, and Otay Mesa, San Diego County, California. The species has recently been documented in Orange County in the Fairview Park vernal pools and at Saddleback Meadows (Service 1997a). In Baja California, it has been recorded at two localities (Valle de Palmas, south of Tecate and Baja Mar, north of Ensenada) and a single isolated female was reported from vernal pools in Isla Vista, Santa Barbara County, California (Service 1995).

### *Habitat Affinities*

San Diego fairy shrimp tend to inhabit shallow, small vernal pools and vernal pool-like depressions (e.g., ruts in dirt roads) with water temperatures of 10-26° C. They are ecologically dependent on seasonal fluctuations in their habitat, such as absence or presence of water during specific times of the year, duration of inundation, and other environmental factors that likely include specific salinity, conductivity, dissolved solids, and pH levels. Gonzalez *et al.* (1996) found water chemistry as an important factor in determining the distribution of the San Diego fairy shrimp.

### *Life History*

San Diego fairy shrimp are non-selective particle filter-feeders, or omnivores. Detritus, bacteria, algal cells, and other items between 0.3 to 100 microns may be filtered and ingested (Eriksen and Belk 1999). Adult fairy shrimp are usually observed from January to March; however, in years with early or late rainfall, the hatching period may be extended (Service 2000b). This species hatches in 3 to 8 days and matures in about 7 to 17 days depending on water temperature (Hathaway and Simovich 1996). San Diego fairy shrimp may only persist for about 4 to 6 weeks after hatching (Hathaway and Simovich 1996). The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks (Service 2000b). Eggs may persist in the substrate for several years. When the pools refill in the same or subsequent rainy seasons, some but not all of the eggs may hatch (Service 2000b). Fairy shrimp may be eaten by a wide

variety of species, including beetles, dragonfly larvae, and other arthropods, frog, salamander, and toad tadpoles, shorebirds, ducks, and even other fairy shrimp.

### *Population Trend*

San Diego fairy shrimp are known to occur in most of the vernal pool complexes in coastal San Diego County (Service, 1998a). Many populations of San Diego fairy shrimp have likely been extirpated or have experienced drastic declines due to the substantial loss of habitat in southern California. The majority of the vernal pools within the range of the San Diego fairy shrimp were lost prior to 1990 (Service 1998a). The greatest recent losses of vernal pool habitat in San Diego County have occurred in Mira Mesa, Rancho Penasquitos, and Kearny Mesa, which accounted for 73 percent of all the pools destroyed in the region from 1979 to 1986 (Keeler-Wolf *et al.* 1998). Other substantial losses have occurred in the Otay Mesa area, where over 40 percent of the vernal pools were destroyed between 1979 and 1990. Similar to San Diego County, vernal pool habitat was once extensive on the coastal plain of Los Angeles and Orange counties. Unfortunately, there has been a near total loss of vernal pool habitat in these areas (Keeler-Wolf *et al.* 1998).

### *Threats*

The San Diego fairy shrimp is especially vulnerable to alteration in hydrology, thus the protection of watershed function is critical to its survival. San Diego fairy shrimp are also threatened by urban, agricultural development, modified hydrology due to adjacent road construction, and illegal trash dumping. Unpredictable natural events such as drought or fire may extirpate the San Diego fairy shrimp due to its fragmented and restricted range. They are also vulnerable to contaminants in runoff waters and watershed quality. Low levels of genetic variability may affect the species potential for long term viability (Service 1997a).

### **Riverside fairy shrimp (*Streptocephalus woottoni*)**

#### *Listing Status*

The Riverside fairy shrimp was listed as endangered on August 3, 1993 (58 FR 41391). A vernal pool recovery plan, which included Riverside fairy shrimp, was published in September 1998 (Service 1998a). Critical habitat was proposed on April 27, 2004 (69 FR 23024).

#### *Species Description*

*Streptocephalus woottoni* is a small freshwater crustacean in the Family *Streptocephalidae*, of the Order *Anostraca*. The species was first collected in 1979 by Dr. Clyde Erickson and formally described as a new species in 1990 (Eng *et al.* 1990). Mature males are between 13 and 25 millimeters (0.5 to 1.0 in) long. The cercopods (structures that enhance the rudder-like function of the abdomen) are separate with plumose setae (feathery bristles) along the borders. Mature females are between about 13 and 22 millimeters (0.5 to 0.87 in) in length. The brood pouch extends to the seventh, eighth, or ninth abdominal segment. The cercopods of females are the

same as in males. The species most taxonomically similar to *S. woottoni* is *S. seali* (Eng *et al.* 1990). However, in *S. woottoni*, both the male and the female have the red color of the cercopods covering the ninth and 30 to 40 percent of the eighth abdominal segments (Eng *et al.* 1990). No red extends onto the abdominal segments in living *S. seali* of either sex (Eng *et al.* 1990). A full description of identifying characteristics for this species is given by Eng *et al.* (1990).

### *Distribution*

The Riverside fairy shrimp is believed to have the most restricted distribution of an endemic California fairy shrimp (Eng *et al.* 1990, Simovich and Fugate 1992). The northern distribution limit for the Riverside fairy shrimp is Cruzan Mesa, Los Angeles County and the former Carlsberg Ranch, Ventura County (Service 2001a). In Baja California, Mexico it has been documented at two locations: Valle de Las Palmas, south of Tecate, and Bajamar, north of Ensenada (Brown *et al.* 1993). With the exception of the Riverside populations, all populations are within 15 kilometers of the coast over a north-south distance of about 140 kilometers (Eriksen and Belk 1999). All known populations lie between 30 and 415 meters in elevation. In San Diego County it is known to occur at Marine Corps Base Camp Pendleton, City of Carlsbad, one complex at Marine Corps Air Station Miramar, and on Otay Mesa.

### *Habitat Affinities*

Riverside fairy shrimp are restricted to deep (greater than 25 cm in depth) seasonal vernal pools, vernal pool like ephemeral ponds, and stock ponds (Eng *et al.* 1990, Service 1993b). They prefer warm-water pools that have low to moderate dissolved solids (Eriksen and Belk 1999). Pools are generally open and unvegetated with turbid water conditions and low total dissolved solids, alkalinity, and chloride levels, as evidenced by approximately neutral pH values (Eng *et al.* 1990). All known habitat lies within annual grasslands, which may be interspersed through chaparral or coastal sage scrub vegetation.

### *Life History*

Riverside fairy shrimp are non-selective particle-feeding filter-feeders, or omnivores. Detritus, bacteria, algal cells, and other items between 0.3 to 100 microns may be filtered and ingested (Eriksen and Belk 1999). Females produce between 17 and 427 cysts over their lifetime (Simovich and Hathaway 1997). Presumably because of the ephemeral and unpredictable nature of the pool resource, few of the available cysts hatch at a time (Eriksen and Belk 1999). Cysts may hatch when water temperature is at 10° C but develop slowly below 15° C (Eriksen and Belk 1999). Hathaway and Simovich (1996) found that Riverside fairy shrimp hatched in 7 to 12 days when water temperature was between 10° and 20° C and maturity was noted between 48 to 56 days. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks (Service 2001a). Eggs may persist in the substrate for several years. When the pools refill in the same or subsequent rainy seasons, some but not all of the eggs may hatch (Service 2001a). Fairy shrimp may be eaten by a wide variety of species, including beetles,

dragonfly larvae, and other arthropods, frog, salamander, and toad tadpoles, shorebirds, ducks, and even other fairy shrimp.

### *Population Trends*

Many populations of Riverside fairy shrimp have likely been extirpated or have experienced drastic declines due to the substantial loss of habitat in southern California. The majority of the vernal pools within the range of the Riverside fairy shrimp were lost prior to 1990 (Service 1998a). Substantial losses have occurred in the Otay Mesa area, where over 40 percent of the vernal pools were destroyed between 1979 and 1990. Similar to San Diego County, vernal pool habitat was once extensive on the coastal plain of Los Angeles and Orange counties.

Unfortunately, there has been a near total loss of vernal pool habitat in these areas (Keeler-Wolf *et al.* 1998). Significant losses of vernal pools supporting this species have also occurred in Riverside County (Service 2001a).

### *Threats*

The Riverside fairy shrimp is especially vulnerable to alteration in hydrology, thus the protection of watershed function is critical to its survival. Riverside fairy shrimp are also threatened by urban and agricultural development, modified hydrology due to adjacent road construction, and illegal trash dumping. Unpredictable natural events such as drought or fire may extirpate the Riverside fairy shrimp due to its fragmented and restricted range. They are also vulnerable to contaminants in runoff waters and watershed quality. Low levels of genetic variability may affect the species potential for long term viability (Service 1993b). With the long distance isolation between the few remaining pools, gene flow is greatly if not completely reduced.

The Riverside fairy shrimp faces threats throughout its range. These threats can be divided into three major categories: 1) direct destruction of vernal pools and vernal pool habitat as a result of construction, vehicle traffic, domestic animal grazing, dumping, and deep plowing; 2) indirect threats which degrade or destroy vernal pools and vernal pool habitat over time including altered hydrology (e.g., damming or draining), invasion of alien species, habitat fragmentation, and associated 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, climatic variations, and changes in nutrient availability (Bauder 1986; Service 1993b).

## **Quino Checkerspot Butterfly (*Euphydryas editha quino*)**

### *Listing Status*

On August 4, 1994, the Service published a petition finding in the Federal Register (*Federal Register* 59: 39868) with a proposed rule to list the Quino checkerspot butterfly as endangered. We published the final rule listing the species on January 16, 1997 (*Federal Register* 62: 2313). We proposed designating critical habitat for the Quino checkerspot butterfly on February 7, 2002 (*Federal Register* 66: 9476), and finalized the designation on April 15, 2002 (*Federal Register* 67: 18356). A final recovery plan for this species was issued on August 11, 2003.

### *Species Description*

The Quino checkerspot butterfly (*Euphydryas editha quino*) is a recognized subspecies of Edith's checkerspot (*E. editha*), and is a member of the Nymphalidae family, the brush-footed butterflies, and the Melitaeinae subfamily, checkerspots and fritillaries. Quino differs from the other *E. editha* subspecies in size, wing coloration, and larval and pupal phenotypes (Mattoni *et al* 1997). Among the other subspecies of *E. editha*, Quino is moderate in size with a wingspan of approximately 4 cm (1.5 in). The dorsal (top) side of its wings is covered with a red, black, and cream colored checkered pattern, the ventral (bottom) side is mottled with tan and gold. Its abdomen generally has bright red stripes across the top. Quino larvae are black and have a row of nine, orange-colored tubercles (fleshy/hairy extensions) on their back. Pupae are extremely cryptic and are mottled black and blue-gray.

### *Distribution*

Quino was historically distributed throughout the coastal slopes of southern California, including Los Angeles, Orange, Riverside, San Diego, and San Bernardino counties, and northern Baja California, Mexico (Mattoni *et al.* 1997; Service database). That distribution included the westernmost slopes of the Santa Monica Mountains, the Los Angeles Plain and Transverse Ranges to the edge of the upper Anza-Borrego Desert, and south to El Rosario in Baja California, Mexico (Emmel and Emmel 1973; Mattoni *et al.* 1997; Service database). Although historical collection records allow for an estimate of a species' range, such records usually underestimate the number of historical sites and extent of local distributions. Collectors tended to frequent well-known sites, and no systematic or comprehensive surveys for Quino have ever been conducted (Mattoni *et al.* 1997).

As recently as the 1950's, collectors described Quino as occurring on every coastal bluff, inland mesa top, and lower mountain slope in San Diego County and coastal northern Baja California. These observations indicate that Quino was historically widespread throughout the southern California landscape, and occurred in a variety of vegetation types, including coastal sage scrub, open chaparral, juniper woodland, meadows, and grasslands. By the 1970's, most of the coastal bluff and mesa habitats in southern California had been urbanized or otherwise disturbed. However, Quino still occupied known habitat locations inland and at higher elevations including Dictionary Hill, Otay Lakes, and San Miguel Mountain in San Diego County, and the Gavilan Hills in Riverside County. By the middle 1980's the species was thought to have disappeared from the known locations; the petition to list the species in 1988 suggested that it might be extinct. Nonetheless, new populations were discovered in Riverside County, Quino was rediscovered in San Diego County, and the species continued to survive in northern Baja California, Mexico. Current information suggests that Quino has been extirpated from Los Angeles, Orange, and San Bernardino Counties.

### *Habitat Affinities*

In southwestern San Diego County, the primary host plant for Quino is the dot-seed plantain (*Plantago erecta*), however Quino may use other species of plantain (*Plantago* spp.) and annual

owl's-clover (*Castilleja exserta*) as primary or secondary host plants. Another apparently important, but only recently documented, primary host plant is white snapdragon (*Antirrhinum coulterianum*; Pratt 2001). Quino is generally found in open areas and ecotone situations which may occur in a number of plant communities, including grasslands, coastal sage scrub, chaparral, and sparse native woodlands. Open areas within a given vegetation community seem to be a critical landscape feature for butterfly populations. Optimal habitat appears to contain little or no invasive exotic vegetation, and especially, a well-developed cryptogamic crust. In its adult stage, Quino uses a number of flowering plants as nectar sources.

### *Life History*

The life cycle of Quino typically entails one generation of adults per year, with a 4- to 6-week flight period occurring generally February to May, depending on weather conditions (Emmel and Emmel 1973, Orsak 1978). During the flight period, adult butterflies move about and search for nectar sources and mates. Females lay multiple masses of 20 to 150 eggs (M. Singer, C. Parmesan, and G. Pratt unpubl. data) with a single female capable of producing more than 1,000 eggs. The eggs hatch in about 10 days and the larvae begin to feed immediately. At lower elevations in San Diego County, the primary host plant for Quino is the dot-seed plantain (*Plantago erecta*), however Quino may use other species of plantain (*Plantago* spp.) and annual owl's-clover (*Castilleja exserta*). As the larvae grow, they periodically shed their skin. Each phase between skin molts is referred to as an "instar" with the first instar being the first larval stage after hatching.

As summer approaches the food plants dry out. In their third or fourth instar, larvae enter into an obligatory diapause. Diapause is a low-metabolic resting state that may last for a year or more, depending on conditions. Diapause allows larvae to survive the regular seasonal climatic extremes and also to better survive times of extended adverse conditions, such as drought. After termination of diapause, larvae become active and feed. They then enter their pupal stage and within two to six weeks, transform into the adults and emerge as butterflies. The butterflies feed, disperse, reproduce, and then die.

Adult Quino, and *E. editha* in general, are sedentary by nature and generally fly close to the ground. Evidence from the bay checkerspot (*E. editha bayensis*; bay checkerspot) suggests that long-distance dispersal is rare (Ehrlich 1961, Brussard and Ehrlich 1970, Ehrlich and Murphy 1981). *Bay checkerspots* have been documented to move up to about 4.5 km (2.8 mi) to colonize distant habitat patches (Harrison 1989). For Quino, many experts familiar with the species believe that Quino populations separated by more than about 3 km (approximately 2 mi) may be demographically isolated. However, responses to abiotic factors, such as weather, may increase the distance butterflies will move (Ehrlich and Murphy 1987). Additionally, adult Quino are known to "hilltop". Hilltopping is a behavior where the males butterflies form territories on hilltops, ridgelines, and other prominent geographic features in order to locate mates.

### *Population Trend*

Until as recently as the 1980s, Quino may have been one of the most abundant butterflies in coastal southern California. More than 75 percent of Quino's historic range has been lost (Brown 1991; Service database), and more than 90 percent of the species' coastal mesa and bluff habitat, where most historic records are located, has been destroyed by habitat fragmentation, degradation, and loss (Service database). It is estimated that Quino population density range-wide has been reduced 95 percent by human-caused impacts. Sources of habitat loss and habitat degradation include competition from non-native plants, livestock grazing, off-road vehicle activity, and fire management practices. Additionally, the butterfly larva are susceptible to predation by exotic invertebrates.

Recent studies have shown competitive exclusion by non-native plants may be accelerated by nitrogen deposition from atmospheric pollution in southern California vegetation communities (Allen et al. 1997, Eliason and Allen 1997, Padgett and Allen 1999, Padgett et al. 1999). The non-native weeds may also directly out-compete the native plants, including butterfly host-plant species. This effect has been documented in a native plant community that supports Bay checkerspot in the San Francisco Bay area (Weiss 1999). Not only does the increase in weeds degrade the quality of the native habitat, it may also increase the frequency or severity of wildfires, further impacting the vegetation community and the wildlife species inhabiting it. Recent fires across southern California have significantly reduced quality Quino habitat which may result in a reduction in Quino populations, particularly in San Diego County where the Cedar and Otay fires consumed large areas of occupied Quino habitat. The vegetation comprising Quino habitat is fire adapted and should recover over time. It is unknown what the long-term affect to the Quino population will be due to the unprecedented size of the fires.

### *Threats*

Quino is threatened primarily by urban and agricultural development, non-native plant species invasion, off-road vehicle use, grazing, and fire management practices (*Federal Register* 62: 2313). These threats destroy and degrade the quality of habitat and result in the extirpation of local Quino populations. Quino population decline likely has been, and will continue to be, caused in part by enhanced nitrogen deposition, elevated atmospheric carbon dioxide concentrations, and climate change. Nonetheless, urban development poses the greatest threat and exacerbates all other threats. Activities resulting in habitat fragmentation or host or nectar plant removal reduce habitat quality and increase the probability of local Quino population extirpation and species extinction.

Other threats to the species identified in the final listing rule (*Federal Register* 62: 2313) include illegal trash dumping and predation. Dumping, a documented problem for some populations (G. Pratt *vide Federal Register* 67: 18356), is detrimental because of resulting habitat degradation and destruction. Over-collection by butterfly hobbyists and dealers is a probable threat, although the magnitude of this activity is unknown. Stamp (1984) and White (1986) examined the effects of parasitism and predation on the genus *Euphydryas*, although it is not clear whether these mortality factors pose a significant threat to this species. Predation by Argentine ants

(*Iridomyrmex humilis*) has been observed in colonies of the butterfly in the laboratory (G. Pratt *vide Federal Register* 67: 18356) and intense predation by nonnative Brazilian fire ants (*Solenopsis invicta*) is likely where they co-occur with Quino (Porter and Savignano 1990). Brazilian fire ants were documented in 1998 in the vicinity of historic Quino habitat in Orange County and have subsequently been found in Riverside and Los Angeles Counties (California Department of Food and Agriculture 1999).

### **San Diego Button-Celery (*Eryngium aristulatum* var. *parishii*)**

#### *Listing Status*

San Diego button-celery was federally listed as endangered on August 3, 1993 (*Federal Register* 58: 41391), after the Service determined that the present range and continued existence of the species was being rapidly destroyed by habitat loss and degradation due to urban and agricultural development, grazing, off-road vehicle use, trampling, invasion from weedy non-native plants and other factors. It has been listed as endangered in the State of California since July 1979. Critical habitat has not been designated for this species. A vernal pool recovery plan which included San Diego button-celery was published in September 1998 (U.S. Fish and Wildlife Service 1998b).

#### *Species Description*

San Diego button-celery is a perennial herb with a persistent tap root. The plant has a spreading to erect habit, reaching a height of 41 centimeters (16 inches) or more. The stems and toothed leaves are gray green with spinose lobes, giving it a prickly appearance. Inflorescences form on short peduncles (stalks) with few to many-flowered heads. Flowers are white and vary in length from 1.7 to 2.8 mm (Munz 1974, Hickman 1996).

San Diego button-celery is one of three subspecies of *Eryngium aristulatum* and belongs to the family *Apiaceae* (Hickman 1996). *Eryngium aristulatum* var. *parishii* is separated from *Eryngium aristulatum* var. *aristulatum* by having styles in fruit that are about the same length as the calyx (outer whorl of protective leaves around the flower) and is separated from *Eryngium aristulatum* var. *hooveri* by having bractlets (modified leaves) without callused margins (Hickman 1996). The majority of populations once identified as *Eryngium aristulatum* var. *parishii* on Camp Pendleton Marine Corps Base have been placed under a recently described species: *Eryngium pendletonensis* (Marsden and Simpson 1999). San Diego button celery is distinguished from *Eryngium pendletonensis* by a combination of leaf and flower structures.

#### *Distribution*

San Diego button-celery occurs in vernal pools from the Santa Rosa Plateau, Riverside County, California, south to the mesas north of Ensenada, Mesa de Colonet, and San Quintin, Baja California, Mexico ([K. Marsden, pers. comm., 1997] in Service 1998). In San Diego County it is found in pools on Del Mar Mesa, Mira Mesa, Kearny Mesa, Marine Corps Air Station Miramar, Marine Corps Base Camp Pendleton, and at sites within the cities of Tierrasanta, San

Marcos, Carlsbad, and Ramona; it was extirpated from a site in the city of La Jolla (Bauder 1986). San Diego button-celery is also found in the southern portion of San Diego County on Otay Mesa, near the Lower Otay Reservoir and in Proctor Valley. It also was found near the Tijuana Airport, but is believed to be extirpated at this locale. There are no known herbarium collections of San Diego button-celery from the San Diego Mesa (e.g., Normal Heights, San Diego State University) (Service 1998). The California Native Plant Society (2001) notes that this plant has been found at elevations from 20-620 meters above mean-sea-level.

### *Habitat Affinities*

San Diego button-celery is associated with white clay bottom vernal pools devoid of hardpans (Service 1993c). However, this species is somewhat more tolerant of peripheral vernal pool habitat than most obligate vernal pool species such as San Diego Mesa mint (*Pogogyne abramsii*) with which it sometimes grows (Reiser 1996).

### *Life History*

Most commonly a perennial herb with a persistent tap root, San Diego button-celery is occasionally an annual under less favorable conditions. San Diego button-celery blooms from April to June. It reproduces by outcrossing and is presumably insect-pollinated (Ogden Environmental *et al.* 2000). It is reliant on vernal wet conditions and has developed mechanisms such as Aerenchyma tissue that promotes gas exchange underwater to cope with this habitat.

### *Population Trend*

In 1979, San Diego button-celery was known from 65 pool groups; by 1986, this plant remained in 61 pool groups (Service 1993c); and by 1998, San Diego button celery continued to exist in 61 pool groups (Service 1998b). Although several sites receive some protection, Reiser (1996) stated that this subspecies is severely declining with continued losses. Many existing pool groups are remnant colonies of once larger populations and are subject to various forms of authorized and unauthorized disturbance (Service 1993c, Reiser 1996).

### *Threats*

This species is threatened by land conversions, habitat fragmentation and degradation, livestock grazing, competition from non-native plant species, and other factors. Urban development remains the primary threat to vernal pool complexes inhabited by San Diego button celery (Bauder 1987). Some proposed projects include expansion of airports and landfills, construction of major roadways, utility infrastructure, resorts and recreational facilities, commercial and industrial properties, and residential housing tracts. Generally, these projects directly impact pools through elimination of the habitat (Service 1998b).

Where pools remain, dumping, trampling, vehicular activity, runoff, and intrusion of non-native species are continued threats. Hydrological changes and erosion can cause profound changes in

the pool flora (Bauder 1987, 1992). Trenching for utilities, on-going operations within easements and lease holding, responses to emergencies such as fire or air crashes, fuel and chemical spills, and recreational activities, such as off-highway-vehicle (OHV) use, can all cause serious damage to vernal pools, particularly during the aquatic or drying phases when soils are most vulnerable and the organisms are growing or reproducing. When disturbance is severe, it can lead to local extirpations of pool species (Service 1998b).

## 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 which are contemporaneous with the consultation in progress.

The entire alignment of the proposed Project occurs within an approved NCCP/HCP that is referred to as the MSCP. The MSCP Planning Area encompasses 582,000 acres within southwestern San Diego County. Except for Bonita Meadows, the proposed Project lies wholly within the City of San Diego's MSCP boundaries. Bonita Meadows is within the San Diego County MSCP boundaries. With the exception of Quino, all species addressed in this Opinion are covered species<sup>1</sup> under the MSCP. Taking of covered species will be allowed in accordance with approved subarea plans and implementing agreement, therefore most of the anticipated impacts associated with private actions (i.e., urban development) have already been analyzed through this program. Table 3-5 "Species Evaluated for Coverage Under the MSCP" of the MSCP (August 1998) outlines the anticipated conservation and impacts for each species. Other federal actions in the action area include the Immigration and Naturalization Service border fence and associated activities, and SR-125.

### *Coastal California gnatcatcher*

The gnatcatcher occupies numerous territories in Spring Canyon both within the proposed Project footprint and in the adjacent side and main canyons to the south of the proposed road corridor. Spring Canyon is preserved as part of the City of San Diego's MSCP and is designated as MHPA lands. Prior to 1999, five gnatcatcher pairs were detected within or adjacent to the study corridor. During surveys conducted in 2002, a new location supporting one gnatcatcher pair was detected west of Old Otay Mesa Road, one pair and one individual were observed in the central section of Spring Canyon to the east of Caliente Avenue, two gnatcatcher pairs were detected to the west of Heritage Road, one pair and one individual was detected in the canyon

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<sup>1</sup>"Covered species" means those species within the MSCP Area which will be adequately conserved by the MSCP when the MSCP is implemented through the subarea plans for which will be adequately conserved through the permitting process pursuant to Section 404 of the Clean Water Act, 33 U.S.S. § 1344

near the southern end of Heritage Road. During surveys for rare plants and Quino, gnatcatchers were observed within and immediately adjacent to the proposed Project footprint. Gnatcatchers are also known from Dennery Canyon adjacent to Wall-Hudson and at Bonita Meadows.

#### *Quino checkerspot butterfly*

Quino historically occurred throughout Otay Mesa. Habitat for Quino exists in areas along the proposed Project alignment. Focused surveys for Quino resulted in no Quino being detected within the action area. In 2001, an adult female Quino was detected within the perimeter of the OCCS preserve, adjacent to the proposed Project alignment. The larval host plant, dot seed plantain (*Plantago erecta*), is found along the upper canyon rims throughout the action area.

During the last few years, Quino have been detected within the Otay River drainage to the north of the proposed Project. Dennery Canyon drains into Otay River and there is the potential that Quino occupy areas within Dennery Canyon and the adjacent Otay River.

#### *Vernal Pool Species*

Riverside fairy shrimp, San Diego fairy shrimp, and San Diego button celery historically occurred in vernal pool complexes throughout the Otay Mesa ecosystem which is part of the San Diego: Southern Coastal Mesa Management Area identified in the Vernal Pool Recovery Plan (Service 1998). Many of these vernal pool complexes have been developed, converted to agriculture, or degraded by OHV use. Most of the historic vernal pool habitat in the northwestern portion of Otay Mesa have either been graded or developed as part of the Pardee Development Projects. Impacts from these development projects have been offset at the Dennery Canyon vernal pool preserve along the southern side of Dennery Canyon and at the OCCS preserve. In addition, the City of San Diego has restored a vernal pool complex adjacent to Dennery Canyon vernal pool preserve for impacts by construction of Otay Mesa Road. The City of San Diego has also purchased property containing the J16-18 vernal pool complexes immediately south of the ROW adjacent to Spring Canyon. Northeast of the Pardee developments and along Dennery Canyon is a vernal pool mitigation site for the Robinhood Ridge Development. To offset impacts to Riverside fairy shrimp and San Diego fairy shrimp from construction of the international border triple fence (Border Infrastructure System), the ACOE Planning is currently restoring 20 acres of vernal pool habitat for south of the ROW adjacent of Spring Canyon. Several other smaller mitigation sites also occur in the vicinity of Spring Canyon. The remaining vernal pool habitat is on private property and receives no management or monitoring.

The vernal pool complexes in the Spring Canyon area have been degraded by OHV activity. Due to recent construction north of Otay Mesa Road, there appears to be increased activity south of Otay Mesa Road. The pools continue to be degraded due to lack of management.

Prior to 1999, and within the three alignments of the central alternative, San Diego fairy shrimp were found in eleven vernal pools and four road pools. Six of these pools are currently within the OCCS preserve. Of the remaining pools, two are now outside of the proposed alignment and

seven pools have been destroyed by development or disturbance. In 2002, San Diego fairy shrimp were detected within six vernal pools and four road pools within the project ROW. In addition, 27 pools within the OCCS preserve support San Diego fairy shrimp. San Diego fairy shrimp are known to occur within pools on the terraces above Spring Canyon south of the Project (e.g., J14 complex) and to the north around Dennery Canyon including Wall-Hudson.

In southern San Diego County, Riverside fairy shrimp historically occurred in eight pool complexes on Otay Mesa near the U.S./Mexico border. A number of these pool complexes have been converted for residential or commercial use. Within the Project survey area, Riverside fairy shrimp were detected in five vernal pools, three of which are situated near Spring Canyon and two to the west near Caliente Boulevard near the intersection of Otay mesa road and Airway Road. Twenty pools within the OCCS preserve also support Riverside fairy shrimp.

Within the Spring Canyon watershed, there are ten historic vernal pool complexes that may still contain extant populations of San Diego button celery. In addition to the Dennery Canyon vernal pool preserve, there is a vernal pool complex that supports button-celery immediately north of Otay Mesa Road on the Saint Jerome's Church property. This parcel is currently undeveloped. Recent surveys conducted in 2003 detected San Diego button celery within the parcel boundaries. To the east of Arnie's Point (near La Media Road) and immediately north of the Mexican border is an area where three vernal pool complexes containing San Diego button celery historically occurred. The current status of these vernal pool complexes is unknown. North of this area and to the southwest of the intersection of Otay Mesa Road and La Media Road is an emergent wetland that is dominated by non-native grasses. Surveys of this wetland for the proposed Project detected approximately 5221 individuals of San Diego button celery (Waldecker 2003). Directly north of these complexes and immediately north of Brown Field Airport are two historic vernal pool complexes that contain San Diego button celery.

Within the proposed alignment, three pools support San Diego fairy shrimp, one pool supports both San Diego fairy shrimp and Riverside fairy shrimp, and one pool supports fifteen individuals of San Diego button celery. Fairy shrimp surveys at the Wall-Hudson property detected San Diego fairy shrimp in four of the five pools on the north mesa and 20 of the 34 pools on the south mesa.

## **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.

*Effects to the Natural Community Conservation Planning Program*

The proposed Project will directly effect 11.75 acres within the MSCP's MHPA including 2.7 acres of MSS, 2.9 acres of CSS, 5.3 acres of non-native grassland, 0.05 acre of vernal pool surface area, and 0.08 acre of southern willow scrub/mulefat scrub. The proposed Project will temporally and indirectly effect 5.88 acre of MSS and 14.76 acre of CSS within the MSCP's MHPA. To avoid reducing the size of the MHPA in the area, 9.06 acres of mesa top immediately adjacent to the MHPA on the Wall-Hudson property in Dennery Canyon will be restored/enhanced and preserved in perpetuity. In addition, 6.24 acres of upland/wetland habitat will be created along the relocated drainage channel west of La Media Road including 3.28 acres of southern willow scrub/freshwater marsh and 2.96 acre of adjacent upland habitat. The La Media drainage is immediately upstream from and drains into a San Diego button-celery preserve which is immediately adjacent to and drains into the MHPA.

The Bonita Meadows Open Space Preserve is within the NCCP planning areas, but outside of the MHPA and the preserve design for the City of Chula Vista Sub-area Plan. To offset impacts to non-native grasslands within the proposed ROW, 44.7 acres of disturbed native grassland will be preserved and managed in perpetuity. In addition, 14.03 acres of ACOE and CDFG jurisdictional areas will be created/restored/enhanced within the drainage corridor of the unnamed creek that crosses Bonita Meadows Open Space Preserve. Much of the remaining acreage at the Bonita Meadows Open Space Preserve is preserved to offset impacts to Otay tarplant from the construction of SR-125 and to offset impacts to CSS and gnatcatchers from the construction of the managed lanes on I-15. The remaining habitat available at the Bonita Meadows Open Space Preserve will be available to offset impacts from future Caltrans projects in the area.

*Coastal California gnatcatcher*

The proposed Project has the potential to directly affect the gnatcatcher. Direct effects will occur from the temporary and permanent removal of habitat, potential effects of noise during construction, potential effects of lighting during construction, and restoration activities to offset permanent and temporary impacts.

Direct effects to one gnatcatcher pair are expected from the permanent removal of 12.3 acres of CSS and 3.2 acres of MSS, and portions of the 134.1 acres of non-native grassland. Although gnatcatchers were not observed directly within the proposed ROW, one pair was detected immediately adjacent to the Project footprint. Since the occupied CSS and MSS are continuous with the occupied gnatcatcher habitat, it is likely that the removal of CSS, MSS and non-native grassland will harm the gnatcatchers in these areas. To offset direct impacts from habitat destruction to the gnatcatcher, 12.3 acres of CSS and 6.2 acres of MSS will be preserved at the Wall-Hudson property. An additional 67.1 acres of disturbed native grassland will be preserved at Wall-Hudson (22.4 acres) and Bonita Meadows (44.7 acres).

Gnatcatchers typically maintain year-round territories that fluctuate in size (breeding vs. non-breeding seasons) and may shift slightly between years (Preston *et al.* 1998). If construction is

conducted during the breeding season (February 15 through August 31), noise and disturbance associated with construction would likely adversely affect gnatcatchers in adjacent occupied habitat by disrupting breeding and foraging, and causing the birds to frequently flush from the nest, endangering eggs and chicks. Construction noise is a concern if it is at such a level that it masks vital communication signals (Awbrey 1993), normal singing behavior, or alters the ability to detect conspecific encroachments, defend a territory, attract a mate, detect or warn of the approach of a predator or other interspecific intruder, and/or forage adequately. Direct effects to one pair of gnatcatchers west of Otay Mesa Road, and another pair of gnatcatcher pairs in the central section of Spring Canyon, detected within 500 feet of the ROW are expected due to construction and operational noise. Indirect effects from construction noise were quantified as occurring within an area 500 feet wide along the length of the ROW, and impacts to 16.72 acres of CSS and 6.25 acres of MSS within this 500-foot wide corridor will be considered permanent. To offset these impacts, 22.97 acres of CSS/MSS will be preserved in perpetuity at Wall-Hudson.

The proposed Project will be constructed during the daytime and nighttime hours. Lighting introduced onto the project site during construction may adversely affect adjacent habitat areas and facilitate predation of gnatcatchers. However, Caltrans proposes to reduce the potential for such impacts by selectively placing, shielding, and directing lights away from adjacent habitat.

Although no gnatcatchers were detected within the Wall-Hudson restoration site, gnatcatchers may occur on lands adjacent to, or within the restoration area. In addition, gnatcatchers do occupy the CSS adjacent to the riparian corridor at Bonita Meadows where restoration will occur to offset impacts to State and Federal jurisdictional waters. Therefore, restoration and maintenance activities during the gnatcatcher breeding season could potentially disrupt breeding and foraging, and cause the birds to frequently flush from the nest, endangering eggs and chicks. To avoid and minimize potential direct effects to breeding gnatcatchers during restoration and maintenance activities, a qualified biologist will monitor the restoration site and adjacent habitat for breeding activity prior to initiating restoration and maintenance activities. A qualified biologist will locate gnatcatcher nests at the restoration site prior to initiating maintenance work. If a nest is detected, maintenance activities will occur by hand and outside of a 100-foot exclusion zone around the nest. Details of the restoration program will be developed in coordination with the Service.

Any direct impacts to designated critical habitat for the gnatcatcher at Bonita Meadows will be beneficial. Enhancing and restoring the riparian habitat along the stream corridor at Bonita Meadows will ultimately benefit the gnatcatcher.

#### *Quino checkerspot butterfly*

The proposed Project has the potential to directly affect Quino. Direct effects would occur due to the temporary and permanent removal of habitat, fragmentation of breeding and foraging habitat, restoration activities to offset permanent and temporary impacts, fugitive dust during construction, and adult Quino colliding with construction equipment and personal vehicles of construction staff.

The proposed Project has the potential to harm or kill Quino during clearing and grading activities. All individuals living within the ROW that will be cleared and graded will be killed when the habitat that they occupy is destroyed. All individuals living adjacent to the ROW may be harmed by the loss of available breeding habitat. To offset this loss, 4.66 acres of mesa top and upper canyon rim at Wall-Hudson will be restored/enhanced to support the life stages of Quino. In addition, the entire ROW will be surveyed for adult Quino prior to the start of construction. If adult Quino are detected, then larval surveys will be conducted and if detected, salvaging of Quino larvae will occur with the salvaged material being translocated to an appropriate location within Dennery Canyon.

In addition, the proposed Project will fragment the mesa tops around the northern portion of Spring Canyon. The mesa tops to the east and west of Spring Canyon are continuous from Otay Mesa Road to the Mexican border. The proposed Project will completely separate the mesa tops to the south with the mesa tops to the north, including the OCCS preserve. Since Quino were sighted within the OCCS preserve, Quino that attempt to fly between the areas on the north side of the ROW and areas to the south of the ROW will have to cross SR905 increasing the chances of collisions with motor vehicles. To reduce the effects of fragmentation, Spring Canyon will be spanned by two bridges creating a wildlife corridor. In addition, a corridor along the northern ROW will connect Spring Canyon with the OCCS preserve.

During restoration activities, there is the potential to harm or kill Quino larvae by inadvertently stepping on individuals, pulling weedy plants that may have Quino larvae on them, or by crushing individuals during grading activities. To avoid and minimize impacts to Quino during restoration activities, restoration areas on the mesa tops at Wall-Hudson will implement conservation measures that include surveying areas with dot seed plantain for Quino larvae, flagging and avoiding areas where Quino larvae are detected, and hand weeding within 10 meters of flagged areas.

To offset impacts from fugitive dust, dust control BMPs will be implemented according the Caltrans Standard Specifications, including Section 7-1.01F Air Pollution Control, Section 10 Dust control, Section 17 Watering, and Section 18 Dust palliative. To avoid and minimize the potential for collisions of adult Quino with motor construction vehicles and personal vehicles of construction staff, vehicle speeds on access roads to the proposed Project footprint will be maintained at below 25 MPH.

### *Vernal Pool Species*

The rarity of the vernal pool species is clearly related to their adaptation to a very specialized and naturally rare habitat. The continued existence of these species is entirely dependent upon the long-term survival of a functioning vernal pool ecosystem. Destruction of the remaining vernal pools, including pools which are suitable but presently unoccupied by listed species, precludes potential recovery efforts for the many listed species dependent upon vernal pools. Task 2 in the Vernal Pool Recovery Plan states that "Restoration and reintroduction are necessary to expand the current ranges of these (vernal pool species) endemic species to reduce risk of extinction through random and natural events." The proposed Project alignment between Caliente

Boulevard and Heritage Road crosses Stockpen gravelly clay loam soils (Stockpen soils). Stockpen soils on Otay Mesa support numerous vernal pool complexes including J14 between Caliente Boulevard and Heritage Road. The loss of Stockpen soils due to constructing the proposed Project will reduce the amount of suitable land available for the restoration and reintroduction of vernal pools and listed vernal pool species respectively.

Clearing and grading activities will directly effect three pools supporting San Diego fairy shrimp, one pool supporting both San Diego and Riverside fairy shrimp and one pool containing 15 button-celery plants. Direct impacts to 0.14 acre of pool habitat and the contributing watersheds will be offset by restoring/enhancing 0.39 acre of pool surface area and 3.9 acres of contributing watershed for a total of 4.29 acres of vernal pool complex at Wall-Hudson. In addition, the enhancement activities to offset impacts to Quino would include enhancing vernal pools and their contributing watersheds.

To minimize impacts to San Diego and Riverside fairy shrimp, a series of conservation measures directing the planning and implementation of restoration efforts at Wall-Hudson are discussed above, including the collection of topsoil from vernal pools to be impacted that area occupied by fairy shrimp. However, there is the potential for the loss of fairy shrimp cysts during the salvage and storage of soils containing vernal pool inoculum. The longer inoculum is stored, the higher the potential for loss of fairy shrimp cysts because of unknown factors such as, natural aging and loss of viability; and infestation by disease, fungus, or some other pest. The Project proponent will implement conservation measures to salvage correctly and store the soil inoculum for one year until the restored pools to be inoculated pond water for a sufficient period of time to support the life cycle of Riverside fairy shrimp.

### **Indirect Effects**

Indirect effects to the gnatcatcher, Quino and, the three vernal pool species may occur from operation and maintenance activities within the road effect zone. The estimates of indirect effects used a habitat-based approach and considered: (1) the degradation of habitat adjacent to the highway as a result of vehicle traffic noise and other proximity effects (wildlife/vehicle collisions) altering the mobility and behavior patterns of wildlife species within the area, (2) the isolation or fragmentation of remaining adjacent habitat following highway construction and the effect on wildlife corridors between these areas, and (3) the introduction and spread of exotic plant species has the potential to convert native habitat into disturbed habitat unsuitable for federally threatened and endangered species.

The road effect zone (Forman *et al.* 1997, 2000) is the area from the road edge to some outer limit within which road traffic has significant ecological effects on wildlife. The effect distance of the road effect zone is based on traffic intensity, whether the road is a two lane or greater than two lane roadway, the species present along the roadway, and a variety of ecological variables. Changes in traffic intensity can alter the effect of roads and the width of the road effect zone. For each species, there is a threshold where the distance of the road effect zone stabilizes. For the SR-125 South Project, Caltrans established a road effect zone threshold width of 300 feet on each side of the roadway where habitat exists. The 300 foot distance is based on the reasonable

assumption that most effects would be diminished to an inconsequential level beyond this distance.

Indirect effects to the gnatcatcher and Quino may occur from operational impacts of SR905 (roadkill, fugitive dust, elevated noise levels) and the introduction and spread of exotic plant species. During the operation of the SR 905 Extension, gnatcatchers and adult Quino that travel into the ROW have the potential to be struck by vehicles. In addition, habitat can become degraded from elevated noise levels and fugitive dust settling on native vegetation. To offset indirect effects to gnatcatchers and Quino from vehicle strikes, fugitive dust and elevated noise levels, 6.5 acres of CSS and 4.8 acres of MSS will be preserved at Wall-Hudson. This acreage overlaps the direct impacts from the temporal habitat loss and therefore is included in offsetting measures for direct temporal loss of habitat.

Invasive species are now recognized as a threat to biodiversity within native vegetation, second only to direct habitat loss and fragmentation (Pimm and Gilpin 1989, Scott and Wilcove 1998). Non-native, weedy species may out-compete and exclude native species potentially altering the structure of the vegetation, degrading or eliminating habitat needed by the gnatcatcher for breeding and foraging south of the ROW, riparian communities downstream of the ROW, vernal pool species adjacent to the ROW and east of the POE, and providing food and cover for undesirable non-native animals (Bossard *et al* 2000).

Caltrans has a history of using invasive exotic species as part of their planting palette along roads within their ROW. In our April 24, 1998, letter to the Chief Landscape Architect and our September 9, 1998, letter to the Wildflower Program Coordinator at Caltrans, we expressed our concern with the continued use of invasive plant species in road construction and improvement projects. We encouraged Caltrans to follow Executive Order 11987 to "restrict the introduction of exotic species into the natural ecosystems on lands and waters which they own, lease, or hold for purposes of administration; and, shall encourage the States, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the United States." Caltrans landscape architects continue to design landscaping plans using invasive species such as iceplant (*Mesembryanthemum crystallinum*) and cat's claw (*Acacia* spp.). Caltrans landscape architects also continue to incorporate new, unknown exotic plant species into their project designs. The long-term affect of these new plants on the natural environment is often unknown until it is too late when the species becomes problematic. We have been working with Caltrans to transition away from using known invasive exotics, but continue to meet with resistance to change, even though our 1998, letters resulted in a Memorandum from the Chief of the Office of State Landscape Architecture encouraging local Districts to "Use regionally-appropriate native plant materials wherever possible, and avoid the use on non-native plant materials in areas near natural open space or wildlands, which may escape and colonize, or hybridize with native species." The indirect effects from introducing invasive exotic plant species along road sides continues to be problematic. To minimize the potential effects to gnatcatchers, and Riverside and San Diego fairy shrimp due to exotic plant invasion into natural habitat, the Service will coordinate with Caltrans Landscape Architects to develop appropriate planting palettes for the Project.

## 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 anticipate that a wide range of activities within the action area may affect the species addressed in this Opinion. Such activities include, but are not limited to, urban, water, flood control, highway, and utility projects; as well as conversion or degradation of habitat resulting from agricultural use. Many of these activities will be reviewed under section 7 of the Act as a result of a federal nexus and therefore would not be considered cumulative impacts. However, emergency repairs to water and sewer infrastructure often never receive permits from regulatory agencies or the permitting occurs after-the-fact. In addition, gnatcatcher, Quino, and vernal pool habitat continues to be degraded from the lack of effective habitat management and protection from off road vehicles, illegal dumping, and invasive weeds. In particular, invasive weeds such as bromes (*Bromus* spp.), artichoke thistle (*Cynara cardunculus*), sweet fennel (*Foeniculum vulgare*) and mustards (*Brassica* spp.) are changing the habitat characteristics to be unfavorable to the long term viability of sensitive and listed plant species.

## CONCLUSION

After reviewing the current status of the species at issue, the environmental baseline for the action area, the effects of the proposed SR-905 Extension Project, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the coastal California gnatcatcher, Quino checkerspot butterfly, San Diego fairy shrimp, Riverside fairy shrimp, and San Diego button-celery; and will not adversely affect designated critical habitat for the gnatcatcher.

We present this conclusion based on the following reasons:

1. The proposed action would harm three (3) pairs of gnatcatchers, a small portion of the range-wide populations of this species. The permanent and temporal loss of 29.02 acres of CSS and 9.45 acres of MSS is not large relative to the extent of habitat remaining over the coastal California gnatcatcher's range. The anticipated loss of CSS and MSS will be minimized by preserving 38.47 acres of CSS/MSS at Wall-Hudson.
2. The anticipated loss of CSS, MSS, and non-native grassland near Spring Canyon and the OCCS preserve is not expected to significantly decrease the long-term viability of the Quino checkerspot butterfly. To minimize impacts to Quino, 4.61 acres of canyon rim and mesa top will be enhanced/restored at Dennery Canyon.
3. The anticipated loss of three pools containing San Diego fairy shrimp and one pool supporting San Diego and Riverside fairy shrimp, and the permanent disturbance of one pool supporting 15 San Diego button-celery plants is not expected to significantly

decrease the long-term viability of these three vernal pool species. The loss of 0.14 acre of pool surface area and contributing watershed is not large relative to the extent of habitat remaining over the San Diego button-celery's range, and the San Diego and Riverside fairy shrimp's range. To minimize impacts to these three species, 0.39 acre of vernal pool surface area and 3.9 acres of contributing watershed will be restored/enhanced on the mesa tops at Wall-Hudson. To further minimize impacts to San Diego button-celery, seed will be collected from the impact area and distributed within pools at Wall-Hudson and the fifteen individuals within the proposed Project footprint will be salvaged and transplanted within pools at Wall-Hudson.

### 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, collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species 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 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 non-discretionary, and must be undertaken by FHWA and/or agencies and individuals designated by FHWA, as the lead federal agency for the project. FHWA has ongoing responsibility to regulate the activity that is covered by this incidental take statement. If FHWA: (1) fails to assume and implement the terms and conditions or (2) fails to require its designated agency(ies) and individual(s) to adhere to the terms and conditions of this incidental take statement through enforceable terms incorporated into contracts, grants, and permits related to work activities associated with the project, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, FHWA or its designated agency(ies) or individual(s), must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(I)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

The Service will not refer the incidental take of any such migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including the amount and/or number) specified herein.

### **AMOUNT OR EXTENT OF TAKE**

The Service anticipates that three (3) pairs of gnatcatchers could be harmed as a result of this proposed action. The take of one pair of gnatcatchers may be in the form of harm as a result of the removal of 12.3 acres of CSS and 3.2 acres of MSS and temporal loss of 16.72 acres of CSS and 6.25 acres of MSS that otherwise could be utilized by the gnatcatcher as foraging and/or nesting habitat. The take of the other two pairs of gnatcatchers detected within 500 feet of the ROW may be in the form of harm from construction and operational noise.

The Service anticipates that an unknown, but small number of Quino could be harmed as a result of this proposed action. The take may be in the form of harm due to fugitive dust during construction, adult Quino colliding with construction equipment and personal vehicles of construction staff, removal of potential Quino habitat in the Project ROW adjacent to the OCCS preserve and Spring Canyon. Take may also occur during restoration activities at Wall-Hudson.

The Service anticipates that an unknown, but small percentage of the populations of cysts/eggs of San Diego and Riverside fairy shrimp in the bottom substrate within the four pools could be harmed by the proposed action. The take may be in the form of harm as a result of the salvaging of pool substrate and the grading and recontouring of the areas containing vernal and road pools.

### **EFFECT OF THE TAKE**

This level of take is not likely to result in jeopardy to the coastal California gnatcatcher, Quino checkerspot butterfly, San Diego fairy shrimp and the Riverside fairy shrimp.

### **REASONABLE AND PRUDENT MEASURES**

The Service believes the following Reasonable and Prudent Measure is necessary and appropriate to minimize take of gnatcatchers, Quino, San Diego fairy shrimp, and Riverside fairy shrimp:

1. The FHWA and their representatives shall ensure that construction activities, and anthropogenic disturbances to listed species and their habitats are avoided and/or minimized.
2. Unavoidable Project impacts will be offset by the implementation of the mitigation as described in the EIS, Biological Assessment, and biological opinion.
3. The Project proponent shall ensure that the conservation goals for the covered species and habitat types of the MSCP are not adversely affected due to the subject Project.

4. To minimize the potential take of Riverside and San Diego fairy shrimp due to loss of cysts in stored inoculum, fairy shrimp vernal pool restoration will commence the first summer/fall season prior to or concurrently with the start of Project construction.

## **TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, FHWA and their representatives must comply with the following term and condition, which implements the reasonable and prudent measures described above and outline required reporting/monitoring requirements. This term and condition is non-discretionary.

The FHWA shall implement reasonable and prudent measures 1, 2, and 3 through the following terms and conditions:

1. The FHWA and their representatives shall fully implement all of the Conservation Measures included as part of the project description of this Opinion.
2. The FHWA and their representatives shall submit all landscape designs and planting palettes to the Service for approval at least 60 days prior to scheduled implementation. All landscaping for the Project shall follow the Service approved landscaping plans.

The FHWA shall implement reasonable and prudent measure 4 through the following term and condition:

1. Because stored fairy shrimp cyst viability may decrease and the probability that cysts may be otherwise be harmed in storage (e.g., fungus, heat, etc...) increases over time, any temporal loss of vernal pools caused by delays in initiating restoration shall be compensated through additional fairy shrimp occupied vernal pool preservation and/or restoration at a 0.5:1 ratio for every 6 months of delay (i.e., 1:1 for 12 months delay, 1.5:1 for 18 months delay, etc.). The Service shall waive the requirement for additional vernal pool preservation an/or restoration only if a justification for any delay is provided to us in writing and we concur with the justification.

The Service retains the right to access and inspect the project site for compliance with the proposed project description and with the term and condition of this biological opinion. Any habitat destroyed that is not in the identified project footprint should be disclosed immediately to the Service for possible reinitiation of consultation. Compensation for such habitat loss will be requested at a minimum ratio of 5:1 (habitat in kind).

## **Reporting Requirements**

In order to demonstrate compliance with the foregoing Project Description and Conservation Measures, FHWA, or its designated contact, shall submit an annual report to the Service that describes and summarizes the implementation of the proposed project and its associated Conservation Measures.

### 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 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. FHWA and their representative agencies should implement a process that leads to the discontinuance of invasive exotic plant species in their landscaping plans and transition into using only non-reproducing exotic plant species and local native plant species.
2. FHWA and their representative agencies should purchase for long-term preservation, all lands supporting the J14 vernal pool complex and other properties with vernal pools on Stockpen gravelly clay loam soils within parcel boundaries required to be purchased for the SR905 ROW. These lands should be added to the MHPA.

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

### REINITIATION NOTICE

This concludes formal consultation on the SR-905 Extension Project outlined in the initiation request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) 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; (2) 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 (3) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions or concerns about this biological opinion, please contact John DiGregoria of my staff at (760) 431-9440.

Sincerely,



Therese O'Rourke  
Assistant Field Supervisor

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