



**Marine Corps Air Station Miramar  
Nomination for  
Secretary of Defense Environmental Awards 2012  
Natural Resources Conservation – Team Award**



### **Introduction and Team Background**

The Miramar Natural Resources Team (NRT) consists of three individuals responsible for natural resources conservation and management over the more than 23,000 acres of Marine Corps Air Station (MCAS) Miramar (station). MCAS Miramar is home to the 3<sup>rd</sup> Marine Aircraft Wing, which consists of two Marine Aircraft Groups, a Support Group and a Control Group. With over 260 helicopters and fixed-wing aircraft assigned to MCAS Miramar, the air station is the largest in the Marine Corps.

The station is also home to ten federally listed threatened and endangered species, thousands of acres of regionally sensitive habitat, regionally important habitat linkages, and the largest concentration of rare vernal pool wetlands in Southern California. MCAS Miramar is one of only two military installations to contain a National Park Service designated National Natural Landmark. The Miramar Mounds National Natural Landmark contains more than 1,500 vernal pools in a pool and mima mound landscape.



**The MCAS Miramar Natural Resources Team (from left to right: Dr. Charles Black, Mr. David Boyer, and Ms. JoEllen Kassebaum).**

Management and regulatory compliance associated with these challenges lies principally with the three experienced and dedicated individuals of the NRT, with more than 70 years of experience working in various conservation fields. All currently work for the MCAS Miramar Environmental Management Department in the Natural Resources Division. Ms. JoEllen Kassebaum, Botanist (B.S. Botany, M.S. Environmental Studies), takes the lead for plant and soil related activities, including: endangered plant monitoring, invasive weed control, soil erosion repair/revegetation, and native plant landscaping. Dr. Charles Black, Wildlife Biologist (B.A. Zoology, M.S. Forestry, PhD Soil Science), is the lead for all fish and wildlife related activities, including: endangered wildlife, urban/injured wildlife, Bird Air Strike Hazards, and the Miramar Fish Pond management. Mr. David Boyer, Division Director (B.S. Wildlife Mgmt., B.S. Range Mgmt., M.S. Wildlife and Range Mgmt.; TWS Certified Wildlife Biologist), is the lead for budget programming, Integrated Natural Resource Management Plan (INRMP) preparation/ implementation, regulatory consultations and environmental impact review. The team works cooperatively on many projects and compliance requirements, particularly impact assessment, wetland conservation, and educational/interpretive work.

## **Program Management**

The team is responsible for ecosystem expertise on 18,000 acres of undeveloped land and assistance with issues on 5,000 acres of developed land. The cornerstone of the station's natural resource program management is the Integrated Natural Resources Management Plan (INRMP), which was updated in 2011. Dedicated implementation of the INRMP continues to preclude Endangered Species Act critical habitat designation for five threatened and endangered species, of which two court-ordered redesignations excluded MCAS Miramar during 2010-2011. Annual reviews with California Dept. of Fish and Game and U.S. Fish and Wildlife Service (USFWS) are completed every year to ensure quality management and staff training. The INRMP provides more than resource, project, and budgeting information, including:

- Management Area Designations for the station providing planners and conservationists with a simplified means of identifying areas most important for conservation and areas more conducive to development.
- A Mitigation Planning Guidance section providing planners with a consistent approach for estimating mitigation requirements. These estimates have been approved by the state and federal fish and wildlife agencies.
- The INRMP, providing guidance and encouraging off-installation mitigation opportunities, such as purchase of mitigation credits and conservation easements rather than further encumbering installation lands with such responsibilities.

Funding for INRMP implementation beyond basic conservation compliance requirements is supported by Agricultural Outlease revenues. The program benefits greatly from income provided by a wholesale plant nursery outlease on about 180 acres of the Station. Conservation program funding was \$ 907K in FY-10 and \$727K in FY-11, of which more than half came from agricultural outlease income. The NRT obtained supplemental funding near the end of year from other sources for expanded work or special projects using IDIQ contract line items and additive bid options.

## **Compliance**

The team provided expertise for significant natural resource compliance requirements in support of two new aircraft basing decisions for the air station (West Coast Basing of MV-22 Osprey to replace aging CH-46 medium-lift helicopters and West Coast Basing for F-35 Joint Strike Fighter to replace the F-18 jet aircraft) in addition to other more routine project planning efforts. Support for these required completion of Environmental Impact Statement (EIS) and formal Section 7 Endangered Species Act (ESA) consultation with the USFWS due to anticipated impacts to multiple threatened and endangered species in the airfield vicinity. The NRT's involvement and success was critical to completion of these planning actions and subsequent execution of required MILCON's.

### MV-22 West Coast Basing

Alternatives considered ranged from basing all ten squadrons to only two squadrons at MCAS Miramar. The NRT was intimately involved with data interpretation, impact assessment, and ESA consultation. Impacts to natural resources, including numerous threatened/endangered species and rare vernal pool wetlands varied greatly between the alternatives. Data previously collected and maintained in our GIS database was critical to timely and accurate impact assessment. Clean Water Act permitting and resource mitigation were challenging on this project.

- Clean Water Act permitting (sec. 404 and 401) required extensive planning and coordination with the U.S. Army Corps of Engineers (ACE). This coordination was not factored into the timeline and could have caused unacceptable delays. The NRT successfully completed complex applications and negotiated with regulatory agencies to obtain permits in a timeframe described by the ACE as “remarkable”.
- Mitigation in compliance with the EIS, BO, and CWA permitting began in 2010. Requirements included ephemeral streambed/wetland compensation, vernal pool wetland compensation, and coastal sage scrub (CSS) habitat compensation. All required coordination with the USFWS, ACE, or both. A noteworthy success was one of the first approved purchases of off-installation conservation credits for MILCON habitat impacts in the Dept. of Navy. Through the efforts of the NRT, 2.2 acres of CSS habitat credits were purchased from a regional conservation bank to offset MV-22 project impacts. This innovative method for addressing mitigation requirements is being considered for several Dept of the Navy projects.

### F-35B Joint Strike Fighter West Coast Basing

Alternatives for this initiative considered a range of two to ten squadrons based at MCAS Miramar. Throughout 2010, the NRT supported and provided contractor oversight for the biological assessment work needed for ESA consultation and EIS preparation. Up-to-date natural resource data allowed preparation of EIS and biological assessment without delay that would have otherwise been associated with survey of species only seasonally present or visible.

### Other Ongoing Project Support

Beyond these two major programs, the NRT maintained station management and oversight of numerous other mitigation commitments in progress on the station.

- Planning for CERCLA cleanup and threatened/endangered species habitat mitigation associated with a new 1400-unit Public Private Venture military family housing project on the station;
- Monitoring restoration and enhancement of vernal pool wetland habitat for compensatory mitigation for construction of a Veterans Administration Cemetery; and
- Managing compensatory habitat restoration for Jet Fuel Farm Replacement project on the station is creating 7.2 ac and enhancing 2.5 ac of coastal sage scrub habitat.

### Damage Repair Protocol Development

Aside from compliance work for projects, the NRT developed a repair protocol for unintentional vehicle damage to vernal pool wetlands containing endangered species, in consultation with the

USFWS. The restoration approach involved hand tool repair of ruts with either a “wet season protocol” that could be immediately executed when the soil was moist or a “dry season protocol” for repairs at sites not found during the wet season and sites supporting well developed populations of vernal pool-associated endangered species. This approach, supported by an ESA Biological Opinion, will streamline the consultation process should other instances of damage occur.

## Conservation

The MCAS Miramar overall strategy for conservation is to manage activities and development in areas of low densities and regulated resources. This strategy enables MCAS Miramar to meet its goals and objectives on a local and regional basis.

Miramar’s core biological resource areas and linkages illustrate regional connections through both major canyons and tributaries. To support these values and endeavors, the Natural Resources Team provides these areas of expertise:

### Threatened and Endangered Species Management

With ten federally listed threatened and endangered species on the installation and many more regionally rare species that are or may be considered for listing, the NRT spent significant effort monitoring and surveying the station to have up-to-date presence/absence data readily available to support operational, facilities, and conservation planning. During 2010-2011, the NRT managed contracted work or in-house projects for:

- Endangered least Bell’s vireos (LBV) and endangered southwestern willow flycatchers, results documenting a notable increase in LBV population;
- Proposed endangered Hermes copper butterflies;
- Endangered Quino Checkerspot butterflies;
- Endangered willowy monardella habitat enhancement study to increase regional plant knowledge and species’ population;
- Vernal pool endangered species update surveys;
- Maintaining GIS data layers of survey results;
- Initiation of an endangered vernal pool plant seed collection/ preservation effort; and
- Protective fencing of sensitive habitat in close proximity to operations or facility use areas.



**Funeral duskywing butterfly on endangered willowy monardella. MCAS Miramar supports 70% of the known habitat of this plant. Designation of critical habitat for this plant was precluded by successful implementation of the INRMP.**

Large-scale, station-wide surveys have provided a cost effective alternative and consistent means of data collection compared to project-by-project survey work otherwise needed for facility projects.

### Vernal Pool Conservation

The NRT has developed a strong vernal pool conservation program to protect the largest extent occurrence of these rare ephemeral wetlands in Southern California. The unique ecology of vernal pools has resulted in many specially adapted species becoming federally listed; the station supports six threatened and endangered species dependent on this habitat. The NRT is responsible for the care and oversight of the Miramar Mounds National Natural Landmark. This landmark is one of only two National Park Service designated National Natural Landmarks entirely on a military reservation. Miramar Mounds is the largest and least disturbed vernal pool/mima mound landscape remaining in Southern California. Management activities included:

- Completion of station-wide inventory/survey of more than 8,000 acres by NTR/contractors;
- Documenting and maintaining a GIS data set for more than 7,000 basins representing more than 140 acres of habitat;
- Maintaining an in-house capability to conduct threatened and endangered species surveys in vernal pools, with required ESA permitting;
- Developed expertise in vernal pool restoration resident with the NRT that is nearly unparalleled within the region;
- Analyzing a extensive nine year data set examining the effects of wildfire on vernal pools ecology for management of vernal pool ecosystems in Southern California;
- Formalization of a long-term ecosystem monitoring (LTEM) program for vernal pools that comprehensively and consistently collects data on a range of natural pools and man-made pools to better understand effects of annual rainfall on diversity, habitat creation success, and possible effects of climate change; and
- Data collection on invertebrate populations and endangered and invasive plant species abundance in vernal pool LTEM pools along transects.



**Vernal pool in winter on MCAS Miramar. MCAS Miramar Commanding Officer, Colonel Frank Richie, and Env. Mgmt. Officer, LtCol Thomas Fries, at the Miramar Mounds National Natural Landmark monument (inset).**

### Native Plant/Water Conservation Demonstration Garden

San Diego County is an arid region with ten inches or less of annual rain. Water conservation is, therefore, critically important. To improve current knowledge of water conservation landscaping, the NRT created an experimental project with aspects that included:

- Interpretive panels explaining benefits of native plant use in landscape and water conservation techniques;
- Continual trials using regionally native plants for landscaping compatibility, adaptability, and desirability; and
- Experiments with mulch (bark, rocks, gravel, sand) and irrigation techniques (rotor low-emit sprinklers, underground drip, seasonal hand watering).

### Invasive Species Control

Left uncontrolled, invasive species cause substantial economic damage, impacts to installation training, increases in fire danger, habitat degradation, loss of recreational areas, impacts to stewardship commitments, and harm to humans, animal or plant health. Executive Order 13112, issued in 1999, requires federal coordination and response to this multifaceted invasive species problem. The NRT developed an invasive species control program that includes:

- Invasive exotic plant control for 18,000 acres of undeveloped land, including habitat for threatened and endangered species, training areas, and wildfire reduction;
- Supportive efforts for the San Diego County Weed Management Area, state noxious weed control program, and California Invasive Plant Council;
- Control of 23 different plant genera, improving and enhancing military operations, soil erosion restoration projects, fire roads, and area access;
- Presentation of invasive species management for installations as a portion of the DoD Pest Management Performance Assessment Representative/Quality Assurance Evaluation and Integrated Pest Management Coordinator Course, San Diego, California; and
- Guidance to weed control contractors for flightline, building, and landscape maintenance.

### Erosion Control/Revegetation

Almost all soils on station are severely erodible, due to steepness, shallow depth to rock, shallow depth to hardpan, or excessive silt in the surface layer. Soil erosion has negatively impacted ranges, bunkers, roads, runways, buildings, and training activities. Erosion control and vegetative restoration is a continual effort. Soil erosion control projects overseen by the NRT has:

- Reduced soil erosion on slopes to 1 cm per year, improving water quality;
- Recontoured and revegetated slopes surrounding ordnance bunkers, which reduced potential weight issues for the facilities;
- Restored a historic homestead dam to reduce siltation of downstream drainage;
- Completed tree planting in support of watershed filtration, soil stabilization, and riparian health;
- Provided expertise and project oversight to reduce slope erosion control in training areas, ranges, lease holdings, or storage facilities; and
- Evaluation of soil erosion annually evaluation to prioritize areas for renovation.

### Long-Term Ecosystem Monitoring

San Diego County's Mediterranean climate, lower rainfall, and fall Santa Ana winds provide a conducive environment to annual fires that impact local habitats and military operations. Miramar ground training, utility easements, law enforcement and agricultural outleasings, fire academy training, facility maintenance, and mission specific construction have varying effects on the 12 vegetative communities that dominate Miramar. To obtain data for analysis of these effects, long-term monitoring and studies were developed to improve management strategies for ecosystem health. The NRT regularly surveys or samples:

- Endangered terrestrial plant habitats for population health, distribution, and census;
- Plant and wildlife plots to evaluate station activities on plant communities and animal populations that provide guidance for land management; and
- Vernal pool transects to evaluate effects of climate change and station activities.

### **Education and Outreach/Community Relations**

The NRT is active in coordinating, cooperating, and sharing of data and acquired expertise. To further education and contribute to community outreach, the Team has produced or provided an:

- Interpretive Kiosk for vernal pools;
- Interpretive Trail design for the Miramar Mounds National Natural Landmark;
- Native Plant/Water Conservation Garden;
- Sensitive Resources Map (done annually as a printed map and electronic file);
- Natural Resources Program Public Web Page that provides the INRMP;
- Brochure describing natural resources;
- Presentations to station personnel, regional command staff, and local NGO's;
- Hosted field trips for local NGO's, college courses, and regulatory agency personnel;
- Wrote articles for newspapers and National Military Fish and Wildlife Association newsletter;
- Represent the command on the Mission Trails Regional Park Citizens Advisory Committee;
- Shared data with local and regional entities, like the San Diego Assoc. of Governments;
- Research support/access for universities and colleges (e.g., Duke Univ., Univ. of Calif.-Davis, Univ. of Calif.-San Diego, San Diego State Univ., Rancho Santa Ana Botanical Gardens); and
- Adjunct Professor status for one team member at San Diego State Univ.



**Interpretive kiosk with vernal pool created to educate and support threatened and endangered vernal pool species found on MCAS Miramar.**