

**APPENDIX F**  
**SECTION 7 OF THE**  
**ENDANGERED SPECIES ACT CONSULTATION**









# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Carlsbad Fish and Wildlife Office  
6010 Hidden Valley Road  
Carlsbad, California 92011



In Reply Refer To:  
FWS-SDG-4652.7

JUN 11 2007

R. J. Pharris  
Lieutenant Colonel, U. S. Marine Corps Director  
Environmental Management Department  
Marine Corps Air Station Miramar  
P.O. Box 452000  
San Diego, California 92145-2000

Subj: Formal Section 7 Consultation on the Fort Rosecrans National Cemetery Annex at  
Marine Corp Air Station, Miramar (FWS File No. 1-6-06-F-4652)

Dear Lieutenant Colonel Pharris:

This letter acknowledges the U. S. Fish and Wildlife Service's (Service) receipt of your letter, dated May 8, 2007, and received by this office on May 9, 2007, requesting clarification of statements included in the Biological Opinion (BO) resulting from the section 7 consultation for Fort Rosecrans National Cemetery Annex on MCAS Miramar. The consultation concerns the possible effects of your proposed action (issuance of a land use agreement between the U. S. Department of the Navy and the U. S. Department of Veterans Affairs to develop an annex for Fort Rosecrans National Cemetery) on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*), and the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*).

Specifically, you are concerned with statements in our BO that might be interpreted as requiring establishment of environmental preserves in perpetuity on MCAS Miramar. You would like clarification that these statements are read as applying to the Fort Rosecrans National Cemetery (Cemetery) development and operations only and not to MCAS Miramar. However, you acknowledge that any future actions initiated by MCAS Miramar that are inconsistent with the measures prescribed in our BO would require consultation under section 7 of the Endangered Species Act (Act).

TAKE PRIDE  
IN AMERICA 



Our office endorses your interpretation of the BO and concurs that those paragraphs identified in your letter containing language referring to preserves in perpetuity apply to those development and operations activities undertaken by the Cemetery. We further acknowledge that if MCAS Miramar initiates any action that is inconsistent with the measures prescribed in our BO, your office would be required to initiate consultation under section 7 of the Act.

If you have any questions regarding this letter, please contact Felicia Sirchia of my staff at (760) 431-9440 ext. 231.

Sincerely,

A handwritten signature in black ink, appearing to read "Therese O'Rourke". The signature is fluid and cursive, with the first name "Therese" and last name "O'Rourke" clearly distinguishable.

Therese O'Rourke  
Assistant Field Supervisor

cc:

David Boyer, Director, Environmental Resources Division, MCAS Miramar





## UNITED STATES MARINE CORPS

MARINE CORPS AIR STATION MIRAMAR  
PO BOX 452001  
SAN DIEGO CA 92145-2001

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5090/

U.S. Fish and Wildlife Service  
Attn: Ms. Felicia Sirchia  
Carlsbad Fish and Wildlife Office  
6010 Hidden Valley Road  
Carlsbad, CA 92011

Dear Ms. Sirchia:

Thank you for completing the biological opinion (BO) for the Fort Rosecrans National Cemetery Annex at Marine Corps Air Station Miramar (1-6-06-F-4652.3). During our review of the BO we identified a few matters that require clarification but should be easily resolved. We are concerned with statements in the BO that might be construed as requiring establishment of environmental preserves in perpetuity. Department of Defense Instruction 4715.3, Environmental Conservation Program (May 3, 1996), specifically states that military lands cannot be set aside as permanent environmental preserves.

We subscribe to the plan of action that involves avoiding certain areas within and adjacent to the proposed cemetery footprint that support sensitive resources. We endorse such efforts to minimize or avoid the loss or degradation of adjacent sensitive resources. We acknowledge that the MCAS Miramar Integrated Natural Resources Management Plan (INRMP) identifies many areas in the vicinity of the cemetery project as warranting special conservation attention for threatened and endangered species. We do not have authority, however, to establish environmental preserves in perpetuity.

That said, we further acknowledge that any future actions inconsistent with the measures prescribed by the BO would require consultation with the Fish and Wildlife Service, and we accept that responsibility without reservation.

We have enclosed the text of the problematic statements in the BO. We hope the Fish and Wildlife Service will understand and accept the limits of Marine Corps authority regarding nature preserves. We ask that the Service endorse this letter as clarifying that the terms and conditions in the biological opinion regarding preservation of sensitive biological resources within and adjacent to the project footprint are to be read as applying to cemetery development and operations.



My point of contact regarding this matter is Mr. David Boyer,  
Natural Resources Division Director, at (858) 577-1125.

Sincerely,

W. C. MOOG  
Acting Environmental Management Officer  
By direction of the Commanding Officer

Enclosure: 1. Problematic Statements

Copy to: Mr. Don Campbell, VA (NCA)



**Problematic Statements in Biological Opinion for  
Fort Rosecrans National Cemetery Annex  
at MCAS Miramar (1-6-06-F-4652.3)**

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- 1.2.8. A Natural Resources Management Plan (NRMP) will be created to ensure sensitive biological resources within and adjacent to the project footprint remain viable in perpetuity.

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- 7.3 MCAS Miramar and/or the VA, NCA will minimize the effects of the project by restoring/enhancing new vernal pool habitat that can support SD fairy shrimp and preserving the enhanced and/or restored vernal pools in perpetuity, per conservation measures 1.2.8 and 1.2.21.

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- 8.1.1. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed by the VA, NCA and approved by the Service (with a 30-day review period) no later than 60 days prior to project implementation. The plan shall address the prevention of erosion and siltation from storm water runoff to avoid introduction of increased storm water to vernal pools located within and adjacent to project footprint, how permanent irrigation or water from irrigation systems will be directed away from on-site or adjacent preserved vernal pool basins, and how natural hydrological regimes for on-site or adjacent preserved vernal pool basins will be maintained. The SWPPP shall be reviewed annually to determine effectiveness and modified if necessary.
- 8.2.1. Conservation Measure 1.2.8 is further clarified by the following language in order to minimize take. The VA,NCA shall be responsible for the development and implementation of a Natural Resources Management Plan (NRMP) that includes vernal pool monitoring and management for all on-site vernal pool preservation areas. The NRMP shall be implemented in perpetuity to protect the existing biological functions and values of all preservation areas. The NRMP shall outline biological resources on the site, provide for monitoring and management of biological resources by a Service-approved natural lands management organization, address potential impacts to biological resources (including adaptive management guidelines), and identify actions to be taken to eliminate or minimize those impacts. The NRMP shall be submitted to the Service for review and approval - project initiation (i.e., grading) is contingent upon this review and approval.









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APR 6 2007

R.J. Pharris  
Lieutenant Colonel, U.S. Marine Corps Director  
Environmental Management Department  
Marine Corps Air Station Miramar  
P.O. Box 452000  
San Diego, CA 92145-2000

Subject: Biological Opinion for Fort Rosecrans National Cemetery Annex at Marine Corps Air Station Miramar, San Diego County, California (1-6-06-F-4652.3)

Dear Lt. Col. Pharris:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Rosecrans National Cemetery Annex (Project), located at the Marine Corps Air Station Miramar (MCAS Miramar), San Diego County, California. You have determined the Project adversely affects the federally threatened coastal California gnatcatcher (*Poliophtila californica californica*; gnatcatcher) and the federally endangered San Diego fairy shrimp (*Branchinecta sandiegoensis*; SD fairy shrimp) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). No designated critical habitat occurs on site.

Your request for formal consultation was dated and received by our office on June 2, 2006. This biological opinion is based on information provided in the biological assessment (BA), dated May 2006; a draft Environmental Impact Statement (DEIS) for this project, dated October, 2006; supplemental information provided by MCAS Miramar dated October, 10, 2006; and various telephone and electronic mail correspondence during the consultation time period. A complete administrative record of this consultation is on file at the Carlsbad Fish and Wildlife Office.

### CONSULTATION HISTORY

The Service reviewed and provided comments on the Notice of Intent to Prepare an Environmental Impact Statement for the proposed Project on November 18, 2005.





On July 10, 2006, the Service requested additional information from MCAS Miramar regarding the following issues:

1. Clarification of habitat conservation measures.
2. Incorporation of native habitat into landscaping plans.
3. Development of an integrated pest management plan.
4. Development of a storm water management plan.

On October 31, 2006, the Service received supplemental information from MCAS Miramar that addressed and clarified the aforementioned issues. At that time, the Service received the Draft Environmental Impact Statement for the Fort Rosecrans National Cemetery Annex that provided additional information about the project.

On February 8, 2007, the Service sent a letter informing MCAS Miramar that due to the recent court ruling regarding SD fairy shrimp, the Service was in the process of undertaking a current, thorough analysis of the range-wide status of the SD fairy shrimp and would need an additional 60 days to complete the biological opinion.

## BIOLOGICAL OPINION

### 1.0 DESCRIPTION OF THE PROPOSED ACTION

The Project is located at MCAS Miramar on one of three primary geographical areas known as West Miramar (see Figure 2 in the BA). The Action Area is located in the northwest portion of West Miramar and includes approximately 323 acres, 206 acres of which would be developed as a result of the Project (Figure 1<sup>1</sup>).

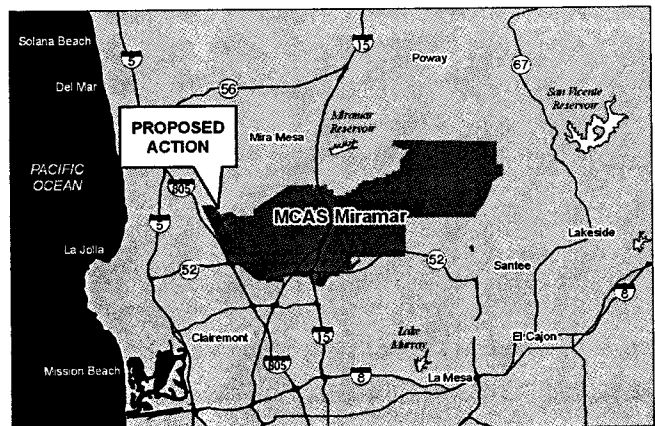


Figure 1. Project Location for the Rosecrans National Veterans Cemetery Annex at MCAS Miramar, California.

The purpose of the proposed action is to provide needed burial space for military veterans and their eligible dependents on Federal property in the San Diego Area. The United States Department of Veterans Affairs National Cemetery Administration proposes to use a portion of MCAS Miramar as a veterans cemetery due to its close proximity to the Fort Rosecrans National Cemetery. Fort Rosecrans has been closed to casket burials since 1966 and will close to cremated remain burials by 2008. Therefore, additional burial space for the 253,000 San Diego area military veterans is needed within close proximity to Fort Rosecrans. The need

<sup>1</sup> Figure 1 is adapted from Figure 2 in the Final Biological Assessment for Fort Rosecrans National Cemetery Annex (MCAS Miramar 2006).



for an annex in close proximity to Fort Rosecrans is in part due to logistics associated with cemetery staff commuting to the annex for operation, upgrade, and maintenance purposes. No additional space is available for expansion in the Fort Rosecrans or Point Loma vicinity. In support of the National Cemetery Administration, the Department of Navy identified potential cemetery sites at MCAS Miramar with the intension of both Federal agencies entering into a land use agreement.

The Project would be conducted over successive phases for a minimum 40-year planning period, with each phase developing additional gravesites, terrace sites, and columbarium niches for cremated remains. The Project includes an entrance, flag assembly area, roadway system, public information center, administration and maintenance complex, committal service shelters, burial sections, cremated remains sites, and other common elements and features (e.g., memorial sites, flag displays, etc.). The Action area (a.k.a. "Survey Boundary" in the associated BA) would encompass a total of 323 acres, approximately 206 acres (64 percent) of which would be developed, i.e., project footprint. The first phase would include development of the infrastructure required for the cemetery to function in addition to the first 10-year burial development, which consists of 12,500 full casket gravesites, approximately 2,500 garden niche or terrace sites, and approximately 10,000 columbarium niches for cremated remains. When the developed gravesites near depletion from Phase I, another phase of the annex would be developed for burials, followed by additional phases as needed until completion. The first interments are expected to take place in 2008 with the entire Proposed Action expected to reach full build-out by 2050.

Four sites were considered during the evaluation process, including the proposed action area. However, the proposed action area (i.e., Alternative #2 from the National Environmental Policy Act process) was the only area to meet the criteria for the cemetery establishment. Search criteria included (1) a large tract approximately 150 to 200 acres; (2) Federal property (due to insufficient funds and extremely high costs for private land purchase); (3) land within 20 miles of Fort Rosecrans for operation and maintenance purposes; and, (4) an area without limited site restrictions to include size, shape, accessibility, utilities and water, surrounding land use, soils, topography, aesthetics, and restrictions to development.

## **1.1 Program Elements and Design Principles**

The Fort Rosecrans Cemetery Annex Project will include development of burial grounds, administration and service buildings, roadways, and assembly areas. Construction activities would include the use of heavy equipment such as graders, backhoes, and dump trucks.

### **1.1.1 Grading, Drainage, and Plantings**

The National Cemetery Administration would like to retain the area in as natural a state as possible. Therefore, grading would be kept to a minimum. Fill may be added to sites with a high water table to create sufficient soil depths for burials to be made above the water table. Soil from on-site would be used and natural features (e.g., sensitive habitat, stream, and wetland) would be left untouched and incorporated into the landscaping to the maximum extent possible. Native



species plantings would be used to accent the site layout. Storm water facilities, used to ensure proper drainage and to aid in storm water management, may serve as landscape features.

#### 1.1.2 Entrance Area, Flag Assembly Area, and Other Features

A main entrance would be designed to incorporate architectural and landscape elements that convey the significance of the site along with a method to restrict and control vehicular access (e.g., gate). A separate service area entrance would be provided on the north side of the project off of Miramar Road. A stand-alone flag area would be designed and landscaped with turf for small gatherings and ceremonies. Additionally, other common elements (e.g., memorial sites, memorial display areas, an avenue of flags, benches, trash receptacles, flower containers) would be included throughout the facility.

#### 1.1.3 Roadway System

A hierarchy of roads would be organized around the entrance road, consisting of primary, secondary, and service drives to serve various sections of the facility (see example roadway drawing within Project footprint on Figure 3 in the BA). The entrance road would connect to Nobel Drive and the primary cemetery road, which would then provide access to all the interior roads, including a loop road to allow guests access without having to turn around. The service road would connect to Miramar Road. Design speed for all roads would be 15 miles per hour with a maximum grade of 10 percent. Parking would consist of parallel pull-offs, parking along roads, and parking areas at buildings. Additionally, a cortege assembly area near a public information center and the entrance road would consist of multiple lanes for vehicles to line up for assembly.

#### 1.1.4 Building Facilities

A Public Information Center (approximately 870 square feet) would be located near the main entrance, consisting of a building, covered plaza, small visitor parking area, restrooms, and electronic gravesite locator for visitors. The Administration and Maintenance Complex (approximately 13,700 square feet) would include offices, workspaces, parking, and a maintenance yard large enough for deliveries by tractor-trailer trucks. This Complex would be situated in an area that is hidden from visitor sight as much as possible. Three Committal Service Shelters (approximately 600 square feet each) would be developed in visually isolated sheltered areas, each large enough to accommodate 60 attendees.

#### 1.1.5 Burial Sections and Cremated Remains Sites

Several areas devoted to full-casket in-ground interments would be developed that are separated by vegetated areas, roads, and/or topography. In general, each burial section would not exceed 3 acres, with placement following topographical features to the maximum extent possible. Cremated remains would be accommodated either in burial sections, garden niches, other in-ground burials, columbariums (i.e., aboveground cremated remains interment structure), or in a cremated remains scattering garden.



## 1.2 Conservation Measures

The proposed project includes the following conservation measures that would be implemented as part of the project to avoid, minimize, and compensate for potential adverse effects of the action on gnatcatchers and SD fairy shrimp. These measures are based on those found in the final Biological Assessment (BA), Environmental Impact Statement (EIS), supplemental information, and Integrated Natural Resources Management Plan (INRMP) for MCAS Miramar (MCAS Miramar 2006).

### General Conservation Measures

- 1.2.1. General conservation measures (i.e., Mitigation Planning Guidance found in section 6.2.2 of the INRMP) will be implemented.
- 1.2.2. Landscape features interspersed within burial areas will be managed to maintain their natural habitat characteristics and to preserve vernal pools contained within the project footprint.
- 1.2.3. An interpretive display will be created for the public information center and interpretive signs will be placed on the cemetery grounds to inform the public about the threatened and endangered species on-site, provide information about their ecology and sensitivity to human activities, and describe the legal protection afforded these species.
- 1.2.4. Best Management Practices (BMPs), a Storm Water Pollution Prevention Plan (SWPPP), and an Integrated Pest Management Plan (IPMP) will be required for implementation during the project. The SWPPP would include erosion control measures and compliance with the Air Pollution Control District (APCD) rules requiring control of construction-related dust.
- 1.2.5. Construction limits will be clearly delineated by flagging, survey lath, or wooden stakes. The construction zone will be designated to reduce impacts to sensitive species. The following statement will be noted on all construction drawings, "under no circumstances shall equipment or personnel move outside the designated construction zone. Should violations occur, the contractor will be responsible for all materials and labor for the replacement/repair of all damaged habitat. Replacement of damaged habitat cannot be conducted on MCAS Miramar. The contractor will be responsible for acquiring land to replace the damaged habitat."
- 1.2.6. Landscaping along the perimeter of the cemetery will use only native vegetation and be planned such that indirect effects of watering, fertilizing, and pesticide application to these areas will be avoided.
- 1.2.7. Landscape planning will incorporate native vegetation to the maximum extent possible and climatically adapted species to supplement where use of native vegetation is not practical.



- 1.2.8. A Natural Resource Management Plan (NRMP) will be created to ensure sensitive biological resources within and adjacent to the project footprint remain viable in perpetuity.

California gnatcatcher

- 1.2.9. A limited operating period (LOP) will be established during each phase to prevent vegetation clearing activities in suitable gnatcatcher breeding habitat during breeding season (i.e., February 15 to August 31).
- 1.2.10. A biological monitor<sup>2</sup> will be employed and required to (1) obtain a Section 10(a)(1)(A) recovery permit to survey for gnatcatchers and conduct nest searches; (2) have a bachelor's degree with an appropriate study area (as described in the BA); and, (3) have previous experience with applying terms and conditions described in a BO.
- 1.2.11. Construction activities and other project-related work will be scheduled to occur during daylight hours. Should construction lighting be required, all structures will be shielded to ensure that light will not enter plant communities recently occupied by gnatcatchers.
- 1.2.12. A contractor training program will be established to educate all construction personnel on the status, description, biology, and protection measures for gnatcatchers.
- 1.2.13. All direct, permanent effects to gnatcatchers within the proposed project footprint will require compensation based on the ratios identified below.

Habitat Description	Acres Impacted	Compensation Ratio <sup>3</sup>	Compensation Requirement
Recently occupied undisturbed suitable, native habitat	3.41	2:1	6.82
Recently occupied disturbed suitable, native habitat	2.60	1:1	2.60
Recently occupied disturbed habitat	0.35	0.5:1	0.18
Recently unoccupied undisturbed suitable, native habitat	1.20	1:1	1.20
Recently unoccupied disturbed suitable, native habitat	10.35	0.5:1	5.18

<sup>2</sup>A qualified biologist or biological monitor for gnatcatchers must have (1) a section 10(a)(1)(A) permit to survey for gnatcatchers; (2) a bachelor's degree with an emphasis in ecology, natural resource management, or related science; (3) 5-years demonstrated local experience and understanding of gnatcatcher ecology; and, (4) previous experience with applying the terms and conditions of a biological opinion.

<sup>3</sup> Compensation ratios are prescribed in Table 6.2.2. of the MCAS Miramar INRMP. Compensation ratios are less than described in Table 6.2.2 where disturbed or degraded habitat is impacted and proposed compensation has a goal of a high-quality end state, and thus have been adjusted accordingly.



- 1.2.14. The loss of suitable gnatcatcher habitat will be off-set by purchase of 15.98 acres<sup>4</sup> of gnatcatcher occupied habitat (either current or historical) within the County of San Diego, preferably within the County's Multiple Species Conservation Program (MSCP) preserve system. This off-site preserve area will have biological values similar to those found in the project area and will be identified, and approved by the Service, prior to project initiation (i.e., brushing or grading). MCAS Miramar or the VA will ensure that a long-term habitat management plan is prepared, and provide endowment funds, for the management of the off-site preserve area in perpetuity. The long-term management plan will include, but not be limited to, the following: (1) the method of protecting the resources in perpetuity (e.g., conservation easement); (2) monitoring schedule; (3) measures to prevent human and exotic species encroachment; (4) Property Analysis Record (PAR) or similar analysis; (5) a description of the funding mechanism; (6) proposed land manager; and (7) contingency measures should problems occur. This long-term management plan will be approved by the Service prior to project initiation (i.e., brushing or grading).

#### San Diego Fairy Shrimp

- 1.2.15. Prior to earthwork activities that could affect occupied vernal pool habitat, qualified biologists<sup>5</sup> will collect vernal pool habitat components (i.e., soil, plant seeds, fairy shrimp cysts) to be used as inoculum for the areas to be restored.
- 1.2.16. Vegetation clearing or grading activities will be conducted when soils are dry enough to reduce the potential for ground surface erosion and minimize impacts to vernal pool basins and watersheds adjacent to the proposed action area.
- 1.2.17. Site grading will follow existing terrain to the maximum extent practicable and slopes will be contoured in accordance with soil type and natural repose, minimizing the length and steepness of slopes.
- 1.2.18. A qualified biological monitor<sup>4</sup> will monitor grading and vegetation removal activities to ensure the proposed action will not impact the watershed of protected vernal pool habitat that occurs both within and outside the project footprint.
- 1.2.19. Direct permanent effects to SD fairy shrimp or other vernal pool habitat that occurs within the project footprint will be offset through restoration of 0.492 acre of vernal pools on MCAS Miramar based on the ratios identified below, which are consistent with those identified in the MCAS Miramar INRMP.

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<sup>4</sup> This number excludes impacts to occupied grassland habitat as this habitat is considered non-suitable for gnatcatchers (MCAS Miramar 2006).

<sup>5</sup> A qualified biologist or biological monitor for vernal pool habitat must have (1) a bachelor's degree with an emphasis in ecology, natural resource management, or related science; (2) five years or more of demonstrated local experience with and understanding of the ecology of vernal pools; and, (3) previous experience with applying the terms and conditions of a biological opinion.



Habitat Description	Acres Impacted	Compensation Ratio <sup>2</sup>	Compensation Requirement
Undisturbed, natural vernal pool habitat without listed species	0.013	1:1	0.013
Undisturbed, natural vernal pool habitat with listed species	0.010	3:1	0.030
Road or ditch pools with SD fairy shrimp and vernal pool plant indicator species	0.299	1.5:1	0.449

- 1.2.20. Permanent fencing will be installed around those vernal pools to be protected on site to restrict human access. The fencing will be designed and installed such that it does not alter the natural hydrological regimes of the area.
- 1.2.21. A detailed restoration plan will be developed to address restoration and enhancement of federally listed species and regionally rare plant communities prior to project implementation. The plan will discuss proposed methods for implementation of a 5-year maintenance and monitoring program and reporting requirements, focusing on the success criteria to be met, maintenance requirements, and monitoring requirements to evaluate success criteria. The plan will also include methods of seed and soil salvage, pre- and post-grading micro-topographic mapping, and plant propagation and installation.

## 2.0 STATUS OF THE SPECIES

### 2.1 Coastal California Gnatcatcher

#### 2.1.1 Listing Status

The Service listed the coastal California gnatcatcher as threatened on March 30, 1993 (58 *Federal Register* 16742). Additionally, the Service issued a special rule, in conjunction with the listing decision 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 (58 *Federal Register* 65088). 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 develop up to five percent of the remaining coastal sage habitat for projects that were consistent with the NCCP conservation guidelines (California Department of Fish and Game and California Resources Agency 1993).

#### 2.1.2 Critical Habitat

A final determination of critical habitat for the gnatcatcher was published on October 24, 2000 (65 *Federal Register* 63680). This determination was litigated in the U.S. District Court, Central District of California. On June 11, 2002, the U.S. District Court for the Central District of



California granted the Service's request for a remand of the gnatcatcher critical habitat designation for us to reconsider the economic impact associated with designating any particular area as critical habitat. The Court ordered us to publish a new proposed rule by April 11, 2003. In a subsequent order, the Court held that the critical habitat designated for the gnatcatcher should remain in place until such time as a new, final regulation becomes effective. Critical habitat for this subspecies was re-proposed on April 24, 2003 (68 *Federal Register* 20228). Current and proposed critical habitat does not occur on MCAS Miramar due to a successfully operative INRMP that provides special management considerations for the species.

Designated critical habitat for the gnatcatcher includes 513,650 acres of Federal, State, local, and private land in Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties, California (65 *Federal Register* 63680). Under the more recent re-proposed rule, critical habitat would be reduced to 200,595 acres in the same counties (68 *Federal Register* 20228).

### 2.1.3 Species Description

The coastal California 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.

### 2.1.4 Distribution

The coastal California gnatcatcher occurs on coastal slopes in southern California, from southern Ventura southward through Palos Verdes Peninsula in Los Angeles County through Orange, Riverside, San Bernardino and San Diego counties to El Rosario in Baja California, Mexico, at approximately 30 degrees north latitude (Atwood 1991). Atwood (1990) reported that 99 percent of all gnatcatcher locality records occurred at or below an elevation of 984 feet (feet). Atwood and Bolsinger (1992) reported that of 324 sites of recent occurrence, 272 (84 percent) were located below 820 feet in elevation, 315 (97 percent) were below 1,640 feet, and 324 (100 percent) were below 2,460 feet. Since that time, additional data collected at higher elevations shows this species may occur as high as 3,000 feet and that more than 99 percent of the known gnatcatcher locations occurred below 2,500 feet (68 *Federal Register* 20228).

### 2.1.5 Habitat Affinity

Gnatcatchers typically occur in or near coastal sage scrub habitat, although they are not uniformly distributed within this structurally and floristically variable vegetative community that is patchily



distributed throughout the range of this subspecies. 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, although data on dispersal use are largely anecdotal (Campbell et al. 1998). Probable dispersing gnatcatchers have been documented in vegetation dominated by such species as wild mustard (*Brassica* spp.), annual grasses, Russian thistle (*Salsola tragus*), mule fat (*Baccharis salicifolia*), willow (*Salix* spp.), and salt cedar (*Tamarix* spp.) (Campbell et al. 1998). Famolaro and Newman (1998) suggest that habitat along linear features such as highways and power-line corridors may be of significant value in linking populations of the gnatcatchers. Although existing quantitative data may reveal relatively little about gnatcatcher use of chaparral, grassland, and riparian habitats, these areas may be critical during periods of drought for dispersal and foraging opportunities (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.

#### 2.1.6 Life History

The gnatcatcher is primarily insectivorous, non-migratory, and exhibits strong site tenacity (Atwood 1990). Fecal sample analyses reveal a diet composed predominantly of leaf- and plant-hoppers and spiders (Burger et al. 1999). Additionally, true bugs, wasps, bees, and ants are minor components of the diet (Burger et al. 1999). Gnatcatcher adults will select prey to feed their young that is larger than expected given the distribution of arthropods available in their environment. Both adults and young consume more sessile than active prey items (Burger et al. 1999).

The gnatcatcher becomes highly territorial by late February or early March each year, generally when males become more vocal (Mock et al. 1990). In southwestern San Diego County the mean breeding season territory size ranged from 12 to 27 acres (ac) per pair and non-breeding season territory size ranged from 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 peak nesting activity occurring from mid-March through mid-May. The gnatcatcher's nest is a small, cup-shaped basket usually found 1 to 3 feet above the ground in a small shrub or cactus. Clutch size ranges between 3 and 5 eggs. 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 suggests high reproductive potential. However, this is typically offset by high rates of nest predation and brood parasitism (Atwood 1990). Nest site attendance by male gnatcatchers has been shown to be equal to that of females for the first nest attempt, followed by a decline to nearly 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 is greater in the upper and lower third of the nest shrub, and lower in nests with full clutch sizes (Sockman 1997). Potential nest predators are numerous, including snakes, raccoons, and corvids (Grishaver et al. 1998). Gnatcatchers in California are also 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).

Natal dispersal for a non-migratory 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 mi, although this dispersal distance appears relatively low and birds were also documented moving up to 6 mi from their natal territory (Bailey and Mock 1998). Additionally, dispersal of juveniles is difficult to observe and to document without extensive banding studies. Therefore, it is likely the few recent 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). Typically, however, the dispersal of juveniles requires a corridor of native vegetation that 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).



### 2.1.7 Population Trend

The gnatcatcher was considered locally common in the mid-1940s, but by the 1960s this subspecies had declined substantially in the United States owing to widespread destruction of its habitat (Atwood 1990). Atwood (1980) estimated that no more than 1,000 to 1,500 pairs remained in the United States by 1980. In 1993 when 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 in Orange County, 261 pairs in Riverside County, and 1,514 pairs in San Diego County (58 *Federal Register* 65088). 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 (58 *Federal Register* 65088). This value is following subtraction of 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.

### 2.1.8 Current Threats

The loss, fragmentation, and adverse modification of habitat are the principal reasons for the gnatcatcher's federally threatened status (58 *Federal Register* 16742). Coastal sage scrub habitat was developed rapidly from the 1940s to 1990s for agriculture, grazing, or urban areas. Habitat loss continues to remain the greatest threat due to the subspecies preferred habitat type (i.e., coastal, low-elevation, shallowly sloped or level lands) coinciding with coastal southern California's highest real estate value land areas.

Fire frequency and the invasion of exotic vegetation (primarily non-native grass and annual forbs) interact to pose potentially serious threats to coastal sage scrub habitat. Fire frequency and burn size should be kept low where these exotic plants are well-established and where irreversible conversion of shrublands to grasslands is likely. The recent 2003 wildfires in southern California affected 4 percent of known gnatcatcher occurrences, 16 percent of designated critical habitat acreage, and 28 percent of the Service's modeled habitat for the gnatcatcher (Bond and Bradley 2004).

Parasitism by brown-headed cowbirds is a current and increasing threat throughout the gnatcatchers range. Nest parasitism appears to decrease gnatcatcher nest success by increasing nest abandonment (Braden et al. 1997).

### 2.1.9 Rangewide Conservation Needs

Based on the threats analysis above, the gnatcatcher has the following needs to survive and recover:



1. Functional habitat should be maintained in large, interconnected blocks sufficient to support viable, interconnected populations. In some cases, such areas may require enhancement or creation of new habitat.
2. Gnatcatcher habitat should be protected from changes in natural fire regimes as a result of fire suppression or increased fire frequency due to anthropogenic ignitions. Habitat should be managed to adequately mitigate those effects, should they occur.
3. The quality of gnatcatcher habitat should be maintained at high levels to include management of exotic plant and animal species (e.g., brown-headed cowbirds, feral cats, etc.).

## **2.2 San Diego Fairy Shrimp**

### **2.2.1 Listing Status**

The SD fairy shrimp was federally listed as endangered on February 3, 1997 (62 *Federal Register* 4925). The Recovery Plan for Vernal Pools of Southern California (Recovery Plan), which includes SD fairy shrimp, was published in September 1998 (Service 1998).

### **2.2.2 Critical Habitat**

Critical habitat for the SD fairy shrimp was designated on October 23, 2000 (65 *Federal Register*: 63438). Critical habitat was remanded but not vacated by the Central District Court of California on June 12, 2002. Critical habitat was re-proposed on April 22, 2003 (68 *Federal Register* 19887). Primary constituent elements include: (1) small to large vernal pools with shallow to moderate depths that hold water for sufficient lengths of time necessary for SD fairy shrimp incubation and reproduction, but not necessarily every year; (2) entire watershed(s) and hydrology for vernal pool basins and their related vernal pool complexes; (3) ephemeral depressional wetlands; (4) flat or gently sloping topography; and (5) any soil type with a clay component and/or an impermeable surface or subsurface layer known to support vernal pool habitat. No critical habitat for the SD fairy shrimp has been designated on MCAS Miramar due to development and implementation of an operative INRMP that provides special management considerations for this species.

### **2.2.3 Species Description**

The SD fairy shrimp is a small freshwater crustacean in the family Branchinectidae of the Order Anostraca. The species was originally described by Fugate (1993) from samples collected on Del Mar Mesa, San Diego County. Male SD fairy shrimp are distinguished from males of other species of Branchinecta by differences found at the distal (located far from the point of



attachment) tip of the second antennae. Females are distinguishable from females of other species of Branchinecta by the shape and length of the brood sac, the length of the ovary, and by the presence of paired dorsolateral (located on the sides, toward the back) spines on five of the abdominal segments (Fugate 1993). Adult male SD fairy shrimp range in size from 0.35 to 0.63 in (9 to 16 mm) and adult females are 0.31 to 0.55 in (8 to 14 mm) long.

#### 2.2.4 Distribution

The range of the SD fairy shrimp includes Orange and San Diego Counties in southern California, and northwestern Baja California, Mexico (USFWS 1998; Brown et al. 1993). In Baja California, SD fairy shrimp have been recorded at two localities: Valle de Palmas, south of Tecate and Baja Mar, north of Ensenada. A single isolated female was previously reported from vernal pools in Isla Vista, Santa Barbara County, California; however, directed surveys have not located any additional individuals (62 *Federal Register* 4925).

In Orange County, the SD fairy shrimp has been documented at Fairview Park (CNDDDB occurrence #11, 1996), Newport Banning Ranch, North Ranch Policy Plan Area, and within the San Juan Creek watershed at Chiquita Ridge and Radio Tower Road (See Appendix A).

In San Diego County, the species occurs in vernal pools from Marine Corps Base Camp Pendleton, inland to Ramona and south through Del Mar Mesa, Proctor Valley, and Otay Mesa (Figure 2). A minimum of 246 pools on Marine Corps Base Camp Pendleton are known to be occupied by SD Fairy Shrimp (See Appendix A, Black 2004). Based on surveys of the 2,856 vernal pool basins currently mapped on Marine Corps Air Station Miramar, 1,303 are occupied by SD fairy shrimp (Miramar 2006, Table 5.1). Of the 62 vernal pool complex assemblages<sup>6</sup> mapped by The City of San Diego's Vernal Pool Inventory<sup>7</sup> (2002-2003), 29 were found to be occupied by SD fairy shrimp and occur at the following localities: Del Mar Mesa (1), Carmel Mountain (1), Mira Mesa (6), Nobel Drive (3), Kearny Mesa (3), Mission Trails Regional Park (1), and Otay Mesa (14).

Additional vernal pool complex assemblages with occurrences of SD fairy shrimp located in San Diego County but not included in the City of San Diego's Inventory include: Carlsbad (Dudek & Associates 1998, Snapp-Cook 2006), San Marcos, Ramona, Poway, Santee, Rancho Santa Fe, Murphy Canyon, Otay Lakes, Imperial Beach, East Otay Mesa, Marron Valley (see Appendix A), and Proctor Valley (CNDDDB Occurrence # 27, 2001).

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<sup>6</sup> Complex assemblages are defined as a series of vernal pool groups that are hydrologically connected with similar species compositions. They were first described and surveyed by Beauchamp and Cass 1979 and subsequently updated in 1986 (Bauder) and 1998 (Recovery Plan). The City of San Diego (2003) surveyed assemblages within City boundaries and MCAS Miramar has surveys current through 2006 for approximately 70% of the Base.

<sup>7</sup> The City of San Diego conducted non-protocol surveys for San Diego fairy shrimp. Therefore this inventory may under-represent the true number of vernal pools with occurrences of San Diego fairy shrimp.



### 2.2.5 Habitat Affinity

San Diego fairy shrimp are restricted to vernal pools and vernal pool-like depressions (e.g., ruts in dirt roads). Vernal pools are ephemeral wetlands that occur from southern Oregon through California into northern Baja California, Mexico (USFWS 1998). They require a unique combination of climatic, topographic, geologic, and evolutionary factors for their formation and persistence. They form in regions with Mediterranean climates where shallow depressions fill with water during fall and winter rains and then dry up when the water evaporates in the spring (Collie and Lathrop 1976; Holland 1976; Holland and Jain 1977, 1988; Thorne 1984).

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

San Diego fairy shrimp tend to inhabit shallow, small vernal pools and vernal pool-like depressions that range in temperature from 10° to 26° Celsius. 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, Hathaway and Simovich 1996, and Holtz 2003)

### 2.2.6 Life History

San Diego 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). Adult fairy shrimp are usually observed from January to March; however, in years with early or late rainfall, the hatching period may be extended (65 *Federal Register* 63438). Like most vernal pool fairy shrimp, SD fairy shrimp have a two-stage life cycle and spend the majority of their life cycle in the cyst stage (Templeton and Levin 1979, Schaal and Leverich 1981, Herzig 1985, Hairston and De Stasio 1988, Venable 1989). After hatching, SD fairy shrimp reach sexual maturity in about 7 to 17 days, depending on water temperature and persist for about 4 to 6 weeks (Hathaway and Simovich 1996). Fairy shrimp mate upon reaching maturity, and female SD fairy shrimp produce between 164 and 479 cysts (eggs) over their lifetime (Simovich and Hathaway 1997). The cysts are either dropped by the females to settle into the mud at the bottom of the pool, or they remain in the brood sac until the female dies and sinks to the bottom (Eriksen and Belk 1999). Fairy shrimp cysts may persist in the soil for several years until conditions are favorable for successful reproduction (Simovich and Hathaway 1997). The cysts will hatch in 3 to 5 days when water temperatures are between 10 and 20



degrees Celsius (Hathaway and Simovich 1996). Not all cysts are likely to hatch in a season, thus providing a mechanism for survival if water quality and ponding conditions are not favorable in a given year (Simovich and Hathaway 1997, Ripley et. al., 2004).

### 2.2.7 Population Trend

The loss of vernal pools that have the potential to support SD fairy shrimp has resulted in a range-wide reduction in diversity and abundance of SD fairy shrimp. Urban and water development, flood control, and highway and utility projects, as well as conversion of wild lands to agricultural use, have eliminated or degraded vernal pools and/or their watersheds in southern California (Jones and Stokes Associates 1987). Historically, vernal pools covered approximately 200 square miles of San Diego County (Bauder and McMillan 1998). Approximately 95 to 97 percent of vernal pools within San Diego County have been lost (Bauder 1986, Bauder and McMillan 1998, Oberbauer 1990). Most of the remaining vernal pools in San Diego County occur on Redding soils, primarily on MCAS Miramar (Service 1998). It is assumed that an unknown quantity of vernal pools occupied with SD fairy shrimp has been lost in Mexico.

A listing, by Management Area<sup>8</sup>, of the current status of the known vernal pool complex assemblages throughout the extant range of SD fairy shrimp are included in Appendix B<sup>9</sup>. Currently, there are 226 complex assemblages identified; 117 of those are occupied by SD fairy shrimp. The Recovery Plan identified 113 of these complex assemblages as necessary to stabilize (94) or reclassify (19) the species. Since completion of the Recovery Plan, there have been 26 new complex assemblages identified, 15 of which have occurrences of SD fairy shrimp. Of the 117 complex assemblages with SD fairy shrimp, 85 (or 73%) are conserved, identified as a conservation priority (on military land), proposed for conservation, or partially conserved and enhanced; 15 (or 13%) have been developed, are proposed for development, or have been impacted. Of the 113 complex assemblages listed in the Recovery Plan as necessary to stabilize or reclassify the population of SD fairy shrimp, 72 (or 64%) are currently conserved, identified as a conservation priority (on military land), proposed for conservation, or partially conserved and enhanced; 19 (or 17%) have been developed, are proposed for development, or are impacted. The following is a status summary of the complex assemblages by each Management Area (MA).

#### Los Angeles-Orange: Los Angeles Basin-Orange Management Area

This MA occurs within the coastal terraces, valleys, and foothills in Los Angeles and Orange Counties. Extensive vernal pool habitat once occurred on the coastal plain of Los Angeles and Orange Counties (Mattoni and Longcore 1997); however, there has been a near total loss of vernal pool habitat in these areas (Ferren and Pritchett 1988, Keeler-Wolf et al. 1998, Mattoni and Longcore 1997, Service 1998). No remaining vernal pools occupied by SD fairy shrimp are

<sup>8</sup> Management Areas were defined in the Recovery Plan based on plant and animal species distributions, soil types and climatic variables. Eight distinct Management Areas, which comprise locally variable vernal pool complexes covered in Southern California, were defined (see Figure 9 in the Recovery Plan).

<sup>9</sup> This includes both verified and unverified vernal pool complex assemblages.



known from Los Angeles County. The Recovery Plan identifies 10 pool complex assemblages in this MA, including one known to be occupied by SD fairy shrimp (i.e., Fairview Park); two are identified as needed to stabilize the species (i.e., Fairview Park and San Clemente). However, there are no known pools in San Clemente. Since completion of the Recovery Plan, there have been six new complex assemblages identified in Orange County, three of which have occurrences of SD fairy shrimp (Newport Banning Ranch, Radio Tower Road, and Irvine Ranch Land Reserve); SD fairy shrimp have been identified in one additional previously unknown complex assemblage (i.e., Chiquita Ridge). Of the five total complex assemblages in Orange County with SD fairy shrimp, four (or 80%) are conserved and/or restored. The Fairview complex assemblage has been restored and conserved as mitigation (Glenn Lukos Associates 2006). Restoration at this complex assemblage has been successful and achieved a no net loss in SD fairy shrimp habitat, but long term management has not been secured. Long term management has been secured for three of the conserved complex assemblages (Chiquita Ridge, Radio Tower Road, and Irvine Ranch Land Reserve). The long-term plans for Newport Banning Ranch are unknown at this time.

#### San Diego: North Coastal Management Area

The vernal pools within this MA are associated with the coastal terraces north of the San Dieguito River within San Diego County. It includes the vernal pool complexes at MCB Camp Pendleton and those within the City of Carlsbad. Currently, there are 19 complex assemblages in this MA, 70 (or 69%) are known to be occupied by SD fairy shrimp. The Recovery Plan identified 10 of these as needed to stabilize (8) or reclassify (2) the species; of these, eight (or 80%) are known to be occupied by SD fairy shrimp. Since the completion of the Recovery Plan, there has been one new complex assemblage identified in Carlsbad that is occupied by SD fairy shrimp. Of the four complex assemblages in Carlsbad (all of which support SD fairy shrimp), three have been partially impacted (including the two complex assemblages identified as needed for stabilization of SD fairy shrimp, and the one new complex assemblage occupied by SD fairy shrimp). Additional impacts are proposed for the other complex assemblage identified in the Recovery Plan as needed to stabilize the SD fairy shrimp (i.e., SD County Airport). Restoration at these complex assemblages has been successful and has achieved a no net loss in SD fairy shrimp habitat, but long term management has not been secured. The status of the 14 complex assemblages on MCB Camp Pendleton is unknown at this time.

#### San Diego: Central Coastal Management Area

The vernal pools within this MA are associated with the coastal terraces and mesas of central San Diego County from the San Dieguito River south to San Diego Bay and north of the Sweetwater River. It includes the vernal pools at Del Mar Mesa and Mira Mesa, the Kearny Mesa vernal pool complexes (MCAS Miramar, Tierrasanta, Montgomery Field), and the San Diego Mesa Complex (Chollas Heights). SD fairy shrimp have been detected from all of these areas. Approximately 73 percent of all the pools destroyed in San Diego County during the 7-year period between 1979 and 1986 (Keeler-Wolf et al. 1998) occurred in this MA. Currently, there are 101 complex assemblages in this MA, 70 (or 69%) are known to be occupied by SD fairy



shrimp. The Recovery Plan identified 55 of these complex assemblages as needed to stabilize (46) or reclassify (9) the species. Since completion of the Recovery Plan, there have been 11 new complex assemblages identified in this MA, eight of which have occurrences of SD fairy shrimp. Of the 70 complex assemblages in this MA with SD fairy shrimp, 58 (or 83%) are conserved and/or restored, identified as a conservation priority (on military land), or partially restored; eight (or 11%) have been developed, partially developed, or development is proposed. Of the 55 complex assemblages in this MA identified in the Recovery Plan as needed to stabilize or reclassify the species, 47 (or 85%) are conserved and/or restored, identified as a conservation priority (on military land), or partially restored; six (or 11%) have been developed, partially developed, or development is proposed. The remaining pools are either on privately owned lands or their status is unknown at this time. In general, restoration within this MA has been successful and achieved a no net loss in SD fairy shrimp habitat, but long term management of restored complex assemblages has not been secured. Because the complex assemblages on MCAS Miramar account for about 44% of those in this MA, they are discussed in more detail below.

The vernal pool habitat on MCAS Miramar is one of the largest and most contiguous in southern California, supporting one of the most important and least disturbed examples of endangered and sensitive species dependent on vernal pool habitat in the region (Bauder and Wier 1991). Based on 2007 GIS data for MCAS Miramar that incorporates survey efforts since 1993<sup>10</sup>, there are approximately 45 complex assemblages occurring on the Base. Of the 27 complex assemblages listed in the Recovery Plan as necessary to stabilize the population of SD fairy shrimp, 20 (or 74%) are currently conserved or have been identified as a conservation priority. SD fairy shrimp occur in 21 of the 27 (or 78%) complex assemblages listed as necessary to stabilize the population (Table 1).

Past development actions on MCAS Miramar have resulted in the total or partial loss of five complex assemblages (GG1+, GG2+, HH4+, W4, and Z11+), one of which was identified as necessary to stabilize the population of SD fairy shrimp (HH4+). However, restoration techniques including decompaction, sculpting/recontouring, reseeding, re-establishment, and invasive species removal have been used, and when necessary modified, to restore impacted or lost pools on Miramar during the past 14 years, as indicated by the following examples (MCAS Miramar 2006).

- In 1997, 2.30 acres (79 pools) were restored within AA4-7, F (north), F16, U15, and U19 pool groups (Black 2000a, 2003a).
- In 1997, 2.3 acres (75 pools) were restored within Management Unit 2, X1-4, Z1-3, EE1, and HH3+ pool groups (Black 2000b, 2003b).
- In 1998-1999, 0.85 acre (69 pools) was restored within A4, AA8, AA9, and AA10 pool groups (KEA Environmental, Inc. 1999; EDAW, Inc. 2005).

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<sup>10</sup> Vernal pool resources were mapped at various times using varying types of mapping technology and therefore contain varying accuracies. Further, only the most recently mapped data contains a presence/absence survey for SD fairy shrimp.



- In 1999-2000 MCAS Miramar re-established/restored about 170,000 square feet of vernal pool surface in the Miramar Mounds National Natural Landmark Vernal Pool Group U (north) (Tomsovic and Macaller 2003, 2004a, and 2004b).

**Table 1 - Status of Miramar Complex Assemblages Identified in the Recovery Plan**

Complex Assemblages necessary for Stabilization of SD Fairy Shrimp (R1)	Current Status	Occupied	*No. of Basins	Complex Assemblages necessary for Reclassification of SD Fairy Shrimp (R2)	Current Status	Occupied	*No. of Basins
1. A4, Tierrasanta	Conservation Priority	Y	67	1. AA8	Conservation Priority	N	12
2. AA1 east	Conservation Priority	Y	22	2. F north (F28)	Conservation Priority/Restoration (Partial)	Y	340
3. AA1 south	Conservation Priority/Mitigation Site	Y	40	3. U15	Conservation/Mitigation Site	Y	47
4. AA1 west	Conservation Priority	Y	66	4. U19	Conservation/Mitigation Site	Y	9
5. AA10	Conservation Priority	Y	411				
6. AA11	Conservation Priority	N	94				
7. AA12	Conservation Priority	N	15				
8. AA12 north+	Impacted	Y	74				
9. AA12 south	Conservation Priority	N	26				
10. AA13	Conservation Priority	Y	184				
11. AA3	Unknown	Y	?				
12. AA4-7	Conservation/Mitigation Site	Y	183				
13. AA9	Conservation Priority	Y	166				
14. EE1	Conservation Priority	Y	953				
15. EE2	Conservation Priority/Restoration (Partial)	Y	418				
16. F16-17	Conservation/Mitigation Site	Y	32				
17. FF1-2	Enhancement/Development (Partial)	Y	59				
18. HH1+	Conservation Priority/Restoration (Partial)	Y	300				
19. HH2+	Conservation Priority	Y	101				
20. HH3+	Enhancement/Development (Partial)	Y	15				
21. HH4+	Developed	N					
22. RR1	Conservation Priority	N	76				
23. RR2	Conservation Priority	N	26				
24. U 1-13 (North)	Conservation Priority/Restoration (Partial)	Y	878				
25. Z10	Enhancement/Development (Partial)	Y	39				
26. Z1-3	Conservation Priority	Y	99				
27. Z6-7	Enhancement/Development (Partial)	Y	108				

\*Includes both verified and unverified basins



Overall, there has been a net benefit to the vernal pool resource on MCAS Miramar because of increased habitat (either through restoration or enhancement) and active or passive management. For example, in the 1991 Bauder and Weir survey, a total of 60 pools were identified for the EE1 complex assemblage. Current mapping efforts indicate a total of 953 pools in this complex assemblage (MCAS Miramar 2007). Further, past impacts have been offset by preserving approximately 3.16 acres in complex assemblages identified as either necessary to stabilize or reclassify the population of SD fairy shrimp (AA4-7, F16-17, U-15, U-19).

Finally, approximately 90% of the vernal pool complex assemblages are encompassed within Level I Management Areas (MAs) to highlight them for management and conservation. Protection of vernal pool habitat has been given the highest management priority at MCAS Miramar. Management recommendations have been, and continue to be, developed to prevent the degradation or destruction of vernal pool habitat (MCAS Miramar 2006).

#### San Diego: South Coastal Management Area

The southern San Diego coastal mesa vernal pools include isolated pools and complexes from the Sweetwater River south to the Mexican border. Included within this management area are the National City and Chula Vista pools (mostly extirpated), Border Field pools, Western and Eastern Otay Mesa complexes, Sweetwater Reservoir pools, and the vernal pools in the vicinity of Otay Lake; SD fairy shrimp have been detected from all of these areas. Substantial losses have occurred in the Otay Mesa Area, where over 40 percent of the vernal pools were destroyed between 1979 and 1990. Currently, there are 66 complex assemblages in this MA, 19 (or 29%) are known to be occupied by SD fairy shrimp. The Recovery Plan identified 31 of these complex assemblages as needed to stabilize (26) or reclassify (5) the species. Since completion of the Recovery Plan, there have been 3 new complex assemblages identified in this MA, two of which have occurrences of SD fairy shrimp. Of the 19 complex assemblages in this MA with SD fairy shrimp, 16 (or 84%) are conserved and/or restored or partially conserved; two (or 11%) have been developed. Of the 31 complex assemblages in this MA identified in the Recovery Plan as needed to stabilize or reclassify the species, 19 (or 61%) are conserved and/or restored or partially conserved; five (or 16%) have been developed, are proposed for development, or impacted. The remaining pools are either on privately owned lands or their status is unknown at this time. Restoration within this MA has been successful and achieved a no net loss in SD fairy shrimp habitat, but long term management of restored complex assemblages has not been secured.

#### San Diego: Inland Valleys Management Area

The San Diego Inland Valley MA consists of pools situated in San Marcos, Ramona, San Dieguito Valley, Poway, Marron Valley, and Proctor Valley. The majority of these pools are isolated to a degree from extreme maritime influence by topography and occur more than nine kilometers (6 miles) from the coast. SD fairy shrimp have been observed in all of these areas. These complexes are smaller and more isolated than the coastal complexes, and as a result are suffering from indirect effects such as fragmentation, off road vehicle use, and changes in



hydrology. Currently, there are 25 complex assemblages in this MA, 13 (or 52%) are known to be occupied by SD fairy shrimp. The Recovery Plan identified 14 of these complex assemblages as needed to stabilize (10) or reclassify (4) the species. Since completion of the Recovery Plan, there have been four new complex assemblages identified in this MA, none of which have occurrences of SD fairy shrimp. Of the 13 complex assemblages in this MA with SD fairy shrimp, three (or 23%) are conserved, partially conserved, or proposed for conservation; seven (or 54%) have been developed, are proposed for development, or have been impacted. Of the 14 complex assemblages in this MA identified in the Recovery Plan as needed to stabilize or reclassify the species, three (or 21%) are conserved, partially conserved, or proposed for conservation; eight (or 57%) have been developed, are proposed for development, or have been impacted. The remaining pools are either on privately owned lands or their status is unknown at this time. Efforts in this management area should focus on conservation, restoration, and management of pools on privately owned lands to reduce further development of known pools.

### **2.2.8 Current Threats**

The SD 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 non-native 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, USFWS 1998, Bohonak 2005).

### **2.2.9 Rangewide Conservation Needs**

Based on current population trends, threats analysis, and new genetic information, the SD fairy shrimp has the following needs to survive and recover:

1. Vernal pool habitat should be restored and enhanced; this includes expansion of existing populations and re-establishment of populations where habitat and historical conditions are appropriate.
2. Vernal pool management plans should be developed and implemented to maintain hydrologic regimes; watershed and habitat functions; and species viability.
3. Land protection strategies should be developed to prevent further loss and fragmentation of existing habitat.
4. Vernal pool complex assemblages not identified in the Recovery Plan as necessary to stabilize or reclassify the population should be re-evaluated based on their genetic



structure to ensure the genetic variation within the SD fairy shrimp population is maintained.

### **3.0 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.

#### **3.1 Action Area**

Under section 7(a)(2) of the Act, the action area is defined as the reach of direct and indirect effects, as well as the analysis area for this opinion. The action area also includes the area in which baseline conditions and cumulative effects are analyzed.

The action area encompasses 323 acres, including 18 plant community types (MCAS Miramar 2006). The actual project footprint will be a maximum of 214 acres or 66 percent of the surveyed action area. This includes approximately 162.3 acres of naturally vegetated area and 43.5 acres of disturbed habitat.

#### **3.2 Site Characteristics and Surrounding Land Use**

The area is relatively flat, with terrain ranging between 300 and 380 feet above mean sea level. The majority of the site harbors Redding gravelly loam with smaller amounts of Olivenhain cobbly loam, Redding cobbly loam, and Alramont clay (USDA 1973 *in* MCAS Miramar 2006). Community types present include the following: nine upland communities (chamise chaparral, disturbed chamise chaparral, burned disturbed chamise chaparral, coastal sage scrub-chaparral, disturbed coastal sage scrub-chaparral, Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, burned disturbed Diegan coastal sage scrub, southern mixed chaparral, disturbed southern mixed chaparral, scrub oak chaparral, disturbed non-native/native grassland, non-native grassland, and disturbed non-native grassland); two wetland communities (disturbed southern willow scrub and disturbed mule fat scrub); and two land cover types (i.e., disturbed habitat and developed area). Descriptions of land cover types and plant communities are described in detail under section III.2.2 of the BA.

The action area, which is located in the far northwest portion of West Miramar, includes undeveloped areas bordering the Main Station on the south and west. The area is primarily used as an air station compatible use zone to buffer high noise and potential accidents. Therefore, the



majority of the area is natural open space, with the only activity in the area being the Miramar Wholesale Nursery. Surrounding land use includes commercial, office, and service-oriented businesses to the north, and an industrial and communications technology community to the west known as Sorrento Mesa. The closest residential community is Mira Mesa located to the north between Sorrento Mesa and Interstate 15. Current ambient noise levels in the action area are estimated to be 67 to 79 dBA as a result of aircraft taking off and landing at the nearby airfield. Additional traffic noise is generated from I-805 directly to the west, Miramar Road to the north, Nobel Drive to the northwest, and the Atchison Topeka Santa Fe Railroad to the south.

The Cedar Fire of 2003 burned a large portion of MCAS Miramar east of Kearny Villa Road, which is east of the action area. As a result, remaining unburned patches of gnatcatcher suitable habitat are typically chaparral dominated by chamise, ranging in size from 0.003 to 105 acres. The remaining gnatcatcher suitable habitat areas west of Kearny Villa Road generally occurs in large sections. All gnatcatchers detected during 2004 station-wide protocol surveys were in unburned areas west of Interstate 5 and the action area, with the exception of two individuals near Camp Elliot east of Interstate 5.

Previous section 7 consultations in the action area include an assessment of impacts from projects outlined in San Diego Gas & Electric's (SDG&E) subregional Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP; 1-6-96-FW-07). Road grading and other impacts specific to the action area have occurred, and are expected in the future from SDG&E's operations and maintenance of electrical and gas transmission lines that traverse the southwestern edge of the action area. These activities would negatively impact SD fairy shrimp located in road ruts adjacent to exiting access roads. Pursuant to SDG&E's NCCP/HCP, impacts to SD fairy shrimp will be avoided unless deemed necessary for emergencies or repairs to existing facilities. Any unavoidable activities will be offset through restoration or enhancement as described in the SDG&E vernal pool clarification document, signed by the Service on July 26, 2004.

Previous section 7 consultations for projects located outside of the action area but that resulted in vernal pool restoration projects within the action area were the Navy Consolidated Brig project (1-6-87-F-34) and the Base Realignment and Closure (BRAC) project (1-6-95-F-33). These restoration projects, established to compensate for the loss of vernal pool basins, are located outside of the project footprint in the northeast corner of the action area. Post-restoration monitoring of these sites indicate SD fairy shrimp and vernal pool plant populations are persistent and have become well established in the restored vernal pools (C. Black, Ecological Restoration Service, pers. comm. 2006).



### 3.3 Status of the Species in the Action Area

#### 3.3.1 California Gnatcatchers

Focused surveys for gnatcatchers were conducted between 1998 and 2001 by Hubbs-Sea World Institute, and during 2004 by Bitterroot Restoration Inc. Appendix D of the BA provides a detailed description of survey conditions and areas surveyed during 2004. Figure 7 in the BA displays the project footprint and gnatcatcher nest locations documented between 1998 and 2004.

Survey data indicate an average of two breeding gnatcatcher pairs have occupied a portion of the proposed action area since 1998. These sitings include nesting sites and use of the area for other activities such as dispersal. Data for 2004 appear lower than previous years, in part likely due to 2004 being the third driest year on record for the installation and gnatcatcher population fluctuations as a result of wildfires during 2003. Undeveloped lands surrounding the action area harbor sage scrub and sage scrub-chaparral communities favorable to gnatcatchers, currently supporting and suitable to support populations of gnatcatchers. The gnatcatchers observed during the 1998-2001 surveys and 2004 surveys represent historically established populations within the proposed action area (MCAS Miramar 2006). Additionally, MCAS Miramar is regionally considered to support an important gnatcatcher population (MCAS Miramar 2006). The annual population on MCAS Miramar between 1994 and 2001 was between 19 and 55 pairs (Hunsaker et al. 2000), with 21 pairs recorded during 2004 in areas not burned by the Cedar Fire (see Appendix D of the BA).

#### 3.3.2 San Diego Fairy Shrimp

Vernal Pool habitat within the action area is defined as the X Series (i.e., West Miramar) of vernal pools that were once a part of the large mesa system extending from Carroll Canyon on the north to Rose Canyon on the south (Bauder 1986, Service 1998). Development has fragmented the mesa such that there are currently five distinct, isolated Series of vernal pool complexes along the mesa top (Bauder 1986). Federally listed species known to occupy vernal pools on West Miramar include the endangered SD fairy shrimp, San Diego mesa mint (*Pogogyne abramsii*), and San Diego button celery (*Eryngium aristulatum* var. *parishii*) (see Appendix A and C of the BA).

Previous vernal pool surveys indicate the number of pool basins in the action area varied from 33 – 55 (1979, 1986, and 1991) and were found mainly in the eastern half of the action area. Differences in survey methods and level of detail used in mapping pools contributed to different numbers of pools being recorded for the area. In addition, the prolonged drought from 1986 through spring of 1990 may have reduced the numbers of vernal pool plant species in a given area and, thus, made locating vernal pools more difficult (Bauder 1991).



Recent vernal pool basin mapping was conducted in the action area in March 2005, and subsequent fairy shrimp cyst surveys were conducted in March 2006. Within the X 1-4 complex assemblage, a total of 648 basins, ranging in size from 1.2 to 5,072 square feet, comprising 4.53 acres were mapped. Of those 648 basins, 366 (or 57%) were found to be occupied by SD fairy shrimp and distributed throughout the action area in both natural and road or ditch rut basins, with a concentration in the deeper and higher diversity pools in the northeast corner (see Appendix C of the BA). These large, natural pools will remain preserved and will continue to be managed as a part of this action. Basins in the western portion tend to be disturbed basins associated with road compaction and ditches created by road and power line construction projects.

#### **4.0 EFFECTS OF THE ACTION**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat that will be added to the environmental baseline, along with the effects of other activities that are interrelated and interdependent with that action. 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.

#### **4.1 Scientific Basis for Effects**

##### **4.1.1 California Gnatcatcher**

###### **4.1.1.1 Habitat Modification**

As reported in Section 2.1.5, gnatcatchers predominantly use California sagebrush-dominated stands on mesas, gently sloping areas, and along the lower slopes of the coast range (Atwood 1990). Scientists estimate up to 90 percent of coastal sage scrub vegetation has been lost as a result of development and land conversion (Westman 1981a and 1981b; Barbour and Major 1977). Consequently, coastal sage scrub is considered one of the most depleted habitat-types in the United States (Kirkpatrick and Hutchinson 1977, O'Leary 1990). Activities that reduce shrub cover (e.g., frequent fire, mechanical disruption, livestock grazing, off-highway vehicle use, and military training activities) appear to reduce habitat suitability and availability for the gnatcatcher (Bontrager et al. 1995b, Mayer and Wirtz 1995, Beyers and Wirtz 1995, Wirtz et al. 1995, Atwood et al. 1998a). Construction activities that remove habitat completely reduce availability of breeding, nesting, and foraging sites for gnatcatchers. The elimination of nearby habitat may artificially increase gnatcatcher populations in adjacent preserved habitat, although these population surpluses may be lost in subsequent years due to crowding and lack of resources (Scott 1993). Even if habitat modification activities occur outside of the breeding season, the



reduction of nesting and sheltering habitat could harm individual gnatcatchers by reducing the available resources for individuals' subsequent reproduction.

Agricultural use (e.g., grazing and field crops), urbanization, air pollution, and the introduction of non-native plants have all adversely impacted extant sage scrub habitat. Early studies suggest the gnatcatcher is highly sensitive to the effects of habitat fragmentation and development activity (Atwood 1990; ERCE 1990; Ogden unpublished data). The loss of coastal sage scrub vegetation is associated with an increasing degree of habitat fragmentation, which reduces habitat quality, promotes increased levels of nest predation and brood parasitism, and ultimately, increased rates of local extinction (Wilcove 1985, Saunders et al. 1991, Soule et al. 1988, 1991). Although the published literature on this subject is based on studies in forested landscapes, the ecological implications of these studies are applicable to other landscape types such as coastal sage scrub.

Habitat modification can also impact levels of predation and nest parasitism further threatening the recovery of the gnatcatcher (Atwood 1980, Unitt 1984). Snakes, birds, rodents, medium-sized mammals, and ants are reported nest predators. Nest predation rates vary from 26 to 68 percent of nests monitored (summarized in Atwood and Bontrager 2001). Additionally, nest parasitism appears to decrease gnatcatcher nest success by increasing nest abandonment, although predation has a greater influence (Braden et al. 1997).

An important corollary of habitat fragmentation is reduced opportunities for successful natal dispersal. Gnatcatcher dispersal is critical to demographic and genetic soundness of the population, and to population persistence in the fragmented habitat characteristic of coastal southern California. Landscape connectivity enhances population viability for many species, and until recently, most species have lived in well-connected landscapes (Beier and Noss 1998). Habitat patch connectivity is likely the most important landscape feature for maintaining species diversity of native biota for relatively sedentary bird species such as gnatcatchers. Corridors counteract the effects of fragmentation and should eliminate or minimize the attrition of species over time by facilitating dispersal and recolonization (Willis 1974, Diamond 1975, Brown and Kodric-Brown 1977, Frankel and Soule 1981, Soule and Simberloff 1986, Noss and Harris 1986, Forman and Godron 1986, Diamond et al. 1987, Noss 1987). Linkages that support resident populations of animals are more likely to function effectively as long-distance dispersal conduits for those species (Bennett 1990).

The reduction of foraging habitat could harm individual gnatcatchers by reducing the available resources for individual gnatcatcher survival and subsequent reproduction. Gnatcatchers need large non-breeding season home ranges for adequate foraging opportunities during cold weather conditions (Mock 1998). Vegetation structure is important because it affects how birds move through the habitat and how they can see and capture prey (Robinson and Holmes 1982). Variable gnatcatcher breeding and post-breeding season territories and home range areas in suitable habitat reflect the changing size needed to meet the particular breeding, feeding and sheltering requirements of the species at any given part of the year.



The recent occurrence of large-scale wildfires throughout southern California has likely temporally reduced the amount of gnatcatcher habitat available throughout the species' range. Most fires have resulted from 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). For example, severe wildfires throughout southern California in October 2003 resulted in the temporal loss of approximately 24,786 acres (21 percent) of designated gnatcatcher habitat in San Diego County, likely impacting several known source populations (Service, unpublished data). Additionally, 2003 fires in Ventura, Los Angeles, Orange, Riverside, and San Bernardino counties resulted in the loss of an additional approximately 39,418 acres (10 percent) of designated critical habitat in the northern extent of the species' range (Service, unpublished data). This loss represents an overall temporal perturbation of 64,204 acres (12 percent) of designated critical habitat across the species' range.

Atwood et al. (1998a, 1998b) found that extensive wildfires result in adverse impacts to gnatcatcher populations within burned and unburned areas due to increased mortality resulting from excessive competitive interactions between resident birds within unburned areas and birds displaced by the fires. Studies conducted after the 1993 Laguna Fire in Orange County (Wirtz et al. 1995, Beyers and Wirtz 1995, Atwood et al. 1998b) suggest that post-fire gnatcatcher population recovery is likely dependant on the amount of suitable vegetation remaining within the burned area, as well as the presence of gnatcatcher source populations in close proximity to areas affected by the fire. Furthermore, Beyers and Wirtz (1995) found that following a fire, gnatcatchers will not recolonize coastal sage scrub re-growth for a minimum of 4 to 5 years until total shrub cover approaches 50 percent. These gnatcatcher habitat areas are expected to take several years to fully recover due to the scope and intensity of the recent southern California fires. Therefore, any remaining gnatcatcher source population habitat is important to the survival and recovery of the species.

#### 4.1.1.2 Disturbance

Noise and visual disturbance associated with construction may adversely affect gnatcatchers by disrupting breeding and foraging if grading or construction activities occur during the breeding season. This would likely cause birds to frequently flush from the nest and endanger eggs, chicks, and adults. However, construction monitoring studies suggest gnatcatchers are tolerant of adjacent construction activities (Atwood and Bontrager 2001) and high noise levels (Famarlano and Newman 1998, Awbrey 1993, Awbrey et al. 1995, Awbrey and Hunsaker 1997, URS Corporation 2004). Regardless, flushing may occur resulting in an adverse effect associated with noise or visual disturbance. Flight from predators incurs an implicit cost in lost foraging time, where birds confronted with a predator at a nest face an explicit choice between loss of current reproduction versus total reproductive loss (Burhans and Thompson 2001).

Research indicates that loud construction noise, aircraft, and other noise disturbance appear to have minimal effects on gnatcatchers once nests are established and incubation initiated (Atwood



and Bontrager 2001). However, slight evidence does exist documenting fewer nests built and fewer eggs laid in areas with high sound levels produced by fixed-wing military aircraft (Awbrey and Hunsacker 1997). Construction noise is a concern if it is at such a level that it masks intraspecific communication (Awbrey 1993, Awbrey et al. 1995). This level is generally accepted to be greater than 60 dBA hourly Leq.

#### 4.1.2 SD Fairy Shrimp

Activities that alter hydrology, increase vernal pool habitat fragmentation, or decrease land types suitable for vernal pool formation have the potential to limit the survivability and recovery of SD fairy shrimp (Service 1998). Changes in the natural micro-topography surrounding vernal pools will alter natural hydrological regimes and may result in increased runoff, erosion, sedimentation, and contamination into the vernal pools. The complex hydrology of vernal pools is supported by both surface flows within a pool's topographic watershed (e.g., the surface area in which water drains into a vernal pool) and subsurface flows that may extend beyond the surface watershed. Surface and subsurface lateral flows between vernal pools and the surrounding uplands influence the onset and level of inundation, and the seasonal drying of vernal pools (Hanes and Stromberg 1998). Therefore, modifications to the uplands surrounding a vernal pool can negatively affect the pool's hydrology, even if such modifications occur outside the pool's surface watershed. For example, grading cuts near pools can accelerate the flow of water out of the subsoil (Bauder 1987). As such, graded slope cuts adjacent to the watersheds of vernal pools may result in 'leakage' of water out of the watersheds (City of San Diego 2003). Conversely, trapping all subsurface flows of water within the surface watershed of the vernal pools via putting in retaining walls may alter the hydrology of the pools by changing the onset or duration of ponding. Modifications to the hydrology of vernal pools can also alter the distribution of other vernal pool flora and fauna that are influenced by the length and frequency of water inundation (Bauder 1987, 2000). For instance, exotic plant species can become more prevalent in disturbed vernal pools when the periods of water inundation are reduced, while freshwater marsh species can expand into disturbed vernal pools when the periods of inundation are increased.

Modifications of landscapes from native to artificial adjacent to existing vernal pools can alter natural hydrologic regimes, biogeochemical processes, and limit gene flow between pool complexes. Irrigation of artificial landscapes adjacent to vernal pools can saturate the soils and alter the timing and duration of inundation in fairy shrimp habitat. Additionally, water from the irrigation system may enter the fairy shrimp habitat, causing hatching of cysts at inappropriate times for their phenology. Altering the timing and duration of ponding also could negatively affect the ability of SD fairy shrimp to grow and reproduce because their phenology is dependent on such factors (Hathaway and Simovich 1996).

SD fairy shrimp are "osmoregulators" that maintain constant internal chemical concentrations, but cannot tolerate wide extremes in sodium or bicarbonate concentrations so they are vulnerable to contaminants in runoff waters and watershed quality that alter levels of salts and alkalinity



(Service 1998). Therefore, runoff laden with fertilizers and pesticides from adjacent artificial landscapes could alter the specific water chemistry (Gonzalez et al. 1996) and temperature (Hathaway and Simovich 1996) required by SD fairy shrimp, thus negatively affecting their ability to mature and reproduce (Gonzalez et al. 1996, Holtz 2003).

Fragmentation and isolation of vernal pools can threaten the important ecological and mutualistic processes that link vernal pools to each other and the surrounding uplands (Service 1998). Such ecological and mutualistic processes involve insects that pollinate the vernal pools plants; mammals and birds that disperse flora and fauna between vernal pools; and amphibians that reproduce in vernal pools. Specialized plant-pollinator relationships can be threatened by fragmentation of vernal pools from the surrounding uplands. For example, some solitary bees from the Andrenidae family focus on vernal pool annuals (e.g., *Blennosperma*, *Downingia*, *Lasthenia*, *Limnanthes*) for collecting pollen (Thorp 1990). Except during the blooming period of their host plants, these bees spend most of their lives nesting underground in the adjacent uplands. These bees have a limited range of foraging, which is not surprising since they are small, have limited flight ability, and tend to remain near their natal site (Thorp 1990, Leong et al. 1995, Thorp and Leong 1995).

General fragmentation of plant-pollinator systems can have detrimental effects on the visitation rates by pollinators and, ultimately, the seed set produced by the plants (Jennersten 1988). Although few empirical studies exist for southern California, similar plant-insect specialization is likely and may be essential to successful reproduction of certain species (Service 1998). Therefore, plants in vernal pools that are isolated from other natural ecosystems may experience reduced pollination and thus produce less offspring. Habitat fragmentation further threatens pollination systems by reducing population sizes and thus potentially increasing occurrences of genetic drift, inbreeding depression, and extinction due to demographic stochasticity (Kearns et al. 1998). Watershed contiguity augments gene flow in populations already naturally low in variability (Davies 1996) by allowing flooding between pools. Vernal pool organisms are typically defined by the complex in which they occur, in part because gene flow between complexes appears to be extremely low (Fugate 1993; Davies 1996). Isolation of pools or modification of the natural watershed potentially compromises gene flow, resulting in a loss of genetic variability and an increased susceptibility to extinction and reduced fitness (Bohonak 2005, Soule 1986).

Preserving small, isolated, fragmented preserves may not sustain the multi-scale ecological processes associated with vernal pools (Leidy and White 1998). As such, the scientific community repeatedly recommends that conservation of vernal pools include the surrounding upland habitats (Bauder 1987, Thorp and Leong 1995 and 1998, California Department of Fish and Game 1998, Hanes and Stromberg 1998, Leidy and White 1998, Service 1998). These surrounding upland habitats influence vernal pool hydrology, species composition, and essential interactions between the species that inhabit them (California Department of Fish and Game 1998). Fragmenting vernal pools from each other can disrupt dispersal and gene flow between



populations of vernal pool flora and fauna, increase their vulnerability to stochastic events (Service 2004), and hinder their ability to reestablish after local extinctions (Fugate 1998). Elimination of predators, which could lead to population increases of herbivores such as burrowing rodents, rabbits, and quail, is an indirect effect resulting from the fragmentation and isolation of vernal pools (Service 1998). Other indirect effects to SD fairy shrimp and its habitat, often referred to as “edge effects,” include unauthorized dumping; human and pet intrusion; trampling; vandalism; plant and animal collection; runoff; erosion and siltation; spills and contamination; invasion of nonnative species; and increased off-road vehicle and bicycle activity.

Habitat favorable for vernal pool formation consists of coastal terraces with an underlying iron-silica impervious soil layer or layers with undulating landscapes, where soil mounds are interspersed with basins, swales, and drainages (Service 1998). As stated under section 2.2.6, approximately 95 to 97 percent of vernal pool habitat within San Diego County has been lost, any loss of remaining habitat that facilitates vernal pool formation will reduce the amount of suitable land available for restoration and re-introduction opportunities of vernal pools, limiting the recovery of listed vernal pool species. Further, there is a high degree of endemism in vernal pool complex assemblages due to local adaptations to climate and environmental variables, this leads to a high degree of genetic differentiation among complex assemblages (Bohonak 2005). Destruction of entire complex assemblages would result in the loss of the considerable genetic variation that currently exists within the SD fairy shrimp population.

## **4.2 Direct Impacts**

### **4.2.1 Gnatcatchers**

Both permanent and temporary direct effects to occupied gnatcatcher habitat are anticipated as a result of the proposed action due to the gnatcatcher's known occurrence within the action area, adjacent to the project footprint. Although gnatcatcher breeding territories mapped during the 2004 survey do not occur within the project footprint, suitable, native gnatcatcher habitat, including areas recently mapped as occupied by the gnatcatcher, would be impacted (see Figure 3.7-7 of the DEIS). Those impacts would result in the permanent loss of an approximate 12.97-acre area of occupied habitat, including: 3.41 acres of Diegan coastal sage scrub, 2.20 acres of disturbed Diegan coastal sage scrub, 0.22 acre of disturbed chamise chaparral, 0.18 acre of disturbed southern mixed chaparral, 0.35 acre of disturbed area, 0.007 acre of non-native grassland, 3.28 acres of disturbed non-native grassland, and 3.32 acres of disturbed native/non-native grassland<sup>11</sup> (DEIS 2006).

Project impacts will also result in the permanent removal of an additional 11.55 acres of suitable, native gnatcatcher habitat (coastal sage scrub-chaparral, 1.18 acres; Diegan coastal sage scrub, 0.02 acre; burned disturbed Diegan coastal sage scrub, 3.33 acres; disturbed Diegan coastal sage

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<sup>11</sup>Native and Non-native grassland habitat, regardless of occupancy, is considered non-suitable for gnatcatchers (MCAS Miramar 2006), therefore the loss of 6.61 acres of grassland habitat is not compensated for.



scrub, 5.83 acres; disturbed coastal sage scrub chaparral, 1.19 acres), that could be used for foraging or sheltering. Although the 2004 surveys did not document gnatcatchers using this area, the 2004 survey data may not be representative of gnatcatcher use areas because 2004 was the third driest year on record for Miramar and gnatcatcher population fluctuations have likely occurred as a result of the 2003 wildfires (see Section 3.3.1).

A total of 24.52 acres (12.97 + 11.55) will be lost due to construction of the cemetery and its supporting infrastructure. The loss of suitable, native gnatcatcher habitat will be off-set, based on the ratios identified in conservation measure 1.2.13, with the purchase of gnatcatcher-occupied habitat that will be preserved in perpetuity, and by including native vegetation in the landscaping to the maximum extent practicable.

Temporary direct effects to gnatcatchers may occur as a result of construction-generated fugitive dust accumulation. These effects would be minimized by limiting vegetation clearing activities to the period outside of the gnatcatcher breeding season (i.e., February 15 – August 31).

Noise levels resulting from construction activities are not expected to result in direct effects to gnatcatchers. Current ambient noise levels due to aircraft operations at the adjacent airfield are estimated at 67 to 79 decibels. Noise levels resulting from construction activities are expected to remain below 65 decibels. Therefore, the proposed action would not result in an increase in ambient noise levels nor disturb gnatcatchers beyond the existing conditions.

#### **4.2.2 SD Fairy Shrimp**

Construction of the proposed action would have permanent direct impacts to an undetermined number of SD fairy shrimp in 29 basins (0.309 acre), two, or 0.010 acre, of which are undisturbed vernal pools. The remaining 27 pools, or 0.299 acre, consist of road pools or ditches that occur along dirt trails. These impacts would be in the form of direct mortality to SD fairy shrimp by grading and filling the basins they occupy. The proposed action would also have direct impacts on SD fairy shrimp habitat by grading and filling four unoccupied vernal pools basins (0.013 acre).

A total of 33 basins (29 + 4), totaling 0.322 acre, will be lost due to construction of the cemetery and its supporting infrastructure. This loss comprises approximately 5% of the recently mapped vernal pool basins in the X 1-4 complex assemblage that are located in the action area (see Section 3.3.2). While these pools were not identified in the Recovery Plan as necessary to stabilize or reclassify the population of SD fairy shrimp, the species occurs in these basins and should be re-evaluated based on genetic information.

The loss of SD fairy shrimp habitat will be minimized by development and implementation of a detailed restoration plan and restoration/re-establishment of 0.492 acre of higher quality SD fairy shrimp habitat on MCAS Miramar. However, the details of the restoration plan need to be



described, and the draft plan reviewed and approved by the Service prior to project initiation to help ensure successful vernal pool restoration.

A beneficial impact of the construction project will be a decrease in the edge effects impacting the X 1-4 vernal pool complex assemblage. Currently, the site is impacted by unauthorized entry of the site via the existing dirt paths. The cemetery will eliminate this access removing the potential for unauthorized dumping, human and pet intrusion, trampling, vandalism, and off-road vehicle and bicycle activity.

### **4.3 Indirect Impacts**

#### **4.3.1 Gnatcatcher**

Permanent removal of gnatcatcher habitat, plus additional edge effect incursions (e.g., increased human presence, habitat fragmentation), into gnatcatcher habitat could reduce the available habitat quality and available resources for gnatcatchers on-site<sup>12</sup>. For example, increased visual disturbance from human presence could flush foraging gnatcatchers away from prime foraging areas into less suitable areas where availability of preferred food items sought by gnatcatchers is diminished. Gnatcatchers may also be flushed into areas that are less concealed from predators or into areas with greater gnatcatcher densities, increasing competition for limited resources. Habitat fragmentation will similarly reduce the quality of habitat available to gnatcatchers, forcing birds into sub-optimal habitat.

#### **4.3.2 SD Fairy Shrimp**

Permanent indirect impacts to SD fairy shrimp would occur in the form of habitat modification that would affect vernal pools adjacent to and completely surrounded by the project footprint. Construction of the cemetery will lead to a loss of upland vegetation and alteration of the micro-topography through grading for burial sites. This habitat modification will impact natural hydrological regimes on-site and have a negative impact on the vernal pools that support SD fairy shrimp. As discussed in Section 4.1.2, altering natural hydrological regimes may result in increased runoff, erosion, sedimentation, and contamination into the vernal pools as well as 'leakage' from the vernal pools. There will also be an increase of ornamental landscapes within the project footprint that will need to be maintained using irrigation, pesticides, and fertilizer. The ability of SD fairy shrimp to grow and reproduce may be limited if pesticide laden irrigation runoff is allowed to flow into the vernal pools that are within and adjacent to the cemetery. These impacts will be minimized by implementation of Best Management Practices (BMPs), a

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<sup>12</sup> MCAS Miramar did not include areas identified as "suitable plant community types distant from known gnatcatcher nesting areas" as occupied habitat in the BA. These unoccupied areas could potentially be utilized by gnatcatchers at the time the project is initiated for foraging or sheltering opportunities, especially if adjacent to undisturbed coastal sage scrub habitat.



Storm Water Pollution Prevention Plan (SWPPP), and an Integrated Pest Management Plan (IPMP).

Permanent indirect impacts will also occur due to fragmenting and isolating vernal pool basins from nearby basins and the native vegetative community. Landscaping for the cemetery will include traditional turfed burial areas interspersed with native habitat. The turfed burial areas will isolate and fragment vernal pools that are located within the project footprint. This may result in reduced pollination and gene flow between vernal pool complexes leading to reduced recruitment and potentially increasing occurrences of genetic drift, inbreeding depression, and extinction due to demographic stochasticity. To minimize these effects, the applicant will develop and implement a Natural Resource Management Plan (NRMP) for all on-site vernal pools. However, the details of the NRMP need to be described, and the draft plan reviewed and approved by the Service prior to project initiation to help ensure on-site vernal pools remain viable.

Direct and indirect effects to SD fairy shrimp will also be minimized through implementation of the proposed conservation measures listed in Section 1.2 of this document. For example conservation measures 1.2.3, 1.2.4, 1.2.5, 1.2.16, 1.2.17, 1.2.18, and 1.2.20, will minimize impacts to vernal pools by controlling for runoff, erosion, sedimentation, contamination, and minimize human intrusion due to construction activities. Moreover, conservation measure 1.2.15 will minimize take of SD fairy shrimp by collecting soil components, to be used as inoculum, from occupied vernal pools prior to earthwork activities.

#### **4.4 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 actions on MCAS Miramar are anticipated to be addressed through section 7 consultations and are not considered in this section because they would require separate consultations pursuant the Act.

#### **5.0 CONCLUSION**

After reviewing the current status of the gnatcatcher and SD fairy shrimp, the environmental baseline for the action area, and effects (direct, indirect, and cumulative) of the proposed action, it is the Service's biological opinion that the Fort Rosecrans National Cemetery Annex, as proposed, is not likely to jeopardize the continued existence of the gnatcatcher or the SD fairy shrimp. No designated gnatcatcher or SD fairy shrimp critical habitat occurs within the project footprint and therefore, the proposed action will not result in the destruction or adverse modification of designated critical habitat for these species.

The Service reached this conclusion for the following reasons:



### **5.1 California Gnatcatcher**

Based on the present status and distribution of the gnatcatcher, the two pair of gnatcatchers that will be affected by the proposed action is not likely to appreciably reduce the likelihood of survival and recovery of the gnatcatcher by reducing the reproduction, numbers, or distribution of the species because:

1. The mapped breeding territories for gnatcatchers in the action area will be avoided.
2. The project will incorporate native vegetation in the landscape design, thus maintaining corridors for natal dispersal.
3. The loss of potential habitat will be offset with the permanent preservation of 15.98 acres of occupied gnatcatcher habitat adjacent to MCAS Miramar.
4. Impacts to gnatcatchers will be minimized through the conservation measures that will be implemented as part of the project description.

### **5.2 San Diego Fairy Shrimp**

The aforementioned loss of 0.322 acre of SD fairy shrimp habitat (which includes 0.309 acre of occupied and 0.013 acre of unoccupied habitat) is not likely to appreciably reduce the likelihood of the survival and recovery of the species by reducing its reproduction, numbers, or distribution because:

1. The number of basins in the X 1-4, West Miramar, complex assemblage (within the action area) have increased from ~44 to ~648. This represents a 15-fold increase in basins since the SD fairy shrimp was listed (see Section 3.3.2), therefore, in the action area and rangewide, the 5% loss of basins is not significant relative to the overall increase and will not compromise the hydrology, biochemistry, or habitat support currently provided by the complex assemblage in the action area or those rangewide.
2. There has been a demonstrated success of restored, enhanced, and newly established pools on MCAS Miramar (Black and Zedler 1998, Black 2007, Pers. Comm.), therefore it is anticipated the restoration resulting from this action will increase vernal pool basin acreage on the Miramar.
3. The conservation measures and compensation ratios that will be implemented as part of the project description will ensure there will be a net increase in higher quality vernal pool habitat.
4. There will be a net benefit under active management since the project provides for long-term management of the species in the action area.



5. The project is consistent with the goals outlined in the Recovery Plan for the SD fairy shrimp because there will be a net increase in higher quality vernal pool habitat upon project completion.

## **6.0 INCIDENTAL TAKE STATEMENT**

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibits the take of endangered and threatened species, respectively, without special exemption. Take is defined as 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 actually kills or injures a listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an action that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. 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) of the Act, such incidental take is not considered a prohibited taking under the Act, provided that such taking is in compliance with this incidental take statement.

The measures described below are nondiscretionary and must be undertaken by MCAS Miramar and the contractor in order for the exemption in section 7(o)(2) to apply. MCAS Miramar has a continuing duty, subject to their jurisdictional authority, to regulate the activity situated within the action area and covered by this incidental take statement. Within the action area, if MCAS Miramar (1) fails to assume and implement the terms and conditions; or, (2) fails to require the contractor to adhere to the terms and conditions through enforceable terms that are added to the contract, the protective coverage of section 7(o)(2) may lapse. If the contractor fails to assume and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. To monitor the impacts of incidental take, MCAS Miramar must report the progress of the action and its impact on the species to our agency as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

### **6.1 Amount or Extent of Take**

The Service anticipates up to two (2) pairs of gnatcatchers could be harmed as a result of the permanent removal of 24.52 acres of suitable, native gnatcatcher habitat, as a result of the project. The Service anticipates that it will be difficult to quantify the exact number of SD fairy shrimp that could be affected by the proposed action for the following reason:

1. The exact population size is difficult to estimate due to the dynamic conditions associated with their habitat. The reproductive success of SD fairy shrimp is dependent on seasonal fluctuations in their habitat, such as presence or absence 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 (See Section 2.2.5). Therefore, the population of SD fairy in any given pool varies dramatically.

Nevertheless, we anticipate that all SD fairy shrimp and/or cysts within the vernal pool habitat located within the project footprint (i.e., 33 basins or 0.322 acre of SD fairy shrimp habitat) will be taken in the form of direct mortality (i.e., harm) by grading and filling the basins they occupy. Should project construction directly impact more than two pair of gnatcatchers or 33 vernal pool basins (0.322 acre of SD fairy shrimp habitat), or if indirect effects are greater than outlined in section 4.3, reinitiation of formal consultation will be required.

## **6.2 Effect of the Take**

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to gnatcatchers or SD fairy shrimp, or the destruction or adverse modification of critical habitat.

## **7.0 REASONABLE AND PRUDENT MEASURES**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SD fairy shrimp:

- 7.1. MCAS Miramar and/or the VA, National Cemetery Administration (NCA) will minimize the effects of the project on SD fairy shrimp and its habitat by implementing the proposed management plans listed in Section 1.2, Conservation Measures.
- 7.2. MCAS Miramar and/or the VA, NCA will minimize the effects of the project by implementing management activities within and adjacent to the project footprint containing preserved and restored/enhanced habitat for SD fairy shrimp after project construction to minimize indirect edge effects.
- 7.3. MCAS Miramar and/or the VA, NCA will minimize the effects of the project by restoring/enhancing new vernal pool habitat that can support SD fairy shrimp and preserving the enhanced and/or restored vernal pools in perpetuity, per conservation measures 1.2.8 and 1.2.21.

## **8.0 TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, MCAS Miramar must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. MCAS Miramar shall



implement reasonable and prudent measures through the following terms and conditions. These terms and conditions are non-discretionary.

8.1. The following terms and conditions implement reasonable and prudent measure 7.1:

- 8.1.1. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed by the VA, NCA and approved by the Service (with a 30-day review period) no later than 60 days prior to project implementation. The plan shall address the prevention of erosion and siltation from storm water runoff to avoid introduction of increased storm water to vernal pools located within and adjacent to project footprint, how permanent irrigation or water from irrigation systems will be directed away from on-site or adjacent preserved vernal pool basins, and how natural hydrological regimes for on-site or adjacent preserved vernal pool basins will be maintained. The SWPPP shall be reviewed annually to determine effectiveness and modified if necessary.
- 8.1.2. An Integrated Pest Management Plan (IPMP) shall be developed and approved by the Service (with a 30-day review period) no later than 60 days prior to project implementation. The plan shall, at a minimum, demonstrate compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1972, as amended (7 U.S.C. 136 et seq.) as well as address controls for aerial drift and methods to avoid on-site or adjacent preserved vernal pool basins. The IPMP shall be reviewed annually to determine effectiveness and modified if necessary.

8.2. The following terms and conditions implement reasonable and prudent measure 7.2:

- 8.2.1. Conservation Measure 1.2.8 is further clarified by the following language in order to minimize take. The VA, NCA shall be responsible for the development and implementation of a Natural Resources Management Plan (NRMP) that includes vernal pool monitoring and management for all on-site vernal pool preservation areas. The NRMP shall be implemented in perpetuity to protect the existing biological functions and values of all preservation areas. The NRMP shall outline biological resources on the site, provide for monitoring and management of biological resources by a Service-approved natural lands management organization, address potential impacts to biological resources (including adaptive management guidelines), and identify actions to be taken to eliminate or minimize those impacts. The NRMP shall be submitted to the Service for review and approval – project initiation (i.e., grading) is contingent upon this review and approval.

8.3. The following terms and conditions implement reasonable and prudent measure 7.3:

- 8.3.2. Conservation Measure 1.2.21 is further clarified by the following language in order to minimize take. Vernal pool restoration will be done in consultation with the Service and MCAS Miramar. The VA, NCA shall submit a vernal pool habitat restoration plan to the Service and MCAS Miramar for review and approval – project initiation (i.e., grading) is contingent upon this review and approval.



8.3.1. The VA, NCA will fully fund and implement the vernal pool restoration plan in consultation with the Service and MCAS Miramar. The final plan shall include the following:

8.3.1.1. All final specifications and microtopographic-based grading, planting and irrigation plans for the restoration sites. Grading plans for each restored pool will be provided. All grading will be conducted outside the rainy season (i.e., from April 15 to October 15) to minimize compacting the clay soils by grading equipment. Topsoil and native plant materials salvaged from the impacted areas (including live herbaceous, shrub and tree species) shall be transplanted to, and/or used as a seed/cutting source for, the restoration areas to the maximum extent practicable as directed by the Service. Collection of topsoil containing seeds, spores, bulbs, eggs, and other propagules from adjacent vernal pool and upland habitats, translocation of propagules of individual species from offsite habitats, and use of commercially available native plant species can be utilized with permission from the Service and MCAS Miramar. Planting and irrigation shall not be installed until the Service has approved of the restoration area grading. All plantings shall be installed in a way that mimics natural plant distribution rather than planted in rows. Exotic weed control shall be implemented within the restoration areas.

8.3.1.2. Topsoil shall be salvaged from the vernal pools and road or ditch depressions to be impacted on site. Topsoil (inoculum) shall be collected when dry to avoid damaging or destroying fairy shrimp cysts. Hand tools (i.e., shovels and trowels) will be used to remove the first 2 inches of soil from the pools. Whenever possible, the trowel shall be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling which can damage the cysts. The soil from each pool 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. Inoculum from different source pools shall not be mixed for seeding any restored pools. Additional inoculum may be desirable to supplement the inoculum salvaged from the pools to be impacted on site. Potential sources of inoculum include other vernal pools on MCAS Miramar. Prior to the use of any inoculum from pools other than those to be impacted by the proposed project, the restoration specialist will contact either the Service or MCAS Miramar for approval no less than 60 days prior to potential inoculum collection dates. No more than 10 percent of the inoculum present in any non-impacted donor pool shall be removed to minimize any adverse effects to the donor pool. The collected soils shall be spread out and raked into the bottoms of the restored pools. Inoculum 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).

- 8.3.1.3. A final implementation schedule that indicates when all fairy shrimp habitat impacts, as well as vernal pool and upland habitat restoration grading, planting and irrigation (uplands only), shall begin and end. Restoration activities shall be initiated prior to and/or concurrent with initiation of project impacts and/or construction. Necessary site preparation and planting shall be completed during the concurrent or next planting season (i.e., late fall to early spring) after receiving Service and MCAS Miramar approval of grading for the restoration.
- 8.3.1.4. Identification that a qualified biologist with a minimum 3 years of vernal pool restoration experience and approved by the Service, will direct the grading for the restored vernal pools. Inoculum, planting, and irrigation shall not be conducted until the Service and MCAS Miramar have approved of habitat restoration site grading. Inoculum shall not be introduced into the restored pools until after the restored ponds have been demonstrated to retain water for the appropriate amount of time to support SD fairy shrimp [i.e., at least 30 days (Hathaway and Simovich 1996, Ripley et. al. 2004)] to the satisfaction of the Service and MCAS Miramar.
- 8.3.1.5. Restriction that all weeding within and immediately adjacent to the restored and existing vernal pools will be performed by hand. No herbicide will be used within or adjacent to the restored and preserved vernal pools. All workers conducting weed removal activities shall be educated to distinguish between native and non-native species so that local native species are not inadvertently killed by weed removal actions.
- 8.3.1.6. Five years of monitoring and evaluation of success criteria for vernal pool and upland habitat restoration areas shall be conducted.
- 8.3.1.7. Monitoring and success criteria for vegetation shall include: a qualitative and quantitative vegetation monitoring plan with a map of proposed sampling locations; photo points for qualitative monitoring and stratified-random sampling for all quantitative monitoring; separate percent cover, composition, and diversity criteria for plants in vernal pools and appropriate adjacent uplands at the end of 5 years; a total of 40-65 percent absolute cover of native upland vegetation; evidence of natural recruitment of multiple species; 0 percent coverage for those species listed on Lists A & B of the California Invasive Plant Council's (Cal-IPC) list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999" (A copy of the complete list can be obtained from Cal-IPC's web site at <http://www.caleppc.org>.); no more than 10 percent coverage for other



exotic/weed species in the watersheds/uplands surrounding the restored pools; and, no more than one percent cover of exotic/weed species in restored vernal pools. Container plant survival shall be 80 percent of the initial plantings for the first 5 years. At the first and second anniversaries of plant installation, all dead plants shall be replaced unless their function has been replaced by natural recruitment.

- 8.3.1.8. Success criteria for restoration and enhancement of SD fairy shrimp habitat shall be determined by measuring the ponding of water, and density of viable cysts, hatched fairy shrimp, and gravid females, within the restored pools. Water measurements shall be taken in the restored pools to determine the depth, duration and quality (e.g., pH, temperature, total dissolved solids, and salinity) of ponding. Dry samples shall be taken in the restored pools to determine the density of viable cysts in the soils. Wet samples shall also be taken in the restored pools to determine the density of hatched fairy shrimp and gravid females. The 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 average viable cyst, hatched fairy shrimp, and gravid female density of the restored pools must not differ significantly ( $p < 0.05$ ) from reference pools for, at least, three wet seasons before a determination of success can be made. Vernal pools selected as reference or control pools for evaluating restoration success shall be identified and described in the restoration plan.
- 8.3.1.9. Contingency measures in the event of restoration failure would be developed. If a performance criterion is not met for any of the restored vernal pools or upland habitat in any year, or if the final success criteria are not met, the project proponent shall prepare an analysis of the cause(s) of failure and proposed remediation.

The Service retains the right to access and inspect the project site for compliance with the proposed project description and with the terms and conditions 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.

The Service believes that two pairs of gnatcatchers and 24.52 acres of suitable, native gnatcatcher habitat, and 0.322 acre of SD fairy shrimp habitat, comprised of 33 vernal pool basins, will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. MCAS



Miramar must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

## **9.0 MONITORING REQUIREMENTS**

Pursuant to 50 CFR 402.14(i)3, MCAS Miramar "...must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement." The reporting requirements are established in accordance with 50 CFR 13.45 and 18.27. To receive coverage under this biological opinion, MCAS Miramar must provide annual monitoring reports of the estimated take that may have occurred in relation to the amount of take that is identified in this Incidental Take Statement. Annual reports are due prior to January 31<sup>st</sup> of each year for the duration of this project. The monitoring report will also identify the amount of habitat affected and must specify whether pre-project surveys were conducted and the results of those surveys.

## **10.0 REPORTING REQUIREMENTS**

The Service's Carlsbad Office is to be notified within three working days should any endangered or threatened species be found dead or injured during this project. Notification must include the date, time, and location of the carcass, and any other pertinent information. Dead animals may be marked in an appropriate manner, photographed, and left on-site. Injured animals should be transported to a qualified veterinarian. Should any treated animals survive, the Service should be contacted regarding the final disposition of the animals. The Service contact person is Felicia Sirchia. Ms. Sirchia may be contacted at the letterhead address or at (760) 431-9440.

Due to recent concerns and outbreaks associated with West Nile Virus or avian influenza, we recommend the following (adapted from guidelines<sup>13</sup> developed in consultation with the Centers for Disease Control and Prevention): Field biologists handling wild birds should at a minimum wear protective clothing, including coveralls, rubber boots, and latex or rubber gloves that can be disinfected or disposed. Wash hands with soap and water often and disinfect work surfaces and equipment between sites. Do not eat, drink, or smoke while handling animals. We recommend minimizing exposure to mucosal membranes by wearing protective eyewear (i.e., goggles) and a particulate surgical mask (NIOSH N95 respirator/mask is preferable). Decontaminate and properly dispose of potentially infectious material including carcasses.

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<sup>13</sup> These guidelines and recommendations are advisory in nature and intended to provide guidance for field biologists and others working with or handling wild birds with specific reference to highly pathogenic avian influenza. The guidance reflects information available as of August, 2005 and may be updated as more information becomes available. For more information, see USGS Field Guide to Wildlife Diseases:  
[http://www.nwhc.usgs.gov/publications/field\\_manual/chapter\\_4.pdf](http://www.nwhc.usgs.gov/publications/field_manual/chapter_4.pdf)



## 11.0 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.

- 11.1. Monitoring of all gnatcatcher pairs (and documentation of their breeding territories) within and outside of the project footprint should document territory and home range size, courtship activities, and nesting outcome of all gnatcatcher pairs.
- 11.2. California gnatcatchers are not well monitored by breeding bird survey counts. Given their sensitivity to habitat degradation, monitoring to determine population trends and demographics should be a high priority. Further studies of gnatcatcher dispersal capability through man-modified landscapes would help in the design of adequate habitat linkages between core populations.
- 11.3. Establish a minimum 100-foot wide habitat buffer to be preserved around vernal pools and their watersheds to limit the more immediate indirect edge effects caused by surrounding development and to ensure natural hydrological regimes are maintained.
- 11.4. Construction fencing should be placed on the impact side to reduce the potential for additional vegetation loss within open space. All temporary fencing will be removed only after the conclusion of all grading, clearing, and construction. The project proponent and/or the biological monitor will contact the Service to verify that the limits of construction have been properly staked and are readily identifiable. Under no circumstances will equipment or personnel move outside the designated construction zone to ensure damage does not occur to adjacent habitat. Should violations occur, the contractor would be required to restore damaged habitat at a ratio of 5:1.

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

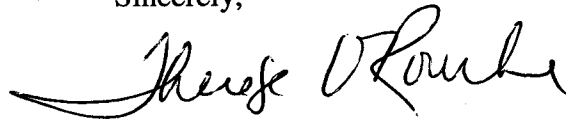
## 12.0 REINITIATION NOTICE

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



causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Sincerely,

A handwritten signature in black ink, appearing to read "Therese O'Rourke". The signature is fluid and cursive, with a long horizontal flourish extending to the left.

Therese O'Rourke  
Assistant Field Supervisor



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#### **Personal Communications**

Black, C. December 13, 2006. Telephone correspondence regarding post-monitoring of BRAC restoration sites on MCAS Miramar, San Diego, California.



**APPENDIX A - Positive Protocol Survey Reports for Occurrences of San Diego Fairy Shrimp as of December, 2006**

Locality	USFWS Report No.	Site Name	Source	County	Year
Camp Pendleton	1750	MCB Camp Pendleton Armor/Anti-Armor Tracking Range P-634	Edaw Inc.	San Diego	2001
Camp Pendleton	4550	Wire Mountain Housing Area	Recon	San Diego	2004
Camp Pendleton	5446	Foothill Transportation Corridor-South	Glenn Lukos Associates	San Diego	2001
Camp Pendleton	6665	MCB Camp Pendleton Red Beach Training Area	Ch2MHill	San Diego	2005
Camp Pendleton	7015	MCB Camp Pendleton	URS	San Diego	2005
Carlsbad	7345	Manzanita Partners Vernal Pool Preserve	Dudek & Associates Inc.	San Diego	2005
Chollas Heights	5225	Chollas Heights Naval Family Housing	Recon	San Diego	1998
East Otay Mesa	995	State Route 11	Helix Environmental Planning Inc.	San Diego	2001
East Otay Mesa	1359	East Otay Mesa Specific Plan Area Amendment	Edaw Inc.	San Diego	2001
East Otay Mesa	1534	State Route 11 Extension	Helix Environmental Planning Inc.	San Diego	2001
East Otay Mesa	6486	Arnaiz Parcel	Helix Environmental Planning Inc.	San Diego	2004
Imperial Beach	1717	Naval Radio Receiving Facility, Imperial Beach	Coralie Cobb	San Diego	2001
Marron Valley	1563	Marron Valley	Conservation Biology Institute	San Diego	2001
Murphy Canyon	2800	Murphy Canyon Naval Family Housing	Recon	San Diego	2003
Murphy Canyon	4553	SDG&E Mission To Miguel 230 Kilovolt #2 Project	Recon	San Diego	2004
Murphy Canyon	5225	Murphy Canyon Naval Family Housing	Recon	San Diego	1998
Orange County	787	Newport Banning Ranch, Newport Beach	Glenn Lukos Associates	Orange	2000
Orange County	928	North Ranch Policy Plan Area, Blind Canyon	Harmsworth Associates	Orange	2001
Orange County	929	Chiquita Ridge	Harmsworth Associates	Orange	2001
Orange County	1322	San Juan Creek/San Mateo Creek Sump	Dudek & Associates Inc.	Orange	2001
Orange County	4554	Irvine Ranch Land Reserve, North Ranch	Harmsworth Associates	Orange	2004
Otay Lakes	285	Otay Ranch Village 13/Resort Site	Dudek & Associates Inc.	San Diego	2000
Poway	1659	Leaseback/Nertamid Site	Jones And Stokes	San Diego	2001
Ramona	0	H1 (Old 17B)	Branchiopod Research Group Usd	San Diego	1999
Ramona	1658	Gerrato/Greenhaus Site	Dudek & Associates Inc.	San Diego	2001
Ramona	1711	Highland Valley Estates	Ecological Restoration Service	San Diego	2001
Ramona	1751	Ramona Airport Integrated Habitat Management Plan	Edaw Inc.	San Diego	2001
Ramona	2621	Ramona Self Storage Project	Helix Environmental Planning Inc.	San Diego	2003
Ramona	2739	City Of Ramona	PCR	San Diego	2003
Ramona	2790	Ramona Airport Vernal Pool Mitigation Site	Edaw Inc.	San Diego	2003
Ramona	3261	Ramona Branch Public Library	Merkel & Associates Inc.	San Diego	2003
Ramona	7104	Apns 282-130-45; -46 & -04	Ecological Restoration Service	San Diego	2004
Ramona	7456	Ramona Grasslands Preserve	Recon	San Diego	2005
Rancho Santa Fe	6583	Santa Fe Valley/San Dieguito River Valley	Helix Environmental Planning Inc.	San Diego	1998
Rancho Santa Fe	6584	Starwood/Santa Fe Valley Vernal Pool Preserve Final Survey	Helix Environmental Planning Inc.	San Diego	2004
San Marcos	1937	Upham Property	Recon	San Diego	2001
San Marcos	7347	Upham Parcel	Dudek & Associates Inc.	San Diego	2005
Santee	6396	Fanita Ranch Site	Dudek & Associates Inc.	San Diego	2004
Santee	7341	Fanita Ranch Site	Dudek & Associates Inc.	San Diego	2005



Appendix B: \*Status of Vernal Pool Complex Assemblages for San Diego Fairy Shrimp

Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
1. LA/Orange	unincorporated Orange County	Radio Tower Road		4 Private	1-6-07-F-812.8	Conserved/Managed	conserved/managed	X/New	Glenn Lukos Associates 2001
2. LA/Orange	Costa Mesa	Fairview Park	8/3.25 acre	City of Costa Mesa	see note below	Conserved/Mitigation Site	mitigation	X/R1	CNDDDB occurrence #11, 1996, Glenn Lukos Associates 2005, 2006
3. LA/Orange	unincorporated Orange County	Irvine Ranch Land Reserve	1	1 Private		Conserved	conserved	X/New	Harmsworth Associates 2001, 2004
4. LA/Orange	unincorporated Orange County	O'Neill Park	1 Private	1 Private		Development (Proposed)	proposed expansion of telecommunication facility		CNDDDB #17
5. LA/Orange	unincorporated Orange County	Chiquita Ridge	3/1.3 acre	Private	1-6-97-F-2 and 1-6-07-F-812.8	Conserved/Managed	conserved/managed	X	Dudek & Associates 2001
6. LA/Orange	Torrance+++	Madrona Marsh	City of 8	City of Torrance		Conserved	conserved	New	Angelos 2003
7. LA/Orange	San Clemente State Park	San Clemente		State		Unknown	unknown	R1	Riefner & Pryor 1996
8. LA/Orange	Orange	SCE Viejo Substation (aka Whiting Ranch)	16 Private	Private		Conservation/Mitigation Site	proposed mitigation bank		PCR 1998
9. LA/Orange	Orange	Saddleback	9/0.76 acre	Private	1-6-01-F-1023	Development (Proposed)	proposed development		HELIX 2000
10. LA/Orange	Newport Beach+++	Newport Banning Ranch	6 Private	Private		Unknown	uncertain	X/New	Glenn Lukos Associates 2000
11. LA/Orange	Laguna Beach	Rancho Laguna		Private		Unknown	unknown		Riefner & Pryor 1996
12. LA/Orange	Laguna Beach	Badlands Park		City of Laguna Beach		Unknown	unknown		Recovery Plan, 1998
13. LA/Orange	Irvine	El Toro	1/0.13 acre	U.S. Department of the Navy	1682.1 (informal section 7)	Conservation/Enhancement	enhanced in 2005		HELIX 2005



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
14. LA/Orange	Rancho Santa Margarita+++	Tijeras Creek	2/0.8	Private	1-6-99-F-15	Unknown	unknown	New	Glenn Lukos Associates 2001
15. LA/Orange	unincorporated Orange County	Live Oak Plaza		1 Private	1-6-99-F-15	Conserved	conserved	New	Glenn Lukos Associates 1997
16. SD Central	Miramar	HH2+	101	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
17. SD Central	Miramar	EE2	418	Marines	1-6-95-F-33	Conservation Priority/Restoration (Partial)	MA 1/Partial BRAC Impacts/restored	X/R1	MCAS Miramar GIS Data, 2007
18. SD Central	Miramar	F north (F28)	340	Marines	1-6-95-F-33	Conservation Priority/Mitigation Site	MA 1/BRAC Mitigation	X/R2	MCAS Miramar GIS Data, 2007
19. SD Central	Miramar	F16-17	32	Marines	1-6-95-F-33	Conservation Priority/Mitigation Site	MA 1/BRAC Mitigation	X/R1	MCAS Miramar GIS Data, 2007
20. SD Central	Miramar	FF1-2	59	Marines	1-6-95-F-33	Enhancement/Development (Partial)	MA 4/Partial BRAC Impacts	X/R1	MCAS Miramar GIS Data, 2007
21. SD Central	Miramar	GA	537	Marines		Conservation Priority	MA 1	X	MCAS Miramar GIS Data, 2007
22. SD Central	Miramar	GG1+	65	Marines	1-6-95-F-33	Conservation Priority/Restoration (Partial)	MA 1/Partial BRAC Impacts	X	MCAS Miramar GIS Data, 2007
23. SD Central	Miramar	GG2+	51	Marines	1-6-95-F-33	Developed	MA 1/BRAC Impacts	X	MCAS Miramar GIS Data, 2007
24. SD Central	Miramar	HH1+	300	Marines	1-6-94-F-24	Conservation Priority/Restoration (Partial)	MA 1/restoration site	X/R1	MCAS Miramar GIS Data, 2007
25. SD Central	Miramar	EE1	953	Marines		Conservation Priority	MA	X/R1	MCAS Miramar GIS Data, 2007
26. SD Central	Miramar	AA12	15	Marines		Conservation Priority	MA 1	R1	MCAS Miramar GIS Data, 2007
27. SD Central	Miramar	GG3+	30	Marines	1-6-95-F-33	Enhancement/Development (Partial)	MA 3/Partial BRAC Impacts	X	MCAS Miramar GIS Data, 2007
28. SD Central	Miramar	AA9	166	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
29. SD Central	Miramar	AA8	12	Marines		Conservation Priority	MA 1	R2	MCAS Miramar GIS Data, 2007
30. SD Central	Miramar	AA4-7	183	Marines	1-6-95-F-33	Conservation Priority/Mitigation Site	MA 1/BRAC Mitigation	X/R1	MCAS Miramar GIS Data, 2007



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
31. SD Central	Miramar	AA3		Marines		Unknown	Not found in miramar data or boulder data	X/R1	MCAS Miramar GIS Data, 2007
32. SD Central	Miramar	AA2	21	Marines		Conservation Priority	MA 1		MCAS Miramar GIS Data, 2007
33. SD Central	Miramar	AA13	184	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
34. SD Central	Miramar	HH3+		15 Marines	1-6-95-F-33	Enhancement/Development (Partial)	MA 2/BRAC Impacts (80% filled, 20% restored)	X/R1	MCAS Miramar GIS Data, 2007
35. SD Central	Miramar	AA12 north+	74	Marines		Impacted	MA 5	X/R1	MCAS Miramar GIS Data, 2007
36. SD Central	Miramar	W3	20	Marines		Conservation Priority	MA 1		MCAS Miramar GIS Data, 2007
37. SD Central	Miramar	AA11	94	Marines		Conservation Priority	MA 1	R1	MCAS Miramar GIS Data, 2007
38. SD Central	Miramar	AA10	411	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
39. SD Central	Miramar	AA12 south	26	Marines		Conservation Priority	MA 1	R1	MCAS Miramar GIS Data, 2007
40. SD Central	Miramar	X1-4	680	Marines	1-6-87-F-34	Conservation Priority/Mitigation Site	MA 1/BRIG mitigation site	X	MCAS Miramar GIS Data, 2007
41. SD Central	Santa Fe Valley/SD County	DD5++Santa Fe Valley Minor Amendment Area		Private		Unknown	?	New	
42. SD Central	Santa Fe Valley/SD County	DD6++4S Ranch-Crosby Estates		Private		Conserved/Mitigation Site	Mitigation/Conserved	X/New	
43. SD Central	Rancho Bernardo	DD4 (Rancho Bernardo)	3	Private		Developed	impacted/filled		Recovery Plan, 1998
44. SD Central	Poway	CC (Poway)		Private		Development (Proposed)	Proposed development	X	Recovery Plan, 1998
45. SD Central	Nobel Research Park	X7		Private (conservation easement)		Conserved/Mitigation Site	Conserved/ managed	X/New	City of San Diego, 2003
46. SD Central	Mission Trails RP	Q2	15	City of SD		Conserved	Conserved	X/New	City of San Diego, 2003
47. SD Central	Miramar	Z9	40	Marines	1-6-95-F-33	Enhancement/Development (Partial)	MA 5/BRAC impacts (70% filled, 30% restored)	X	MCAS Miramar GIS Data, 2007
48. SD Central	Miramar	Z6-7	108	Marines	1-6-93-F-33	Enhancement/Development (Partial)	MA 5/10% filled, 90% restored	X/R1	MCAS Miramar GIS Data, 2007



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
49. SD Central	Miramar	Z1-3	99	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
50. SD Central	Miramar	V 1-4 (Sim J. Harris)	45	Marines		Conservation Priority	MA 1		MCAS Miramar GIS Data, 2007
51. SD Central	Miramar	Z10	39	Marines	1-6-95-F-33	Enhancement/Development (Partial)	MA 5/BRAC impacts (90% filled, 10% restored)	X/R1	MCAS Miramar GIS Data, 2007
52. SD Central	Miramar	HH4+		Marines	1-6-94-F-37, ESA 3232	Developed	MA 1/90% filled	R1	MCAS Miramar GIS Data, 2007
53. SD Central	Miramar	X1-4+ (Rose Canyon)	26	Marines	ESA 3232	Conservation Priority/Mitigation Site	MA 1/Restoration site	X/New	MCAS Miramar GIS Data, 2007
54. SD Central	Miramar	W4		Marines	1-6-94-F-37	Developed	Filled		MCAS Miramar GIS Data, 2007
55. SD Central	Mira Mesa	C27 (Cousins)	1	Cousin's Market Center	1-6-98-F-23	Developed	Conserved/ Enhanced	X	S. Wynn Update, 1999
56. SD Central	Miramar	W1-2	53	Marines		Conservation Priority	MA 1	X	MCAS Miramar GIS Data, 2007
57. SD Central	Miramar	AA1 west	66	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
58. SD Central	Miramar	U19	9	Marines	1-6-95-F-33	Conservation Priority/Mitigation Site	MA 1/BRAC Mitigation site	X/R2	MCAS Miramar GIS Data, 2007
59. SD Central	Miramar	U15	47	Marines	1-6-95-F-33	Conservation Priority/Mitigation Site	MA 1/BRAC Mitigation site	X/R2	MCAS Miramar GIS Data, 2007
60. SD Central	Miramar	U North	878	Marines		Conservation Priority/Restoration (Partial)	MA 1/Partial restoration site	X/R1	MCAS Miramar GIS Data, 2007
61. SD Central	Miramar	RR2	26	Marines		Conservation Priority	MA 1	R1	MCAS Miramar GIS Data, 2007
62. SD Central	Miramar	RR1	76	Marines		Conservation Priority	MA 1	R1	MCAS Miramar GIS Data, 2007
63. SD Central	Miramar	Z11+		Marines	1-6-95-F-33	Developed	MA 4/BRAC impacts (filled)	New	MCAS Miramar GIS Data, 2007
64. SD Central	Del Mar Mesa	H31-32;38+ Sorrento Hills (Carmel Mountain)	30	City of SD		Conserved/Mitigation Site	Conserved/ managed	X	S. Wynn Update, 1999



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
65. SD Central	Mira Mesa	C28 (Maddox)		82 School District		Private	Proposed school	X	
66. SD Central	Kearny Mesa	I13		2 Private		Developed	filled		Recovery Plan, 1998
67. SD Central	Kearny Mesa	I12		City SD-6 MWWD		Private	Not conserved	X	S. Wynn Update, 1999
68. SD Central	Kearny Mesa	I1 (Arjons)		Private/City 20 easement	1-1-80-F-73	Conserved/Not Managed	Mitigation -illegally impacted	X	S. Wynn Update, 1999
69. SD Central	Kearny Mesa	G2		88 Navy	1-6-94-F-23	Conserved/Mitigation Site	Conserved/ mitigation site	X/R1	S. Wynn Update, 1999
70. SD Central	Kearny Mesa	G1		146 Navy	1-6-94-F-23	Conserved/Mitigation Site	Conserved/ mitigation site	X/R1	S. Wynn Update, 1999
71. SD Central	Kearny Mesa	BB2 (general dynamics)	16, 0.2 acre	Private	1-6-98-F-32	Developed	impacted/filled	X/R2	Recovery Plan, 1998
72. SD Central	Kearny Mesa	BB2 (General Dynamics)	34, 0.42 acre	Private - 98-F-32	1-6-98-F-32	Conserved/Mitigation Site	Conserved/ mitigation site	X/R1	S. Wynn Update, 1999
73. SD Central	Del Mar Mesa	H41++ Black Mountain Ranch		2 TET		Conserved/Mitigation Site	Conserved		S. Wynn Update, 1999
74. SD Central	Del Mar Mesa	H40+ Li Collins	2	2		Conserved	conserved		City of San Diego, 2003
75. SD Central	Kearny Mesa	I6c		Private - City 15 easement		Conserved/Mitigation Site	mitigation	X	S. Wynn Update, 1999
76. SD Central	Del Mar Mesa	H33	2	SDGE	ESA 3232	Conserved/Mitigation Site	conserved/ managed, mitigation site	R1	F. Sirchia Update, 2007
77. SD Central	Kearny Mesa	I7	63	Marines		Conservation Priority/Restoration (Partial)		X/New	Recovery Plan, 1998
78. SD Central	Del Mar Mesa	H24-26	20h	Private		Developed	filled (per bauder 86)	R2	S. Wynn Update, 1999
79. SD Central	Del Mar Mesa	H18-23 (Rhodes, portion of Del Mar Mesa)	60	Private	ESA 2135	Conserved/Mitigation Site	proposed development	X/R1	S. Wynn Update, 1999
80. SD Central	Del Mar Mesa	H17 (Shaw Texas)	56	Private	1-6-06-F-4005.4	Impacted	impact site	X/R2	S. Wynn Update, 1999
81. SD Central	Del Mar Mesa	H13-15 (Del Mar Mesa)	60	CDFG - SR 52 mitigation	1-6-86-F-33	Conserved/Mitigation Site	mitigation in MHPA & NWR	X/R1	S. Wynn Update, 1999
82. SD Central	Del Mar Mesa	H4-10 (Del Mar Mesa)	27	CDFG - sr 52 mitigation	1-6-86-F-33	Conserved/Mitigation Site	mitigation in MHPA & NWR	R1	S. Wynn Update, 1999
83. SD Central	Del Mar Mesa	H1-3 (Del Mar Mesa)	45	City of SD		Conserved/Mitigation Site	mitigation in MHPA & NWR	X/R1	S. Wynn Update, 1999
84. SD Central	Del Mar Mesa	H?, Neigh 8a		Private		Conserved/Development (Partial)	partially in MHPA	R2	S. Wynn Update, 1999



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
85. SD Central	Del Mar Mesa	H, Subarea 3	2?	Private		Unknown		X/R2	Recovery Plan, 1998
86. SD Central	Carmel Mtn	H39+ (Greystone Torrey Highlands)	19	Private		Conserved/Mitigation Site	Conserved/ mitigation site		City of San Diego, 2003
87. SD Central	Carmel Mtn	H38 (Carmel Mountain)	30	City of SD		Conserved/Mitigation Site	Conserved/ managed	X/New	City of San Diego, 2003
88. SD Central	Del Mar Mesa	H36, Subarea 5 (Shaw Texas)	5	Private		Development (Proposed)	proposed development		Recovery Plan, 1998
89. SD Central	Mira Mesa	B6 (Tierra Alta)	1	City of SD		Conserved/Mitigation Site	mitigation in MHPA & NWR	X/R1	S. Wynn Update, 1999
90. SD Central	Miramar	AA1 east	22	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
91. SD Central	Miramar	A4, Tierrasanta	67	Marines		Conservation Priority	MA 1	X/R1	MCAS Miramar GIS Data, 2007
92. SD Central	Miramar	I7 - Eastgate Mall	62	Marines		Conservation Priority/Restoration (Partial)	MA 1/Restored	X/New	MCAS Miramar GIS Data, 2007
93. SD Central	Mira Mesa	D5-6 (Carroll Canyon)	10	City of SD		Conserved/Mitigation Site	mitigation in MHPA & NWR	X/R1	S. Wynn Update, 1999
94. SD Central	Mira Mesa	D1 (Fenton Mira Mesa Sandmine)	3	Private		Developed	impacted/filled		S. Wynn Update, 1999
95. SD Central	Santee	Q1	6	Grossmont College		Conservation/Development (Partial)		X	Recovery Plan, 1998
96. SD Central	Mira Mesa	C27 (Cousins)	64, 0.2	Cousin's Market Center	1-6-98-F-23	Developed	impacted/filled	X	S. Wynn Update, 1999
97. SD Central	Santee	Fanita Ranch				Development (Proposed)	Proposed Development	X	F. Sirchia Update, 2007
98. SD Central	Mira Mesa	C17-18 (Fieldstone)	5, 0.3 acre	Private	1-1-80-F-66	Conserved/Mitigation Site	mitigation		S. Wynn Update, 1999
99. SD Central	Mira Mesa	C10-16.26 (Winterwood Park)	39	City of SD		Conservation (Proposed)	proposed park/mitigation bank	X/R1	S. Wynn Update, 1999
100. SD Central	Kearny Mesa	I6b	8	Private - City easement		Conserved/Mitigation Site	mitigation	X	S. Wynn Update, 1999
101. SD Central	Mira Mesa	B7-8E (Brown Parcel)	17	City of SD - mit for sander		Conserved/Mitigation Site	mitigation in MHPA & NWR	X/R1	S. Wynn Update, 1999
102. SD Central	Miramar	AA1 south	40	Marines	1-6-92-F-31	Conservation Priority/Mitigation Site	MA 1/restored/mitigation site	X/R1	MCAS Miramar GIS Data, 2007



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
103. SD Central	Mira Mesa	B5 (Lopez Ridge)	1	City of SD		Conserved/Mitigation Site	mitigation site in MHPA & NWR	X/R1	S. Wynn Update, 1999
104. SD Central	Mira Mesa	B11 (Mesa Norte)	45	Private (conservation easement)	1-6-98-F-23	Conserved/Mitigation Site	Conserved/ mitigation site	X/R1	S. Wynn Update, 1999
105. SD Central	Mira Mesa	B2	23	Private		Conserved/Mitigation Site	mitigation	X/R1	
106. SD Central	Kearny Mesa	Chollas Heights	39	Navy	1-6-94-F-23	Conserved/Mitigation Site	mitigation	X/R1	S. Wynn Update, 1999
107. SD Central	Kearny Mesa	X7+ (Nobel Research Park)	28	Private		Conserved	Privately owned, fenced, conserved	X	City of San Diego, 2003
108. SD Central	Kearny Mesa	X5	7	City of SD		Conserved/Mitigation Site	mitigation site in MHPA	X/R1	S. Wynn Update, 1999
109. SD Central	Kearny Mesa	Teledyne	40, 0.59 acre	Private		Development (Proposed)	proposed development		S. Wynn Update, 1999
110. SD Central	Kearny Mesa	N8 (Gen Dynamics)	21	private	1-6-98-F-32	Conserved/Mitigation Site	Conserved/ mitigation site	X/New	City of San Diego, 2003
111. SD Central	Kearny Mesa	N7 (Serra Mesa Library)	25	City of SD	ESA 3752	Private	Not Conserved	New	City of San Diego, 2003
112. SD Central	Kearny Mesa	N1-4, 6 (Montgomery Field)	278	City of SD	1-6-94-F-32	Conserved	partially impacted	X/R1	S. Wynn Update, 1999
113. SD Central	Mira Mesa	B7-8W (Crescent Heights)	7	Private		Development (Proposed)	Proposed development/partially in NWR	R1	S. Wynn Update, 1999
114. SD Central		Grassland		City SD-Parks		Unknown			S. Wynn Update, 1999
115. SD Central		M.T. Westridge		City SD-Parks		Conserved	conserved		S. Wynn Update, 1999
116. SD Central	Santa Fe Valley/SD County	DD1 (Santa Fe Valley Minor Amendment Area)	3	Private		Unknown	unknown		Recovery Plan, 1998
117. SD Inland	San Marcos	L1-6	30	private	1-6-93-F-40	Conservation/Development (Partial)	Upham - filled 1/2	X/R1	Recovery Plan, 1998
118. SD Inland	Ramona	Oak Country Estates	22	private	ESA 2356	Conservation (Proposed)	proposed for preservation as part of Oak Country Estates project	New	M. Moreno Update, 2007
119. SD Inland	Ramona	Habib	38 (as of 2004)	private	3663	Impacted	pools impacted by discing in 2003. Pools damaged, but not developed	X/New	M. Moreno Update, 2007



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
120. SD Inland	San Marcos	L9-10	39431	private		Development (Proposed)	superior ready mix proposed Batching plant/Universal Boot	X/R1	Recovery Plan, 1998
121. SD Inland	San Marcos	L7-8	5	private	95-20068-EW	Developed	Filled	R1	Recovery Plan, 1998
122. SD Inland	San Marcos	L21+ Las Posas/San Marcos Blvd	5	private		Developed	filled in 1997 - nw permit		
123. SD Inland	San Marcos	L20+ Los Vallecitos	39116	private		Unknown	gone?		Recovery Plan, 1998
124. SD Inland	San Marcos	L19+ Grand Ave	5	private		Impacted	periodically disced		Recovery Plan, 1998
125. SD Inland	San Marcos	L18+ Mission/Las Posa	10	private		Developed	filled		Recovery Plan, 1998
126. SD Inland	San Marcos	L16+ Arnolite South	39429	private		Developed	gone - too much water- Palomar Station		Recovery Plan, 1998
127. SD Inland	San Marcos	L15+ Arnolite North	5	private		Impacted	3 pools - too much water- Palomar Station	X/R2	Recovery Plan, 1998
128. SD Inland	San Marcos	L14+ Grand/Pacific	9	private		Impacted	severely impacted - no vps in 93	R2	Recovery Plan, 1998
129. SD Inland	Ramona	Montecito Road (on Montecito Ranch property?)	1	Private	ESA 2787	Impacted	impacted by discing 2002; still ponding as of 2005; recent bio report says no VP on-site	X/R1	Recovery Plan, 1998
130. SD Inland	Ramona	Highland Valley (oak Country?)	3+	Private		Unknown		New	Recovery Plan, 1998
131. SD Inland	San Marcos	L17+ Pico/Mission	10	private		Unknown	unk		Recovery Plan, 1998
132. SD Inland	Ramona	Main Street	6 (not sure which pools this refers to)	Private		Unknown		X/R1	Recovery Plan, 1998
133. SD Inland	San Marcos	L11-13	39445	private		Conserved	~20 pools - conservation easement recorded	X/R2	Recovery Plan, 1998



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
134. SD Inland	Ramona	Ramona High School	5. PSBS 1989; Pentis 1997; 22 Jones and Stokes 2006	Ramona School District	1573	Impacted	0.076 acre impacted by discing-impact area has been restored/managed; remaining pools subject of proposed school development	X/R1	M. Moreno Update, 2007
135. SD Inland	Ramona	Ramona, T	39+	County of SD-Airports	1-6-98-F-833.3-R1	Impacted	0.45 acre impacted for airport and airport expansion	X/R2	M. Moreno Update, 2007
136. SD Inland	Ramona	Quisenberry	1	private	ESA 4720	Conservation (Proposed)	proposed for preservation	New	M. Moreno Update, 2007
137. SD Inland	Ramona	Ramona Grasslands/TNC	?	TNC		Conserved	preserved	New	M. Moreno Update, 2007
138. SD Inland	Ramona	Ta, Hwy 67 & 15th (SE)	1	Private	1-6-98-F-09	Developed	developed for post office	X/R1	Recovery Plan, 1998
139. SD Inland	Ramona	Tb, Hwy 67 & Hunter (SE)	1	private		Private	unimpacted	X/R1	Recovery Plan, 1998
140. SD Inland	Ramona	Tc, La Brea & Kalbaugh (SE)	1	Private		Conserved	preserved for postoffice	X/R1	Recovery Plan, 1998
141. SD Inland	Ramona	Hwy 67 & Kalbaugh area	1 (potentially 8 pools 2006)	private		Private	appear to be unimpacted	X/R1	Recovery Plan, 1998
142. SD North	Camp Pendleton	San Mateo	17 complexes	Marine Corps		Unknown		R1	Recovery Plan, 1998
143. SD North	Camp Pendleton	Sierra I	1 complex	Marine Corps		Unknown			Recovery Plan, 1998
144. SD North	Carlsbad	JJ4 ++ Manzanita Partners	1, 0.02 (impacted) 15, 0.19 (conserved)	Manzanita Partners	1-6-99-F-06377	Conservation/Development (Partial)	Partially Impacted-Partially Conserved/Mitigation	X/New	D. Zoutendyke Update, 2007
145. SD North	Carlsbad	JJ3 (Water's End/Dunn)		Water's End-1 Dunn Property	4440	Conserved/Mitigation Site	Conserved/Mitigation	X	Recovery Plan, 1998
146. SD North	Carlsbad	JJ2 (SD Co Airport)		County of SD-Airports		Development (Proposed)	Proposed Development		Recovery Plan, 1998
147. SD North	Carlsbad	JJ2 (Palomar Point/Hieatt/Jett)	5, 0.05 (unoccupied, impacted) 13, 0.08 (occupied, conserved)	Palomar Point/Hieatt/Jett	3934/4145	Conservation/Development (Partial)	Partially Impacted-Partially Conserved/Mitigation	X/R1	D. Zoutendyke Update, 2007



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
148. SD North	Carlsbad	JJ1 (Poinsettia Train Station)		Poinsettia Train Station	3779/1-6-94-F-9	Conserved/Mitigation Site	Partially Impacted-Partially Conserved/Mitigation	X/R1	Recovery Plan, 1998
149. SD North	Camp Pendleton	Upper Stuart Mesa	9 complexes	Marine Corps		Unknown		R1	Recovery Plan, 1998
150. SD North	Camp Pendleton	San Onofre mgmt unit	1 complex Dudek	Marine Corps		Unknown		X/R1	Recovery Plan, 1998
151. SD North	Camp Pendleton	Coastal	16 complexes	Marine Corps		Unknown		X	Recovery Plan, 1998
152. SD North	Camp Pendleton	O'Neill Lake	5 complexes	Marine Corps		Unknown		X/R2	Recovery Plan, 1998
153. SD North	Camp Pendleton	Aliso Cyn	1 complex	Marine Corps		Unknown			Recovery Plan, 1998
154. SD North	Camp Pendleton	Wire Mountain (Y1-6)	15 complexes	Marine Corps		Unknown		X/R1	Recovery Plan, 1998
155. SD North	Camp Pendleton	Camp, Del Mar	1 complex	Marine Corps		Unknown			Recovery Plan, 1998
156. SD North	Camp Pendleton	Cocklebur Mesa		Marine Corps		Unknown		R1	Recovery Plan, 1998
157. SD North	Camp Pendleton	Las Flores	8 complexes	Marine Corps		Unknown		X/R1	Recovery Plan, 1998
158. SD North	Camp Pendleton	Las Flores East	6 complexes	Marine Corps		Unknown		X/R1	Recovery Plan, 1998
159. SD North	Camp Pendleton	Las Pulgas	64 complexes	Marine Corps		Unknown		R1	Recovery Plan, 1998
160. SD North	Camp Pendleton	Basilone	1 complex	Marine Corps		Unknown			Recovery Plan, 1998
161. SD South	Otay Mesa	J18		1 City of SD		Conserved	conserved	R1	S. Wynn Update, 1999
162. SD South	Otay Mesa	J28E		9 Private		Conserved/Not Managed	In MHPA - drainage issues	R1	S. Wynn Update, 1999
163. SD South	Otay Mesa	J23-24	617	Private		Unknown		R1	Recovery Plan, 1998
164. SD South	Otay Mesa	J27		Private - 5 Empire Center	1-6-96-F-3	Conserved/Mitigation Site	mitigation	R1	S. Wynn Update, 1999
165. SD South	Otay Mesa	J28W	2h	Private -		Impacted	Drainage issues	R1	S. Wynn Update, 1999
166. SD South	Otay Mesa	J26		30 Private		Conserved/Mitigation Site	mitigation	R1	Recovery Plan, 1998
167. SD South	Otay Mesa	J25	177	Private		Unknown		R1	Recovery Plan, 1998



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
168. SD South	Otay Mesa	J22		3 Private		Unknown			Recovery Plan, 1998
169. SD South	Otay Mesa	J21		Private - 7 drainage issues		Impacted	agriculture/border fence	R1	S. Wynn Update, 1999
170. SD South	Otay Mesa	J29-30	323	Otay Ranch		Conservation/Development (Partial)	Partially in MHPA & NWR	X/R1	S. Wynn Update, 1999
171. SD South	Otay Mesa	J19	0	Private		Impacted	agriculture	R1	S. Wynn Update, 1999
172. SD South	Otay Mesa	J16-17	37	City of SD		Conserved	conserved	X/R1	S. Wynn Update, 1999
173. SD South	Otay Mesa	J15	22 (4 impacted)	INS - Amie's Point	1-6-9-F-1089	Conservation/Development (Partial)	partially impacted/partially conserved as mitigation	X/R1	S. Wynn Update, 1999
174. SD South	Otay Mesa	J14 (Recon south & 905)	64	Private & City of SD (conservation easement)		Conserved/Mitigation Site	Conserved/ mitigation site (created)	X/R1	S. Wynn Update, 1999
175. SD South	Otay Mesa	J14	58	Private		Unknown		X/R1	City of San Diego, 2003
176. SD South	Otay Mesa	J20	0	Private		Impacted	agriculture	R1	S. Wynn Update, 1999
177. SD South	Otay Mesa	J5 (Robinhood Ridge)	12, 0.02 acre	Greystone - Robinhood Ridge	1-6-97-F-57	Conserved/Mitigation Site	Conserved mitigation in MHPA	X/R1	S. Wynn Update, 1999
178. SD South	Marron Valley	MM1	14	City of SD		Conserved	Conserved		City of San Diego, 2003
179. SD South	Otay Mesa	J13W+	34	TET		Conserved	informal mitigation bank	X/New	S. Wynn Update, 1999
180. SD South	Sweetwater Reservoir	S1-3	12	Sweetwater 12 Authority		Conserved	Conserved(?)		Recovery Plan, 1998
181. SD South	Proctor Valley	R4+	2	private		Unknown			S. Wynn Update, 1999
182. SD South	Proctor Valley	R3+	3	private		Unknown			S. Wynn Update, 1999
183. SD South	Proctor Valley	R2+	9	private		Unknown			S. Wynn Update, 1999
184. SD South	Otay Mesa	J3 (J33, from VPI, Sweetwater High School)	0.05	Sweetwater Union High School Dist.	1-6-99-F-77	Conservation/Development (Partial)	Conserved/mitigation (8 pools)	X/R2	S. Wynn Update, 1999
185. SD South	Otay Mesa	J6-7	50	Private		Development (Proposed)	proposed dev.	Xh	Recovery Plan, 1998



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
186. SD South	Otay Mesa	J2N	~271 acres	Pardee - CalTerace	1-6-95-F-35	Conserved/Mitigation Site	Conserved /mitigation site (MHPA)	X/R1	City of San Diego, 2003
187. SD South	Otay Mesa	J4 (Robinhood Ridge)	61 0.23 acre	Graystone - Robinhood Ridge	1-6-97-F-57	Conserved/Mitigation Site	Conserved mitigation	X	S. Wynn Update, 1999
188. SD South	Otay Mesa	J32 (West Otay A+B)	44	TET		Conserved/Mitigation Site	Conserved/ Mitigation site	X/New	City of San Diego, 2003
189. SD South	Otay Mesa	J31+		Otay Ranch		Conservation/Development (Partial)	Partially In MHPA & NWR	New	S. Wynn Update, 1999
190. SD South	Otay Mesa	J3+		St. Jeromes/Clayton	5102	Conservation/Development (Partial)	proposed development	X	S. Wynn Update, 1999
191. SD South	Otay Mesa	J2W	59	Private		Unknown		X/R1	City of San Diego, 2003
192. SD South	Otay Mesa	J2S (Olay Mesa Rd, Helix & Recon sites)	34	City of SD		Conserved/Mitigation Site	Conserved/ Mitigation site (created)	X/R1	City of San Diego, 2003
193. SD South	Proctor Valley	R1 - Proctor Valley	14	City of SD		Conserved/Not Managed	In MHPA - hammered by ohv		S. Wynn Update, 1999
194. SD South	Kelton	S4	3	City of SD		Conserved	Conserved		City of San Diego, 2003
195. SD South	Olay lakes	K14+	6	Private		Unknown	Not identified in VPI		Recovery Plan, 1998
196. SD South	Olay lakes	K13+	5	Private		Private	Not conserved		Recovery Plan, 1998
197. SD South	Olay lakes	K12+	7	Private		Unknown	Not identified in VPI		Recovery Plan, 1998
198. SD South	Olay lakes	K10+	15	Private		Private	Not conserved		Recovery Plan, 1998
199. SD South	Mission Village	O1	0	private		Developed	Developed		S. Wynn Update, 1999
200. SD South	Olay lakes	K1	7	Private		Unknown	Not identified in VPI	R2	Recovery Plan, 1998
201. SD South	Marron Valley	Marron Valley	6	City of SD-MWWD		Conserved	In MHPA	X	S. Wynn Update, 1999
202. SD South	Olay lakes	K17+	8	private		Unknown	Not identified in VPI		Recovery Plan, 1998
203. SD South	Imperial Beach/Navy	Naval Radar Receiving Facility, Imperial Beach		Navy		Unknown			Recovery Plan, 1998



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
204. SD South	Chula Vista	M5+		1 private		Unknown			Recovery Plan, 1998
205. SD South	Chula Vista	M4		1 private		Unknown			Recovery Plan, 1998
206. SD South	Chula Vista	M3	4h	private		Unknown			Recovery Plan, 1998
207. SD South	Chula Vista	M2		5 private		Unknown			Recovery Plan, 1998
208. SD South	Amaya Drive	LL		2 Caltrans		Conserved/Managed	conserved/managed		Recovery Plan, 1998
209. SD South	Tijuana Slough			U.S. Fish and Wildlife Service		Conserved/Mitigation Site	Conserved/ managed	X/R2	Recovery Plan, 1998
210. SD South	Otay lakes	K9+		9 Private		Unknown	Not identified in VPI		Recovery Plan, 1998
211. SD South	Otay Mesa	J13N		41 Private		Unknown	mitigation site(not according to VPI)	X/R1	S. Wynn Update, 1999
212. SD South	Otay Mesa	J13E		1 Private		Conserved	in NWR	R1	S. Wynn Update, 1999
213. SD South	Otay Mesa	J12		3 Private		Conserved	in MHPA/NWR	R1	S. Wynn Update, 1999
214. SD South	Otay Mesa	J11W		3 Private		Conserved	in MHPA/NWR	X/R1	S. Wynn Update, 1999
215. SD South	Otay Mesa	J11E		3 Private		Conserved	in MHPA/NWR	R1	S. Wynn Update, 1999
216. SD South	Otay Mesa	J1+	37 (-5 at risk)	Hidden Trails		Development (Proposed)	proposed dev/mit		City of San Diego, 2003
217. SD South	Otay lakes	K15+	10 Private	10 Private		Unknown	Not identified in VPI		Recovery Plan, 1998
218. SD South	Otay Mesa	J1		Pardee - CalTerace	1-6-95-F-35	Developed	filled	Xh	Recovery Plan, 1998
219. SD South	Otay lakes	K16+		1 private		Unknown	Not identified in VPI		Recovery Plan, 1998
220. SD South	Otay lakes	K8+		14 Private		Unknown	Not identified in VPI		Recovery Plan, 1998
221. SD South	Otay lakes	K7		2 Private		Unknown	Not identified in VPI	R2	Recovery Plan, 1998
222. SD South	Otay lakes	K6		12 Private		Development (Proposed)	proposed development	R2	Recovery Plan, 1998
223. SD South	Otay lakes	K5		15 Private		Private	Not conserved		Recovery Plan, 1998
224. SD South	Otay lakes	K3-4		25 Private		Private	Not conserved		Recovery Plan, 1998



Management Area	Location	Complex ID	Pools/Basin Area	Owner	ESA Log/BO/ Corps Permit	Normalized Status	Status 2007	SDFS	Source
225. SD South	Otay Mesa	J13S	4	Private		Conserved	in NWR	X/R1	S. Wynn Update, 1999
226. SD South	Otay Mesa	J1,2,4+	pools on 3 small mesas	Wall/Hudson		Conserved	in MHPA-conserved by Caltrans	R1	S. Wynn Update, 1999

\*Includes both verified and unverified complex assemblages

**SDFS Codes:**

X = Occupied

R1 = Identified in Recovery Plan as necessary to stabilize the population of SD fairy shrimp

R2 = Identified in Recovery Plan as necessary to reclassify the population of SD fairy shrimp

New = New occurrence found subsequent to publishing of Recovery Plan







OPTIONAL FORM 99 (7-90)

## FAX TRANSMITTAL

# of pages &gt; 2

To	Hyphil Clemente	From	NRD, MCAS Miramar
Dept./Agency		Phone #	858-577-6426
Fax #	619-532-4160	Fax #	858-577-4200
NSN 7540-01-317-7388		5099-101 GENERAL SERVICES ADMINISTRATION	



FISH AND WILDLIFE SERVICE  
Ecological Services  
Carlsbad Fish and Wildlife Office  
6010 Hidden Valley Road  
Carlsbad, California 92011

In Reply Refer To:  
FWS-SDG-4652.2

JUL 13 2006

R.J. Pharris  
Lieutenant Colonel, U.S. Marine Corps Director  
Environmental Management Department  
Marine Corps Air Station Miramar  
P.O. Box 452000  
San Diego, California 92145-2000

Subject: Request for Formal Section 7 Consultation on the Fort Rosecrans National Cemetery Annex at MCAS Miramar (FWS File No. 1-6-06-F-4652.2)

Dear Lt. Col. Pharris:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your letter, dated and received by this office on June 2, 2006, requesting initiation of formal section 7 consultation under the Endangered Species Act of 1973, as amended (Act). The consultation concerns the possible effects of your proposed action (issuance of a land use agreement between U.S. Department of the Navy and the U.S. Department of Veterans Affairs to develop an annex for Fort Rosecrans National Cemetery) on the federally threatened coastal California gnatcatcher (*Poliophtila californica californica*), and the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and San Diego button-celery (*Eryngium aristulatum* ssp. *parshii*). The majority of information required for us to initiate formal consultation was either provided, or referenced, in your initiation request. However, to complete consultation we require further discussion, clarifications, or more information on certain aspects of the project proposal, including the proposed compensation, enhancement, and restoration plans. These concerns were briefly discussed during a recent site visit between Mr. David Boyer (MCAS Miramar Natural Resources Director) and Ms. Heidi E.D. Crowell (US Fish and Wildlife Biologist) of my staff. Additionally, electronic mail correspondence between Ms. Crowell and Mr. Boyer on July 10, 2006, detailed our questions in writing. We have assigned log number FWS-SDG-4652.2 to this project. Please refer to that number in future correspondence on this consultation.

Section 7 of the Act allows the Service up to 90 days from receipt of the necessary information to conclude formal consultation with your agency and an additional 45 days to prepare our biological opinion (unless we mutually agree to an extension). Therefore,

TAKE PRIDE  
IN AMERICA

1006/2179  
RB



Lieutenant Colonel R.J. Pharris FWS-SDG-4652.2


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provided we receive the information necessary to complete the consultation (as identified in the July 10, 2006 electronic mail message from the Service to MCAS Miramar), we expect to provide you with our biological opinion on or before October 15, 2006.

As a reminder, the Act requires that after initiation of formal consultation, the Federal action agency make no irreversible or irretrievable commitment of resources that limits future options. This practice insures that agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitat.

If you have any questions regarding this letter, please contact Heidi E.D. Crowell of my staff at (760) 431-9440 ext. 292.

Sincerely,

  
for Therese O'Rourke  
Assistant Field Supervisor

cc: David Boyer, Director, Environmental Resources Division, MCAS Miramar





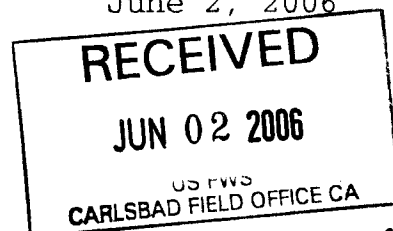
# UNITED STATES MARINE CORPS

MARINE CORPS AIR STATION MIRAMAR  
P.O. BOX 452001  
SAN DIEGO CA 92145-2001

5090

Ser 1303

June 2, 2006



Mr. Jim Bartel, Field Office Supervisor  
U.S. Fish and Wildlife Service  
Carlsbad Fish and Wildlife Office  
6010 Hidden Valley Road  
Carlsbad, CA 92011

Dear Mr. Bartel:

SUBJECT: INITIATION OF FORMAL SECTION 7 CONSULTATION

Marine Corps Air Station Miramar (Station) requests initiation of formal Section 7 Endangered Species Act consultation on the issuance of land use agreement between the U.S. Department of the Navy (DoN) and the U.S. Department of Veterans Affairs (VA) for the construction and operation of a national veterans' cemetery on the Station by the VA. The VA and DoN entities (Station and Naval Facilities Engineering Command, Southwest) are cooperating agencies for the development of an Environmental Impact Statement (EIS) that will soon be published as a draft for public review. The enclosed Biological Assessment (BA) addresses the preferred alternative site, as identified in the draft EIS, and provides a description of the actions to be taken and the federally listed species that may be affected.

The purpose of the project is to provide needed burial space for military veterans in the San Diego area. The only national cemetery (Fort Rosecrans National Cemetery) in San Diego County has been closed to casketed burials since 1966 and is scheduled to be closed to cremated remain burials by 2008.

The proposed action may affect three federally listed species, including one plant, the endangered San Diego button-celery (*Eryngium aristulatum* spp. *parshii*), and two wildlife species, the endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*), and threatened coastal California gnatcatcher (*Polioptila californica californica*).

The description of the Proposed Action is based on general design criteria for VA cemeteries. All potential effects discussed in the BA represent the likely worst-case scenario assuming that all habitat within the project footprint will be cleared, graded, or developed. A more detailed site plan and design, which will likely result in fewer impacts, will be developed following the completion of the Record of Decision on the EIS and this consultation.

Sml



5090  
Ser 1303  
June 2, 2006

The VA will develop a plan to address restoration, enhancement, and/or compensation of threatened and endangered species and regionally rare plant communities. Subsequently, the VA will conduct resource compensation actions in areas outside of the boundaries MCAS Miramar.

Our project schedule necessitates that we obtain your biological opinion by 6 October 2006 to support a Final EIS and Record of Decision (ROD) by 31 December 2006. The VA cannot begin their contracting process for the design and construction of the cemetery until the ROD is signed. With the Fort Rosecrans National Cemetery expected to close for cremated remain burials in 2008, the contracting efforts for the cemetery need to be initiated by January 2007.

Our primary point of contact for this consultation is Mr. David Boyer, our Natural Resources Division Director, at (858) 577-1125.

Sincerely,



R. J. PHARRIS  
Lieutenant Colonel, U.S. Marine Corps  
Environmental Management Officer  
By direction of the Commanding Officer

Enclosure: 1. Project Biological Assessment

Copy to: Don Campbell, Department of Veterans Affairs