

## **CHAPTER 6**

### **REGIONAL ISSUES, CONTRIBUTIONS, AND INVOLVEMENT**

Land use and natural resource management issues are rarely confined to jurisdictional boundaries. Just as land use and management decisions on Base may have an effect on surrounding communities (e.g., noise from training, potential fire occurrences, allowance for public transit and utility easements through the Base, provision of recreational opportunities), the land use decisions and resource utilization in surrounding communities have an effect on Camp Pendleton (e.g., urban encroachment, water use upstream from the Base, increasing numbers of threatened and endangered species from regional habitat loss).

Effective natural resource management, successful INRMP implementation and mission support, must include an ecosystem perspective. Such an approach not only involves a need to consider issues covering a greater region (increased spatial scale), but also issues spanning many years (increased temporal scale). Many of these “fence crossing” and regional issues are long term, persisting beyond the tenure of most installation commanders.

Implementation of an ecosystem approach requires decision making on a whole host of issues both local and regional, short and long term, and involvement by many different groups operating at many different organizational levels. Depending upon the issue, the level of involvement by the Base ranges from passively maintaining vigilance to active participation. In all situations of regional involvement, effective communication and the fostering of positive, long lasting relations with surrounding communities and diverse interest groups greatly improves the success of the natural resources program and benefits the overall status of the Base.

Camp Pendleton staff involvement in the Santa Margarita River watershed planning is one example of the positive and potentially long lasting benefits that regional participation has had on the Base. Active involvement by Base staff has helped in the creation of water use agreements with surrounding communities that will help stabilize on-Base flood regimes, maintain groundwater recharge and potable water supplies, and protect current flood control measures. Other examples of regional involvement are also provided in this chapter.

This chapter presents many of the regional issues affecting the Base and covers areas in which the Base has contributed to the region and has been involved in planning, partnering, and cooperative agreements.

#### **6.1 REGIONAL ISSUES AFFECTING CAMP PENDLETON’S MILITARY MISSION**

Camp Pendleton is, and will continue to be, affected by the geographic, socioeconomic, and ecological setting of the region within which it is located. Land use planning and growth management efforts of local and regional jurisdictions have a potentially significant influence

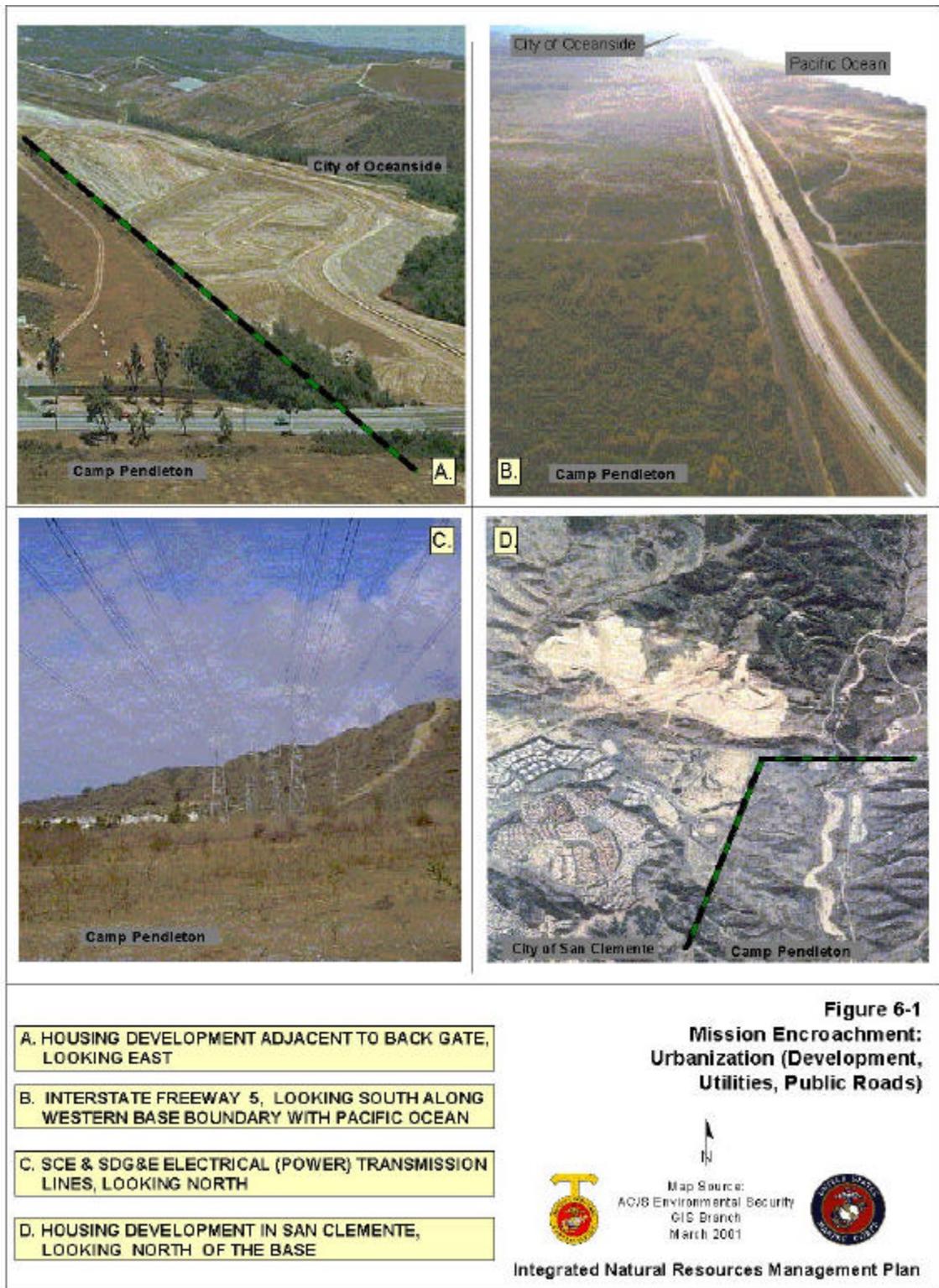
on the Base's land use, planning, environmental compliance, and natural resource utilization and management. For the past fifty years, the southern California region has been marked by rapid urbanization, unimpeded development, and spiraling population growth. Projected population growth figures for the region suggest the situation will only intensify (see Chapter 2). As a study completed by Harvard University in 1996 suggested, "By 2030, urbanization will completely surround Camp Pendleton, with the exception of the Cleveland National Forest (approximately 12 kilometers along [Camp Pendleton's] northern boundary) and the Pacific Ocean" (Figure 6-1).

These regional influences ultimately constrain the Base's ability to train Marines. The individual and cumulative effects of these regional influences represent encroachment on the Base's ability to accomplish its mission. In this context, the term encroachment refers to "any action planned or executed in the vicinity of a Marine Corps installation's normal area of operations which inhibits, curtails, limits, or possesses the potential to impede the Marine Corps' interests" (MCO 11011.22A). Nonmilitary projects adjacent to or within Camp Pendleton's borders that are continually proposed must be acknowledged by Base planners, military trainers, and the surrounding developing communities, as part of actual or potential encroachment. For example, leases and easements, particularly above ground utilities such as the SONGS, SDG&E, I-5, and railway lines, represent a severe constraint to military training activities, particularly to amphibious landing exercises along the Base's entire western boundary (Figure 6-2). Currently, only one underpass (out of 11 total) along the entire 17 miles of beach allows for passage of all types of military vehicles. Ultimately, this encroachment degrades military readiness capability, as well as constrains natural resource management on Camp Pendleton.

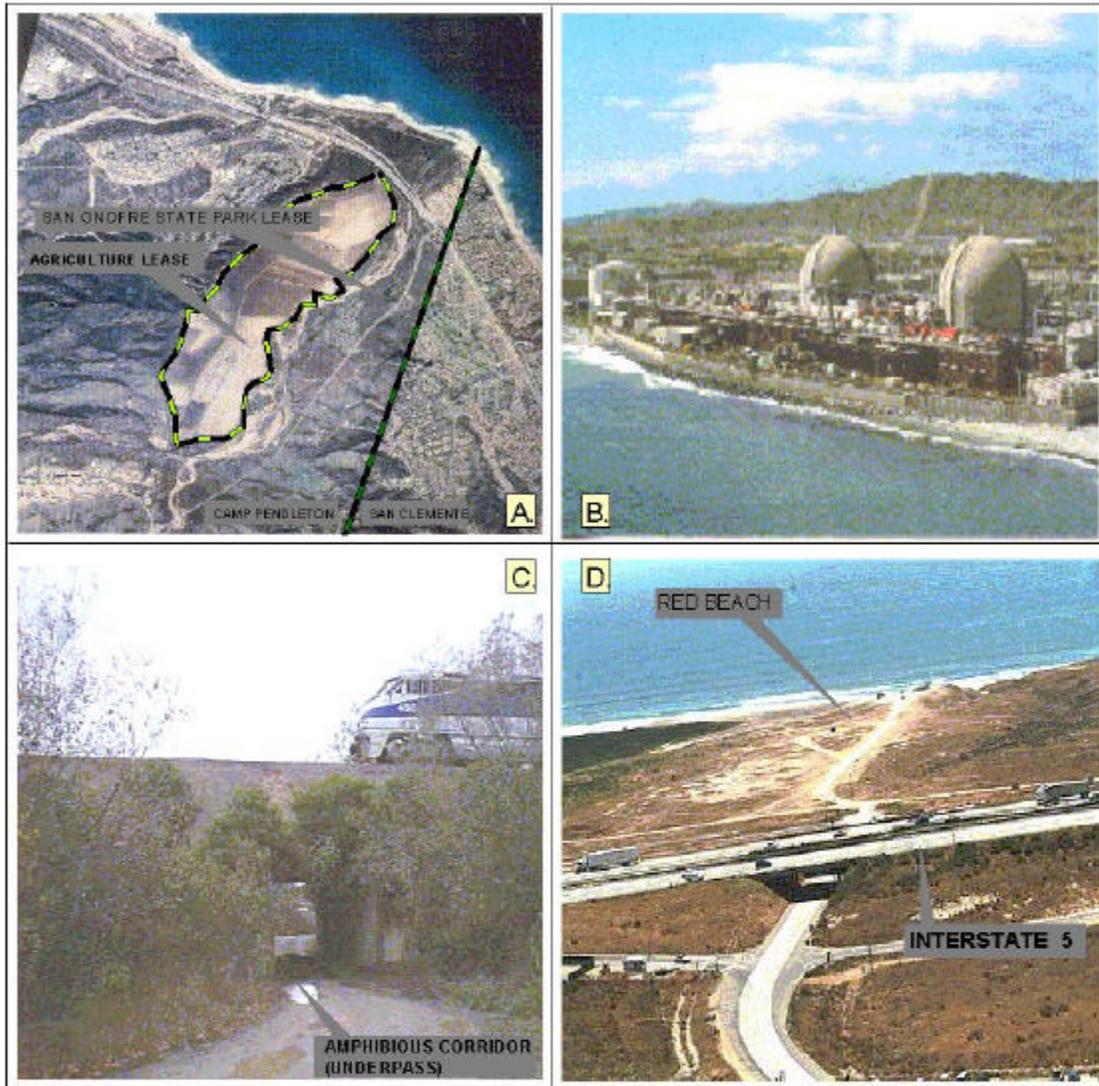
Urbanization, unimpeded development, and spiraling population growth in the region have created pressure along the Base's boundaries affecting how Marines train. Ultimately, this encroachment degrades military readiness capability. This same unchecked development that is creating encroachment pressure on the Base has also placed San Diego County in the position of having more listed rare, threatened, and endangered plant and wildlife species than any other county in the continental United States. Indirectly, this, too, has created a form of encroachment pressure for Camp Pendleton with the increasing dependence on the Base for habitat for these species.

Of the 38 federally listed threatened and endangered species in San Diego County, 18 occur on or transit Camp Pendleton, which has only about 3% of the total land area in the southern California ecoregion. With dwindling habitat remaining in the region for many of these species, the Base's resources represent a disproportionate contribution to the remaining populations and habitats of these species. Camp Pendleton currently represents:

- Approximately 20% of the least tern (*Sterna antillarum browni*) population breeding in California;
- 12% of the of the region's coastal California gnatcatcher (*Polioptila californica californica*) populations;
- Nearly 6% of the region's coastal sage scrub habitats;
- More than 50% of the region's least Bell's vireo populations (*Vireo bellii pusillus*);



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**Figure 6-2**  
**Mission Encroachment:**  
**Lease Agreements**  
**(Rail, Highway, Agriculture, SONGS)**

- A. SAN MATEO CANYON AGRICULTURAL FIELDS
- B. SAN ONOFRE NUCLEAR GENERATING STATION (SONGS)
- C. RAILWAY LINES SHOWING CONSTRAINED INGRESS/EGRESS UNDERPASS
- D. AMPHIBIOUS LAND INGRESS/EGRESS CORRIDOR UNDER I-5





Map Source:  
 ACJR Environmental Security  
 GIS Branch  
 March 2001

**Integrated Natural Resources Management Plan**

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- Approximately 12% of the southern California southwestern willow flycatcher (*Empidonax trailli extimus*) population and 24% of San Diego County southwestern willow flycatcher population (Kus 2001);
- 42% of San Diego Counties breeding western snowy plovers (*Charadrius alexandrinus nivosus*) (Pers. comm. Jill Terp, USFWS; data provided by U.S. Geological Survey and USFWS field monitors);
- 75% (3 of 4 sites) of the known populations of Pacific pocket mouse (*Perognathus longimembris pacificus*);
- Western-most coastal populations of Stephens' kangaroo rat (*Dipodomys stephensi*);
- 100% of the known tidewater goby (*Eucyclogobius newberryi*) populations in Orange and San Diego Counties (USFWS 2000d, Federal Register);
- Most abundant populations of Arroyo toad (*Bufo californicus*) in three major drainages;
- Approximately 10% of the remaining vernal pools in San Diego County. Additionally, the Department of Defense lands (Camp Pendleton and Miramar) represent 88% of the remaining vernal pools in the San Diego County;
- More than 30% of the region's thread-leaf brodiaea populations (*Brodiaea filifolia*);

Camp Pendleton is concerned that continued regional development and habitat loss off Base will lead to an ever increasing emphasis on Base lands/resources for their importance to species conservation on a regional scale. The Base wants to ensure that its training lands do not become viewed as opportunities for further development expansion (e.g., for commercial airports, additional transit corridors) or as regional preserves in which training activities are then undesirably constrained or prohibited altogether. It is important that Camp Pendleton's efforts to maintain open, undeveloped land within its borders is not viewed by the region as "the solution" for land use needs due to the perceived minimal economic and political cost of using the Base's land (Creswell 1993).

Ultimately, the increased value in the Base's land has the potential to jeopardize the long term sustainability of the military mission. Yet it is the very presence of the Marine Corps at Camp Pendleton for nearly sixty years that has made the land so valuable in the first place. Several issues have been identified by Camp Pendleton's CG and other military personnel as serious threats to Camp Pendleton's very existence as a military training base. As expressed by the Commandant of the Marine Corps: "*Without [Camp Pendleton], there is no place to live and no place to train.*" (Commanders Encroachment Brief, December 2000). Future warfighting guidance also captures the essence of the complexities of the encroachment issues facing the CG and natural resource managers at Camp Pendleton, "*Emerging warfighting concepts, plus [Base Realignment And Closure] impacts, and more home training, means Camp Pendleton is busy, and going to get busier...*" *Camp Pendleton is one of the Department of Defense's busiest installations and the Marine Corps' only west coast amphibious training facility.* The value of Camp Pendleton to the Marine Corps is undeniable, making encroachment issues of paramount importance. Several of the encroachment threats to the mission are presented in this section to help maintain vigilance and to foster a greater understanding of these issues by both the Base and surrounding communities.

### **6.1.1 Public Interstate Freeways, Railroad Right-of-Ways, and Future Transportation Corridors**

An easement of approximately 726 acres, for the construction, operation, and maintenance of I-5, along with additional easements for operation of two Interstate Rest Stop areas, two California Highway Patrol Truck Weigh Stations, and an Immigration & Naturalization Service Border Patrol Checkpoint facility, have all been granted to State and federal agencies for the operation of these facilities on Camp Pendleton land by the Department of the Navy. All of these easements have been granted in perpetuity. The I-5 easement, in particular, presents a significant impact to the Camp Pendleton training mission because of its creation of an artificial barrier between the beach area and inland portions of the Base. I-5 runs the entire length of Camp Pendleton along the coastal bluff area of the Base, and as a result of its presence, it actually separates the entire length of Camp Pendleton's beaches from all of the Base's inland training areas. This man-made barrier severely restricts the transition of amphibious training operations to the Base's interior training areas where the majority of field training occurs. Only a limited ability is currently available to cross this I-5 barrier through the use of small underpass tunnels for crossing under the freeway. These underpass crossings were constructed to support the movement of troops and equipment in use at the time this freeway was built in the 1960s. While not totally preventing Base training operations to occur, in today's day and age of larger amphibious vehicles and weapons systems, large scale movements of troops and equipment are greatly hindered due to the small size of these freeway underpasses. Unfortunately, the I-5 freeway represents the only direct means of public highway access between San Diego and Los Angeles, two of the largest cities in the United States. With the huge political and financial pressures it places on the system, this Interstate highway will remain a permanent fixture of Camp Pendleton landscape.

Running adjacent and parallel to I-5 is a railroad line that also traverses the entire length of Camp Pendleton in a north to south direction. Like I-5 does for vehicles, this rail line provides the only direct rail linkage between the cities of Los Angeles and San Diego. The presence of this rail line through the Base actually dates back to the late 1880s when it was initially constructed as the very first rail line connection between these two large metropolitan areas. Over the course of its hundred-plus years of existence on land that's now Camp Pendleton, the alignment of this rail line has been adjusted on several different occasions. Generally speaking, however, this rail line has continued to remain a landmark and permanent fixture along the entire coastal portion of Camp Pendleton. Like I-5, this rail corridor, located parallel and adjacent to I-5, also creates an access barrier between the beach areas of the Base and Camp Pendleton's inland training areas. It presents one more man-made obstacle that must be negotiated (through crossing over or under) by military personnel and vehicles during amphibious training exercises.

As previously stated in paragraph 3.2.3.6, the North San Diego County Transit Development Board, also known as the North County Transit District, is the current owner and operator of this rail line through the Base. This rail corridor is primarily used to support commuter rail train operations serving communities in both San Diego and Orange Counties; but this rail

corridor also supports Amtrak and freight train operations on a daily basis. Approximately 50 trains per day pass through Camp Pendleton on this trackage.

The Southern Orange County Transportation Improvement Program (SOCTIP) is a planned 4-lane toll road approximately 16 miles in length. It's being planned and developed by the Transportation Corridor Agencies, a Joint Powers Agency in Orange County, to serve as a transportation alternative to I-5. Once built, it would connect the inland portion of central Orange County with the northern portion of San Diego County. SOCTIP will complete the last of three new toll roads being constructed in Orange County by the TCA, all designed to help alleviate existing traffic gridlock and mitigate the increased traffic growth forecast to occur in southern Orange County by the year 2010. The TCA has already completed 51 miles of this planned tollway system; SOCTIP will add the final piece in completing Orange County's 67-mile network of toll roads.

In 1988 the Marine Corps Commandant agreed that the TCA could evaluate an on-Base alignment of the proposed SOCTIP toll road project, subject to the following stipulations: (1) that other off-Base alignment alternatives must also be considered and evaluated in an equal manner; (2) that any planned Camp Pendleton alignment must closely adhere to the Base's northern boundary; (3) that any adverse environmental impacts created as a result of siting this route on the Base must be fully and properly mitigated; and most importantly, (4) that any on-Base alignment must not impact the Marine Corps' mission nor interfere with the Base's operational flexibility. This Marine Corps position has remained steadfast throughout the years of TCA planning for this proposed road; and the Marine Corps continues to monitor and sometimes participate in TCA's further planning efforts for this proposed transportation improvement project. If constructed on Camp Pendleton, only one alignment alternative, meeting the above stipulations, is considered acceptable to the Marine Corps.

### **6.1.2 Public Utilities**

Easements for public utilities (and access roads/corridors to maintain those utilities) are located throughout the Base. These facilities include supporting structures for power lines, telephone lines, cellular towers, radio repeaters, fiber optic cables, and pipelines. While each easement may not seem significant in its own right, when taken as a whole they do have the potential to restrict or constrain amphibious and aviation training opportunities. The physical structures located in these easements (e.g., power poles and telephone poles) pose restrictions on ground and air movement.

The San Onofre Nuclear Generating Station is another non-DoD tenant facility located on Camp Pendleton along the coastal area of the Base on approximately 450 acres of leased property. This facility is contained within two separate lease areas on each side of I-5.

### **6.1.3 Commercial Airport Facilities**

At least 40 airports exist within a 60-mile radius of the Base. Most airports in southern California are operating at or near maximum capacity. It has been projected by most regional

planning agencies that by the year 2025, air travel and passenger volume in southern California will double. SANDAG, San Diego County's regional transportation planning agency, is currently in the process of evaluating whether there is a potential to locate a new commercial airport facility somewhere within the regional area to meet San Diego County's growing passenger and air cargo needs. As has occurred in several previous airport siting studies, Camp Pendleton has been suggested as a potential location for the siting of such an airport, or even if an airport were not to be sited here, the Base could serve as the host site for relocation of other military activities from other DoD installations considered more favorable as a commercial airport site. This airport siting issue was most recently raised during the November 2000 election campaign for the City of San Diego Mayoral election.

There are no areas on Camp Pendleton where a large commercial airport could be located without a devastating impact on training operations and natural resources. The relatively level coastal plain, where a commercial airport might be most suited, is extensively occupied by most of the remaining vernal pools (and associated threatened and endangered flora and fauna) in San Diego County and three of the four remaining locations of the endangered pocket mouse.

#### **6.1.4 Recreational Use and Access**

Camp Pendleton receives numerous requests to access the Base for recreational purposes. This is largely due to the fact that the Base has one of the last remaining extensive tracts of undeveloped coastal land in southern California, from the Mexican border to Ventura County; and the Base is situated between two of the largest population centers in the state, San Diego and Los Angeles. Base policies support recreational access when it does not conflict with mission, security, and safety requirements. Chapter 5 provides detailed information on recreational and public access programs. Any proposed development of non-military land uses along the coastal area of the Base is of great concern because of the need to ensure continued access to landing beaches and inland access routes in conjunction with amphibious training activities. This is also the area of most recreational encroachment with the Marine Corps' use of the Base's northern beaches already limited by the lease to the State Park for the San Onofre State Park.

On occasion, trespassing occurs on the Base by civilian beach users, campers, hikers, mountain bikers, and off-road vehicle operators, which interferes with training operations, the Base's own recreational programs, and natural resource management actions. Unauthorized access continues to adversely impact sensitive habitat, damage trails, roads, and firebreaks and increase the potential for erosion.

During any given year, Camp Pendleton receives any number of requests from outside agencies, business entities, and even individual persons, all asking for some form of access to the Base.

### **6.1.5 Environmental Encroachment Issues**

While the Marine Corps and Camp Pendleton support the conservation of natural resources, particularly sensitive biological resources, conservation planning and natural resource management efforts must provide for *operational flexibility* and avoid the potential for creating preserves on lands specifically established by Congress for military training. The Marine Corps believes that most military activities can be generally compatible with the conservation of sensitive biological resources (Brabham 1995). However, many environmental laws and regulations do not consider the military's unique use of resources and, as written, create conflicts between congressionally mandated military training and congressionally mandated resource management.

Several environmental laws and regulations protecting wetlands must be strictly followed. These include the Clean Water Act (Section 404) and Executive Order 11990. These laws provide significant restrictions for training on or through wetland areas. Several other laws such as ESA and NEPA indirectly protect wetlands since they are designated to protect species that inhabit wetland areas. All actions on Camp Pendleton that could have an affect on these sensitive areas must be submitted to AC/S ES for review or the Environmental Officer if aboard the Air Station.

The federal Endangered Species Act is also a significant environmental law for Camp Pendleton because of the presence of so many federally threatened and endangered species on Base. With the addition of several thousands of acres of potential habitat (currently unoccupied), the percentage of Base lands subject to ESA requirements increases dramatically. Under the ESA, Base is required to avoid and minimize adverse impacts to these species and their habitats, and to provide compensatory mitigation for impacts that do occur, to ensure that Base actions do not cause jeopardy to the continued survival of the species.

To ensure compliance with the ESA, the Base has presented to the USFWS conservation and management plans for its federally threatened and endangered species. Further development of these plans, in consultation with the USFWS, has resulted in the Riparian and Estuarine/Beach Habitats Biological Opinion (1-6-95-F-02). This BO covers the management of seven federally listed riparian and estuarine/beach species on Base and ensures that Base actions do not threaten their continued survival. Consultations are currently underway with the USFWS on the Biological Assessment of Upland Habitats, covering nine federally listed upland species and Base activities within those areas of the Base; a Biological Opinion is expected to result by the end of 2001.

The designation of critical habitat for federally threatened or endangered species on Base is viewed as another encroachment issue. Critical habitat designation identifies geographic areas that are important for the conservation of the species and may require special management considerations, requiring federal agencies to consult with the Service on activities they undertake, fund, or permit that may affect critical habitat. Critical habitat would impede the flexibility that is required to accomplish Camp Pendleton's military mission. Under the Endangered Species Act, the USFWS is required to designate critical habitat upon listing a species as federally threatened or endangered to the maximum extent

prudent. Camp Pendleton's management policy for federal threatened and endangered species is to manage the habitat and ecosystem upon which the species depends to ensure that the primary constituent elements that are essential for the primary biological needs of foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering are provided to preclude the need for additional or special management considerations. The designation of critical habitat for federally listed species on Camp Pendleton has been addressed on an individual basis by the USFWS. For some species, areas on Base have been identified as critical habitat whereas, for other species, existing management and training requirements have precluded listing (see Chapter 2).

## **6.2 REGIONAL PLANNING, PARTNERING, AND COOPERATIVE AGREEMENTS**

Camp Pendleton maintains a position of proactive support for a regional ecosystem management approach to natural resources. Camp Pendleton encourages local, state, and federal involvement and participation in regional biodiversity conservation and management planning that ensures the continued existence of all species of regional importance, consistent with existing land uses and regional economic needs. Camp Pendleton is working to ensure that its land use and regional planning efforts are complementary with surrounding biodiversity conservation efforts such that Base lands help support the region's habitat conservation needs while also providing continued support of the Base's mission.

Camp Pendleton actively monitors and/or provides input to each of the following regional conservation planning and research efforts: (1) County of San Diego's MSCP, (2) North San Diego County MHCP, (3) North County Wildlife Forum, (4) the Coordinated Resource Management Planning group, which consists primarily of major federal and state land managers in support of regional biodiversity; (5) South and Central-Coastal Orange County Subregional plans, and (6) Riverside County's Multiple Species and Habitats Conservation Plan and the new Riverside County Integrated Planning program.

Participation in regional planning efforts is a key element of the Base's strategy to ensure that off-Base development and mitigation plans take into account the military mission requirements and official land use designations. Moreover, adequate provision for, and promotion of, biodiversity conservation within the region surrounding Camp Pendleton will help to ensure functioning landscape linkages and wildlife corridors to Base ecosystems.

### **6.2.1 Natural Communities Conservation Planning (NCCP)**

Over the past several years, and in response to rapidly expanding urban development and the declining numbers of native species and their habitats, local jurisdictions and regulatory agencies, along with the general public, have come to realize the importance of regional conservation and the vital role that San Diego's suite of natural resources provides to the region's economy. As a result, city, county, state, and federal governments, facilitated by the passage of the Natural Community Conservation Planning Act (State of California 1991), began a process to encourage the voluntary, collaborative conservation of natural

communities (Figure 6-3). NCCP program goals were developed to provide a regional framework for long term protection of natural communities and species, while allowing continued development and economic growth of selected private lands (CDFG 1992). NCCP members include state and local governments, developers, conservation groups, and small landowners, but not federal agencies. Since coastal sage scrub represents a community in southern California with many sensitive species, including the coastal California gnatcatcher, this community has become the first focus of the program. The planning area includes parts of San Diego, Orange, Riverside, Los Angeles, and Santa Barbara counties. Natural communities on private land may be protected through regulation, land purchases, transfer, conservation easements, and other strategies. Completed “landscape conservation” plans are legally binding and based on CDFG criteria and guidelines (Peck 1993).

With the exception of the Multiple Habitat Conservation Plan (see below), Camp Pendleton has not been a direct participant in the NCCP process. However, the DoN has been represented over the years via the NAVFACENCOM, SWDIV. The DoN perspective on the NCCP process is to focus on development of habitat preserve design alternatives which could be implemented locally by regional sub-area plans like that of the North County Wildlife Forum. Camp Pendleton acknowledges that, with its 125,000 acres of primarily undeveloped lands, management of natural resources is of mutual concern to the Base and other federal, state, and local agencies and jurisdictions. Although the conservation of natural resources, particularly sensitive biological resources, at Camp Pendleton are being planned separately from other regional conservation planning and management efforts, the Base nonetheless supports maintenance of a region-wide perspective and is interested in obtaining mutually beneficial management solutions.

#### **6.2.1.1 City of San Diego Multiple Species Conservation Program (MSCP)**

Since the early 1990s, San Diego County became a focal point in the state and the nation for regional conservation and management planning efforts resulting from the NCCP program described above. The Multiple Species Conservation Program was completed (signed) in 1996, and the process of building the reserve initiated by local jurisdictions and resource management agencies. The MSCP encompasses 582,000 acres and establishes a 172,000 acre preserve system in southwestern San Diego County (MSCP 1997). This subregional plan covers 85 species of plants and animals and 23 vegetation types.

Thus far only the MSCP subregional plan has been completed for the County of San Diego. Two other similar NCCP plans are currently in varying stages of development: the north San Diego County MHCP and the County of San Diego (eastern) Multiple Habitat Conservation and Open Space Plan.

The City of San Diego MSCP subregional plan encompasses the following eleven planning Subareas in various stages of plan development. Other jurisdictions within the MSCP Subregion include Imperial Beach, Lemon Grove, and National City. These cities have not initiated the development of subarea plans. Approved Subarea Plans to date include the La Mesa Subarea Plan, Poway Subarea Plan, City of San Diego Subarea Plan, and the County of San Diego Subarea Plan

#### **6.2.1.2 MULTIPLE HABITAT CONSERVATION PLANNING (MHCP) AND NORTH COUNTY WILDLIFE FORUM**

The MHCP is a comprehensive habitat conservation planning process being developed to address multiple species needs and the preservation of native vegetation residing within seven city jurisdictions across northern San Diego County, namely Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista. These cities encompass a 183-square-mile (about 119,000-acre) area. The MHCP is recognized as a subregional plan that helps fulfill the requirements of the NCCP Act. Although SANDAG is coordinating the MHCP for these North County cities, it will be implemented through individual sub-area plans prepared by each local jurisdiction, and potentially by other public entities, and will allow local jurisdictions to maintain land use control and development flexibility. The plan is designed to streamline procedures for review and permitting of projects.

A sub-planning group of the MHCP, the North County Wildlife Forum, includes Camp Pendleton as a participant along with federal, state, and local agencies, environmental groups, and developers. Guidelines from the County of San Diego's MSCP are used by the MHCP.

#### **6.2.1.3 COUNTY OF SAN DIEGO MULTIPLE HABITAT CONSERVATION AND OPEN SPACE PROGRAM (MHCOSP)**

The County of San Diego has deferred planning within this subregion until it completes its North County Sub-Area Plan amendment.

#### **6.2.1.4 SAN DIEGO GAS & ELECTRIC (SDG&E) COMPANY SUBREGIONAL PLAN**

The NCCP Subregional Plan for SDG&E, extending from southern Orange County to the Mexican border, was the first plan approved in San Diego County (1995). The project provides coverage for 110 plant and animal species and emphasizes avoidance of impacts. The plan establishes mitigation requirements, which may include revegetation or use of up to 240 acres of mitigation credits, set aside in several land parcels purchased by SDG&E, as mitigation banks. SDG&E's properties and easements play an important role in the NCCP region in providing habitat connectivity in areas where little natural habitat remains.

#### **6.2.1.5 SOUTH ORANGE COUNTY SUBREGIONAL PLAN**

Development of a subregional plan for south Orange County is currently underway. This southern subregion of Orange County is one of eleven NCCP subregions, within the five county southern California ecoregion, that has been identified by the southern California NCCP program to focus on coastal sage scrub conservation. The South Orange County Subregional Plan is expected to set aside tens of thousands of acres of a variety of habitats.



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This subregional plan extends as far north as Dana Point along the coast north of Camp Pendleton, and inland to the Santa Ana Mountains in the Cleveland National Forest.

#### **6.2.1.6 CENTRAL COASTAL ORANGE COUNTY SUBREGIONAL PLAN**

The Central Coastal Orange County Subregional Plan was approved in July 1996. It established a reserve system covering more than 37,300 acres, 12 regional habitat types, and 39 different sensitive plant and wildlife species.

#### **6.2.2 Riverside County Integrated Planning Program**

Similar to Camp Pendleton, the County of Riverside decided not to participate in the southern California NCCP program. Rather, the Riverside County elected to develop its own regional conservation planning and management program independent of direct NCCP participation. However, planning efforts by the county are being conducted in cooperation with all county stakeholders, including landowners and state and federal resource management agencies. A draft of the Riverside County Integrated Planning (RCIP) program is pending completion of formal review. Camp Pendleton continues to monitor the RCIP progress and development.

The RCIP program provides a framework that affects future decisions on land use, habitat conservation, and transportation planning. The decisions addressed required an integrated approach that is stakeholder-driven. The approach attempts to focus technical analysis to respond to the common vision as agreed to by all regional stakeholders. The goals of the RCIP program include: (1) update the County General Plan, (2) create a Multiple Species Habitat Conservation Plan (MSHCP), and (3) identify transportation corridors to solve the County's future transportation needs.

In 1992-94, Riverside County participated in an effort to improve cooperative land use and water resources planning within the Santa Margarita River watershed. The two Riverside County supervisors whose districts are in the watershed formed a committee with one San Diego County supervisor and representatives of the Cities of Murrieta and Temecula and Marine Corps Base, Camp Pendleton. Technical sub-committees, addressing water supply, water quality, habitat, recreation, flood protection and land use were formed to advise the committee. The initiative was supported by grants from U.S. Environmental Protection Agency and the California Coastal Conservancy. It's intent was to improve the quality of information provided to land use decision-makers about the effects of their decisions at the watershed scale. In the aftermath of devastating flooding in the Santa Margarita River watershed in 1993, the initiative became highly politicized and ultimately bogged down and stopped meeting. Camp Pendleton is currently seeking to establish an alternative forum or mechanism to accomplish the original goals of this initiative, and has facilitated regional discussion groups on water supply and water quality. Camp Pendleton is participating as a member of the Murrieta Creek Advisory Committee with regard to a major flood control and environmental restoration project being developed by the Army Corps of Engineers in the upper watershed. Most recently, Camp Pendleton became a partner with San Diego County,

the U.S. Bureau of Reclamation, San Diego State University, and other stakeholders in a proposal seeking a state grant for watershed plan development, which the Base hopes to integrate with Riverside County's other comprehensive planning efforts.

Prior to the RCIP effort, nine jurisdictions, including the County of Riverside, prepared a MSHCP and a Planning Agreement that was expected to be signed by 1997. The MSHCP was being developed by the Riverside County Habitat Conservation Agency (RCHCA). The MSHCP attempted to build upon the previously approved Stephens' Kangaroo Rat Habitat Conservation Plan. Core area reserves in the Stephens' Kangaroo Rat Habitat Conservation Plan included habitats such as riparian, oak woodland, and up to 15,000 acres of coastal sage scrub. The RCHCA established a scientific advisory group to assist in providing scientific information to the RCHCA. Information developed as part of this planning effort is expected to form the basis for completing the County's second listed goal; creation of a Multiple Species Habitat Conservation Plan.

### **6.2.3 San Diego County Water Authority**

The San Diego County Water Authority is a public agency that supplies imported water to San Diego County. Its mission is to provide a safe, reliable water supply to its 23 member agencies serving the region. Camp Pendleton is one of the member agencies of the San Diego County Water Authority and serves on its Board of Directors.

The history of the San Diego region revolves around a never-ending search for a safe, reliable water supply. The San Diego County Water Authority was organized June 9, 1944 in response to the rapidly increasing population growth in the region as a public agency to administer the region's Colorado River water rights. Water from the river first arrived locally in November 1947. Since then, the Authority has met its mission of providing San Diego County with a safe, reliable and cost-effective supply of imported water. The Authority wholesales imported water to its member agencies, which in turn deliver the water to individual homes and businesses throughout the county. The county's 2.7 million residents typically rely on imported water for 90 percent of their total supply in a typical year.

But the Authority has never been a simple "pass-through" agency that buys water and sells it to its member agencies. The agency always has been active on the state and federal levels as well. Authority officials currently work in Sacramento and Washington, D.C., in many areas. The Authority promotes legislation facilitating water conservation and reclamation programs. It joins with other urban water agencies to support legislation that will allow California farmers to voluntarily sell their water to meet the needs of thirsty cities and industry. Much of the agency's attention is devoted to issues surrounding the Sacramento-San Joaquin River Delta, an environmentally significant area that also is a water source for San Diego County and much of the rest of California. The Authority is encouraging legislation that will meet both environmental and water supply needs in the optimal fashion.

Unlike their predecessors of 50 years ago, current Authority officials also are involved with development of local water resources. The agency works with its member agencies to expand programs that reclaim and reuse wastewater and allow maximum use of groundwater

sources. Water conservation also plays a major role in the Authority's efforts. The agency promotes installation of water-tight plumbing fixtures in homes and businesses, informs the public about low-water-use landscaping and, in general, encourages water-wise behavior as a way of life for county residents. In addition, through its Emergency Water Storage Project, the Authority is contemplating building a reservoir as part of an overall effort to ensure the county has sufficient water to endure a prolonged, emergency interruption of its imported water supply without severe economic damage.

#### **6.2.4 The Nature Conservancy Cooperative Agreement for Exotics Control**

A Cooperative Agreement between the DoD and The Nature Conservancy (TNC) for the maintenance of biological diversity on Defense installations was signed in 1988. The primary interest of TNC is biological diversity. A goal of TNC is to identify, protect, and maintain endangered species and the best possible examples of communities and ecosystems. The purpose of the Cooperative Agreement was to establish procedures for planning and conducting cooperative efforts by TNC and DoD on DoD lands and to establish policies and agreements for TNC to provide technical assistance to DoD. Camp Pendleton has worked cooperatively with TNC in mapping out strategies for exotic plant control on Base and in exchanging information and maintaining dialogue on regional ecosystem planning, fire management, and habitat/biota management techniques.

#### **6.2.5 National and Regional Interagency Fire Management Planning, Coordination, and Response**

Camp Pendleton's Fire Department is actively engaged in regional planning and partnering to the mutual benefit of the Base and local, regional, and national agencies. In addition to providing personnel and equipment to assist in emergency wildfires in the region, the Fire Department staff regularly provides professional expertise in fire management planning and in personnel training. The following contributions highlight some of the ways in which the Camp Pendleton Fire Department has contributed to, or is involved in, local, regional, and national partnering efforts:

- **Federal Wildland Fire Policy Review Working Group and the National Wildfire Coordinating Group.** Camp Pendleton's Fire Chief acts as the DoD representative to the Federal Wildland Fire Policy Review Working Group and the National Wildfire Coordinating Group, which were established to develop and implement fire management policy for use on all federal lands.
- **Wildland Fire Suppression Training Support.** Camp Pendleton's Fire Department annually host two weeks of wildland fire suppression training for US Forest Service personnel and all other regional cooperating agencies.
- **Wildland Fire Suppression Mutual Aid Agreements.** Camp Pendleton's Fire Department provides personnel and equipment, as available, as part of mutual aid agreements with local, regional and national with members, as part of Interagency

Incident Management Teams. Camp Pendleton's Fire Chief was an Incident Commander in Los Alamos, New Mexico Fire (*Cerro Grande Incident*) during May and June 2000.

- **Camp Pendleton's Fire Management Plan.** Camp Pendleton's Fire Management Plan was developed in cooperation with the USFWS and is being viewed by several DoD installations and National Forests as a potential regional model.
- **Naval Weapons Station Fire Management Plan.** Camp Pendleton's Fire Department is currently assisting Naval Weapons Station, Seal Beach Annex personnel (and their contractors) in development of a Fire Management Plan that is complementary to Camp Pendleton's new Fire Management Plan and strategy.
- **Santa Ana Mountains Fire Alliance and the San Diego County Fire Safe Council.** Camp Pendleton's Fire Department is a member of the Santa Ana Mountains Fire Alliance and the San Diego County Fire Safe Council.
- **San Diego County Fire Service Working Groups.** Camp Pendleton's Fire Department personnel are active around San Diego County in several fire service working groups to help ensure the availability of, and ready access to, up-to-date information on fire incidents and fire-related land management issues on Base.
- **Regional Fuels Management and Fire Resource Allocation Planning.** Camp Pendleton's Fire Department is working with the Cleveland National Forest and Orange County Fire Authority on fire management issues that integrate both fuels management and fire resource allocation planning.
- **Fire Department Local Mutual Aid Memorandum of Understanding (MOU).** Camp Pendleton's Fire Department has established a MOU with all fire agencies in San Diego County, the Orange County Fire Authority, the California Department of Forestry & Fire Protection, U.S. Forest Service, San Onofre Nuclear Generating Station, Cal Trans, and California Highway Patrol for providing mutual aid, when requested.

### 6.2.6 Fish and Wildlife Inter-Agency Coordination

Camp Pendleton has been, and continues to be, involved in coordinated management and partnering efforts with fish and wildlife agencies at both the state (California Department of Fish and Game) and federal (U.S. Fish and Wildlife Service) levels.

Camp Pendleton is required to manage fish and wildlife cooperatively with the U.S. Fish and Wildlife Service and the California Department of Fish and Game in accordance with the federal Sikes Act and the Fish and Wildlife Coordination Act. Camp Pendleton's INRMP was developed in cooperation with the USFWS and CDFG. Many of the components of Camp Pendleton's INRMP were developed in coordination with these agencies and have

been implemented over the last few decades, including the hunting and fishing programs and federally listed threatened and endangered species management.

The Base hunting and fishing program is managed in cooperation with the CDFG and is in compliance with California law and the annual framework established by CDFG. Section 640, Title 14, California Code of Regulations (Management of Fish and Wildlife on Military Lands) and Sections 3450 through 3453 of California Fish and Game Code allow the Base sufficient flexibility in administering its hunting and fishing program to avoid conflicts with military training. The Base has coordinated with the California Department of Fish and Game to revise the deer hunting management approach on Camp Pendleton to improve hunting opportunities. A change in the season opening dates helped to reduce restrictions to hunting area access historically imposed by the high fire danger common during deer hunting season. The result has been excellent military and civilian participation and perennially high hunter success rates. In the case of deer, the Base has maintained rates of deer reproduction and hunter success consistent with the remainder of California. In addition, the Base has traditionally invited the California Fish and Game personnel to participate in conducting helicopter surveys of pre-hunt deer populations, including sex and age ratios.

Sikes Act provisions and cooperative agreements for outdoor recreation, such as hunting and fishing, are implemented nationally by a MOU between the DoD and DoI. Locally, Camp Pendleton has a draft Outdoor Recreation Plan, the completion of which is a planned action identified within this INRMP. The final Outdoor Recreation Plan is to be included in future revisions of this INRMP and, therefore, will be reviewed by state and federal wildlife agencies.

Although later superceded by the programmatic consultation (Riparian and Estuarine/Beach Biological Opinion), the 1986 USFWS/Camp Pendleton MOU for management of endangered least Bell's vireos on the Santa Margarita River provided the first ecosystem based approach within the DoD covering more than 10,000 acres of sensitive riparian wetlands, coastal estuaries, beaches, and dune areas. It developed an agreement on, and framework for, species specific management of Camp Pendleton's contribution to the region's endangered least Bell's vireos population.

In addition to working with the USFWS on regulatory and management issues, Camp Pendleton has contracted staff from the Federal Projects Branch of the USFWS to conduct surveys, research, and monitoring on Base. Examples of these projects include southern steelhead trout (*Oncorhynchus mykiss*) habitat suitability survey (USFWS 1998f), Pacific pocket mouse monitoring (USFWS 1997b), snowy plover surveying (USFWS 2000b), upland habitat restoration and maintenance for federally listed species (in progress, see Section 6.3.4 below), survey of the status of wildlife watering devices (USFWS 2000e).

Lastly, Camp Pendleton also participates in quarterly partnering sessions with the Navy and USFWS. In addition to providing a forum for dispute resolution, these sessions have generated partnering efforts such as the development of a mutually agreed upon format for biological assessments and the arroyo toad symposium (held at MCAS in October 1999).

### **6.3 RESEARCH, SURVEYS, AND MONITORING**

Base sponsored research, surveys, and monitoring contribute to the regional understanding of species, habitats, and ecosystem dynamics. While investigative research, surveys, and monitoring do not provide direct management of natural resources, they can yield information that supports effective avoidance, minimization, mitigation, and both local and regional recovery efforts. Investigative research is absolutely necessary if recovery efforts are to advance beyond trial and error for those species about which little is currently known. Such research can address specific questions about species' life history characteristics, habitat preferences, and responses to disturbance to better facilitate avoidance and recovery efforts. Research on management techniques, methods, and tools can also contribute to a greater efficacy in regional management.

Surveys and monitoring provide essential data on the spatial and temporal distributions of species and habitats and on the dynamics and processes that may be influenced by management and land use actions. Ultimately, research, surveys, and monitoring are helpful in guiding adaptive management through decision making processes both on and off the Base. Much of the knowledge gained from data derived on the Base can be directly applicable to issues of regional concern and has a clear benefit to local and regional management and planning efforts.

#### **6.3.1 The Camp Pendleton Alternative Futures Study**

The Camp Pendleton Alternative Futures Study (*Biodiversity and Landscape Planning: Alternative Futures for the Region of Camp Pendleton, California*) was conducted during 1995 by the Biodiversity Research Consortium, a team of investigators from the Harvard University Graduate School of Design, Utah State University, the National Biological Service, the U.S. Forest Service, The Nature Conservancy, and Marine Corps Base Camp Pendleton, with the cooperation of the two relevant regional planning agencies: the San Diego Association of Governments and Southern California Association of Governments.

This study examined how urban growth and change in a 50-by-80-mile region situated between San Diego and Los Angeles (surrounding Camp Pendleton) might influence, or be influenced by, the region's existing biodiversity. This research study was funded by the Strategic Environmental Research and Development Program (SERDP), a joint program of the U.S. Department of Defense, and supported by the U.S. Department of Energy, and the U.S. Environmental Protection Agency, through a grant to the Western Ecology Division of the EPA's National Health and Environmental Effects Research Laboratory, and the U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station.

The sole purpose of the study effort and subsequent publication was educational, principally to provide information regarding issues, strategic planning options, and possible consequences related to regional development and associated impacts to biodiversity to the many stakeholders and jurisdictions in the region. As a follow-on to the study results, Camp Pendleton provided to both the DoD, SERDP, and EPA sponsors a "lessons learned" assessment from the original effort and provided further direction on how to undertake an

expanded version of the study within the entire County of San Diego, including all military bases in the region.

As a result of the Harvard Study, Camp Pendleton has realized direct benefit through the assurance that regional land use maps in the future include the “military” as an official land use category. Up to that point, local jurisdictions and regional planning agencies had assigned all military lands in the region as “unused.” Further, tenets of the study are being used in planning biodiversity preserves off-Base to preserve critical nodes which will support linkage to the Base’s multi-species approach in both the riparian and upland ecosystem management plans, which support the most viable matrix of biologically diverse elements in the region. Camp Pendleton, in cooperation with the USFWS as the regional ecosystem manager, continues to use the Harvard Study to influence off-Base regional planning efforts to help achieve species recovery plans and goals.

During 2000, Camp Pendleton initiated a follow on study to review and evaluate the 1996 study using existing conditions to validate the results of the predictive models used in the 1995 and 1996 studies and refine the regional biodiversity picture and alternative futures in light of changed growth and preserve patterns resulting from the significant development of regional habitat conservation plans in San Diego, Orange and Riverside counties. Further, the scope of study has been expanded to include: (1) MCAS Miramar and coastal San Diego County down to the San Diego River, (2) an evaluation of the sufficiency of regional habitat conservation plans to achieve conservation goals and biodiversity requirements within the parameters of alternative futures, (3) assessment of the recovery potential of select threatened and endangered species within the context of the alternative futures scenarios, and (4) an assessment of Camp Pendleton’s and MCAS Miramar’s role and contributions to regional biodiversity in view of the alternative futures scenarios. The results of this study will provide the Marine Corps and regional planners with an enhanced ability to understand and project the expected impacts of alternative futures scenarios on its ability to manage both its land use and its biodiversity.

### **6.3.2 Effects of Wildfire on Coastal California Gnatcatchers**

Initiated in 1998, a multi-year study by Atwood et al. (1999, 2000) from the Antioch New England Institute (New Hampshire) has been collecting data on the ecology and behavior of the California gnatcatcher on Camp Pendleton, focusing in particular on how gnatcatcher habitat quality and distribution is influenced by fire. Funded by the Camp Pendleton, this research is expected to contribute to a greater understanding of the behavior and ecology of this federally listed threatened species for natural resource managers both on Base and within the region. Final study results for this project are still pending.

### **6.3.3 Habitat Suitability Evaluation for Endangered Southern Steelhead Trout**

A habitat suitability study (USFWS 1998f), completed in 1997 for all Base streams, evaluated the potential for the San Onofre, San Mateo, and Santa Margarita River watersheds

to support runs of southern steelhead. The results of this report have provided valuable information to the Base natural resource managers and are used by other professional biologists in the region as a means for evaluating potential steelhead recovery efforts in southern California.

#### **6.3.4 Restoration and Maintenance of Upland Habitat**

Recently, the Base contracted the USFWS to develop methodology for identifying upland habitat areas that are important to actively manage for selected listed upland species, including the coastal California gnatcatcher, Stephens' kangaroo rat, Pacific pocket mouse, and thread-leaved brodiaea. Development of this methodology will enable the Base to better maintain habitat for listed upland species populations during project planning and will identify sites for potential future mitigation, compensation, or stewardship.

Among other required elements, this research will involve (1) determining the utility of existing data and imagery for monitoring landscape level habitat changes; (2) mapping of selected areas and field verification of existing GIS layers; (3) locating, designating, and mapping all habitat within selected areas that has the potential to become suitable for federally listed upland species; (4) determining the general restoration approach for potential habitat areas; and (5) prioritizing the importance of selected habitat areas, including consideration of patch size and connectivity/proximity to adjacent populations and habitat (both on and off Base). This research is scheduled for completion by the end of 2001.

#### **6.3.5 Wildland Fire Studies**

Wildland fire on Camp Pendleton is a continual challenge to land managers and firefighters, especially in the context of many sensitive and federally protected natural resources. As part of the adaptive management foundation for the Wildland Fire Management Plan (MCB Camp Pendleton 1998), a follow-up program of field studies (Fire Studies program) was designed to address data gaps and to validate and support recommended management strategies associated with the effects of wildland fire on sensitive natural resources. Examples of some of the strategies recommended in the Wildland Fire Management Plan that were recently investigated in the Fire Studies program included: (1) controlling patch size and maximizing edge habitats; (2) maximizing seed banks of native, fire-following annuals by reducing the fire frequency and intensity; (3) buffering riparian drainages from excessive fire frequency and nonpoint source pollution; (4) improving age class structure of shrub communities; (5) providing

Research conducted from 1997 to 2000 by Tierra Data Systems (MCB Camp Pendleton 2001) has contributed to the Fire Studies program.

### **6.3.6 Basewide Herpetological (Amphibian and Reptile) Survey**

In 1995 an intensive study of the diversity and autecology of the herpetofauna (amphibians and reptiles) of the California portion of the California Floristic Province was begun. Monitoring the diverse array of species in this region is critical in understanding, managing, and protecting them for the long term. As part of this effort, over thirty study sites were established that range from the southern end of the Los Angeles Basin, south to the Mexican Border. Contributing to this region wide, long term data collection effort, several herpetological pitfall arrays (low barrier fencing oriented toward subterranean pitfall traps) were placed on Camp Pendleton in 1995. To date, data collected from these pitfall arrays have contributed to the production of a comprehensive reference guide, *A Guide to the Amphibian and Reptiles of MCB Camp Pendleton, San Diego County, California* (Holland & Goodman 1998a), and to management recommendations for sensitive species of amphibians and reptiles (Holland & Goodman 1998b). Survey data gathered from a reduced number of pitfall arrays representing various upland habitats from December 1996 to September 1999 is also summarized in Fisher (2000). Although the number of sites on Base has been reduced and the level of survey effort has varied from year to year, the Base has secured funding to continue the basewide herpetological surveys in 2001. Continued herpetological survey efforts are essential for revealing trends over time and are expected to provide greater information concerning the value of Base lands to the regional ecosystem.

### **6.3.7 International Partners in Flight Program: Monitoring Avian Productivity and Survivorship (MAPS)**

The Monitoring Avian Productivity and Survivorship program was created by the Institute for Bird Populations in 1989 to provide basic demographic parameters of migratory bird species that breed within the U.S. and Canada. This data is critical for the conservation and management of numerous species, many of which are imperiled regionally and globally.

Professional biologists and trained volunteers mist-net and band birds at monitoring stations throughout the continent for the MAPS program. Since its first season, MAPS has grown from 17 to over 500 stations and has received the support and endorsement of many federal agencies and conservation groups, including the National Park Service, the U.S. Fish and Wildlife Service, the Biological Resources Division of the U.S. Geological Service, the Forest Service, the Department of Defense, the National Audubon Society, and the international Neotropical Migratory Bird Conservation Initiative, "Partners in Flight."

In 1995, two MAPS stations were established at Camp Pendleton and operated annually thereafter: one in riparian habitat along De Luz Creek and the other in oak woodland near Case Springs in a mountainous region of the Base (Kus & Beck 2000). The Case Springs station is expected to cease operation; however, a third station was established in 1998 in riparian habitat along the Santa Margarita River west of Ysidora Basin, at the site of the former settling ponds (Kus & Beck 2000). The Camp Pendleton MAPS stations were established as part of a long term study of the status (including reproduction and long term survival) of neotropical migratory birds at Camp Pendleton and are being operated in a manner consistent with other MAPS stations. The MAPS program is expected to continue on

Base for several more years, so long as funding remains available. Additional funding was secured during 2001.

### 6.3.8 Deer Management Study

Hunting and active management of the southern mule deer (*Odocoileus hemionus fuliginatus*) population at Camp Pendleton has been ongoing since at least 1955. To facilitate management of this species, the Base contracted Floyd W. Weckerly of Humboldt State University (Weckerly 1998) to analyze years worth of accumulated deer survey and hunting data, review the existing management plan, and develop a revised management plan to maintain sustained yield hunting on Base. Findings from that study indicated that the Camp Pendleton management program for the deer population is sound and effective. Additional recommendations were also provided.

### 6.3.9 California Least Tern Studies

The largest and most productive California least tern colony is found on Camp Pendleton and has been intensively studied since 1983 (see Belluomini 1993, and references therein). From 1989 to 1992, the Denver Wildlife Research Center conducted research on the interactions between terns and ravens (*Corvus corax*) at Camp Pendleton. The initial year's study focused on determining home ranges and habitat use patterns of territorial ravens in relation to the tern colony at White Beach (Linz et al. 1990, 1992). A 1992 study conducted by the U.S. Department of Agriculture (Avery et al. 1993), funded in part by the U.S. Navy (contract number N68711-92-LT-2006), investigated predation of California least tern eggs by common ravens, conducted experiments using nonlethal aversive techniques, and proposed management methods.

### 6.3.10 Other Non-Base Funded Research

Camp Pendleton continues to support limited non-Base funded research that would enhance understanding of regional ecosystems by providing access to the Base, when compatible with military training, safety, and natural resource management goals, for qualified research projects that are regional in nature. Examples of non-Base funded research supported over the last several years include the following:

- California Gnatcatcher Habitat Utilization Research : Bill Wirtz (Pomona College)
- Monarch Butterfly (*Danaus plexippus*) Overwintering: Dave Marriott (The Monarch Program)
- Golden Eagle Survey (*Aquila chrysaetos*) of San Diego County: Dave Bittner and John Oakley (Eagle Survey Project)
- Status of Golden Eagle Population on Camp Pendleton: Peter Bloom (Independent Researcher)
- Long-Term Raptor Population Research: Peter Bloom (Independent Researcher)
- San Diego Bird Atlas: Phil Unitt (San Diego Natural History Museum)

- Foraging Behavior of Terns in Southern California: Dan Robinette and Patricia Heron Baird (California State University at Long Beach)
- Arroyo Toad Movement, Mortality, and Habitat Utilization in San Mateo Creek: Paul Griffin (University of California at San Diego)
- Capacity of the Santa Margarita River to assimilate nitrite and other constituents associated with treated sewage effluent: Rancho California Water District

### **6.3.11 Fire Management Equipment Field Testing and Evaluation**

Camp Pendleton lands have been instrumental in the testing and development of the utility and applicability of Type-1 Helicopters (large Heli-tankers) as an initial attack resource on wildfires. The first Type-1 initial attack Helicopters were stationed and tested for three years at Camp Pendleton. Results of this test has resulted in the placement of initial attack type I helicopters throughout southern California.

Camp Pendleton's Fire Department, in conjunction with the program sponsor, California's Department of Forestry and Fire Protection, also hosted and coordinated research and development of the "*Operation Fire Stop II*" project. This joint effort was designed and initiated to test and evaluate new, 21st century wildfire fighting equipment.

## **6.4 ECOSYSTEM MANAGEMENT AND WATERSHED PROTECTION**

Ecosystem management and watershed protection require the stewardship of resources on Base as well as involvement at the regional level. While the management and protection of natural resources within the Base's boundaries are important (and contribute to regional conservation efforts), Camp Pendleton recognizes that long term sustainability of ecosystem processes and watershed functioning requires a regional perspective and a coordination of efforts to achieve common goals.

### **6.4.1 Programmatic Ecosystem Management Planning: Riparian and Estuarine/Beach Habitats**

The Riparian and Estuarine/Beach Biological Opinion (1-6-95-F-02), commonly referred to as the Riparian BO, was the result of formal Section 7 Endangered Species Act Consultation with the USFWS on Programmatic Activities and Conservation Plans for Riparian and Estuarine/Beach Ecosystems on Marine Corps Base, Camp Pendleton. During its signing, in October 1995, Secretary of Interior, Bruce Babbitt, hailed the Plan as a model for national and regional ecosystem management implementation, including setting a precedent for future consultations between and within the Departments of the Interior and Defense. Further, as a result of the programmatic consultation process and resultant Biological Opinion, the Secretary of the Interior awarded the Base with the USFWS, Region 1, '*Silver Eagle Award*' for its significant promotion of, and contributions to, regional ecosystem management biodiversity conservation.

The Base takes a proactive leadership role within the region for multi-species ecosystem management planning. The programmatic ecosystem management plan mentioned above for riparian and estuarine/beach ecosystems established Camp Pendleton's goals for contributing to regional conservation efforts that local governing jurisdictions and regulatory/land management agencies must now attain in their planning efforts. Further, this plan ensures that "mitigation dumping" (off-Base entities who sought to establish wildlife preserves for endangered species on military training lands), through the regional conservation planning efforts (e.g., NCCP), would not occur. This "programmatic consultation" process established a "template" that is being followed in the ongoing "upland" programmatic consultation.

#### **6.4.2 Santa Margarita River Watershed Management Program**

Inter-jurisdictional planning and management to protect the stream-related resources of the Santa Margarita River Watershed is the reason that Camp Pendleton, the counties of San Diego and Riverside, along with the cities of Murrieta and Temecula, initially formed this program in 1989. As many as 50 other agencies and organizations located in the watershed are affected. Primary areas of discussion include: (1) maintenance of water quality and quantity; (2) protection of wildlife and sensitive natural resources; and (3) management of stream corridors for multiple uses including recreation, habitat, flood damage reduction, live-stream discharge and retention/detention for both reclaimed water and stormwater (USNPS 1992). In 1994-95, the State Coastal Conservancy funded preparation of three resource enhancement and integrated watershed plans for the primary sub-basins: Temecula, Murrieta, and main stem of the Santa Margarita.

The Environmental Protection Agency plans to augment the work on these watershed plans in the future. The EPA intends to evaluate the assimilative capacity of the watershed's wetlands, and implement actions to protect them using the water permitting program and the wetlands advance identification process (USEPA 1993).

Camp Pendleton's concerns for flood damage reduction in the watershed accelerated following the January 1993 flood, in which over 300,000 tons of sediment from mainly upper basin sources were deposited on the Base's floodplain, causing millions of dollars of damage to the Air Station alone. Preventing more frequent or even more damaging recurrences requires the cooperation of local governments and landowners in the upper watershed, where the population is expected to expand three-fold in the next twenty years (USEPA 1993). Since Camp Pendleton is situated at the mouth (bottom) of the Santa Margarita watershed, it is the direct recipient of the consequences of upstream water use, land use, wildland fires, and resulting impacts to water quality. It has been identified that, to be effective, remedial measures must be initiated first upstream of the Base, near the top of the watershed basin. Without participating in, and promoting, such an approach to effectively change management action priorities upstream, Camp Pendleton has little ability to directly influence, let alone protect its own natural and hydrologic resources.

### 6.4.3 Team Arundo-Watershed Exotics Control

The Marine Corps has been implementing a systematic multi-year *Arundo donax* (giant reed) control program on the Santa Margarita River since the fall of 1995. *Arundo* is an invasive, non-native plant that has infested and adversely affected much of the riparian habitat within southern California watersheds in general and the Santa Margarita River watershed in particular. In 1995 the Marine Corps partnered with federal regulators, The Nature Conservancy, and private land owners to move mitigation commitments as far up stream in the watershed as possible. This is because *Arundo* propagates vegetatively, so control efforts must proceed from upstream to downstream, to preclude re-infestation of treated sites on Camp Pendleton. Since 1995, *Arundo* treatments have been initiated at site specific locations along a 17-mile section of the watershed and are in various stages of completion (Figure 6-4). All control projects were initially funded for 5-year treatment periods through the Endangered Species Act and Clean Water Act mitigation requirements and/or as required by Camp Pendleton's environmental stewardship programs. *Lessons learned* for these control efforts are being translated into greater understanding of cost reductions, control efficiencies, treatment effectiveness, and plant community responses in the San Luis Rey River exotics control programs, as well as other watershed management efforts within the southern California ecoregion.

### 6.4.4 Santa Margarita and San Luis Rey Weed Management Area Program

The Santa Margarita and San Luis Rey Weed Management Area (SMSLR/WMA) program, sponsored and coordinated by the Mission Resource Conservation District (Mission RCD), is the follow-on program to Team Arundo for weed management at the watershed scale (Figure 6-5). The Mission RCD has initiated planning efforts for the continued development and implementation of regional *Arundo* control.

Camp Pendleton plays an active role in the organization, with staff having assisted in writing several grant proposal letters for the SMSLR/WMA program. In addition, Base staff from OWR, Land Management Branch and Wildlife Management Branch attend periodic SMSLR/WMA meetings.

The Base and the SMSLR/WMA coordinate exotics control project activities to ensure no "gaps" exist on the Santa Margarita River. In this way, Camp Pendleton ensures that upstream sources of *Arundo* are being reduced, thereby preventing re-infestation of *Arundo* on Base lands. Camp Pendleton has further contributed to the watershed-based *Arundo* control efforts along the Santa Margarita River by carrying out *Arundo* removal on Fallbrook Public Utilities District lands situated upstream from the Base. This has greatly contributed to the watershed based *Arundo* control effort. This effort counts for mitigation for the Base, while contributing to improved sensitive species habitat, recreation, flood control, and long-term fire risk reduction for public land used by many Fallbrook residents.

#### **6.4.5 Santa Margarita Ecological Reserve (SMER)**

The Santa Margarita Ecological Reserve (SMER) is a Research Field Station of San Diego State University (SDSU) and the San Diego State University Foundation. The purpose of the reserve is "to keep the property in its natural state for the preservation and protection of the native plants, animals and habitat, and for related educational and research purposes."

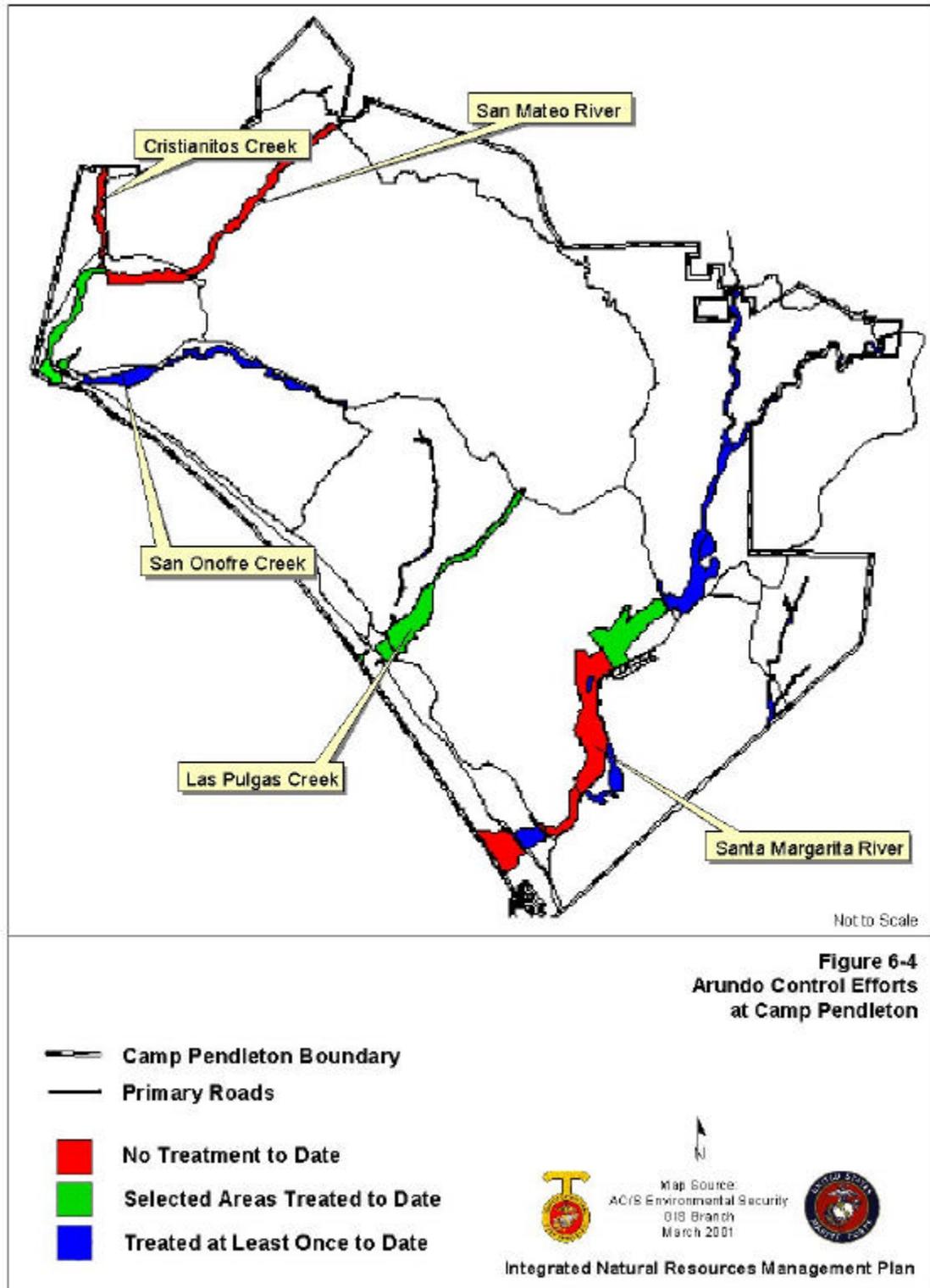
The Reserve is a key part of preserving the entire Santa Margarita River, one of the last free-flowing rivers in coastal Southern California, and its rich ecosystem. The Santa Margarita River officially begins at the northwestern boundary of the Preserve, at the confluence of Temecula and Murrieta Creeks. The River flows through the impressive Temecula Gorge of the Reserve, the lands owned by the Fallbrook Public Utility District, and empties into the Ocean through the largely undisturbed lands of Camp Pendleton.

The Reserve has a total area of 4344 acres. Murray Schloss bequeathed the core 2,480 acres to SDSU in 1962, approximately 1200 acres are leased from the Bureau of Land Management, and The Nature Conservancy donated about 400 acres. The Nature Conservancy intends to acquire and donate nine more nearby parcels of lands as they become available. The research focus of the Reserve has become critical as humans pave over more and more of Southern California. It is now recognized that large number of endangered plants and animals cannot be saved without saving large areas of the right kinds of habitat required for them to thrive. Experiments=conducted at the Reserve help the understanding of what needs to be done to save southern California's world-recognized rich plant and animal diversity.

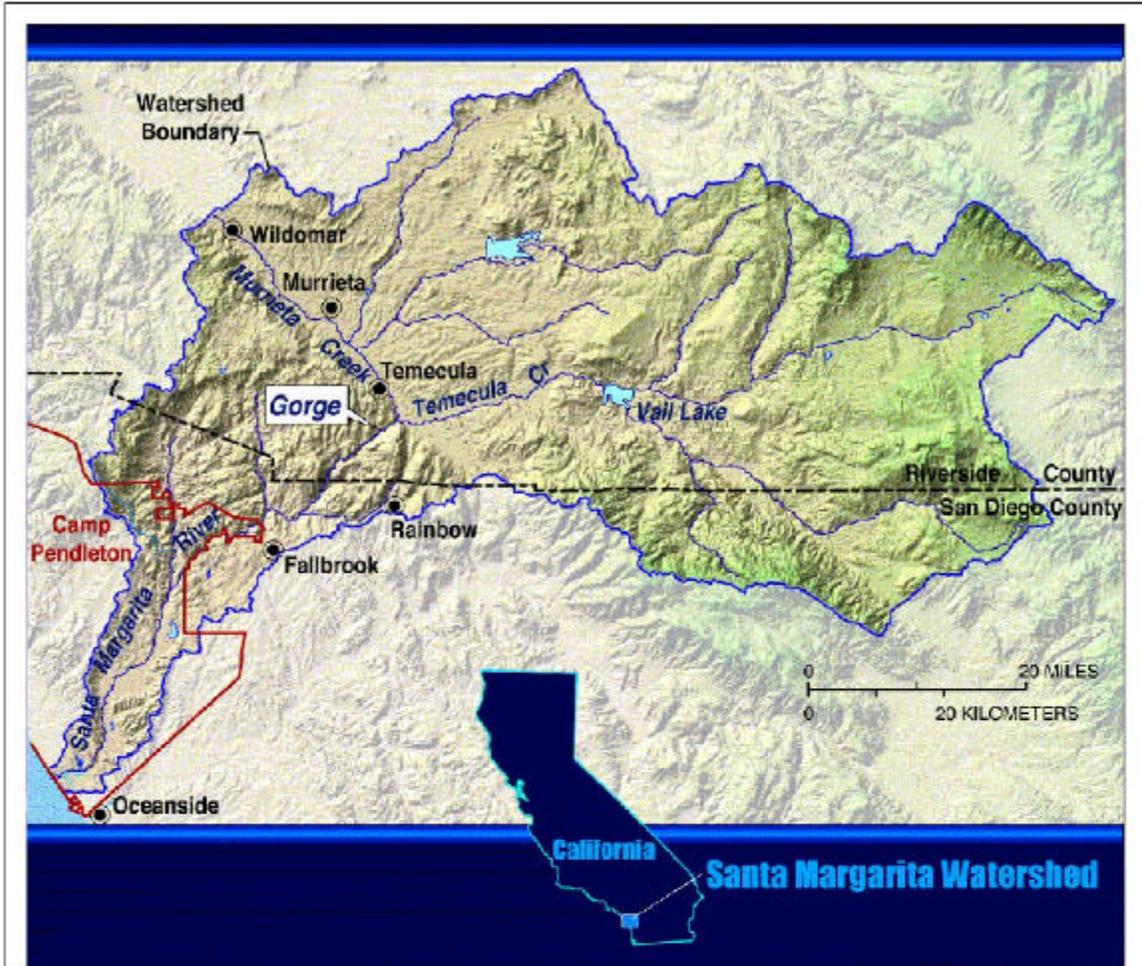
Research is also done that benefits humans directly. The Reserve has a working citrus and avocado grove and a eucalyptus plantation with over 35 varieties. Past research led to the introduction of a predator to control the bark borer that devastated eucalyptus plantings in the 1980s. Current research includes a study on the effectiveness of importing bees to pollinate groves.

### **6.5 EDUCATION, AWARENESS, AND INFORMATION EXCHANGE**

The provision of information through public education and awareness programs, as well as professional exchanges (e.g., data and idea sharing), is an important form of regional participation and involvement. Helping to foster an understanding and appreciation of environmental issues both on and off Base provides an important contribution to a greater collective stewardship ethic that is mutually beneficial to the Base and surrounding communities. For environmental researchers, managers, and professionals, access to information is essential for the advancement of natural resource management and conservation.



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Data Source: USGS

Figure 6-5  
Santa Margarita River Watershed



Map Source:  
ACRS Environmental Security  
GIS Branch  
March 2001



Integrated Natural Resources Management Plan

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### **6.5.1 Regional Information Exchange**

The Base is participating in a regional Geographic Information System database information exchange with SANDAG and the Transportation Corridor Agency to enhance documentation of regional biodiversity.

Camp Pendleton is partnering with several groups to improve regional sharing of ecological data. The Base is working with The Nature Conservancy and San Diego State University to develop a riparian monitoring program related to its pending water rights settlement agreement with Rancho California Water District. To that end, the Marine Corps has provided \$100,000 of Legacy funding to SDSU to develop a web-accessible data base for hydrology, water quality, sediment, and habitat and biocriteria data. SDSU's work is part of a larger regional effort to develop an Internet environmental data transfer system to support regional planning and research. At the same time, Camp Pendleton is participating in an effort, funded initially by the US Bureau of Reclamation, to develop a science-based, watershed-scale water quality monitoring program. That effort also includes database design, and the Base is coordinating between the Reclamation consultants and SDSU, to avoid duplication or contradiction in their work products.

### **6.5.2 Off-Base Environmental Awareness Education**

The environmental staff conducts frequent slide presentations on natural resources and Base management programs to a variety of on-Base and off-Base groups such as conservation organizations, service groups and college classes. Base personnel also lead field trips to observe wildlife and discuss our management programs. Groups include an annual tour for the Friends of the Santa Margarita River, the Biodiversity Research Consortium, National Research Council, and regulatory agencies. During 1998, a major Earth Day celebration was held and involved live displays of reptiles, birds and various mammals that naturally occur on Base. News articles are prepared periodically for the Base paper, and interviews are given frequently to local newspapers, for local and regional Base highlights. Staff also participates with local high schools in a School-to-Career program, orienting students monthly to the environmental compliance and natural resource management professions, education requirements, and expertise being exercised at the local Base.

The Mission Resource Conservation District under contract with the Riverside County Flood Control District provides elementary school education programs for watershed and stormwater awareness on Base. When Camp Pendleton obtains a Phase II municipal stormwater permit, it will likely contribute to the funding of this program as one of its best management practices under that permit.

### **6.5.3 Arroyo Toad Symposium**

On 5 October 2000, MCAS Camp Pendleton convened a symposium on conservation and management of the Arroyo Toad. The symposium was organized to support the ongoing partnering efforts between the Department of Navy and U.S. Fish and Wildlife Service in San

Diego County. More than 120 people attended the event, including representatives from 6 government agencies, academia, consultants, and interested citizens.

The goals of the symposium were to: (1) facilitate interaction and sharing of information regarding arroyo toad life history and management practices, (2) share information on the latest Arroyo Toad research, (3) identify future research needs, and (4) enhance toad and breeding habitat identification skills.

Discussion topics included: natural history and basic lifecycle biology; habitat requirements of larva, metamorphs, and adults in riparian and upland habitats; ongoing research funded by/on Camp Pendleton; management issues such as non-breeding season survey protocols and standardization of data collection survey sheet; effectiveness, appropriateness, and standardization of mitigation requirements and methods; Arroyo Toad relocation; future research needs; non-breeding season activity; predation and exotics species impacts to Arroyo Toad and an Arroyo Toad identification workshop.

#### **6.5.4 State of California Biodiversity Council (CBC)**

On June 7 and 8, 2000, the United States Marine Corps hosted the California Biodiversity Council (CBC) Regional Meeting at Camp Pendleton. The CBC, formed in 1991 to improve coordination and cooperation between the various resource management and environmental protection organizations at federal, state, and local levels, met to formally discuss biodiversity and watershed management issues related to Camp Pendleton and its military mission, because it [Camp Pendleton] sits in a high growth area – San Diego, Orange and Riverside are three of the fastest growing counties in California. The rapid growth of the region has brought development and urbanization issues, and with them, military noise becomes less tolerable, demand for military lands increases, and competition increases for airspace used for military training. Furthermore, since southern California is a major “hotspot” for endangered species, expanding environmental legislation and regulations directly impact undeveloped military training areas. Strengthening ties between local communities and governments has been a focus of the Council by way of promoting strong local leadership and encouraging comprehensive solutions to regional issues.

The CBC has 38 members, including 8 regional associations of county supervisors and governments, 16 state agencies, 12 federal agencies, the University of California, and the California Association of Resource Conservation Districts. Camp Pendleton is not currently a CBC member, however, the Marine Corps Western Regional Environmental Coordinator is an ex-officio member.