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CHAPTER 2

MISSION, LAND USE, AND REGIONAL SETTING

2.1. LOCATIONS AND MISSION

2.1.1. Location

Camp Pendleton occupies approximately 125,000 ac of largely natural areas, with approximately 17 miles of coastline bordering the Pacific Ocean, in northwestern San Diego County of southern California (Figure 2-1). Camp Pendleton is situated between two major metropolitan areas: Los Angeles, 82 miles to the north, and San Diego, 38 miles to the south. Nearby communities include Oceanside to the south, Fallbrook to the east, and San Clemente to the northwest. Camp Pendleton shares portions (approximately 8 miles) of its northern border with the San Mateo Wilderness Area of the Cleveland National Forest and its eastern border with the Naval Weapons Station Seal Beach Detachment Fallbrook. Aside from the Wilderness Area and the Naval Weapons Station Seal Beach Detachment Fallbrook (which are both largely natural areas), surrounding land use includes urban development, rural residential development, and active farms and ranches.

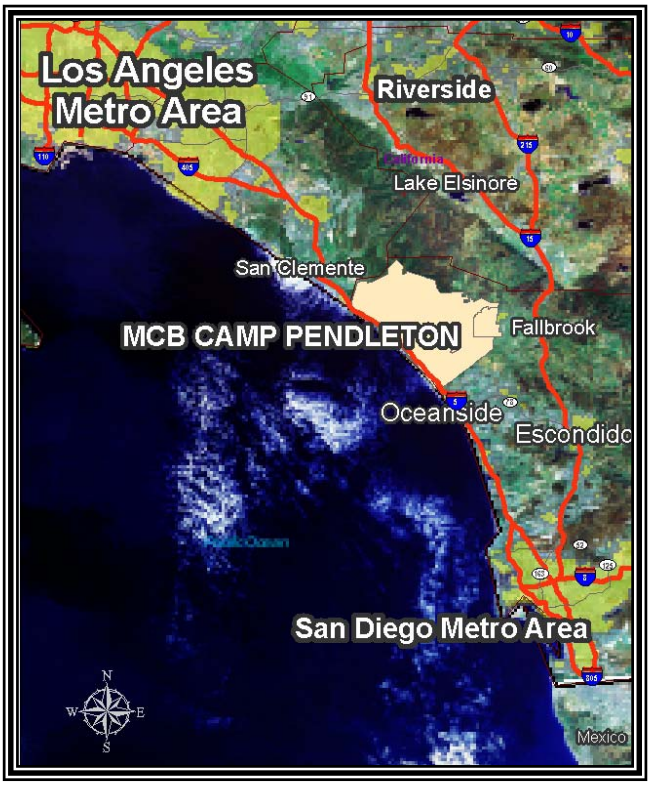

FIGURE 2-1. CAMP PENDLETON LOCATION

2.1.2. Mission

The mission of Camp Pendleton is "to operate the finest amphibious base possible; to promote the combat readiness of Marines and Sailors by providing necessary facilities and services; to support the deployment of the Fleet Marine Force and other organizations; and to provide support and services responsive to the needs of the Marines, Sailors, retirees and families aboard Camp Pendleton (MCBCP 2006)." Camp Pendleton maintains and uses its natural areas to ensure the readiness of the nation's military forces. The ability of the military to fight and win our nation's wars is tied directly to readiness resulting from realistic training. There is no substitute. Camp Pendleton is the Marine Corps' premier amphibious training Base, its only west coast amphibious assault training center, and the

only west coast installation capable of supporting combined and comprehensive air, sea, and ground combat training. The Base has been conducting air, sea, and ground assault training since World War II, providing a unique combination of natural and military resources for the training of Marines and other DoD personnel. For over 60 years, Camp Pendleton has served as one of the nation's most important training Bases and has contributed substantially to the success of our national security forces in conflicts and missions worldwide.

Camp Pendleton is arguably one of the busiest DoD installations in the U.S. Approximately, 45,000 training events are scheduled for the nearly 60,000 Service members that train at Camp Pendleton each year. These events range from small unit training to Regimental and Marine Expeditionary Brigade (MEB) exercises. The Base provides training facilities for many active duty and reserve Marine, Navy, Army, Air Force, and National Guard units, as well as other federal, state, and local agencies. The Base's proximity to the Navy's homeport at San Diego is strategically significant in supporting mobilizations and deployments to and contingencies for the western Pacific and Southwest Asia. The Base is the home for the Commander, Marine Corps Installations West and a cornerstone of the Marine Corps' training range complex in the southwestern U.S., which includes the Marine Corps Air Ground Combat Center in Twenty-nine Palms, California, the Barry M. Goldwater Range near Marine Corps Air Station (MCAS) in Yuma, Arizona, and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in the southeastern corner of California (Figure 2-2). Each installation plays an integral role in the training of Marines and Marine Air and Ground Task Forces (MAGTFs) for combat operations. Marine units from Camp Pendleton utilize these ranges to accomplish specific training requirements. Current and emerging doctrine point to the ever-increasing importance of Camp Pendleton as a point of entry and operational platform that connects to Naval and Joint Bases and training lands within the western U.S. and replicates operational reach consistent with the exercise of Expeditionary Maneuver Warfare, and Operational Maneuver from the Sea.

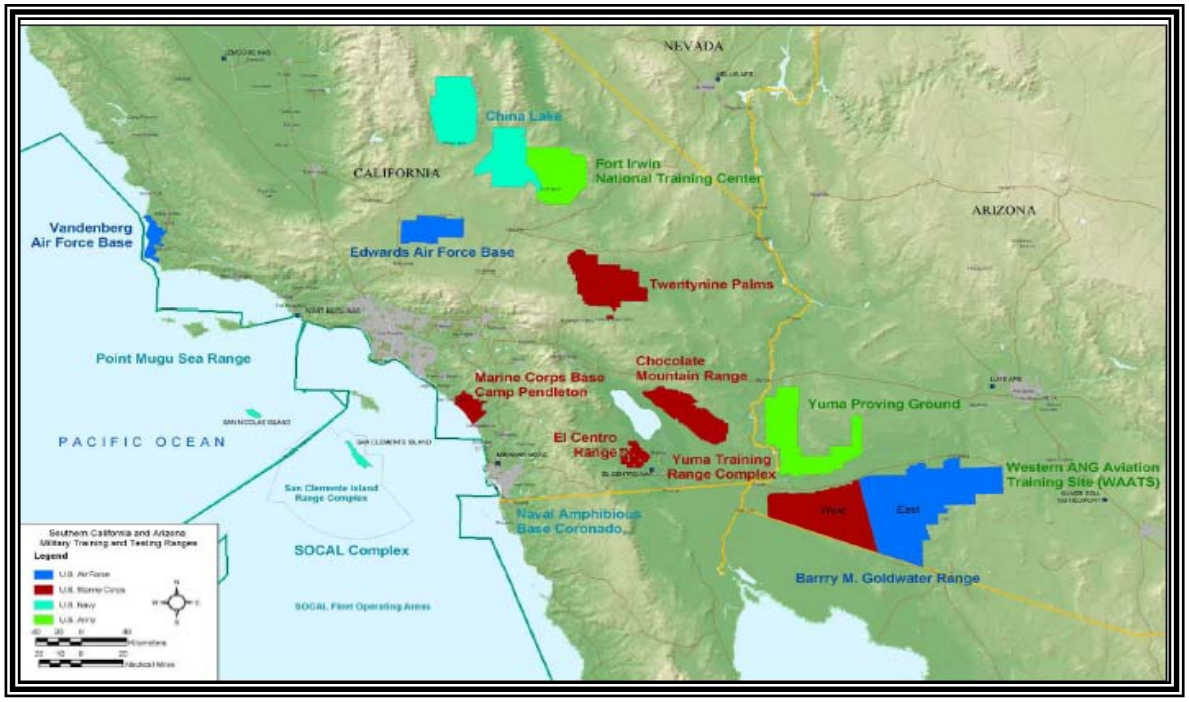

FIGURE 2-2 REGIONAL RANGE MAP

Camp Pendleton is the Marine Corps' only training installation on the west coast for conducting amphibious operations (operations that involve the projection of U.S. forces from the sea), which is a principal mission of the Marine Corps. Camp Pendleton is the home to the First Marine Expeditionary Force (IMEF) and the Marine Corps Installations West. Major subordinate commands of the MEF, the First Marine Division (1st MarDiv), the First Marine Logistics Group (1st MLG) and elements of the Marine Aircraft Group 39 (MAG-39) (an element of the Third Marine Aircraft Wing [MAW]) are also based at and train on Camp Pendleton. Many other units, including the Marine Corps Tactical Systems Support Activity (MCTSSA), Assault Craft Unit 5 (a U.S. Navy command), Naval Hospital Camp Pendleton, Naval Dental Clinic Camp Pendleton, the Field Hospital Operations and Training Command (a U.S. Navy command), an Army Reserve Center and the Weapons and Field Training Battalion (an element of Marine Corps Recruit Depot, San Diego), are also based on Camp Pendleton. Forces of the IMEF are continuously deployed in support of operations and contingencies worldwide to meet national security objectives as directed by the National Command Authority.

To accomplish the national security mission and support the nation's Overseas Contingency Operation (aka Global War on Terror), Marines and other DoD personnel must be trained in all requirements for responding to national security threats. Training activities include, but are not limited to: amphibious landings, use of tracked vehicles, infantry and vehicle maneuvers, artillery and small arms firing, aerial weapons delivery, engineer support operations, logistics support, field combat service support, communications, airlift support for troops and weapons, equipment maintenance, and field medical treatment. Camp Pendleton units train with some of the most modern and sophisticated weapon systems and equipment available. Such technology is constantly evolving to stay ahead of weapon system advancements by threat forces. Continual training to maintain personnel/unit proficiency is a critical component of combat power, and is the primary mission of the Base.

Training on Base is supported by a wide range of Marine Corps and DoD service support activities, including: an airfield and aviation landing areas, ammunition storage areas, radar and communication facilities, supply warehouses, motor vehicle storage and maintenance facilities, recreational activities, bachelor and family housing facilities, medical and dental services, military security, child and family care services, and fire fighting.

2.2. HISTORIC USE

2.2.1. Pre-Marine Corps

Historic uses of the area that Camp Pendleton currently occupies, and regional growth over the past 200 years, have significantly influenced not only the physical appearance of Camp Pendleton and its environs, but also the ecological setting in which the Base finds itself today. Much of southern California's biodiversity and its high degree of species endemism have been significantly impacted through historic land use and increasing human population and development.

The land currently occupied by the Base has a long history of human presence (>10,000 years), from the prehistoric Shoshonean-speaking people who used the coastal lands for shellfish and vegetable gathering, and the higher oak woodlands for acorn gathering and deer hunting, through Spanish colonials (1769-1821) and Mexican (1821-1848) and American ranchers (1848-1942) (Zedler et al. 1997). Cattle grazing and later, crop cultivation, were the primary land uses in the region until the U.S. government purchased a majority of the land in 1942.

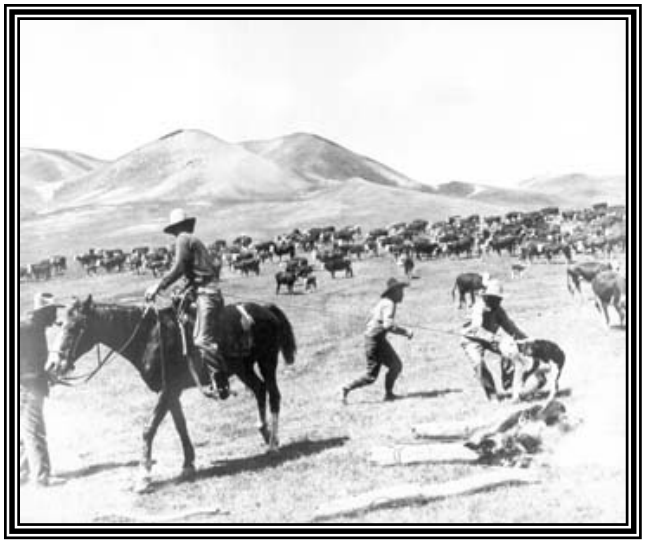

FIGURE 2-3. RANCHO SANTA MARGARITA
(PHOTO SOURCE: U.S. MARINE CORPS)

During the Rancho period, agriculture and livestock was the economic base of the region. Rancho Santa Margarita once stretched 200,000 ac from Oceanside to Saddleback Mountain, and at its peak 10,000 head of cattle and 250 horses roamed the area (Ritchie 2007). It is believed that sheep were introduced in the late 1800s. Subsequent owners of the property also used the land for grazing, and grazing leases continued after the military took over the property during World War II. Camp Pendleton was reputed to have the finest grazing land in southern California during the early 20th Century. Grazing and farming activities were supported by El Camino Real, the old thoroughfare used by the missionaries that became Highway 101 and used to follow what is now the Basilone Road alignment before it was moved closer to the coast. Infrastructure development included a railroad, which ran from San Diego to Oceanside, inland along the Santa Margarita River to Temecula, and connected to the transcontinental railroad at San Bernardino. In the Santa Margarita River, the tracks were generally ten to thirty feet above the riverbed in the canyon, however, thirty miles of track was washed out in 1884 and again in 1891. This route was then replaced by a more-secure route along the coast.

Extensive farming was first established in the Las Flores/Las Pulgas basin in 1897, with a bean farm that grew to eventually cover approximately 1,980 ac by 1943. Other areas farmed on Camp Pendleton over the years include the Las Pulgas, San Mateo and San Onofre valleys, Ysidora Basin, the Chappo area (now the Supply Depot and airfield), the coastal bench from

FIGURE 2-4. LAS FLORES RANCHO

Oceanside to San Onofre east and west of I-5, and Stuart Mesa. At one time, farmed areas of the Base totaled around 10,000 ac (Zedler et al. 1997). Coastal farms were unirrigated, as were parts of the San Onofre and Las Flores areas. Irrigated farms included Ysidora Basin, Stuart Mesa, San Mateo, and parts of San Onofre. Truck farming started in the San Onofre valley in 1925. A 3,000 ac guayule (*Parthenium argentatum*) crop deemed the "Emergency Rubber Project" was in place that included most of the coastal bench lands north of Horno Canyon. Other historical crops included lemons, nursery stock, dry-land farmed lima beans, tomatoes, strawberries, sweet corn, barley, bulbs, vegetable seed, flowers, and potatoes for the California Potato Experiment Station. In 1944 and 1945, the Base tried to cancel its agricultural leases, but gave up after a general protest. It was decided that the "agricultural economy of the entire U.S. would have been affected," particularly because of vegetable seed and poinsettia production.

2.2.2. Historic Marine Corps Use

As the Marine Corps' only amphibious training base on the west coast Camp Pendleton has been, is, and will continue to be responsible for the training and deployment of Marines throughout the Pacific Region. For over 60 years, the Base has provided a unique combination of natural and military resources for training Marines in every conflict since World War II, contributing substantially to the success of national security objectives around the world.

In 1931, the United States government wanted to establish an emergency airfield on the Rancho Santa Margarita y Las Flores property due to increased air travel on the southern flight path from New York to Los Angeles. The manager of the ranch, Charles S. Hardy agreed to lease the land to the government for such a purpose because the owner refused to sell the land. The lease started on 1 July 1931. In 1941, the DoN bought 9,000 ac of the Rancho Santa Margarita y Las Flores property for $2,500,000 and designated the area as an ammunition depot. Then in 1942, the DoN purchased an additional 123,620 ac of the property for $4,239,062 for use as a military training center (Herbert 1961). Later that year, President Franklin D. Roosevelt named the Base, Camp Joseph H. Pendleton, in honor of Major General Joseph H. Pendleton, a pioneer of Marine Corps activities in San Diego and an advocate for a major Marine Corps installation on the west coast.

Construction on the Base commenced immediately, with initial construction taking place in the Mainside area of the Base, which is located in the southeastern corner of the Base. This region was sub-divided into smaller areas that were numbered in order of their construction beginning with Area 11 and ending with Area 17, a numbering system that exists today. Tent camps 1 (Las Pulgas), 2 (San Onofre), and 3 (Cristianitos) were created in the outlying canyon areas west of the Mainside area. These tent camps were purposely dispersed to reduce bombing and fire hazards. In addition, an airstrip and a 600-bed hospital were constructed.

Between 1942 and 1945 over $25 million was spent on Base construction and improvements. Initially, thousands of tents were erected but they were quickly replaced with Quonset huts in the three tent camps.

Originally, Camp Pendleton was meant to serve as an auxiliary training camp for the MCB at San Diego, but it quickly became the center of West Coast Marine Corps activity as the Corps took on an increasingly crucial role in amphibious warfare necessary to take control of Pacific Islands from the Japanese in the Pacific Theater. Throughout the war, Camp Pendleton was responsible for training Marines for full-scale combat in the Pacific. Its land area was large enough so that it could support training for three full divisions. In 1942, Camp Pendleton received its first combat units, the Ninth Marines, a reinforced regiment that had been training at Camp Elliott (former portion of MCAS Miramar) and later became part of the 3rd MarDiv. The Ninth Marines were followed by the 4th and 5th MarDivs.

FIGURE 2-5. WWII BEACH LANDING
(PHOTO SOURCE: U.S. MARINE CORPS)

All three divisions were housed at the Mainside area of Camp Pendleton, while whole regiments were assigned to the tent camps at Las Pulgas, San Onofre, and Cristianitos. Marines were relegated to the camp areas to experience more realistic field conditions. Each camp was self-contained and fully equipped for its unique training requirements. Each contained a Marine exchange, theater, library, club, and recreational facilities, as well as a combat and rifle qualification range for training. Ranges were used for machine gun, rifle, and mortar firing, and were designed for small arms combat training such as the use of grenades, bayonets, and other infantry procedures. Marine training also involved long conditioning hikes through the wild terrain and numerous large-scale amphibious landing exercises that took place along the shore and at San Clemente Island, located 25 miles west of the Base.

In 1944, Camp Pendleton was declared a permanent installation. Camp Elliott merged with Camp Pendleton, and Pendleton became the biggest Marine camp in the nation with a population peaking at 86,749 Marines, sailors, and civilians. The Fleet Marine Force, San Diego Area headquarters, which had been located at Camp Elliott, moved to Pendleton and Camp Elliott became a distribution center for the Navy. To make room for these incoming men, thousands of additional tents and Quonset huts were erected**.**

That same year, the 5th MarDiv that was destined to go to Iwo Jima was formed. Among their most famous veterans was Gunnery Sgt. John Basilone who as an enlisted Marine was awarded the Congressional Medal of Honor for heroic actions at Guadalcanal. He was killed at Iwo Jima when an enemy mortar shell struck him and part of his platoon. He was awarded the Navy Cross posthumously. In 1949, Basilone Road, a major thoroughfare at Camp Pendleton, was renamed in his honor**.**

At the close of the war, Camp Pendleton became a demobilization center for all troops returning from the Pacific Theater. As divisions were reduced or disbanded, the population of the Marine Corps went from a high of 485,000 to a low of 80,000 in 1947.

FIGURE 2-6. FLAG RAISING AT IWO JIMA
(PHOTO SOURCE: U.S. MARINE CORPS)

In 1946, General Vandegrift, CMC, ordered that Camp Pendleton remain the center of all Marine Corps activities on the West Coast and designated it as the permanent home of the 1st MarDiv and the Signal Communication School. The following year Camp Pendleton's unofficial title was changed from "Marine Training and Replacement Command, San Diego Area" to "Marine Barracks, Camp Pendleton."

MajGen. Graves B. Erskine was put in command of the Base in 1947. He was the first Base commander who operated the Base separately and not as part of the "San Diego Area" command. It was his wish to develop the installation into a first-class Marine installation. Upon his arrival, he moved into the old Ranch House, instituted the Camp Pendleton Rodeo, and set about to rebuild and upgrade the facility. Changes he ordered included planting of trees, installation of lawns, and most importantly, the replacement of temporary buildings with permanent ones. A shortage of funds and building materials required the Marines to renovate old buildings rather than construct new ones. Tents were torn down and replaced with Quonset huts and barracks were renovated. A $130,000 beach club was built at San Onofre, a commissary was opened at Chappo Flats, and a library began to operate across from the Headquarters Building in the Mainside area. Between World War II and the Korean War new construction activity at Camp Pendleton consisted of a few warehouses and a permanent brick and reinforced concrete barracks and mess hall complex in Area 22.

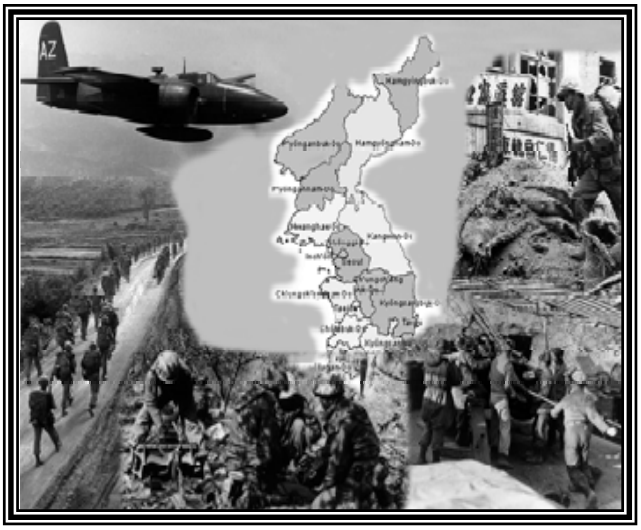

FIGURE 2-7. KOREAN CONFLICT

On 25 June 1950, when the North Korean People's Army invaded South Korea, only 9,000 Marines of the 1st MarDiv, along with a small maintenance force, were stationed at Camp Pendleton. Immediate attention was placed on rebuilding the existing units to fighting strength. The first unit formed was the First Provisional Brigade with the Fifth Marines as a nucleus. Within days, this newly

formed brigade was shipped out to reinforce the Pusan perimeter in Korea.

After June 1950, attention was shifted to rebuilding the 1st MarDiv, which was used in the amphibious assault landing at Inchon on 15 September 1950 and ground operations, including at Chosin Reservoir, where seven divisions of the Chinese Communist Army engaged Camp Pendleton-based Marines in a failed attempt to prevent them from leaving. At Camp Pendleton a massive buildup took place as active duty and mobilized reserve Marines trained and staged through Camp Pendleton. Nearly 200,000 Marines (including twenty-two reserve units, mostly battalions) passed through the Base on their way to Korea.

In this same period, the Training and Replacement Command and the First Advanced Infantry Training Regiment were established at Camp Pendleton. The Training and Replacement Command was located at Camp San Onofre and the First Advanced Infantry Training Regiment, designated to provide four weeks of combat training for boot camp graduates, was located at Tent Camp 1. In an effort to expose the Marines to as real combat conditions as possible, Marine instructors built a "combat town" to simulate a North Korean village. Similarly, Camp Pendleton's satellite training facility at Pickel Meadows in the high Sierras near Bridgeport, California was opened as a cold-weather training facility to prepare the Marines for the harsh North Korean winters. Situated at between 7,000 and 11,000 feet, this training camp enabled Marines to train and test cold-weather clothing and equipment up to a month without interruption.

Construction at Camp Pendleton during the Korean War years occurred at a frenzied pace and even outdid what had occurred during World War II. Twenty million dollars was expended for renewing and upgrading existing facilities. Permanent facilities, constructed mostly of concrete block, were developed at Las Pulgas, San Mateo, Horno, and Margarita. With no rapid demobilization after the Korean War as there had been after World War II, Maj. Gen. John Sheldon, commander of Camp Pendleton, embarked on a long-range planning program to make Pendleton a more permanent facility. In 1953, the official name of Camp Pendleton was changed from Marine Barracks, Camp Pendleton to Marine Corps Base, Camp Pendleton.

After the war, Camp Pendleton served as a training facility and provided administrative and logistical support for Fleet Marine Force units and replacement units. Camp Pendleton was not only home to the 1st MarDiv (which returned home after a five-year tour in Korea), but also became home to the 5th MarDiv, located in the Margarita area. Camp San Mateo became home to the Second Battalion (later called the Ready Battalion Landing Team), and the northern edge of Camp Talega became home to the First Pioneer Battalion. This battalion had served as an Engineer Battalion in Korea where it had built bunkers and reinforced defensive positions. At Pendleton, this battalion built rifle and pistol ranges and maintained roads and bridges.

During the following decade, the Marine Corps took steps to change troop organization and fighting techniques to increase strategic and tactical mobility without sacrificing combat effectiveness. Based on the threat of nuclear warfare and the development and success of vertical envelopment (amphibious helicopter assault) in particular, changes in divisional

organization were made to adapt the helicopter to amphibious warfare without minimizing the Marines' "force in readiness" role. Testing of these new theories in amphibious operations was conducted through large-scale exercises on the beaches of Camp Pendleton throughout the 1950s and 1960s. Among the largest and most elaborate were Operations Greenlight and Exercise Silver Lance. Exercise Silver Lance involved 55,000 sailors and Marines, 60 ships, and 520 aircraft and proved that Marines could airlift nearly a complete regiment into battle by helicopter. These exercises involved advance troops moving by helicopter on high ground as other troops moved ashore from various landing craft.

Although Camp Pendleton remained a busy installation in the years following the Korean War, little was appropriated for construction. This was mostly due to lack of funds caused by a continuing legal battle between Camp Pendleton and Fallbrook residents over Santa Margarita River water rights and Congressional reticence to approve construction funding because an unfavorable finding in the legal case could affect Camp Pendleton's future.

The election of John F. Kennedy to the presidency in 1960 and his belief that the nation was unprepared for a conventional war resulted in an increase in Marine Corps end strength and a major Marine Corps expansion in the San Diego area. Camp Pendleton's Del Mar area received a number of permanent messing, billeting, administrative and training facilities and major construction took place at Edson Range, an annex of the Marine Corps Recruit Depot, San Diego.

In 1965, the 7th Marine Regiment from Camp Pendleton saw the first major American engagements in Vietnam during Operations *STARLITE* and *PIRANHA*. By June 1966, the entire 1st MarDiv had left Camp Pendleton and was in action in Vietnam.

FIGURE 2-8. OPERATIONS IN VIETNAM
(PHOTO SOURCE: U.S. MARINE CORPS)

Mostly because of its strategic location, Camp Pendleton became the Marine Corps chief training installation during the Vietnam War. Marines from units throughout the country descended upon the Base and upon arrival were immediately assigned to the Staging Battalion. During the Vietnam War the Staging Battalion was what the Training and Replacement Command had been in World War II and Korea, the final jumping-off point for battle. Once assigned to a Staging Battalion, a Marine became part of a unit and took part in an intensive fifteen-day training program oriented toward guerilla warfare. The first few days involved administrative processing and routine lectures and inspections, which were followed by tactical, weapons training involving the M-14 and M-16 rifles and the M-60 machine gun. The Marines took part in strenuous physical conditioning and were introduced to elements of guerilla warfare such as mines, booby traps, and ambushes. The majority of the guerilla warfare training took place at Camp Las Pulgas and in the wooded terrain behind the Naval Hospital in Area 26. To further assist Marines in improving jungle-fighting skills, as well as to

accommodate the influx of troops into the station, new combat villages were built. Marines learned to fight amongst bamboo structures complete with underground tunnels, concrete bunkers, and barbed wire. These villages were not only designed to teach fighting techniques, but also to acquaint Marines with the traditions and cultures of Vietnam.

Reactivation of the 5th MarDiv and training of tens of thousands of Marines for Vietnam brought about a billeting shortage followed by a construction boom at Camp Pendleton. The demand was so great that nearly two-thirds of new arrivals were forced to live temporarily in tents while permanent barracks were being constructed. This not only affected Camp Pendleton, but also caused a housing crisis in Oceanside. In April 1967, the 5th MarDiv moved four of its battalions into modern $3.8 million barracks at Las Flores. From 1958 to the mid-1970s, development across the Base continued as Vietnam became a priority for Camp Pendleton. Between 1969 and 1970 alone, nearly 80,000 Marines were trained at Pendleton and sent to Vietnam.

Although Base construction slowed down a bit during the 70s, a few facilities were constructed. In 1972 a special research and development complex was created for the Marine Corps Tactical Systems Support Activity. In addition, dispensaries and dental clinics were upgraded and a modern correctional center and a shopping center were added at the north end of the Base. In 1974, a 600-bed naval Regional Medical Center was opened, replacing numerous single-story World War II-era structures that had functioned as the hospital for the Base. This new hospital was designed to serve the Marines at Camp Pendleton, the Marine Air Station at El Toro, the MCB at Twenty-nine Palms, the Marine Corps Supply Center at Barstow, and the Naval Weapons Station Seal Beach Detachment Fallbrook at Fallbrook, as well as dependents and retired military personnel**.**

FIGURE 2-9. DESERT STORM
(PHOTO SOURCE: U.S. MARINE CORPS)

From April 1975 to October 1975, Camp Pendleton served as a refugee camp for Vietnamese and Cambodian refugees who had fled Southeast Asia. Over 50,000 refugees were supported in Camps Talega, Cristianitos, and San Onofre. After years of supporting post-Vietnam Cold War training and deployments of Marines, in August 1990, Camp Pendleton was again used to prepare and deploy Marines. Marines from Camp Pendleton were among the first sent overseas to assist in the defense of Saudi Arabia. Through March 1991, when the Camp Pendleton-based 1st MarDiv, supported by the 3rd MAW and First Force Service Support Group (1st FSSG), liberated Kuwait from the occupying Iraqi Army, the Base provided logistic support and received, trained and further deployed mobilized Marine reservists and reserve units.

In more recent times, military operations other than war have increased in frequency and Camp Pendleton-based and trained Marines have been increasingly called upon to assist in

these missions, including Operation *INTERFET*, in East Timor and Operation *ALLIED FORCE*, in Kosovo. As stated in the U.S. Marine Corps (USMC) *Strategy 21* doctrine, "Whether winning our Nation's battles or reducing human suffering due to man-made or natural disasters, the Marines' unique qualities offer the Nation an unparalleled ability to respond to threats or crises, influence world peace, and promote peace and stability."

In March 2003, Marines and Sailors from Camp Pendleton as part of IMEF used skills learned at the Base in their historic drive from Kuwait to Baghdad during Operation Iraqi Freedom. Beginning in 2008, ongoing operations in Afghanistan have required the development of new training programs and facilities at Camp Pendleton to implement lessons learned in sustaining stability and security operations.

FIGURE 2-10. MARINES IN BAGHDAD
(PHOTO SOURCE: SGT. JOSEPH R. CHENELLY)

2.3. CURRENT USE

A variety of land uses occur at Camp Pendleton, however, the priority of Camp Pendleton is, and will continue to be, to provide training and support facilities for active duty and reserve Marine, Navy, Army, Air Force, and National Guard units, as well as other federal, state, and local agencies. Camp Pendleton is host to over 80,000 military, civilian and contracted personnel daily. Annually, nearly 60,000 personnel train at Camp Pendleton, with up to 47,000 service members and their dependents actually assigned-to/living at Camp Pendleton. Additionally, more than 77,000 retired military personnel reside within a 50-mile radius of Camp Pendleton with access to Base recreation facilities, commissary, exchange and medical services.

While some locations and land uses on Base support only one type of activity (e.g., family housing and impact areas), most areas on Base support multiple activities. The following sections discuss the predominate types of land uses on Base: military training, Base infrastructure and mission support (including cantonment and recreational facilities), and real estate agreements and leases.

2.3.1. Military Training

The uniqueness and variety of Camp Pendleton's topography, combined with its contiguous offshore amphibious training areas, its live-fire ranges, and its protective restricted airspace, offer maximum flexibility for establishing realistic combat training scenarios. Camp Pendleton's use of its more than 125,000 ac of land for training includes 31 training areas, five impact areas, more than 100 live-fire facilities, 5 amphibious assault landing beaches, and approximately 230 square miles of Special Use Airspace. While the combat training environment, weapons, and tactics have changed over the years, Camp Pendleton's training emphasis has continued to be *designed to mold young men and women into the Country's finest fighting force*. As a training base, Camp Pendleton must maintain its ability to provide ready, capable Marines in the right place, at the right time, and with the right training for them to survive and accomplish their mission in the uncertain challenges of future battlefields.

Camp Pendleton's role in the modern Marine Corps is summarized by the CMC: "[Bases and stations] provide the means by which we develop, train and maintain a modern force that is prepared to win our Nation's battles. Installations are the platform from which we project expeditionary power by deploying and sustaining Marine Air-Ground Task Forces. They will continue to grow in importance as we fully implement our future doctrine and the '*reach back*' requirements it demands." Camp Pendleton must ensure that Marines, individually and as a unit, are ready to answer the Nation's call, anytime, anywhere.

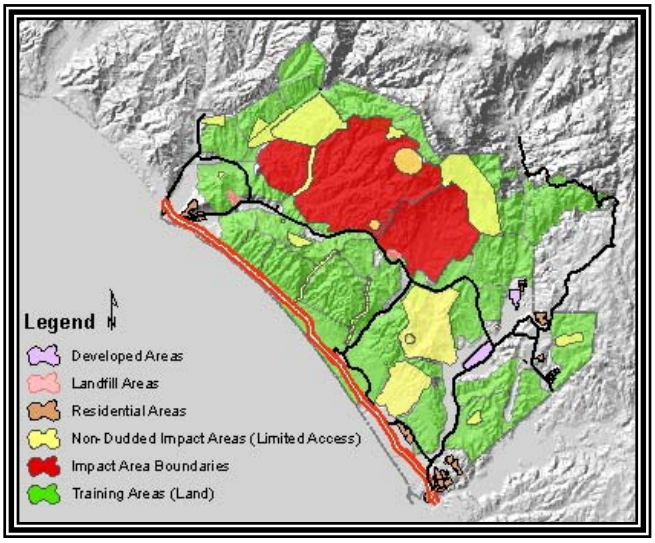

FIGURE 2-11. LAND USE

Marines are required to be trained in all USMC Title 10 mandated requirements and to be combat-ready for global deployment in pursuit of national security objectives. Training activities must include, but are not limited to: amphibious landings, use of tracked vehicles, personnel maneuvers in natural areas and urban/built-up areas, artillery and small arms firing, aerial weapons delivery, engineer support operations, logistics support, field combat service support, communications, airlift support (re-supply) of troops and weapons, equipment maintenance, and field medical treatment.

Camp Pendleton is most heavily used by and structured to support the IMEF. The IMEF is the command element for the 1st MarDiv, 1st MLG, and 3rd MAW. The latter is headquartered at MCAS Miramar. One of the 3rd MAW's four Aircraft Groups, MAG-39, a helicopter Group, is based at MCAS Camp Pendleton. Portions of the IMEF are continuously deployed worldwide to project and protect the Nation's security as directed by the National Command Authority. The Base also supports several specialized schools: Headquarters and Support Battalion, Security Battalion, Amphibious Vehicle Test Branch, and a Reserve Support Unit. Camp Pendleton's training ranges are heavily used, not only by active Marine and Navy units, but also by reserve Marines, Army National Guard, and local community law enforcement agencies.

2.3.1.1. Amphibious Operations

Camp Pendleton's amphibious training operations take place within a variety of offshore ocean training areas that extend the Base's operational capabilities. The waters immediately west of the Base, known as the Camp Pendleton Amphibious Assault Area (CPAAA), contain 294 square miles of amphibious assault training and maneuvering areas, including the seaward portion of restricted airspace area R-2503A and R-2503D. The CPAAA includes an area dedicated to Landing Craft Air Cushion (LCAC) training and operations, as well as the Camp Pendleton Amphibious Vehicle Training Area (CPAVA). No live ordnance is used within the CPAAA during amphibious training operations; only

occasional aviation operations take place within the seaward portion of R-2503A. Extensive Naval surface, subsurface, and aviation operations take place during amphibious training evolutions within the CPAAA. The CPAAA is not an exclusive military-use area and is used daily by commercial and private vessels. Located immediately adjacent to the shoreline is the CPAVA. The CPAVA is used for amphibious operations, simulated dive, glide, and low-level bombing. It also includes an LCAC Transit Lane. No live or inert ordnance is expended in this area.

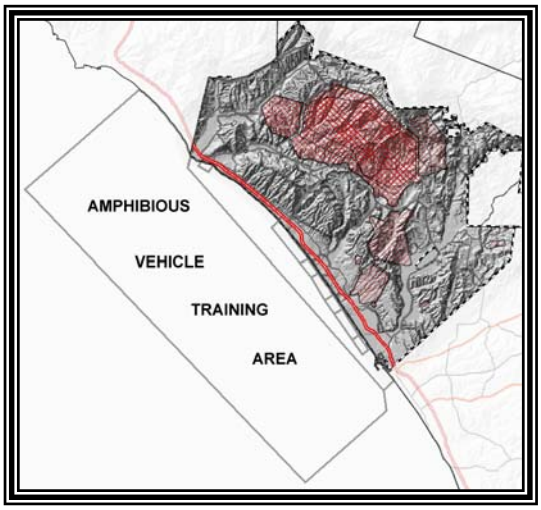

FIGURE 2-12. CAMP PENDLETON AMPHIBIOUS VEHICLE TRAINING AREA

The majority of amphibious assault training activity occurs at Red Beach. Other amphibious assault training can take place at Gold, Green, White, and Blue Beaches. These four beaches, though, have environmental and physical limitations that reduce their effectiveness for training and ingress opportunities. Of the five amphibious landing beaches, Red Beach has the least amount of environmental and physical constraints on training activities.

2.3.1.2. Maneuver Corridors

Proficiency with the variety of military weapons and hardware used by Marines stationed at Camp Pendleton is crucial to the readiness of the Marine Corps and the military training mission of the Base. A key to developing weapons proficiency is ready access to the various firing ranges spread across the Base's interior, particularly those firing positions located around the perimeter of the Zulu, Whiskey and Quebec impact areas located generally in the center of the Base. One of the primary components of accessing interior ranges is the availability of inland transit routes, called maneuver corridors. These maneuver corridors represent key locations where movement of military personnel, equipment and vehicles are facilitated, or at least relatively unrestricted by either terrain, vegetation, man-made constraints (e.g., buildings and developed areas) and/or rigid environmental regulations (e.g., designated critical habitat, sensitive species, archaeological locations, wetlands, etc.).

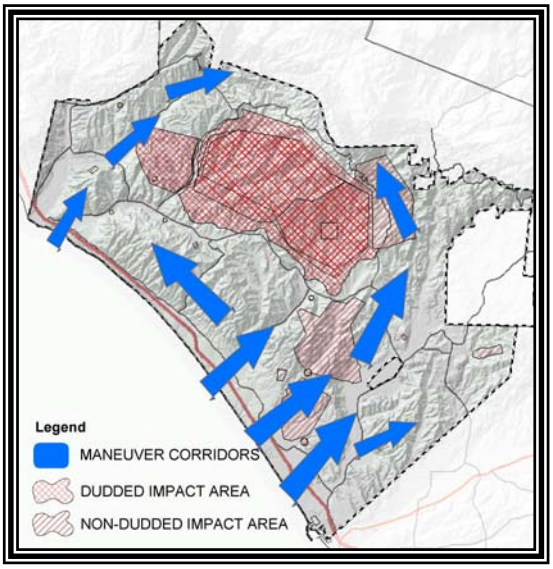

FIGURE 2-13. MANEUVER CORRIDORS

2.3.1.3. Training Areas

Camp Pendleton's 35 training areas and open space lands facilitate the intensive training mandated by Marines to acquire a full range of basic and advanced combat readiness skills, weapons proficiency, and tactical leadership skills. The Base's natural areas are unique and irreplaceable to the Marine Corps because they combine over 17 miles of coastline and extensive, diverse inland training areas. Camp Pendleton is the only west coast Marine Corps facility where amphibious training operations can be combined with elements of Marine aviation and other supporting combat arms to develop, evaluate, and exercise Marine Corps combat doctrine to the fullest extent feasible. The ability to maintain certification of ready Marine Expeditionary Units (MEUs) on the west coast is made entirely possible by the existence of the sea, land, and air training capabilities provided by Camp Pendleton.

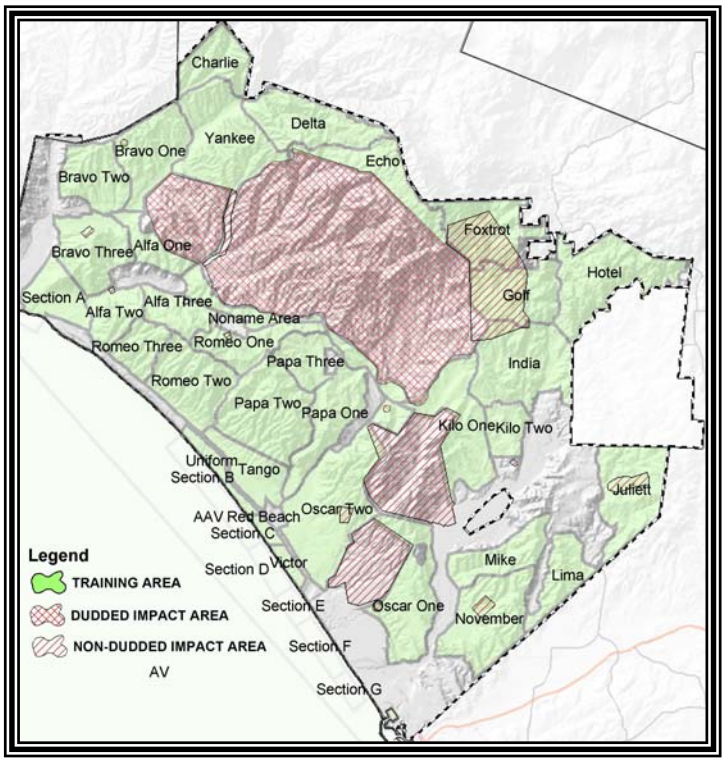

FIGURE 2-14. BASE TRAINING AREAS

Inland training areas consist of nearly 114,000 ac of live-fire ranges, impact areas, and training areas. Camp Pendleton's 31 training areas and ranges are designed to facilitate all phases of combat readiness training - from individual basic warrior (small arms) training to larger company/battalion-sized training operations. Even larger live-fire combined arms training evolutions that include the use of artillery and Close Air Support (CAS) are conducted aboard the Base.

2.3.1.4. Impact Areas

Several locations on Camp Pendleton have been specifically designated for the receipt of live-fire ordnance (projectiles and explosives) and serve as targeting areas for associated live-fire exercises for the various weapons used in training. These locations, designated as impact areas, cover approximately 33,200 ac of Camp Pendleton. Of this amount, nearly 4,200 ac (including the Range 409 impact area and firing Ranges 312A, 313A, and 403) overlap with the training area acreage provided above. Impact areas on Camp Pendleton are classified as either *dud-producing* or *non dud-producing*.

Dud-producing impact areas support the delivery of ground-to-ground and air-to-ground ordnance and may contain unexploded (dud) ordnance. Dud-producing impact areas are designated as the Quebec, Whiskey, and Zulu impact areas. These three impact areas contain most of the live-fire ranges on Base, and are bordered on all sides by safety zones and the remaining maneuver and training ranges.

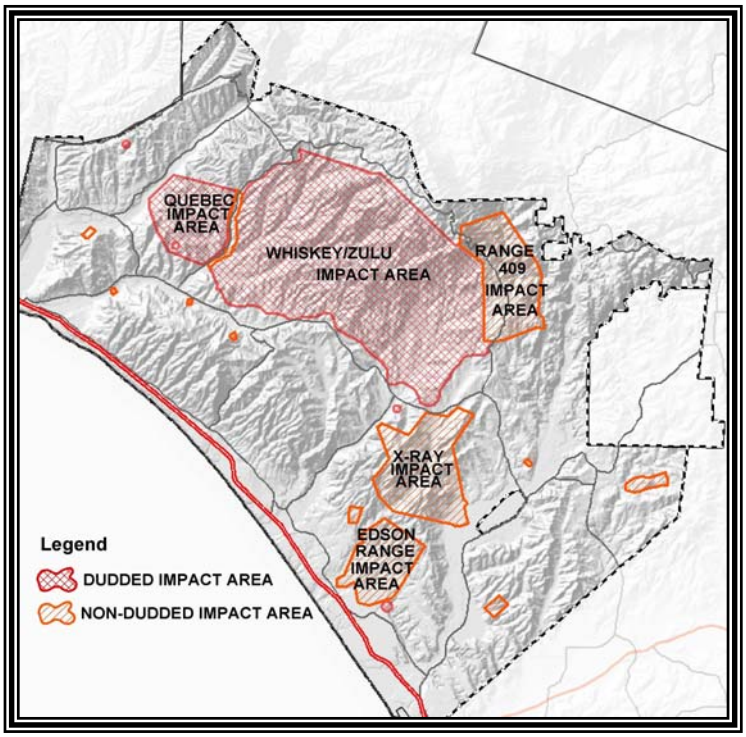

FIGURE 2-15. IMPACT AREAS

No maneuver activities are conducted within the Quebec, Whiskey, and Zulu impact areas, with the exception of transit of Jardine Canyon. Access to dud-producing impact areas is tightly controlled for safety reasons. Wildfire in these areas is not normally suppressed due to safety concerns. Firebreaks are used to contain wildfires in dud-producing impact areas.

Dud-producing ordnance impact areas have been in use throughout the Base's existence. As a result, the Quebec, Whiskey, and Zulu impact areas are off-limits to all ground activities and personnel, unless authorized by the Assistant Chief of Staff Operations and Training (AC/S O&T) and preceded by a safety sweep (locate, detonate, and/or remove) by an Explosive Ordnance Disposal (EOD) team. The most usual exception to this includes transit of Jardine Canyon, but does require EOD validation. Due to safety concerns over the potential presence of unexploded ordnance, the collection of biological information from these three impact areas has been extremely limited. Therefore, active management or survey of resources located in these areas is not conducted.

Non dud-producing impact areas, referred to collectively as "secondary impact areas," support training activities that utilize small arms firing and the use of non dud-producing ordnance in live-fire exercises. Secondary impact areas are scattered across the Base and include: Edson Range, X-Ray impact area, 409 impact area, and firing Ranges 312A (currently inactive), 313A (currently inactive), and 403 (currently inactive) located within the Juliett training area. Upon request, maneuver activities may be conducted within these impact areas.

2.3.1.5. Training Support Facilities

Camp Pendleton has numerous training-related facilities to support the diverse sea and land-based training. These facilities range from Combat Training Towns (CBTs) and rappel towers to designated areas for the use of live fire, explosives, and other potentially

hazardous training. Training facilities in support of aviation operations are discussed in Section 2.3.1.6. below.

LIVE FIRE, EXPLOSIVES, BLANKS, PYROTECHNICS, SMOKE, CHEMICAL MUNITIONS, AND LASERS

Live fire is defined to include the use of weapons or weapon systems that produce projectiles (e.g., small arms, artillery, aviation ordnance, and other dud- and non-dud producing ordnance). For ease of coverage in this document, live fire does not include explosives, pyrotechnics, and other incendiary devices.

Training operations that involve the use of live fire are restricted to impact areas (described above), established ranges, Artillery Firing Areas (AFAs), Mortar Positions (MPs), Mortar Firing Areas (MFAs), and Live Fire and Maneuver Areas (LFAM). The Base currently operates nearly 100 established ranges, 53 AFAs, 7 MPs, 11 MFAs, and 12 LFAM areas.

A live-fire range is a designated area equipped with a variety of targets and monitoring/ scoring devices for live-fire training. These ranges are designed to accommodate a broad spectrum of weapons including pistols, rifles, machine guns, mortars, antitank assault weapons, grenades, missiles, and artillery. Also included are man-portable weapons, vehicle-mounted weapons systems, and rotary and fixed wing aircraft systems. Ranges are designed to simulate combat conditions and scenarios, to train personnel and test the capabilities of weapon systems. As a result, live-fire ranges must be continuously upgraded to keep pace with evolving technology. With few exceptions, the firing ranges are located within and along the perimeter of the impact areas.

AFAs, MPs, and MFAs are designated locations for the firing of inert and explosive artillery and mortar ammunition into the impact areas. AFAs are fairly large and relatively flat areas, usually free of brush and shrubs. MPs are similar but much smaller in area. MFA sites are generally larger than MPs and are used for simulating emergency suppression tactics. Specially designated AFAs are also used in conjunction with live-fire operations by wheeled and tracked assault vehicles. AFA or MP training includes the burning of unused powder and charges, which is conducted in trenches and in accordance with the Range and Training Regulations, equipment technical manuals and operation manuals. There are six nonfiring AFAs on Base known as Reconnaissance, Selection, Occupation of Positions (RSOPs) that are used for AFA-types of training without live fire. RSOPs are also included in Figure 2-16 and they receive training-related impacts (less the firing noise and associated impacts) similar to AFAs.

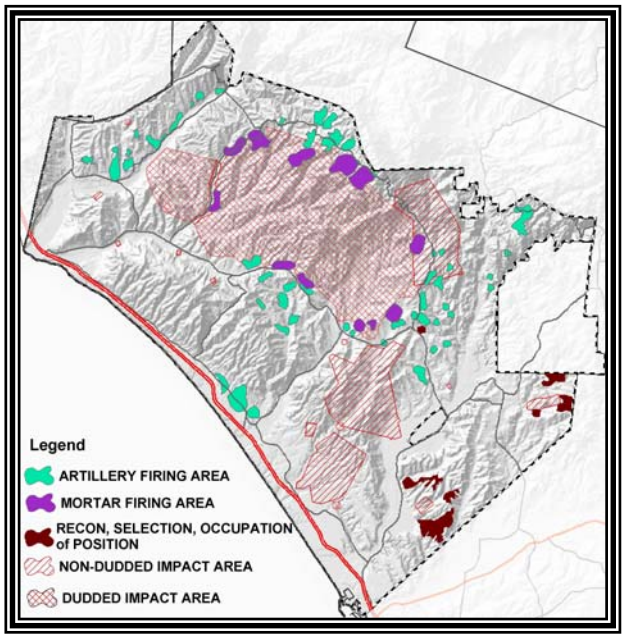

FIGURE 2-16. AFAS AND MPS

MP and MFA sites are located within and along the periphery of the Quebec, Whiskey, and Zulu impact areas. AFA and RSOP areas are located in training areas throughout the Base.

LFAM activities are field-training exercises that practice the coordination of infantry, vehicle, flight operations, and combat service support operations during various offensive assault and attack scenarios. LFAM operations enable personnel to experience realistic, combat-scenario simulations. There are twelve specific locations on Base designated for LFAM operations:

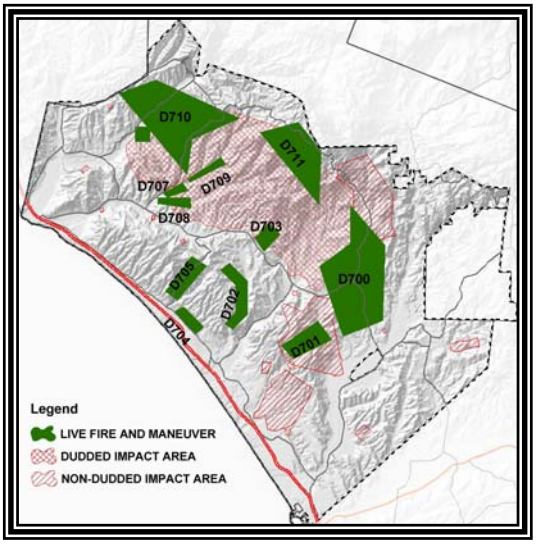

FIGURE 2-17. LFAMS

- LFAM 700 occupies an area that overlaps portions of several training areas, including India, Kilo One, and Kilo Two. This LFAM site has been selected to accommodate battalion-sized or larger units in mobile assault scenarios that integrate infantry, aviation, mechanized, and motorized units with direct, live fire and supporting arms, live fire.
- LFAM 701 occurs within the X-Ray impact area. This LFAM site has been selected to integrate battalion-sized or larger infantry and mechanized, aviation, and motorized assault units with scenarios that include minefield breaching operations and both direct live-fire and supporting arms live-fire.
- LFAM 702 occupies a small canyon situated in overlapping portions of three training areas: Papa One, Two, and Three. This LFAM has been selected to integrate company- and platoon-sized or smaller infantry assault units with LFAM scenarios that include use of both direct live-fire and supporting arms live-fire.
- LFAM 703 primarily occupies lands within the Zulu impact area and is located northeast of Basilone Road across from the ASP facility, including a portion of AFA#10. This LFAM has been selected to integrate company- and platoon-sized or smaller infantry assault units within LFAM scenarios that include both direct, live fire and supporting arms, live fire.
- LFAM 704 occupies an area that lies exclusively within the Tango training area, overlapping with a portion of AFA#14, east of I-5. This LFAM has been selected to integrate company- and platoon-sized infantry maneuver activities within scenarios that include direct live-fire. This LFAM will also integrate mechanized unsupported LFAM attacks.
- LFAM 705 occupies a portion of Horno Canyon that includes parts of several training areas: Papa Two and Romeo One and Two. This LFAM site has been selected to accommodate company- and platoon-sized mobile assault scenarios that integrate both mechanized and motorized units in live-fire, offensive attacks.
- LFAM 706 is primarily situated within a portion of the Quebec impact area, but also includes portions of the Bravo One and Yankee training areas. This LFAM site

has been selected to support platoon-sized or smaller infantry assault units within a live-fire, ambush scenario.

- LFAM 707 is exclusively situated within the Whiskey impact area, near Jardine Canyon. This LFAM site has been selected to support squad-sized infantry units within an offensive range, live-fire scenario.
- LFAM 708 is primarily situated along a hillside overlooking the south fork of San Onofre Canyon, east of the 52 Area near Jardine Canyon. This LFAM site has been selected to support squad-sized infantry units conducting live-fire assault scenarios.
- LFAM 709 is primarily situated along the drainage within the north fork of San Onofre Canyon, east of Jardine Canyon. This LFAM site has been selected to support aerial assaults on a mechanized enemy column using anti-armor weapons systems.
- LFAM 710 occupies a larger region of the northern part of the Base, overlapping portions of several training areas: Bravo One, Charlie, Yankee, Quebec impact area, and the northernmost reaches of the Whiskey impact area, including Jardine Canyon. This LFAM site is designated as LFAM Area #4 and has been selected to accommodate company- and platoon-sized units in mobile assault scenarios that integrate infantry units with direct fire and aerial support live fire, including the use of ordnance.
- LFAM 711 is primarily situated adjacent to Echo training area and includes portions of the Whiskey-Zulu impact areas and its adjoining buffer zone. This LFAM site has been selected to support company-sized units in helicopter insertion of heavy weapons and coordinated, live-fire attacks in an offensive scenario.

Except for hand grenade training (the use of which is designated for specific hand grenade-compatible ranges), use of explosives is limited to demolition training and to simulate battlefield conditions. Typical explosive devices involve trinitrotoluene (TNT), C4, shape charges, 1,700-pound line charges, and demolition equipment. Demolition and explosives training involving quarter-pound blocks of TNT and C4 or smaller may be used on all ranges and training areas (or wherever a unit commander believes is safe), so long as usage complies with the fire danger rating and Base Order restrictions. Larger charges are permitted on Ranges 219 and 600, but require proper approvals for use on any other range or training area. Hand grenade training is restricted to Ranges 109, 202, 307, and 503, and specified Military Operations in Urban Terrain (MOUT) settings.

Blanks are non-projectile firing rounds that may be used with an array of small arms to simulate weapons firing without the safety risks involved with the use of live ammunition. Blanks may be used Basewide in all training areas, so long as usage complies with the fire danger rating and Base Order restrictions.

Pyrotechnics are devices that create smoke and/or light for signaling or illumination (e.g., flares or smoke grenades) or for simulating battlefield conditions. Some devices are designed to produce smoke for targeting or for “self-screening” that is not typically considered pyrotechnics (e.g., white phosphorous, which is used largely for targeting, is not considered a pyrotechnic in the Range and Training Regulations manual). Pyrotechnics and smoke-producing devices are permitted in training areas throughout the Base, so long as usage complies with the fire danger rating and Base Order restrictions.

Chemical munitions used during infantry training refer, almost exclusively, to nontoxic tear gas (2-Chlorobenzalmalononitrile), which is used in designated nuclear, biological, and chemical (NBC) chambers, in CTTs, the MOUT, and throughout training areas, in general.

Camp Pendleton has been certified for the use of a variety of man-portable, vehicle-mounted, and airborne laser-targeting systems generally employed in target designation in ranges and impact areas. Laser systems may be operated only from observation posts and live-fire ranges as specified in the Range and Training Regulations.

COMBAT TOWNS, TRAINING AND IMPROVISE EXPLOSIVE DEVICE (IED) FACILITIES

The base has a variety of enhanced areas for the training of DoD personnel. The 25 Area, 52 Area, Bravo Three, Deluz and the Piedre De Lumbre Industrial Combat towns provide rudimentary facilities for initial MOUT training. The Kilo-2 Area training facility and the Infantry Immersion Trainer (IIT) facility in the San Mateo training area provide enhanced MOUT training utilizing role players, training simulators and video instrumentation for after action review. For backyard training facilities in support of remote units there are the San Mateo and Horno Regimental Urban Facilities (RUF). In support of ongoing training for SOCAL MEUs, there are the Special Operations Training Group (SOTG) Romero 2 and Bravo 2 Hit Sites that provide a facility to train for "in extremis" extractions or raids.

In the Bravo One training area there is the Joint Improvised Explosive Device Defeat Organization (JIEDDO) facility which provides training to DoD personnel in the techniques and tactics in locating, identifying and disposing of IEDs through a myriad of scenarios.

All the above training may use blanks, Simunitions, pyrotechnics and breaching charges.

OBSTACLE COURSES, RAPPELLING TOWERS AND GAS CHAMBERS

Individual skill set training is provided at nineteen obstacle courses, five rappel towers and four gas chambers.

2.3.1.6. Airspace and Aviation Operations

Camp Pendleton's Special Use Airspace consists of four Restricted Areas established to support military training and ground-weapons firing per agreement with the Federal Aviation Administration (FAA). Restricted Areas R-2503 A and R-2503 B are used on a regular basis and are approved for military use from 0600 to 0000, seven days a week, year-round; R-2503 C and D are available for special operations only.

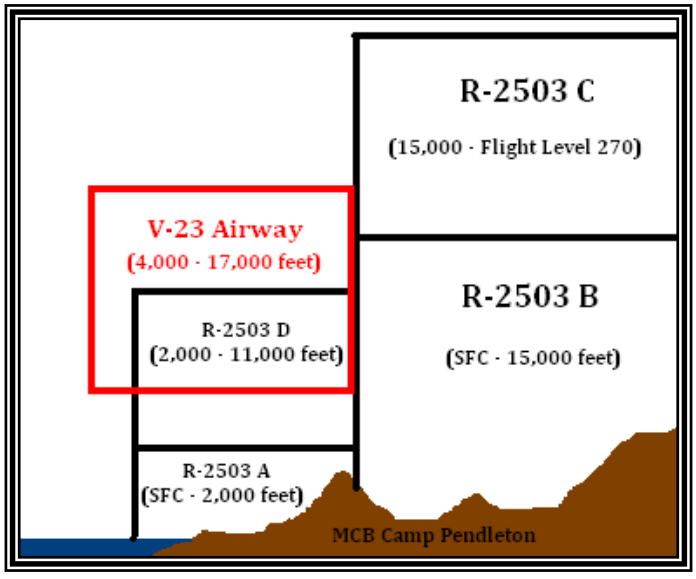

FIGURE 2-18. CAMP PENDLETON RESTRICTED AIRSPACE

Special Use Airspace over Camp Pendleton has been established by the FAA to segregate hazardous military air operations and ground-firing activities from nonparticipating civil aviation operations. Restricted Area R-2503 A overlies the Base's coastal area from the surface to 2,000 ft above mean sea level (MSL) (out to 1 nautical mile offshore); while R-2503 B overlies most of the Base's landmass, including all of its inland training ranges up to 15,000 ft above MSL. The lateral boundaries of R-2503 C and D are consistent with R-2503 A and B, and are available up to 11,000 and 27,000 ft (Flight Level 270) as required. The use of R-2503 D is intermittent by NOTAM (Notice to Airmen) 24 hours in advance, and limited to a maximum use of 20 days per year from 0600 to 0000 hours local time, and no more than 90 days per year between 0001 and 0600 local time. The restricted area is available for joint-use and is scheduled for training operations on an as needed basis subject to the maximum use limits.

As many as five unlawful intrusions from private civilian aircraft into Camp Pendleton's airspace occur each month. MCAS Camp Pendleton, with 8 helicopter squadrons, 180 aircraft, and over 148,000 flight operations annually on a single runway, is the busiest helicopter airstrip in the Marine Corps (at peak periods, a military aircraft, usually a helicopter, takes off or lands at MCAS Camp Pendleton within the R-2503 B airspace every two minutes). Adding to the situation, the commercial airway (V-23) located over the Camp Pendleton coastline is considered the busiest in southern California (see Figure 2-18). At peak periods, a commercial aircraft operates in this airspace every two minutes, as well. The close location of intensively used commercial airspace with Camp Pendleton's Special Use airspace requires constant vigilance and visibility to maintain the mandated airspace training and operational requirements.

Nearly 4,000 personnel and 180 rotorcraft are stationed at MCAS Camp Pendleton. Helicopters participating in flight operations on Base include the Huey (UH-1), Cobra (AH-1), Sea Knight (CH-46E), and Super Stallion (CH-53E). Additionally, the Osprey (MV-22) tilt-rotor aircraft and helicopters from MCAS Miramar routinely operate on Camp Pendleton. On a less frequent basis, aircraft from local Navy installations and ships, Coast Guard stations, Air Force Bases, and Army facilities utilize the aviation training facilities located throughout the Base.

Helicopter flight operations are typically conducted at 200 to 700 ft above ground level (AGL), depending upon the training scenario and the number of aircraft involved. Terrain Flight (TERF) routes (Figure 2-19) afford aircraft low-altitude (50 to 200 ft AGL) navigation training. Aviation live-fire training events are restricted to the designated impact areas. Aviation operations occur year-round at the Base's various aviation facilities.

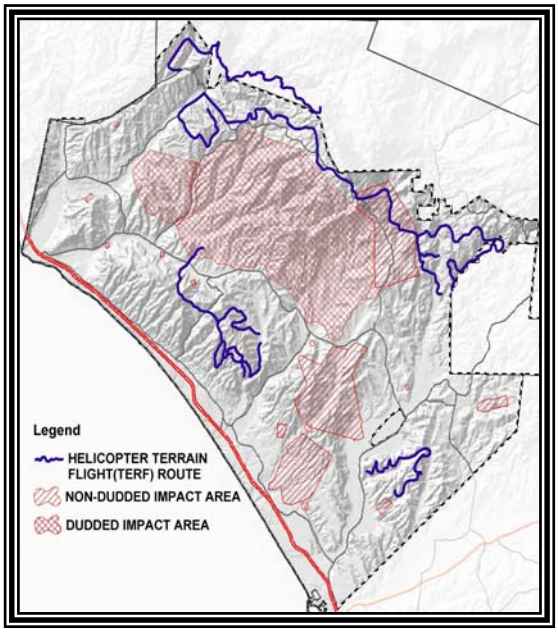

FIGURE 2-19. TERF ROUTES

Aircraft operations include: ordnance delivery (e.g., rockets, gunnery), air-launched anti-armor missile training, night vision goggle training, parachute drops of supplies and personnel, vertical replenishment (VERTREP) from ship-to-shore, external load training, door gunner training, Low Altitude Anti-aircraft Defense (LAAD) training, and TERF route operations. Take-offs and landings are conducted from established landing zones (LZs), Confined Area Landing (CAL) sites, Vertical/Short Takeoff and Landing (V/STOL) pads, the Helicopter Outlying Landing Field (HOLF) and simulated amphibious assault ship flight decks (LHA/LHD Pads).

At present, no fixed wing aircraft are permanently stationed at MCAS Camp Pendleton. However, fixed wing aircraft from MCAS Miramar and Yuma use the Zulu impact area and V/STOL landing areas located across the Base. Fixed wing aircraft participating in flight operations on Base include the Harrier (AV-8), Hornet (F/A-18), Orion (P-3), Hercules (C-130), Globe Master III (C-17), as well as numerous Unmanned Aerial Systems.

Flight operations involving fixed wing aircraft include: Close Air Support (CAS), command and control, air reconnaissance, transport of troops and equipment, parachute operations for the deployment of personnel and equipment, vertical and short take-off and landings, and LAAD training. Fixed wing aircraft, with the exception of AV-8Bs, confine their takeoff and landing operations to the air station. AV-8Bs can perform takeoffs and landings at the V/STOL pad located south of Red Beach, the LHA/LHD pad in the Tango Area, the V/STOL-2 pad in the Oscar Two Area, and the designated Road Operations Area on old Highway 101 east of I-5 in the Tango area. Parachute operations occur within designated Drop Zones. Fighter and attack aircraft conduct CAS activities with live and inert ordnance in the Zulu impact area located in the center of the Base.

2.3.2. Base Infrastructure and Mission Support

A wide range of support activities and facilities sustain Camp Pendleton's military training mission. Similar to local municipalities, the Base provides Marines, Sailors, and their families with support facilities and services, including: housing, water and sewage service, recycling, solid waste disposal, medical and dental services, schools, child care, employment assistance, and recreational opportunities. Providing these support functions in close proximity to housing areas and where Marines live and train is an important factor in maintaining quality of life for Marines and their dependents.

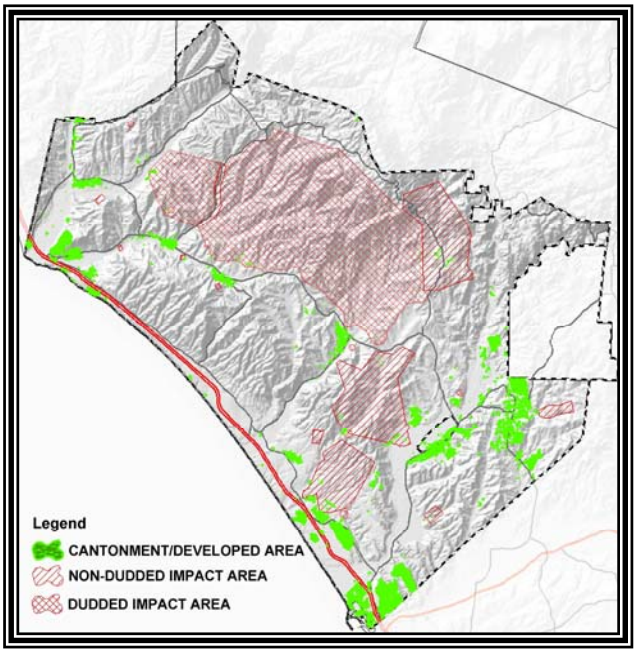

Figure 2-20 Cantonment and Developed Areas

The Base is home to as many as 47,000 residents: 23,000 single service members and 24,000 married service members and their family members. In addition, almost 10,000 civilian workers (e.g., DoD, SONGS, California State Park personnel, contractors) transition on- and off-Base each day. Camp Pendleton currently has more than 2,800 buildings and structures, 530 miles of roads, and nearly 1,000 miles of utility lines Basewide. The current value of Base land and physical assets is over $5.3 billion, not including military equipment and material. These assets are located on approximately 10,000 ac scattered across the Base in pockets of development (Figure 2-20). Much of the infrastructure development of Camp Pendleton, over its 60-plus year history, has occurred on lands previously disturbed by cattle ranching and farming activities that covered approximately 82,500 ac of the former *Rancho Santa Margarita y Las Flores.*

At Camp Pendleton, current and previous Base commanders have restricted infrastructure development to less than 15% of the Base. When additional facilities have been required, the Base's preferred approach has been to refurbish or replace outdated facilities, or to build within existing developed areas. This disciplined land management, coupled with the fact that military training is a relatively low-impact land use, has resulted in the continuing presence of large tracts of natural areas beneficial to the wildlife that occupy Base lands (Wilcove et al. 1998). In marked contrast to the typical development practices found in other parts of the region, Camp Pendleton's experience is that species, both federally listed and not listed, coexist with Base operations and flourish under Base management.

2.3.2.1. Developed Areas

As of October 2011, developed areas (cantonment and housing areas) on Base, not including roads, total approximately 9,400 ac. Cantonment areas are portions of the Base that generally contain infrastructure development (Figure 2-21), including more than 2,800

FIGURE 2-21. CANTONMENT AREA
(PHOTO SOURCE: KEN QUIGLEY)

buildings and other permanent structures. Some portions of designated cantonment areas on Base maps contain open space and may be used for training, recreation, etc. Likewise, designated training areas may contain some buildings and infrastructure development.

Acreage designated as developed areas includes a cultural resource area (*Estancia de las Flores*) and the Marine Memorial Golf Course, adding 180 ac and 331 ac, respectively, to the total.

Seven separate cantonment areas for infantry and artillery regiments and schools are located along Basilone and San Mateo Roads, namely San Mateo, San Onofre, Horno, Las Pulgas, Margarita, Vado Del Rio, and Talega. Two cantonment areas, Las Flores and Edson Range, are located on the coastal plain east of I-5 and three other cantonment areas (Del Mar, MCTSSA, and Assault Craft Unit 5) are located on the coastal plain west of I-5.

The largest concentration of development is in the southwestern corner of the Base. Just east of I-5 at the Oceanside gate, twelve family housing areas and major community support facilities exist, and will include a new Naval Hospital (construction to be completed in October 2014) and Marine Corps Exchange facility (construction to be completed in April 2012). The second largest concentration of development occurs in the southeastern corner of the Base, close to the Fallbrook and San Luis Rey gates, where five family housing areas and major community support facilities exist that include the Naval Hospital (built in 1974), the Chappo industrial area, and MCAS Camp Pendleton. The Del Mar boat basin and an additional family housing area lie to the west of I-5, in the southern portion of the Base. The largest family housing community, Stuart Mesa, consisting of 1,670 homes, is located south of Edson Range, adjacent to the former agricultural field; up to an additional 775 homes are planned for future development in this housing community. San Mateo Point and San Onofre family housing areas and a shopping center are located near the San Onofre gate at the northwestern corner of the Base. Currently, the Base maintains a total of 7,538 standard family residential units, as well as, eight General Officer Quarters and one Installation Commander Quarters. The projected housing end-state for the Base could reach a total of 8,302 family homes.

2.3.2.2. Recreation Areas

The Base recreation program provides a variety of recreational opportunities for Base patrons and the public. Chapter 5 identifies the locations of recreational activities on Base and details the extent of public access allowed for the purpose of fish and wildlife-oriented recreation/education. Many recreational activities occur in cantonment areas (e.g., fitness centers, bowling, and cinemas), on roads or trails (e.g., jogging and bicycling), or training areas (e.g., hunting and camping). Few areas on Base are appropriated for recreational use only. However, the Stepp Stables, the Championship Paintball Park, and the Marine Memorial Golf Course are dedicated solely for those purposes. Although the primary purpose of Lake O'Neill is as an aquifer recharge, the lake also provides recreational opportunities for fishing, camping, and boating. Even the land leased to the California State Parks is not solely devoted to recreational usage because it also is available for training operations, with prior coordination.

2.3.2.3. Roads, Trails, Firebreaks, etc.

Primary and secondary roads, parking lots, and culverts are widely distributed across the Base. Primary roads consist of paved and improved roads, while secondary roads are dirt roads with decomposed granite, gravel, or shale as a surface covering. Of the more than 530 miles of roadways that exist on Base, approximately 103 secondary roads exist. In

addition, the Base has established an extensive network of 76 firebreaks and 22 fuelbreaks, totaling nearly 1,636 ac and covering approximately 187 linear miles (Goodman pers. comm. 2011). A firebreak is any natural or constructed barrier consisting of bladed or disked bare earth used to segregate, stop, and control the spread of fire. A fuelbreak is a natural or constructed barrier that includes mowed or modified vegetation and is used to segregate, slow and control the spread of fire, or provide a control-line from which to work. Fuelbreaks are wider than firebreaks and unlike firebreaks, are not designed to completely stop a fire. As a result, fuelbreaks allow more time for the fire's heat to dissipate before reaching the firefighter.

2.3.2.4. Borrow Sites, Landfills, and Wood Yard

The Base Facilities Maintenance Division (FMD) operates 6 active borrow sites: 20 Area Shale Pit, 62 Area Shale Pit, Stuart Mesa Borrow Site, 22 Area Chappo Site, Three Mile Concrete/Asphalt Site, and the Three Mile Decomposed Granite Pit. An additional 4 borrow sites are inactive: the Piedra de Lumbre Shale Pit, River Road, 14 Area, and One Mile Decomposed Granite Pits; however, they serve a continuing purpose for heavy equipment staging/transfer and clean-fill stockpiling. Borrow sites are used at various times for excavation of fill material or construction projects and maintenance actions such as, the extraction of shale material for use in resurfacing and repairing secondary roadways and unpaved parking lots.

Camp Pendleton also operates and maintains two *active* Class 3 landfills, Las Pulgas and San Onofre, for the acceptance, disposal, and daily capping of non-hazardous, solid waste generated on Base. A third landfill site, the Box Canyon was closed in February 2003. The closure included the installation of a 6 ft. thick evapotranspiration cap. After the closure activities were completed, land use restrictions and long-term post-closure monitoring and maintenance were put in place to assure that the final closure cap performs as designed.

The Base maintains a "wood yard" as a central staging area for woody debris (e.g., tree stumps, logs and limbs), not to include leaf matter, green waste, or lumber/scrap wood. The woody debris within the wood yard, generated from tree trimming, maintenance and construction projects, provide a source of firewood for military personnel, and avoids needless land-filling of this material.

2.3.2.5. Utilities and Fencing

To help maintain this self-sustaining support, the Base maintains and operates the following: 4 sewage treatment plants, 139 miles of gravity and force sewer mainlines, 59 sewage lift stations, 23 water wells, 375 miles of water mainlines, 35 reservoirs, 145 miles of gas lines, 487 boilers, 335 miles of electrical lines, 215 electric substations, 2 landfills and a telephone system. These utilities are separate from those owned and operated by leaseholders on Base (see Sections 2.3.3.3. and 2.3.3.4.).

Underground and aboveground utility lines are located throughout the Base. Aboveground telephone and fiber-optic cables typically follow major roads throughout Camp Pendleton. Within the last several years, there has been significant effort to route and locate underground utility lines within the footprint of existing roads and trails to reduce disturbance to natural areas and restrictions to training operations.

The majority of fences on Base are chain link; however, there are also some barbed wire and wooden fences. These fences are concentrated in developed areas and around facilities, with additional fencing on some portions of the Base and range boundaries.

2.3.2.6. IR Program

There are 62 locations on Camp Pendleton that have been identified as sites where the disposal or discharge of hazardous waste (HW) may have resulted in potential environmental contamination (Figure 2-22). Once identified, these sites are researched, investigated and remediated through the Camp Pendleton Installation Restoration (IR) program. The IR program is designed to comply with procedural and substantive requirements of the CERCLA and the Superfund Amendments and Reauthorization Act (SARA), with regulations promulgated under these Acts and other relevant and applicable federal and State laws including the ESA. Contamination at Camp Pendleton has resulted primarily from past waste disposal practices, many of which are no longer accepted (due to the evolution of environmental regulatory guidelines). These wastes resulted from Base operations, such as maintenance and repair of trucks, tanks, and aircraft. Vehicle fluids and solvents have been the principal wastes generated on Base. Camp Pendleton has grouped its 62 locations into five operable units (OU), based on similarities such as the types of environmental issues, selected cleanup methods, and/or geographic location. Detailed and specific information regarding Camp Pendleton's CERCLA program sites can be found at the Oceanside Public Library.

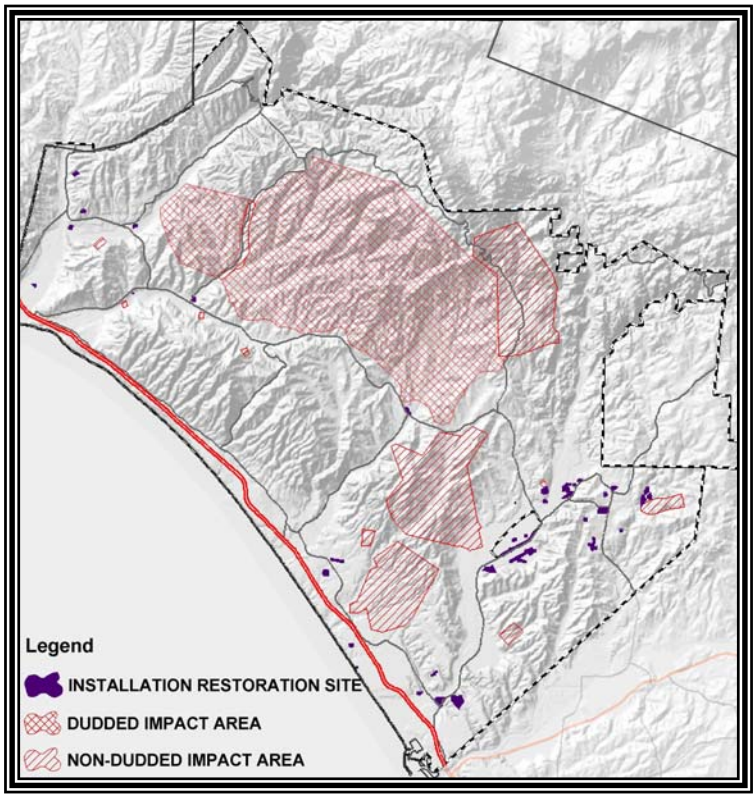

FIGURE 2-22. IR SITES

As required by CERCLA, Section 120 (e), Camp Pendleton has developed and signed a Federal Facilities Agreement (FFA) with the Environmental Protection Agency (EPA) and the State of California for the management, conduct and concurrence of the cleanup process. The Camp Pendleton FFA established an FFA management team consisting of: the EPA, San Diego Regional Water Quality Control Board (RWQCB), California Department of Toxic Substances Control (DTSC), Naval Facilities Engineering Command (NAVFAC) Southwest, and Camp Pendleton. The purpose of the management team is to ensure that all "applicable and/or relevant and appropriate requirements (ARAR)," such as federal, State,

and local standards and regulations (including those for protection of sensitive species) are taken into account and schedules and remedial actions to be taken are established.

CERCLA and EPA guidance further requires that regulatory agencies and the public be informed of the results of studies and investigations as they occur. Input is sought at all stages of environmental investigation and cleanup work, for example, upon completion of draft remedial action plans/proposed plans, record of decision(s) (ROD) or their equivalent. To ensure that EPA, resource agencies, appropriate state and local officials and the general public are provided adequate opportunity to review and comment on assessments/studies and proposals, Camp Pendleton has implemented a proactive public information program and established a Technical Review Committee. Formal public comment periods of at least 30 days have been and will continue to be held as required and will be announced through fact sheets and published notices in the *San Diego Union-Tribune*, *Scout*, and *North County Times.* Following each public comment period, a responsiveness summary will be prepared to document the DoN's responses to significant public comments and explain how public comments have been addressed.

The Technical Review Committee was established in 1991 to review and comment on actions and proposed actions, with respect to releases and to facilitate input from all parties affected by environmental investigation and cleanup. The Technical Review Committee consists of 17 individuals or organization representatives, including representatives from the CDFG, the USFWS, and the National Oceanic and Atmospheric Administration (NOAA). The Technical Review Committee meets as needed, for example, before a major project document is released for review and provides comments and recommendations to the FFA team.

When the FFA team selects a Remedial Action or "no further action" alternative, a ROD or decision document to record the decision-making process is developed. As required by CERCLA, Section 117 (b), notice of a final ROD is published and made available to the public and the Technical Review Committee prior to adopting any Remedial Action or "no further action" alternative. Any significant comments or new data submitted by the public requires a response and must be made available to the public before the commencement of any Remedial Action. The ROD is forwarded to the EPA for concurrence. If agreement is not reached on the selection of a Remedial Action or "no further action" alternative, the EPA must make the selection, ensuring ARARs are taken into account. "No further action" alternatives are selected when investigations and analysis of a site indicates that the site does not possess a risk to human health or the environment.

Provisions followed throughout the IR process ensure close coordination with regulatory agencies and the public. The EPA, the Technical Review Committee and appropriate state and local officials and agencies are given adequate opportunity to review and comment on assessments/studies and proposals. Remedial Program Managers solicit early involvement of other Marine Corps/Navy specialists, including natural and cultural resources personnel to ensure that the ESA, including Section 7, the National Historic Preservation Act, Section 106, and related requirements are identified and the intent of those laws are met.

Camp Pendleton natural resources staff also participate, as appropriate, in the IR process to identify potential impacts to natural resources caused by the release of contaminants, communicate natural resource issues, review and comment on documents and ensure that response actions, to the maximum extent practicable, are undertaken in a manner consistent with the goals and objectives set forth in this INRMP. In addition, natural resources staff review IR maps and documents and coordinate with IR personnel to ensure that potential impacts from environmental contaminants remediation activities are fully considered when planning and implementing natural resource conservation measures on the Base.

2.3.2.7. Petroleum Site Remediation Program

Camp Pendleton has multiple petroleum-based clean-up sites undergoing active remediation, pending remediation, pending closure (no further action based upon completed remedial actions), or site closure is complete. Identification, assessment and remedial actions of petroleum-contaminated sites are managed by the AC/S ES Remediation Branch. The Remediation Branch manages two distinct categories of cleanup sites, RCRA Facility Assessment (RFA) sites and underground storage tank (UST) sites. The RFA sites were identified in response to Camp Pendleton's FFA with State Regulatory Authorities and was completed in June 1993. The RFA study conducted site inspections at 257 suspected contaminated sites throughout Camp Pendleton. Of the 257 inspected sites, 107 sites require further investigation and possible cleanup actions. To date 82 of the 107 RFA sites identified have been investigated, and are closed and/or require no further action (NFA). This includes: 8 Sewage Treatment Plant sites that have been transferred out of the RFA Program, portions of 12 RFA sites that have been transferred to existing UST/IR sites, but are not technically considered RFA sites, 50 RFA sites that have received official closure from the RWQCB, and 12 RFA sites that have been approved for NFA by separate letters from the RWQCB (Murtaugh pers. comm. 2011).

The UST cleanup program was initiated to meet federal and State of California requirements that stipulated any unmodified UST installed before 1988 in California must be upgraded with secondary leak protection, replaced or removed by 22 December 1998. Camp Pendleton met this requirement with a massive tank removal operation. By the end of 1998, 580 USTs from 454 locations were removed. Of the total removed, 266 had failed integrity and released contamination into the subsurface environment requiring future remedial activities. California Code of Regulations Title 23 (Division 3, Chapter 16, Underground Storage Tanks) is the regulatory authority directing cleanup activities. Currently, 243 sites are "closed, with no further action required," while 24 sites remain "open." The open sites are undergoing remedial activities (Storrs pers. comm. 2011 & Murtaugh pers. comm. 2011).

Historically, cleanup actions managed under the Remediation Branch were executed with oversight by two regulatory agencies--the San Diego County Department of Environmental Health (DEH) and the San Diego RWQCB. However, the RWQCB is the sole oversight regulatory authority at this time, as the last "open" DEH site was "closed, no further action" in December of 2004. At the onset of the Remediation Program, the Remediation Branch entered into negotiations with DEH and RWQCB to develop a comprehensive program with the primary objective of protecting the Base drinking water supply. The 266 open sites were prioritized on a scale of one to four, with Priority 1 sites posing the greatest

environmental health threat and Priority 4 sites posing the least threat (see Table 2-1). This prioritization also optimized the allocation of time, money and resources. Furthermore, both RWQCB and DEH have/had environmental agents assigned to the Base as primary representatives for their organizations. This enhanced the flow of information and the effectiveness of the cleanup program since the same core of regulators and AC/S ES personnel interfaced on a continual basis.

TABLE 2-1. UST PROGRAM PRIORITIZATION

Priority Level	UST Site Location
Priority 1	Sites Within 1000 Meters of Production Wells
Priority 2	Sites Within the 22 and 26 Areas (main drinking water production area)
Priority 3	Sites Within 100 Meters of Surface Waters
Priority 4	Sites Located on Mesas

[a] AC/S ES records, Camp Pendleton.

The RWQCB monthly Executive Board Meetings are the primary venue in which the public is notified of UST remedial activities aboard Camp Pendleton. Prior to these meetings, an agenda is mailed to the press, interested public participants and local environmental groups. Planned remediation actions for Camp Pendleton, as proposed in Corrective Action Plans, are included in this notification. This allows interested and concerned citizens to get directly involved in environmental affairs. Also, upon initiation of cleanup activities, public notification signs are posted on-site to give a brief system description and points of contact in case of an emergency or other concerns. Much of the cleanup efforts on Camp Pendleton are conducted within built-up areas. Notifications are made to the Area Commanders, building occupants and the Public Works Office prior to commencement of construction activities. In addition, project kickoff meetings are conducted with all parties that may be affected by cleanup activities.

2.3.2.8. Hazardous Waste Sites

Camp Pendleton has a comprehensive Hazardous Waste (HW) management program. There are 84 HW management sites on Camp Pendleton. One of these sites is a State-permitted storage facility, which allows the Base to accumulate HW for up to one year. The other 83 sites are accumulation sites where HW can be stored on-site for no longer than 90 days according to State regulation. These 83 accumulation sites do not require a State HW Permit; however, they do require a County of San Diego Health Permit, which the Base has obtained.

Although State and federal regulations allow for storage of HW up to one year at the State-permitted storage facility and up to 90 days at the 83 accumulation sites, Camp Pendleton has developed a program requiring all HW be removed from all sites within 60 days of the waste being generated. This ensures that HW does not stay on-site longer than regulations allow. In addition, Camp Pendleton has initiated a program for the contracted pickup and disposal of HW directly from the 83 accumulation sites.

2.3.3. Real Estate Agreements and Leases

A number of long-term leases and easements have become part of the land use on the Base. Base real estate agreements (e.g., leases, easements, assignments) cover approximately 4,350 ac of the Base. These agreements include easements for public utilities and transit corridors, leases to public educational and retail agencies, and State Beach leases. Leaseholder agreements require that each leaseholder comply with any and all applicable federal and State regulatory laws. Some of the real estate agreement acreage is also available to training (e.g., utility corridors and State Beach land).

Future requests for non-military projects and leases on Camp Pendleton will be evaluated, with regards to potential impacts to the Base. Not only will proponents need to identify impacts from construction, but also identify long-term and daily impacts to the Base. Lease reviews will envision Base interests 100 years from now and be implemented by requiring proponents to meet the following conditions:

- Proposal cannot adversely affect training.
- Proposal cannot degrade Camp Pendleton quality of life.
- Proposals must be environmentally non-degrading.
- Proposal must ensure safety of operating forces.
- Construction must be consistent with Base architecture.

Lessees are required to manage the natural resources on the lands leased for their use, consistent with the philosophies and supportive of the objectives of the Camp Pendleton INRMP and Integrated Cultural Resources Management Plan (ICRMP). Each lessee that manages and/or controls use of lands leased from Camp Pendleton (e.g., State Parks and agriculture leases) is required to generate and submit a natural resources management plan for approval by the Base within one year of establishment of their lease or upon renewal. Lessees are also required to identify any activity that may affect federally regulated resources (listed species, wetlands, waters of the U.S., etc.) and provide information and mitigation that may be required to support consultation with the applicable regulatory agency.

2.3.3.1. Agriculture

Various areas on Base are utilized under a lease agreement, for native seed harvesting. However, no agricultural production leases remain in effect on Base; each former agricultural lease specified soil and water conservation practices required to protect and improve land productivity and fertility, a schedule for application of the required practices, and provisions for restoration of the land upon termination of the lease. Conservation measures included erosion control projects, irrigation system upgrades, pest management requirements, fire prevention, debris removal, road damage prevention, and access policies. Additionally, each plan included agricultural and pest management practices that were consistent with State and federal regulatory requirements and the overall goals of the Base per MCO 5090.2A (USMC Environmental Compliance and Protection Manual). Per 10 U.S.C. 2667 and the Navy Real Estate Manual P-73, funds obtained from agricultural leases can be used exclusively for administrative support of agricultural leases and

financing land management programs; funds are specifically restricted from being utilized for mitigation funding and funding of non-land management staff or projects.

LIVESTOCK GRAZING

Historically, the principal land use of Camp Pendleton was cattle grazing. It is thought that livestock grazed the land since the late 1700s. Rancho Santa Margarita once stretched 200,000 ac from Oceanside to Saddleback Mountain, and at its peak 10,000 head of cattle and 250 horses roamed the area, a portion of which is now Camp Pendleton (Ritchie 2007).

At one time, approximately 24,000 ac of land at Camp Pendleton was leased-out for sheep grazing. In 2002, 8,942 ac of sheep grazing outleases were terminated, leaving approximately 15,000 ac available for grazing, however, available land went unutilized until all sheep grazing leases were cancelled in 2003.

ROW CROP PRODUCTION

No active agricultural row crop production is currently permitted on Base. Approximately 6,000 ac total of row crop parcels were leased for farming in the 1940s and 1950s. Even larger areas, as many as 10,000 ac, were farmed before the military purchased the property. The Base has reclaimed all historically farmed acreage over time to support military training requirements. The last remaining lease for row crop production, totaling approximately 300 ac located in the Stuart Mesa area on the west side of I-5, was terminated in 2010.

NATIVE SEED COLLECTION

Contracts have been awarded for the commercial harvest of native seeds on Base since 1988. As part of the harvest lease agreement contractors pay an annual fee for a license to harvest on Base, submit a proposed harvesting plan by the first of the year, and produce quarterly reports to NAVFAC and the Base contract management personnel. The LMB receives native seed bank credit for 15% of the clean seed value per species harvested on Base annually (approximately $50,000 in credit per year). Camp Pendleton uses the seeds for native vegetation restoration, erosion control and ornamental landscaping purposes. The use of seeds grown on Base helps ensure a genetic stock that is adapted to the environmental conditions of the area, and reduces expenses on site restoration.

Over 200 species on 76,550 ac are approved for harvest but no more than 30% of the annual seed crop of a tree, brush, forb, or grass species in any individual location is permitted to be harvested each year. Only 2-3 species will be harvested per area, per harvest season. The harvest must rotate areas from which a species is collected from year to year; no species shall be harvested in the same location for more than one consecutive year. All seed harvesting is done by hand and/or with hand-carried vacuum-type devices. No mechanical harvesting or injury of plants is allowed. The harvesting of endangered, threatened, or proposed endangered or threatened species is regulated through a permit issued by the USFWS. Some native plant species are harvested from October to December, while other species are harvested between April and July. Since seed-collecting activity is conducted on foot, most locations on Base (excluding impact areas) are available for seed collection (Goodman pers. comm. 2011).

2.3.3.2. Public Recreation - San Onofre State Beach

The largest single leaseholder on the Base is the State of California Department of Parks and Recreation, which accounts for approximately 2,000 ac, leased from the DoN on 1 September 1971 for a 50-year term. The San Onofre State Beach includes: 1) 3.5 miles of sandy beaches with six access trails cut into the bluff above; 2) a beachfront campground along Old Highway 101 adjacent to the sandstone bluffs; 3) Trestles and San Onofre surf beaches; and 4) San Mateo campground (see Figure 2-23). The San Mateo campground lies inland within the San Mateo drainage, immediately adjacent to and along the north-side of the creek. State Park-leased areas are used for public recreation. However, with advanced coordination, military training is permissible within the park.

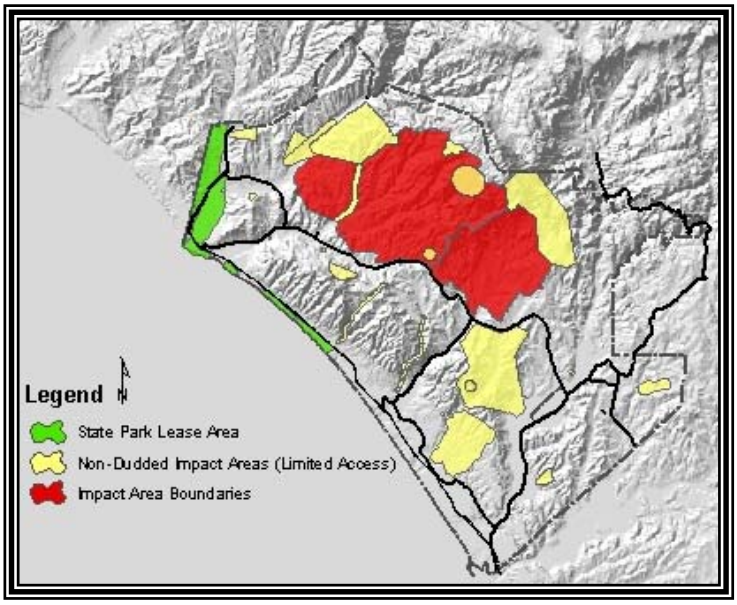

FIGURE 2-23 State Park Lease Area

Lease agreements require that the California State Parks comply with any and all applicable federal and State regulatory laws. The State of California Department of Parks and Recreation has established general management guidelines for their leased lands. These guidelines exist as policy statements within the general plans for each facility operated by the State Park system. These statewide policy statements provide necessary guidance for all staff and visitors for the operation, maintenance, and use of San Onofre State Beach campgrounds, hiking/biking trails, and beaches to ensure protection of natural resources within State Park lease lands. Maintenance operations in the parks include maintaining the existing camping and recreational facilities, landscape maintenance, and erosion control. In addition, the California State Parks is required to conduct its natural resources management consistent with the philosophies and supportive of the objectives of this INRMP. Ongoing coordination and cooperative projects between the Base and San Onofre State Beach are conducted in line with the Base's ecosystem approach.

2.3.3.3. San Onofre Nuclear Generating Station (SONGS)

The SONGS was established on Camp Pendleton in July 1963, when Congress passed Public Law 88-82 directing the SECNAV to grant Southern California Edison (SCE) and San Diego Gas and Electric Company (SDG&E) an easement for the purpose of constructing and operating a nuclear power facility. Unit 1, the first reactor, was completed in 1964. Over the past 36 years, the SONGS facility has expanded to include two more reactors (Units 2 and 3) and more land. SONGS real estate rights on Camp Pendleton are

vested in nine DoN-issued easements and two leases totaling 438 ac. Current real estate grants authorize SONGS to maintain a presence on Camp Pendleton until approximately 2024.

Camp Pendleton is the only DoD installation in the country where a nuclear power plant has been constructed and operated on its property.

2.3.3.4. SDG&E Company (Sempra Energy)

SDG&E, through its parent company Sempra Energy, holds more than 1,300 ac of leases/right of way agreements with the Base for transmission lines and various associated support facilities.

2.3.3.5. Interstate Highway 5 (I-5 Freeway)

An easement of approximately 726 ac has been granted by the DoN to State and federal agencies for operating facilities on Camp Pendleton. It is used for the construction, operation, and maintenance of I-5, along with additional easements for operation of two Interstate rest stop areas, a viewpoint, two California Highway Patrol truck weigh stations, and a U.S. Customs and Border Protection checkpoint facility. All of these easements have been granted in perpetuity.

FIGURE 2-24. I-5 AND RAIL LINE NEAR RED BEACH
(Photo Source: Ken Quigley)

The I-5 freeway stretches along Camp Pendleton's coastal area and is located adjacent to coastal bluffs and undeveloped beach areas. Currently, there are 11 separate underpasses (ingress/egress points) located along the 17-mile Camp Pendleton portion of I-5 that are available for the transition of military personnel, vehicles and equipment from the beachside of I-5 to inland training areas. These narrow underpasses were created during the initial I-5 construction through Camp Pendleton in the mid-1960s, and they currently do not reasonably accommodate today's inventory of USMC tracked and wheeled vehicles.

2.3.3.6. North County Transit District Rail Line and Maintenance Yard

North San Diego County Transit Development Board owns and operates a commuter rail train system between the City of Oceanside (Oceanside Transit Center) and the City of San Diego (Santa Fe Depot). This North County Transit District (NCTD) commuter rail system is also known as the Coaster. NCTD owns and maintains the rail line that runs between the San Diego/Orange County boundary line and the City of San Diego, including approximately 18 miles of rail line traversing Camp Pendleton. The Base rail line segment parallels I-5 freeway along the coastal area of Camp Pendleton. NCTD's railroad corridor

through Camp Pendleton is contained within a 100' right-of-way easement, granted to NCTD in perpetuity by the DoN. It was initially constructed in the late 1880s, 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 is now Camp Pendleton, the alignment of the 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.

As owner of the rail line between the City of San Diego and the Orange County border, NCTD also coordinates and approves use of this rail line by other train operators including the Metrolink commuter rail trains which serve Orange and Los Angeles Counties, Amtrak trains, and Burlington-Northern Santa Fe (BNSF) freight trains. Currently, approximately 54 trains per day pass through Camp Pendleton on this track.

In support of their commuter rail operations, NCTD maintains and operates a 24-hour Commuter Rail Maintenance Facility located on Camp Pendleton. This Commuter Rail Maintenance Facility, located within the Stuart Mesa area of Camp Pendleton, is situated immediately adjacent to NCTD's railroad right-of-way through the Base. Its presence has been authorized by a second and separate easement in perpetuity, granted by DoN to NCTD in 1994. This NCTD easement also supports the operation of a BNSF railroad switching yard located adjacent to the Maintenance Facility. The easement for the NCTD Commuter Rail Maintenance Facility and BNSF switching yard operations totals approximately 20 ac.

2.4. EMMERGENT AND FUTURE TRAINING

U.S. military doctrine requires joint forces capably trained to conduct complex operations at sea and along the coastline, and to project military power ashore over vast distances in ways barely imaginable a generation ago. The Marine Corps, guided doctrinally by "*Marine Corps Strategy 21*" and "*Expeditionary Maneuver Warfare*," charges bases such as Camp Pendleton with providing training resources, particularly land and airspace, that are sufficient to accommodate emerging training requirements (MCBCP 2008).

2.4.1. Future Training Goals

The goal of training is to achieve and maintain a threshold level of combat readiness, in core capabilities for units and sections and core skills for individuals, by accomplishing a series of progressively more challenging training events. The level of challenge for the individual and the unit increases as each training event builds on the preceding ones, from the simple to the complex.

Training requirements are determined by expected future missions. The Training and Readiness (T&R) program, as promulgated in the T&R manuals, focuses on training for the successful accomplishment of MAGTF missions across the range of military operations, including stability operations, contingency operations, and major theater war. It also focuses on operational environments, such as military operations on urbanized terrain (MOUT), extreme environments, and littoral warfare. The operational environment greatly affects how the Marine Corps plans and executes its training and education programs. In particular, the factors of uncertainty, complexity, and the increasing concentration of the

world's population within littoral and urban environments impact the continuum. The combination of these factors results in a marked increase in the number and types of tactical and operational tasks a Marine must be trained to execute.

In its building block approach to training, the T&R program identifies core capabilities and core skills for each military occupational specialty (MOS) and unit to be trained. Core capabilities are the essential collective functions that a unit must be capable of performing during extended contingency or combat operations. Core plus capabilities are advanced functions that are specific to the environment, mission, or theater. Core skills are essential individual skills that enable a Marine to perform in combat and qualify that Marine for an MOS. Core plus skills are those combat-focused skills that are specific to the environment, mission, rank, or billet, and are developed upon a Marine's assignment to an operational unit.

Training requirements for each type and level of training are contained in the T&R manuals, which describe specific training events to be accomplished to achieve combat readiness. These manuals are based on specific performance standards for mission-essential tasks designed to ensure proficiency in core competencies. Using the building block approach to training, T&R events are categorized according to the nature and scope of the training objectives:

- The 1000-level events consist of initial MOS training conducted at formal schools and provide core skill training to Marines of that MOS. Upon graduation, Marines have completed all 1000-level events and are assigned an MOS.
- The 2000-level events occur when a Marine is assigned to an operational unit. This core plus skills training raises the proficiency of the individual Marine and builds upon core skills introduced in formal school. At the completion of 2000-level training, Marines have mastered the core skills in their specialties and are proficient enough in their MOSs to perform in combat. Units will normally train Marines through this level prior to operational deployment or major collective training exercises. This training also includes formal advanced individual MOS training completed at a formal school or on the job, called managed on-the-job training. Many MOSs require Marines to complete follow-on MOS training as they advance in rank and billet responsibility. This training is accomplished at appropriate intervals in a Marine's career.
- The 3000- to 4000-level events, or unit core capability, are collective events conducted at the lower echelons, such as sections, teams, and squads.
- The 5000- to 8000-level events, also called unit core capability, are collective events conducted at the higher echelons, such as platoon, company, battalion, and regiment.

Periodic demonstration of capabilities is required to ensure perishable skills are maintained, so that the unit can accomplish its mission as part of the MAGTF. Proficiency and currency are two measures of training established in the T&R programs. Proficiency is a function of unit capability and individual skill that must be demonstrated to an evaluator. Currency is a T&R event's sustainment interval or period of time within which skills must be refreshed and re-evaluated (USMC 2009).

The infrastructure involved in this training must keep pace with operating force mission requirements and force modernization (USMC 2009).

2.4.2. Future Training Requirements and Capabilities

In order to support I MEF units, formal schools, Navy units, other services and Federal agencies, the Camp Pendleton Range Complex and training support services will have been modernized, expanded, and adapted to attain the following characteristics by 2025:

- Reconfigurable, non-live fire MOUT facilities to support platoon level training, located in the vicinity of the infantry regiment cantonment areas.
- Convoy operations training site to support live fire training, including close air support.
- Mitigated fire danger conditions to open up training opportunities year-round.
- Mitigated environmental restrictions to lessen negative training impacts.
- Improved secondary road network to allow safe dependable access to ranges throughout the year.
- Green and White Beaches available for unencumbered training, with additional access points under the railroad and Interstate 5 (I-5), to the perimeter training areas.
- Red Beach available for unencumbered training with improved access points under the railroad and I-5.
- Expanded range of training support services such as role players, targets, scenarios, and after-action critiques to enhance the training experience while reducing the burden on units conducting training.
- Cleared and revitalized artillery firing area (AFA) 17, with a live fire raid site constructed to support limited size MOUT training with combined arms fires, including close air support.
- Marine Air Ground Task Force (MAGTF) expeditionary command post exercise (CPX) site to support exercises from small to large scale including joint exercises.
- Instrumented training facilities with after-action feedback.
- Integration of unmanned aerial vehicles (UAVs) into training operations.
- Common, FMF-compatible communications systems, avoiding stand-alone systems.
- Adequately funded range support infrastructure, including targetry, sound systems, and lighting, as necessary.
- Recapture of the leased agricultural fields for training.

The training continuum will change as needed to produce Marines who are capable of meeting diverse and challenging operational environments. Tasks, conditions, and standards for future MAGTF training requirements will be driven by anticipated operational contexts and principles employing new systems and weapons, and are characterized by:

- Extended range training operations to exercise capabilities.
- MEB live fire and maneuver exercises.

- Increased requirements for both small- and large-unit MOUT training.
- Significant enhancements to training and feedback/evaluation through instrumented range and target systems.
- Increased reliance on MAGTF sustainment training during deployment.
- Increased joint training.

The training infrastructure identified in Table 2-2 below is recommended in Camp Pendleton's current Range Complex Management Plan (RCMP) to enhance the existing training capabilities of Camp Pendleton.

Table 2-2. Future Desired Training Infrastructure

	Individual Level	Unit Level	MAGTF (MEU) Level	MAGTF (MEB) Level
Gas Chamber	X	X		
Land Navigation Course (17412)	X	X		
Personnel Equipment Drop Zone (17440)		X	X	X
Mine Warfare Area (17905)	X			
Wheeled Vehicle Drivers Course (17906)	X	X		
Tracked Vehicle Drivers Course (17907)	X			
Amphibious Vehicle Training Area (17908)	X			
Air Transport Mockup (17911)	X			
Rappelling Training Area (17917)	X	X		
Road/Airfield Construction Training Site (17918)	X			
Floating Bridge Site (17922)		X		
Water Supply Training Area (17924)		X		
Medium Heavy Equipment Training Area (17931)		X		
Decontamination Training Site (17932)	X	X		
POL Training Site (17933)		X		
Fire Fighting and Rescue Training Areas (17951)	X	X		
Infiltration Course (17981)	X	X		
Confidence Course (17991)	X			
Obstacle Course (17992)	X			
Command and Control/Exercise Support Facility (XXXXX)	X			
Range Operations Building (17310)		X	X	X
Bayonet Assault Course (17901)	X	X	X	X
Range Support Building (17311)	X			
Covered Training Area (17330)	X	X	X	X

The Aviation Training and Facilities Survey, completed in October of 2005, identified the following projects to enhance the future aviation training on Base:

- Insert sustainable aviation targets.
- Insert lighting at the Helicopter Outlying Landing Field.
- Establish additional Landing Zones (LZs) and Confined Area Landing Sites (CALs).
- Repair surfaces and markings of LZs, Heavy Lift LZ, and simulated flight decks.
- Establish a program to remove range debris (USMC 2009).

Camp Pendleton must also advance its effectiveness as the primary training venue for the I MEF-sourced MEUs; time frames for near, mid and far term recommended investments are 1-2, 3-8, and 10-25 years respectively:

- Improve beach access/egress to enhance amphibious training operations: Red Beach (mid term), White Beach (mid term), and Green Beach (long term).
- Refurbish R-800 to provide a company-sized live fire and maneuver range (near term).
- Establish a dedicated maneuver corridor through Aliso Canyon from R-131 to Basilone Road (long term).
- Build an additional Multipurpose Machine Gun (MPMG) range (mid term).
- Build a 40 mm machine gun qualification range (long term).
- Modify R-103 to support combat marksmanship training fully, with built up firing lines inside of the 100 yard line for the entire width of the range (near term) (USMC 2009).

2.4.3. Future Range Availability and Management

Current and future training requirements and the capabilities necessary to support them while preventing encroachment, non-compliance with environmental regulations, obsolescence of range infrastructure and fragmented management are discussed in Camp Pendleton's current RCMP. The specific purposes of the RCMP are to:

- Provide a range complex management plan for use and expansion by the Base staff and external Marine Corps range organizations.
- Provide an inventory and condition assessment of the ranges, training areas and facilities.
- Identify and analyze required capabilities (requirements) shortfalls derived from Fleet Marine Force and formal school's training needs.
- Outline investment needs for range improvement and modernization.
- Identify and analyze encroachment and sustainment challenges.
- Provide recommendations for further environmental planning.
- Develop a strategic vision for range operations with a 25-year planning horizon (MCBCP 2008).

The problems associated with management, maintenance and sustainability of military training ranges have escalated dramatically during recent years due to increasingly complex and multi-faceted range management issues such as:

- Urban and coastal encroachment.
- Air and noise pollution abatement.
- Environmental regulatory and compliance requirements.
- Land use considerations.
- Endangered species and critical habitat concerns.
- Natural resource use, conservation and preservation.
- Competition for frequency spectrum.

- Competition for airspace.
- Stakeholder involvement.
- Munitions management, including UXO.
- Safety for surrounding communities.

According to the current RCMP, of the 435 encroachment impacts identified by Camp Pendleton Range Complex Subject Matter Experts (SME), over 50% of all encroachment impacts were created by just two issues, Endangered Species (30.8%) (see Table 2-3) and the Fire Danger Rating (21.6%). Additional encroachment impacts were created by Cultural Resources (7.4%), UXO/Munitions (5.2%), Frequency Encroachment (0.10%), Maritime Sustainability (3.0%), Airspace Restrictions (6.4%), Air Quality (2.8%), Clean Water (0.05%), Wetlands (10.4%), Airborne Noise (7.1%), and Urban Growth (4.1%) (MCBCP 2008).

TABLE 2-3. SENSITIVE NATURAL RESOURCES IN TRAINING AREAS

Training Areas	Least Bell's Vireo	Arroyo Toad	Stephen's Kangaroo Rat	California Gnatcatcher	Least Tern/Western Snowy Plover	Pacific Pocket Mouse	Rare Plant Sites	Light-footed Clapper Rail	Vernal Pools	Southwestern Willow Flycatcher
Sect. A	X						X			
Sect. B							X		X	
Sect. C	X						X		X	
Sect. D							X		X	
Sect. E					X		X		X	
Sect. F				X	X			X	X	
Sect. G					X		X			
Sect. H					X					
Alpha 1	X	X								
Alpha 2	X	X		X			X			X
Alpha 3	X	X								X
Bravo 1		X		X			X		X	
Bravo 2		X		X			X		X	
Bravo 3	X	X		X						
Charlie		X					X			
Delta		X							X	
Echo							X			
Finch	X	X					X			X
Foxtrot							X			
Golf	X	X	X				X			
Hotel	X	X	X				X			
India	X	X	X				X			X
Kilo 1			X				X		X	
Kilo 2		X	X	X			X		X	
Juliet	X		X	X			X			
Lima	X			X			X			X
Mike	X			X			X			
November	X			X			X		X	
Oscar 1	X	X		X		X	X		X	
Oscar 2	X			X			X		X	X
Papa 1	X			X			X			
Papa 2				X			X			
Papa 3							X			
Romeo 1										
Romeo 2				X			X			
Romeo 3				X			X			
Sierra 1		X								
Sierra 2		X								
Sierra 3		X								
Tango				X						
Uniform				X			X		X	
Victor							X		X	

Camp Pendleton updated its *Wildland Fire Management Plan* in October 1998 (MCBCP 1998). This plan is the Commanding General's intent for guiding wildland fire management and planning decision-making on Camp Pendleton for ten years (1999-2008) (Bieber pers. comm. 2011). It incorporates or modifies many recommendations from previous fire planning documents (plan is currently being revised, and is due to be republished in 2013).

Wildland Fire Management Plan recommendations have been partially implemented on Base; however, three important recommendations have not been implemented:

- Acquisition of or access to a fire-fighting helicopter.
- Obtain a bulldozer module that operates under the management and control of the fire department.
- Hire two 10-person seasonal wildland suppression hand crews.

If implemented, these recommendations could mitigate the adverse effects of the fire danger rating on training. The *Wildland Fire Management Plan* is being reviewed and updated to provide support for the Commanding General's future training goals when republished in 2013.

Additionally, as Camp Pendleton attempts to move aggressively toward range sustainment, it often encounters a fiscal roadblock caused by a lack of funding for National Environmental Policy Act (NEPA) documentation and mitigation. This is brought about because there is no proponent above the installation level that is ensuring adequate funding is available to support the NEPA aspects of range sustainment and encroachment management programs. This situation particularly manifests itself with range improvement or modification projects valued below the Military Construction (MILCON) dollar level. Projects at this lower dollar value level do not include NEPA-related funds. The solution to this situation does not lie within the capabilities of the installation, but should be properly addressed by Regional Commanders to the headquarters level for resolution. Without resolution and a funding line, range sustainment and encroachment management programs will continue to progress out of synch with NEPA documentation and mitigation funding, often resulting in failure of the project to be competed due to a lack of scarce resources, or an unnecessary lag time between project conception and completion, which could be overcome by synchronization of funding for local projects.

Effective encroachment control requires Marine Corps leaders to understand that continued population growth, environmental regulations, and economic development around Camp Pendleton's operational ranges and training areas can create resource (land, air, water, frequency spectrum) uses that are incompatible with current and future military testing, training and general mission activities. To support installation commanders there are programs stipulated in MCO 11011.22B that describe strategies and establish programs pertaining to encroachment control.

Effective management of encroachment requires an encroachment control program within an overarching systematic sustainability process, which includes both scheduled reviews and assessment tasks, whereby both the effects of previously identified encroachment issues and emergent issues can be evaluated. The previously identified issues can be assessed against established baselines to determine increases or decreases in the severity of the various encroachment factors. These issues require processes and actions which identify and evaluate the issue, as required, establish baseline information to be used in future reviews and updated assessments, and initiate consultation actions as required by law.

An effective database retrieval support tool that supports this process is the Installation Capability Assessment and Sustainability Support System (ICAS3). ICAS3 is a web-based application that provides customized tools and interfaces to assist in data collection, analysis, and management of installation resources. ICAS3 resides within the Navy Marine Corps Intranet (NMCI) and is available to installation resource managers. ICAS3 has retained the Training Range Encroachment Information System (TREIS) module, which enables users to generate reports on quantitative impacts of encroachment on training activities. The system is a standalone website managed by the installation. The TREIS module was developed subsequent to the Base's encroachment quantification study titled "Encroachment Impacts to Training and Readiness at Marine Corps Base Camp Pendleton," and is based upon the methodology developed in the study. A component of ICAS3 enables environmental and range managers to collect, and analyze encroachments. In addition, the information contained within the application can be updated and maintained over the long term. ICAS3 also directly links with the GEOFidelis West spatial repository. Future enhancements include interactive links with the Range Facility Management Support System (RFMSS) database to display information on range and training area usage and capacity.

The TREIS module of ICAS3 uses a powerful relational database that links training tasks, as defined by the user, with the installation's operating areas and their associated encroachment factors. ICAS3, in conjunction with the INRMP, assists in assessing and managing the capabilities of Camp Pendleton to support both current and future mission requirements, as well as the sustainment of natural resources to support long-term military land use.

2.5. REGIONAL LAND USE AND CONSERVATION PROGRAMS

Regional land use provides a context for understanding the circumstances under which the Base currently operates and a starting point for understanding its conservation role, as a result of land development trends, regional socio-economics, land planning decisions made by agencies other than the DoD and regional conservation efforts. Understanding regional land uses and conservation efforts also provides a context for predicting future trends. Land use and conservation efforts (or lack thereof) in the region also affect the Base.

Land uses and regional growth over the past 200 years have significantly influenced not only the physical appearance of Camp Pendleton and its environs, but also the ecological setting in which the Base finds itself today. Southern California has a substantial number of federally listed threatened and endangered species, due to the high number of endemic species in southern California and the loss of habitat caused by increasing human population and development. Military installations in southern California, with their requirement for large natural areas for training, are among some of the last remaining places for the region's federally listed and sensitive species. Camp Pendleton has managed to maintain more than 90% of its land as natural areas. By virtue of its land mass, location, and natural areas, Camp Pendleton contributes significantly to the continued survival of the threatened and endangered plant and wildlife species in San Diego County. Of the 48 federally listed threatened and endangered species potentially present in San Diego County, 16 are known to occur on or transit through Camp Pendleton. With dwindling habitat

remaining in the region for many of these species, the Base's resources represent a substantial ecological contribution to the remaining populations and habitats of these species. Within the region, Camp Pendleton represents:

- Approximately 21% of the California least tern (*Sterna antillarum browni*) population breeding in the State (see Base and state figures for the least tern in Appendix F) (Marschalek 2008).
- 11% of the region's coastal California gnatcatcher (*Polioptila californica californica*) populations (Corey et al. 2003).
- Approximately 32% of the region's LBV populations (*Vireo bellii pusillus*) and more than 50% of San Diego County's LBV populations (Corey et al. 2003 & Nevada Hydro Company 2008).
- Approximately 23% of San Diego County's southwestern willow flycatcher (*Empidonax traillii extimus*) population (USFWS 2004b).
- Approximately 64% of San Diego County's breeding western snowy plovers (*Charadrius alexandrinus nivosus*) (USFWS 2007k).
- 75% (3 of 4 sites) of the known populations of PPM (*Perognathus longimembris pacificus*) (USFWS 1998a).
- 80% of the known tidewater goby *(Eucyclogobius newberryi*) populations in Orange and San Diego Counties (USFWS 2011d).
- Maybe the only remaining populations of Arroyo toad (*Bufo californicus*) on coastal plain lands in southern Californian's three major drainages (USFWS 1999a).
- Marine Corps lands (Camp Pendleton and Miramar) represent 88% of the remaining vernal pools in San Diego County. Approximately 95% to 97% of vernal pool habitat in San Diego County has been lost because of cultivation and urbanization (USFWS 1998b).
- Just less than 10% (917 ac of 9,403 ac) of the region's thread-leaved brodiaea habitat (*Brodiaea filifolia*) (USFWS 2004c).

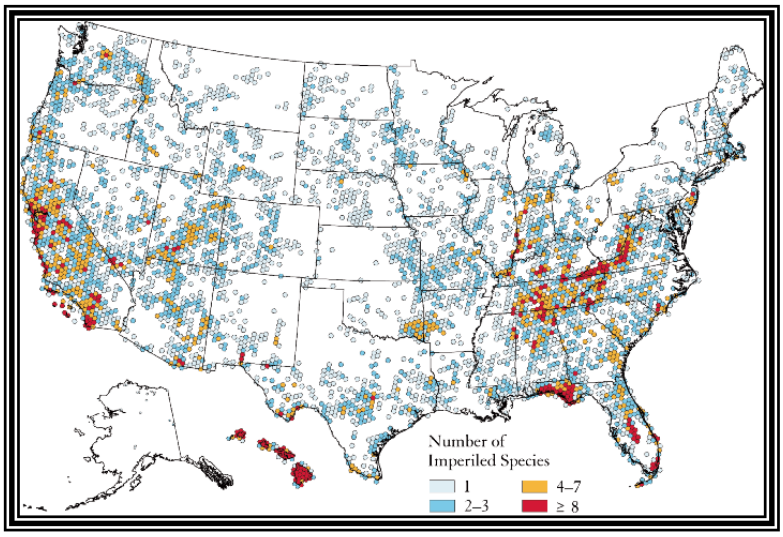

FIGURE 2-25. U.S. DISTRIBUTION OF IMPERILED SPECIES
Figure Source: NatureServe 2008

2.5.1. Adjacent Land Use and Trends

Increasing population growth and the resulting pressure to accommodate more and more people within southern California is the primary driving force for land use and trends in the region surrounding Camp Pendleton. Statewide, more than 38.6 million people currently

live in California, with over 22.5 million people in southern California, including Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura Counties (California Department of Finance 2010). Projected population growth figures suggest the population will continue to grow, with the State population predicted to increase to nearly 44 million in 2020 and 52 million by 2040 (California Department of Finance 2004a). According to a press release (4 May 2004) from the Demographic Research Unit of the California Department of Finance, the top five fastest-growing counties in the State (based on numerical population increases) are Los Angeles, San Diego, Riverside, Orange, and San Bernardino Counties. Southern California (defined using the same counties listed previously) is projected to increase to populations over 24 million in 2020 and 27 million in 2040 (California Department of Finance 2004b).

The southern California landscape is rapidly changing due to the increasing urbanization and unimpeded development needed to support the region's population growth. Urbanization and development pressures have occurred and are expected to continue along the coastal strip stretching from metropolitan Los Angeles to San Diego. Consequences of this urbanization and development include a decrease and displacement of agricultural acreage and open spaces, an increase in habitat fragmentation and isolation, and an increase in the number of native and endemic species and habitats that are becoming threatened with extinction. According to a report by TNC, that tallied all known extinctions in the U.S. state-by-state since the 17th century, California led the list for the continental U.S. with 46 known or suspected extinctions of plants and animals. Dobson et al. (1997) tallied the number of rare and federally listed threatened and endangered species county-by-county across the continental U.S., and San Diego County led the list.

Camp Pendleton and the adjacent Cleveland National Forest occupy some of the last, significant open space and wildlife habitats in the coastal areas of southern California. A two-year research study (Steinitz 1996) conducted as a collaborative effort by Harvard University, Utah State University, National Biological Service, the U.S. Department of Agriculture (USDA) Forest Service, EPA, TNC, and the Biodiversity Research Consortium concluded that "by 2030, urbanization will completely surround Camp Pendleton, with the exception of the Cleveland National Forest (approximately 12 kilometers along the Base's northern boundary) and the Pacific Ocean."

2.5.1.1. Communities of De Luz and Fallbrook

Northeast of Camp Pendleton and south of the Cleveland National Forest is an unincorporated area of San Diego County that includes the communities of De Luz and Fallbrook. Topography and zoning limit the density of development in the vicinity of the Base boundary. This does not limit large tracts of real estate from being developed as a single project, as long as the overall average meets the zoning requirements. De Luz is the closest buildable area to training areas on Camp Pendleton, without any type of buffer to minimize land use conflicts between residential development and military training. Although Camp Pendleton's impact areas are separated from residential areas by space allocated for maneuvers, this space is of limited size. Unfortunately, this leaves room for a potential conflict similar to that which has occurred on the Base's southern boundary near the San Luis Rey gate on Vandegrift in eastern Oceanside. Both the areas surrounding the developed portion and the region to the south of Fallbrook are only partially buffered from

Camp Pendleton operations and noise by the Naval Weapons Station Seal Beach Detachment Fallbrook.

Developments in the De Luz and Fallbrook areas tend to congregate in and around the developed portion of Fallbrook. The remaining planned developments are to the east of Fallbrook, closer to the I-15 corridor.

2.5.1.2. City of Oceanside

The southeastern boundary of Camp Pendleton is shared entirely with the City of Oceanside. The western portion of Oceanside, its commercial district, has grown along with the growth of the Base itself. The types of land uses found in this area are common to both sides of the boundary. A mixture of residential, commercial, and light-industrial areas abounds in Oceanside, as well as in the adjacent southwestern area of Camp Pendleton. New development in Oceanside, which consists mainly of housing and its related entities, has pushed east to previously vacant land and now constitutes a large percentage of the common boundary with the Base.

A large portion of the new development in Oceanside includes residential units adjacent to training areas just south of the Headquarters Area along Vandegrift Boulevard. A review of City records shows that this development is consistent with their existing General Plan.

2.5.1.3. City of San Clemente

The most productive years for housing growth in San Clemente were the 1970s and 80s when 5,433 and 5,746 residential permits were issued in their respective decades. After a severe decrease in residential building activity during the recession of the 1990s, a series of master planned communities and infill multifamily projects boosted housing production in the early 2000s. Between 2000 and 2007, 5,039 homes were permitted to be constructed in San Clemente. The decline in the housing market and the lack of available land contributed to decreased growth in San Clemente's residential sector. In 2009 only 31 residential building permits were issued. The City estimates that 600 new homes will be constructed between 2010 and 2014, primarily in the Marblehead Coastal Specific Plan area.

San Clemente's population increased 27.2 percent from 2000 to 2010. With little undeveloped land remaining in the City, the past trend of population and housing growth cannot continue in the future without the addition of new land areas to the City's jurisdiction. One may, however, think of the long-term trend as the potential population growth, should San Clemente grow its housing stock as it has in the past, either through annexation or intensification of existing housing density.

San Clemente is a built-out community with only 336 ac of undeveloped land designated for uses other than open space. However, much of the acreage that appears to be vacant is actually entitled (projects have already been approved for those sites) through specific plans and development agreements that legally bind the property for certain types of development. Several master planned areas such as Marblehead, Talega, and the Rancho San Clemente Business Park have vacant parcels, but are not considered areas of potential change in the General Plan process because they are entitled.

Most of the City's truly vacant land resources are small infill sites scattered throughout the western and central areas of the community. Small residential parcels are assumed to develop in a fashion similar to their neighboring residential uses. Several vacant sites of various land use designations are located along major corridors, such as El Camino Real, and opportunities for those sites will be explored in the General Plan. The General Plan land use process will also identify key underutilized land resources. Underutilized sites are underdeveloped parcels or deteriorating developments that could be targets for reinvestment and reuse during the 2030 General Plan timeframe.

2.5.1.4. Cleveland National Forest

Roughly 25 percent of the eastern boundary of Camp Pendleton is contiguous with the Cleveland National Forest or holdings of the Bureau of Land Management (BLM) that are virtually uninhabited. This natural area represents an important habitat linkage and wildlife corridor for the Base. The only conflict that occurs in this area is the infrequent Base-entry violations by visitors to the forest. These infrequent violations may be misguided hikers, willful trespassers, vagrants, and/or game poachers. While such occurrences are of a relatively minor concern, they are monitored. Any proposed changes to the wilderness designation of the national forest that would increase access to the area would be of concern to the Marine Corps. Areas with the wilderness designation are closed to all forms of mechanized transportation and are lightly traveled, due to their isolation and limited access.

2.5.2. California's State Wildlife Action Plan

In 2000, Congress enacted the State Wildlife Grants Program in support of state wildlife/ habitat programs for "species of greatest conservation need." In order to receive funding for this program, State wildlife agencies were required to submit a Wildlife Action Plan (WAP) to the USFWS in 2005. The California Department of Fish and Game, in collaboration with the Wildlife Health Center, University of California at Davis, consequently developed the report, *California Wildlife: Conservation Challenges*, the State's Wildlife Action Plan, and associated Web publications. The report was published in 2007 and is available online at www.dfg.ca.gov/wildlife/wap/report.html. The report is concerned with answering three primary questions:

1. What are the species and habitats of greatest conservation need?

2. What are the major stressors affecting California's native wildlife and habitats?

3. What are the actions needed to restore and conserve California's wildlife, thereby reducing the likelihood that more species will approach the condition of threatened or endangered?

The WAP provides guidance and recommendations for Statewide and regional conservation actions, as well as for NCCPs on public and private lands, including military installations. The report discusses the State's wildlife challenges and recommendations from a regional perspective, whereby Camp Pendleton is located in the South Coast Region. This INRMP addresses each recommendation as outlined below.

TABLE 2-4. CALIFORNIA STATE WILDLIFE ACTION PLAN (CSWAP) RECOMMENDATIONS AND CPEN CORRESPONDING ACTIONS

CSWAP Recommended Statewide Conservation Actions	**CPEN Corresponding INRMP Section**
Federal and State agencies should work with cities and counties to secure sensitive habitats and key habitat linkages.	2.5.3. Natural Communities Conservation Planning (NCCP) Programs 2.5.4. Other Regional Conservation and Management Programs 2.6.5. Environmental Encroachment Issues
Federal, State, and local agencies should provide greater resources and coordinate efforts to control existing occurrences of invasive species and to prevent new introductions.	4.3.3.2. Exotics Control 4.3.6.8. Exotic Aquatic Animal Control 4.4.1.3. Invasive Weed Control
Federal, State, and local agencies and non-governmental conservation organizations, working with private landowners, should expand efforts to implement agricultural and rangeland management practices that are compatible with wildlife and habitat conservation.	2.3.3. Real Estate Agreements and Leases
Federal and State governments should give greater priority to wildlife and natural resources conservation education.	5.5. Environmental Education

CSWAP Recommended Region-Specific Conservation Actions	**CPEN Corresponding INRMP Section**
Federal, State, local agencies and private conservancies should safeguard and build upon CPEN's contribution to the regional network of conservation lands.	2.5.3. Natural Communities Conservation Planning (NCCP) Programs 2.5.4. Other Regional Conservation and Management Programs 2.6.5. Environmental Encroachment Issues
To address regional habitat fragmentation, federal, State, and local agencies along with non-governmental conservation organizations, should support the protection of the priority wildlands linkages identified by the South Coast Missing Linkages Project.	2.5.4.3. Buffer Acquisition 2.5.4.4. Santa Ana-Palomar Mountain Linkage 3.3. Landscape Linkages and Wildlife Corridors
Federal, State, and local public agencies should sufficiently protect sensitive species and important wildlife habitats on their lands and should be adequately funded and staffed to do so.	3.2.2. Species and Communities 3.2.3. Fish and Wildlife Species 3.2.4. Federally Listed Threatened and Endangered Species at Camp Pendleton

	3.2.5. Critical Habitat
Federal, State, and local agencies, along with non-governmental conservation organizations, should protect and restore the best remaining examples of coastal wetlands that provide important wildlife habitat.	4.4.1.1. Wetland Management
Federal, State, and local agencies should provide greater resources and coordinate efforts to eradicate or control existing occurrences of invasive species and to prevent new introductions.	4.3.3.2. Exotics Control 4.3.6.8. Exotic Aquatic Animal Control 4.4.1.3. Invasive Weed Control
Federal and State agencies and non-governmental partners should collaborate to institute appropriate fire management policies and practices to restore the ecological integrity of the region's ecosystems while minimizing loss of property and life.	4.4.1.5. Fire Management

CSWAP Recommendations for the Southern Subregion NCCP	**CPEN Corresponding INRMP Section**
Safeguard and build upon CPEN's contribution to the regional network of conservation lands.	2.5.3. Natural Communities Conservation Planning (NCCP) Programs 2.5.4. Other Regional Conservation and Management Programs 2.6.5. Environmental Encroachment Issues
State and federal wildlife agencies should continue to work with the Base to review management success and to renew and update plans as needed.	1.2. INRMP, Coordination, Evaluation, and Updates
Rancho Mission Viejo's currently undeveloped ranch lands (adjacent to the Base's northern boundary) are also important. Opportunities to protect this area include continued conservation planning for the area through the Orange County Southern Subregion NCCP process, purchase of lands by conservation buyers, and collaboration with the USACE Special Area Management Plan to protect and restore the San Juan Creek and San Mateo Creek watersheds.	2.5.3.4. South Orange County Subregional Plan **The Rancho Mission Viejo lands are within the South Orange County Subregional Planning Area. The South Coast Conservation Forum (SCCF) and the Base are aware of these lands and are continuously reviewing opportunities to purchase parcels from willing sellers.*

CSWAP Recommended Marine Region Actions	**CPEN Corresponding INRMP Sections**
The U.S. military should expand their	4.3.3.5. Wildlife Conflict Management

collective efforts to completely eradicate all introduced terrestrial predators (primarily rats and cats) from seabird colonies and roosting areas.	

2.5.3. Natural Communities Conservation Planning (NCCP) Programs

FIGURE 2-26. NCCP REGION

A quick drive on San Diego's freeways makes it easy to understand why, over the past decade, southern California has become a focal point for regional conservation planning efforts that focus on ensuring the continued survival of sensitive plant and wildlife species and their associated habitats. Homes priced well into the millions perched on hilltops, ridge-tops and mesas are readily visible, as well as bulldozers rapidly carving new lots out of the region's vanishing coastal scrub vegetation. San Diego's population has more than doubled in 30 years to over 3 million people. All this is happening in a wildly varied landscape that includes mountains climbing to well over 6,000 feet, deserts dotted with prickly pear, agave and cholla cacti, and a series of coastal mesas covered with rare plant communities, such as CSS, southern maritime chaparral and maritime succulent scrub. This combination of ecological variety, significant endemism, and a human population explosion has resulted in San Diego County having more imperiled species than any other county in the continental U.S. Roughly 200 plant and animal species here are already protected by State or federal law, are candidates for protection, or are considered rare or sensitive. By 1998, development had eliminated 70 percent (City and County of San Diego 1998) of the County's CSS, and more than 90 percent (City and County of San Diego 1998) of other sensitive coastal vegetation communities. Close to 97 percent (USFWS 1998b) of the County's vernal pools (seasonal pools filled by rain that support a very unique community

of plants and animals, including two endangered fairy shrimp species) have been lost due to cultivation and urbanization.

Regional conservation planning efforts that focus on ensuring the continued survival of sensitive plant and wildlife species and their associated habitats have been facilitated by the NCCP Act of 1991 passed by the State of California. The NCCP process was developed to encourage the conservation of natural communities before species within those communities are threatened with extinction. The program is designed to be a voluntary, collaborative effort and its approach represents an ecosystem view.

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 CSS habitat represents an ecological community in southern California with many sensitive species, including the coastal California gnatcatcher, this habitat type became the first focus of the program. The Southern California NCCP planning area includes parts of San Diego, Orange, Riverside, Los Angeles, and San Bernardino 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, based on CDFG criteria and guidelines (Peck 1993). A parallel federal process allows for the development of Habitat Conservation Plans (HCPs). Applicants, consisting of the same non-federal entities that participate in the NCCP process, may receive authorization for incidental impacts to federally listed species under Section 10(a)(1)(A) of the ESA.

There are now seven NCCPs being implemented (including sub-area plans) Statewide, which cover an area of over 2 million ac. An additional seventeen NCCPs are in various stages of development statewide which cover another 1.7 million ac. The finalized NCCPs which are currently being implemented include: 1) Orange County Central-Coastal NCCP; 2) Coachella Valley Multiple Species Habitat Conservation Plan; 3) East Contra Costa County; 4) San Diego County Multiple Species Conservation Plan; 5) San Diego Gas and Electric; 6) San Diego Multiple Habitat Conservation Plan; and 7) Western Riverside Multiple Species Habitat Conservation Plan. NCCPs currently in various planning stages include: 1) Altamont Pass Wind Resource Area; 2) Bay Delta Conservation Plan; 3) Butte County; 4) Desert Renewable Energy Conservation Plan; 5) East Bay Regional Park District; 6) Imperial Irrigation District; 7) Mendocino Redwood Company; 8) Orange County Transportation Authority; 9) Palos Verdes Peninsula; 10) Placer County Conservation Plan; 11) San Diego County Water Authority; 12) San Diego East County Multiple Species Conservation Plan; 13) San Diego North County Multiple Species Conservation Plan; 14) San Diego Joint Water Agencies; 15) Santa Clara Valley; 16) Yolo Natural Heritage Program; and 17) Yuba-Sutter Counties. Table 2-4 summarizes habitat conservation planning in the counties in the regional vicinity of the Base.

TABLE 2-5. HABITAT CONSERVATION PLANNING IN SAN DIEGO COUNTY, RIVERSIDE COUNTY, ORANGE COUNTY, LOS ANGELES COUNTY, AND SAN BERNARDINO COUNTY

Agency	Year Permit Issued	Planning Area (Ac)	Conservation Plan Goal (Ac)	Number of Ac Acquired
San Diego County				
MSCP				
San Diego – Incorporated Subarea Plans & South County Subarea		582,000[b]	171,920[b]	
San Diego MSCP - North County		311,800[b]		
San Diego MSCP - East County MSCP		1,600,000[b]		
San Diego County MHCP	2004[b] (City of Carlsbad only)	111,908[b]	19,000[b]	
San Diego Gas and Electric Subregional	1995[a]	124[a]		
Riverside County				
Western Riverside County MSHCP	2004[b]	1,258,780[b]	505,910[b]	
Coachella Valley MSHCP	2007[b]	1,100,000[b]	745,900[b]	
Orange County				
Orange County Southern Subregion HCP	2007[a]	132,000[a]	32,818[e]	
Orange County Central-Coastal NCCP Subregion Plan	1996[b]	208,000[b]	37,380[b]	57,378[d]
Los Angeles County				
Palos Verdes Peninsula NCCP	2004[b]	8,661[b]	1,428[b]	1,188[c]

[a] USFWS Conservation Plans & Agreement Database; web page http://ecos.fws.gov/conserv_plans/servlet/gov.doi.hcp.servlets.PlanReportSelect?region=8&type=HCP&hcpUser=.

[b] CDFG Natural Community Conservation Planning (NCCP); web page www.dfg.ca.gov/habcon/nccp/status/index.html.

[c] The City of Rancho Palos Verdes, Planning and Zoning, Palos Verdes Nature Reserve; web page www.palosverdes.com/rpv/planning/Palos-Verdes-Nature-Preserve/.

[d] USFWS Journal, Orange County Central-Coast HCP Gets a Big Boost from Land Donation; web page www.fws.gov/FWSJournal/regmap.cfm?arskey=28824.

[e] USFWS – Orange County Southern Subregion HCP (USFWS 2011f).

2.5.3.1. Multiple Species Conservation Program

In 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. In December 1996, the CDFG and the USFWS approved a habitat plan that encompasses 582,243 ac and establishes a minimum of a 171,920 ac preserve system in southwestern San Diego County. This subregional plan covers 85 species of plants and animals and 23 vegetation types.

The original MSCP encompassed eleven participating jurisdictions that are in various stages of Subarea Plan development. To date, approved subarea plans include the City of El Cajon, Santee, Poway, Chula Vista, and San Diego (CDFG 2009a).

Habitat conservation efforts within the City of San Diego's MSCP preserve area, referred to as the Multi-Habitat Planning Area (MHPA) were focused on acquiring critical areas of sensitive habitat and securing wildlife corridors with the MHPA and initiating monitoring efforts. The City's MSCP study area includes 206,124 acres within the City's jurisdiction. The City's planned MHPA totals 56,831 acres, with 52,012 acres (90%) targeted for preservation (approximately 30% of the planned regional preserve) (City of San Diego 2011).

Since the inception of the MSCP, the County and its partners have conserved through acquisition, dedication of easements and baseline preserve of 68,573.41 ac of land. An additional 14,125.5 ac of land have been acquired outside the designated preserve boundaries. These additional lands, while within the Planning Area, are outside of the MSCP preserve boundary and will not count toward the County's 98,379 ac requirement (County of San Diego 2005 & 2010).

North County MSCP Subarea Plan: The County of San Diego is developing a subregional plan that will expand the original MSCP to the northern part of the unincorporated area and is referred to as the North County Subarea Plan. The North County MSCP includes the unincorporated County lands in the northern part of the County, including the areas around Ramona, Rancho Santa Fe, and the unincorporated areas around the cities of Oceanside, Encinitas, San Marcos, Vista, and Escondido, east to the Cleveland National Forest and north to the county line. This stand-alone plan intends to cover 63 species, many of which were covered in the existing MSCP Plan, as well as some additional species. Additional species most notably covered have been the SKR, which lives in grasslands, and the San Diego fairy shrimp which inhabits vernal pools (County of San Diego 2009).

East County MSCP Subarea Plan: The third phase of the County's MSCP will involve all of the land not included within the first two phases. The East County Study Area covers approximately 1.6 million acres in eastern San Diego County. The County only has land use authority over private parcels which account for approximately 27% (418,930 acres) of the Study Area. This portion of the Study Area is referred to as the Plan Area. The Plan Area includes the backcountry communities of Central Mountain, Cuyamaca, Descanso, Pine Valley, Desert/Borrego Springs, Julian, Mountain Empire, Boulevard, Jacumba, Lake Morena/Campo, Potrero, Tecate, portions of Dulzura, and Palomar/North Mountain (County of San Diego 2009b). The County of San Diego has authorized baseline information-gathering to support planning for this subarea. Currently a large number of

species are being considered for inclusion (250+), however, the County intends to narrow this list using a variety of criteria.

2.5.3.2. San Diego MHCP

The MHCP is a comprehensive habitat conservation planning process developed to address multiple species needs and the preservation of native vegetation residing within the northwestern portion of San Diego County (cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, and Vista). The SANDAG Board of Directors approved the MHCP on 28 March 2003. The MHCP study area encompasses 111,908 ac of which 29,962 ac is natural habitat, and provides conservation for 77 rare, threatened, or endangered species (48 animals and 29 plants) within a proposed 19,000 ac reserve. Although SANDAG developed and coordinated the MHCP for these North County cities, it will be implemented through individual subarea plans prepared by each local jurisdiction. This 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. Currently, only the City of Carlsbad Habitat Management Plan has been approved (15 November 2004) and State and federal permits issued to implement the plan. The remaining cities' subarea plans are still in development.

2.5.3.3. 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 (in 1995). The project provides coverage for 110 plant and animal species and emphasizes avoidance of impacts. The plan establishes mitigation requirements that may include re-vegetation or use of up to 240 ac of mitigation credits, set aside in several land parcels purchased by SDG&E as a mitigation bank. SDG&E's fee-owned rights-of-way and easements may play an important role in the NCCP region in providing habitat connectivity in areas where little natural habitat remains.

2.5.3.4. South Orange County Subregional HCP

The Orange County Southern Subregion HCP was approved by the USFWS in 2007. This southern subregion of Orange County is one of the eleven NCCP subregions, within the five-county southern California ecoregion, that has been identified by the southern California NCCP program to focus on CSS conservation. The South Orange County Subregional Plan set aside 32,818 ac of a variety of habitats (e.g., CSS, grasslands, and oak woodlands) within the County of Orange, Rancho Mission Viejo and the Santa Margarita Water District (USFWS 2011f).

The Orange County Southern Subregion HCP 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. Currently undeveloped lands in Rancho Mission Viejo adjacent to the Base's northern boundary are ecologically important because they constitute a core block of habitat continuous with Camp Pendleton's open space and create continuity with portions of the Cleveland National Forest, and other smaller conservation lands belonging to the National Audubon Society and Caspers Regional Park. This area also encompasses two of the largest watersheds in Southern California, the San Juan Creek and San Mateo watersheds. Opportunities to protect this area include continued conservation planning for

the area through the Orange County Southern Subregion HCP process, purchase of lands by conservation buyers, and collaboration with the USACE Special Area Management Plan to protect and restore the San Juan Creek and San Mateo Creek watersheds. The South Coast Conservation Forum (SCCF) is aware of the Rancho Mission Viejo property and will continue to review opportunities to purchase lands from willing sellers. Camp Pendleton will work with SCCF partners to determine if acquisition of these lands for conservation purposes is feasible (CDFG 2007 & USFWS 2011f).

2.5.3.5. 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 37,380 ac in a 208,000 ac planning area. The plan protects significant areas in 12 regional habitat types and covers 39 different sensitive plant and wildlife species, some of which are California's rarest and most sensitive animals and plants. Reserve lands are managed and monitored by the Nature Reserve of Orange County.

2.5.3.6. Western Riverside County Multi-Species HCP

The County of Riverside has developed a regional conservation planning and management program for western Riverside County, in cooperation with all county stakeholders, including landowners and State and federal resource management agencies that are part of the Western Riverside County Integrated Planning (RCIP) program.

The RCIP program provides a framework that affects future decisions on land use, habitat conservation, and transportation planning. The decisions addressed require 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 MSHCP, and 3) identify transportation corridors to solve the County's future transportation needs.

State and federal regulators approved Riverside County's MSHCP on 22 June 2004, issuing permits required to implement the plan and proceed with creating a reserve system in Western Riverside County. The Western Riverside MSHCP is a comprehensive, multi-jurisdictional HCP focusing on conservation of species and their associated habitats in Western Riverside County. The MSHCP Plan area encompasses approximately 1.26 million ac (1,966 square miles) and will create an MSHCP conservation area in excess of 500,000 ac and focuses on the conservation of 146 species. The core area reserves include habitats such as riparian, oak woodland, and 15,000 ac of CSS. The MSHCP conservation area includes approximately 347,000 ac on existing Public/Quasi-Public lands and approximately 153,000 ac of additional reserve land. It includes all unincorporated Riverside County land west of the crest of the San Jacinto Mountains to the Orange County line, and the jurisdictional areas for the cities of Temecula, Murrieta, Lake Elsinore, Canyon Lake, Norco, Corona, Riverside, Moreno Valley, Banning, Beaumont, Calimesa, Perris, Hemet, and San Jacinto.

2.5.4. Other Regional Conservation and Management Programs

Other local, state and federal entities are developing ecosystem-based natural resource conservation and management plans similar to, but independent of, the State NCCP

process. Playing a major role in regional planning efforts are the many federal installations scattered across the southern California landscape. Local DoD installations such as MCAS Miramar, Camp Pendleton and other DoN installations, have been continually active in resource management activities throughout their history in the region. However, these installations have been moving forward in their efforts to move from a species-by-species resource management approach toward a more landscape-scale, ecosystem-based approach. The development and implementation of INRMPs are major steps in that process. The four national forests in the South Coast Ecoregion are working together to develop updated forest management plans, so that all national forests in the region take a similar approach to resource management.

2.5.4.1. DoD Installations

As noted in Section 1.3., DoD lands are used for a wide variety of purposes, including munitions testing, deployment of weapons systems, combat training, recreational opportunities (e.g., hunting and fishing) and agriculture. Designated airspace is used to train pilots and test fighter planes and air-based weapons systems. The DoD is also steward for some of the nation's most important biological resources. Many installations include substantial areas where natural ecological communities have not been significantly altered, in contrast to surrounding areas where landscapes often have been converted as part of urbanization or for agricultural purposes. These natural areas may be particularly diverse and rich in species and habitats. This is especially true in San Diego County, where DoD installations such as Camp Pendleton, MCAS Miramar and Naval Weapons Station Seal Beach Detachment Fallbrook contain a majority of some remaining native species and habitats once prevalent throughout San Diego County (e.g., 80-85% of remaining vernal pools, 75% of known sites supporting PPM, more than 50% of LBV locations, etc. [see Section 2.4.]).

On DoD installations valuable regional biological resources remain due to the mission requirement for large contiguous natural areas for training, or as buffer/safety areas around critical facilities such as airfield and ordnance storage areas. Various regionally important habitat types occur on these installations, and thus a significant quantity and quality of locally rare, state-sensitive and federally listed plant and animal species are present. Additionally, DoD lands provide valuable regional habitat linkages. For instance, the area from the Santa Ana Mountains of the Cleveland National Forest to the southern California coastline on Camp Pendleton provides linkages necessary to connect habitats of southern Orange County with those remaining open space lands identified in the MHCP in northern San Diego County (see Section 3.3.).

As described in Section 1.3.3. DoD has adopted an ecosystem-based philosophy and approach to managing the various natural resources found on its many military installations, and under the Sikes Act is preparing, developing and implementing INRMPs that are installation-specific. These INRMPs will promote the use of DoD resources in a manner consistent with the DoD's mission, while ensuring the continued conservation and survival of the region's dwindling sensitive species and habitats. The combination of partnership, development and integrated planning provides a means for integrating biodiversity conservation with existing military activities and other regional conservation initiatives surrounding the installation. To support regional planning efforts and incorporate

the philosophy, standards, guidelines and goals of ecosystem management within its resource management programs and processes, INRMPs address large-scale, landscape planning and management efforts on military lands.

2.5.4.2. National Forests

The national forests of southern California include over 3.5 million ac of federally managed public land--extending from Big Sur (a region of the central California coast), to the north and the international border with Mexico, to the south. These lands constitute four of the most urban-influenced forests in the total national forest system. They serve as an open space, visual backdrop, recreation destination, and natural environment for a diverse, urban population of over twenty million people who live within an hour's drive of any one of the four forests.

On a regional scale, the forests:

- Provide habitat for 31 federally listed threatened and endangered animals, 29 federally listed threatened and endangered plants, 34 USFS sensitive animals and 134 USFS sensitive plants.
- Offer a variety of outdoor recreation opportunities in settings ranging from coastal shoreline to rugged canyon and mountain areas.
- Play an important regional role in maintaining large blocks of wildland habitat within one of the most highly urbanized landscapes in the U.S.
- Contain diverse habitats important to maintaining well-distributed populations of native and desired nonnative plant, fish and animal species.
- Contain areas that are the only remaining habitat "refugia" for species imperiled by the loss or degradation of habitat.

In September 2005, each forest issued their Revised Land Management Plans (USDA 2005). These land management plans were prepared according to the requirements of the National Forest Management Act, NEPA, and other laws and regulations and replaced land management plans for the southern California forests that were approved between 1986 and 1989. The Forest Plans provide a strategic framework for management of the national forest over the next several years. The preparation of the Forest Plans, and accompanying Final Environmental Impact Statements (FEIS), was underway for over five years, as a joint effort between the Angeles, Cleveland, San Bernardino and Los Padres Forests in southern California. The land management plans for the southern California national forests describe the strategic direction and provide broad program-level guidance for managing the land and its resources. Land management plans do not make project-level decisions, nor do they contain commitments to implement specific projects. Those decisions are made after more detailed analysis and further public comment. Site-specific project decisions must be consistent with the land management plan, unless the plan is modified by amendment.

2.5.4.3. Buffer Acquisition

Through the National Defense Authorization Act for Fiscal Year 2003, Congress granted the authority to military departments to partner with NGOs and state and local governments to acquire land adjacent or proximate to military installations, to prevent incompatible

development and preserve habitat that may eliminate or relieve current or anticipated environmental restrictions that could interfere with military training, testing or operations. Camp Pendleton is active in a partnership effort, the South Coast Conservation Forum (SCCF), to investigate opportunities to acquire an interest in lands that could assist in the conservation of many of the federally protected species in the region and achieve the maximum potential of the authorization provided in the 2003 National Defense Authorization Act. Participating in the SCCF are representatives of the State of California, Orange, Riverside and San Diego Counties, San Diego State University (SDSU), and non-governmental conservation organizations (e.g., The Nature Conservancy, Trust for Public Land, Sierra Club, Fallbrook Land Conservancy, and Endangered Habitats League). Though driven by differing concerns and motivations, these groups quickly found common purpose for acquiring lands available from willing sellers, to support compatible land use and help achieve both encroachment relief and resource conservation objectives.

One of the common goals of the SCCF and the Base is acquiring land and/or conservation easements that support the Santa Ana - Palomar Mountains Linkage Plan. This linkage is the last remaining habitat connection to inland areas of the South Coast Ecoregion (see Section 3.3). Preserving this connection would also serve to reduce the need for additional listings of species in the future, conserve watershed values, buffer the Base from incompatible land uses, etc. Loss of this linkage is predicted to result in the extirpation of mountain lions on Base (Luke et al. 2004) with possible repercussions to a variety of species throughout the ecosystem.

2.5.4.4. Santa Ana – Palomar Mountain Linkage

Camp Pendleton is at the western end of the Santa Ana – Palomar Mountains Linkage Project area (Luke et al. 2004). Scientists and conservationists have long recognized the ecological value of natural lands in the Santa Ana – Palomar Mountains region. Drawing on decades of research and localized planning efforts, SDSU Field Station Programs and South Coast Wildlands targeted the area for further planning to address ongoing habitat loss that threatened existing conservation investments and ecosystems processes. This planning effort for the Santa Ana – Palomar Linkage (called the South Coast Missing Linkages Project) was instigated by the Field Station Programs as part of a conservation planning initiative and involved a coalition of agencies, universities, and organizations dedicated to securing a network of wildlands in the South Coast Ecoregion.

The Santa Ana – Palomar Mountains Linkage was determined by the South Coast Missing Linkages Project to be critical for sustaining a regional network of interconnected wildlands in the South Coast Ecoregion. The area contains the last remaining natural habitats that connect the Santa Ana Mountains and the coastal lowland areas of Camp Pendleton to an inland chain of largely protected mountain ranges (Palomar, San Diego, San Jacinto, and San Bernardino mountains). Rugged foothills, plateaus and drainages in the linkage support a diversity of habitats including grasslands, coastal scrub, chaparral, and oak and riparian woodlands. The Santa Margarita River, which winds through the linkage, is the longest intact free-flowing riparian corridor in southern California.

The Santa Ana – Palomar Mountains Linkage represents an opportunity to protect a truly functional landscape-level connection. The cost of implementing the vision created by the

plan will be substantial, but this cost is small compared with the benefits to existing conservation investments and long-term viability of ecosystem processes. When implemented, this plan would not only conserve valuable habitats and ecological processes between the Santa Ana and Palomar Mountains, but also large-scale ecosystem processes essential to the continued integrity of existing conservation investments throughout the South Coast Ecoregion.

In support of the South Coast Missing Linkages Project, the SDSU Field Station Programs and South Coast Wildlands jointly developed the methods and analyses for identifying key lands necessary to preserve the connection. In a prioritization analysis designed to assess the biological importance and vulnerability of habitat linkages in the South Coast Ecoregion, the South Coast Missing Linkages Project identified the Santa Ana – Palomar Connection as one of 15 linkages of crucial biological value that is likely to be compromised by development projects, unless immediate conservation action occurs. The conservation plan for the Santa Ana – Palomar Mountains Linkage provides valuable support for local conservation efforts (e.g., Natural Community Conservation Planning) by identifying landscape-level connections and ecoregion processes necessary to sustain the local biodiversity within smaller planning areas.

Conservation planning for the linkage was based on the needs of 20 focal species identified as indicators of linkage function by biological experts at regional workshops. Species included 3 plants, 4 insects, 2 amphibians, 2 fish, 2 reptiles, 4 birds and 3 mammals. This diverse taxonomic group was chosen so that linkage planning could capture the broadest possible array of movement needs for all species in the planning area. These species preferred a variety of habitat types, represented many dispersal modes and abilities, and varied in their susceptibility to human barriers. They were specifically chosen based upon their sensitivity to habitat fragmentation or loss in the linkage area, rather than their current status of endangerment. Focal species were subjected to GIS-modeling analyses to identify the best remaining habitats in the linkage area that support movement needs between the Santa Ana and Palomar Mountains. Analyses included the following:

- Permeability analysis was used to model the relative cost of travel (based on species responses to vegetation, road density, elevation, and slope) for selected focal species to move between protected Core Areas. Combining output results for the 8 focal species that were modeled identified an area with the lowest cost of travel (Least-Cost Union) for these species in the linkage planning area.
- Patch size and configuration analyses further evaluated whether distribution and size of suitable habitat in the Least-Cost Union would allow focal species to successfully travel, either inter- or intra-generationally, between the Santa Ana and Palomar Mountains. These analyses were conducted for all 20 focal species. In areas where the Least Cost Union was inadequate to meet species needs, the boundaries were modified.

The final Linkage Design is a band of habitat roughly 4 miles wide and 16 miles long that extends from the Cleveland National Forest-Trabuco Ranger District, Camp Pendleton, and the Naval Weapons Station Seal Beach Detachment Fallbrook to the western and northern boundaries of the Cleveland National Forest-Palomar Ranger District. The Linkage Design

encompasses riparian (Santa Margarita River-Temecula Creek-Vail Lake-Arroyo Seco/Temecula Creeks) and upland habitat components (Santa Margarita Mountains-Gavilan Mountain-Mt. Olympus) to meet the movement needs of all focal species.

The final report from this project "*A Linkage Design for the Santa Ana - Palomar Mountains Connection*," has been used to support a number of land conservation efforts in the area including the development of a CDFG Conceptual Area Protection Plan (CAPP), prioritization of SCCF efforts and conservation endeavors by a number of non-governmental (conservation) organizations.

2.6. REGIONAL ISSUES AFFECTING CAMP PENDLETON'S 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, development, and population growth. Projected population growth figures for the region suggest the situation will only intensify (see Section 2.4.1.).

Rampant regional urbanization and development to support current and anticipated population growth ultimately have the potential to constrain the Base's ability to train Marines. The individual and cumulative effects of these regional issues represent encroachments that can impact the Base's ability to accomplish its mission. In this context, encroachment is defined as any non-DoD action that has the potential to impede or interfere with Camp Pendleton's responsibility for the military readiness of Marines that train there. Continually proposed, nonmilitary projects adjacent to or within Camp Pendleton's borders 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 and particularly, aboveground utilities such as the SONGS, SDG&E, I-5, and railway lines reduce the land available for military use, effect the use of aviation assets and challenge the conduct of realistic military training activities. Constraints exist for amphibious landing exercises along the Base's entire western boundary and create artificial restrictions for maneuvers inland from the coast.

Increasingly rapid growth and development throughout the region (and up to the Base's boundaries) has resulted in intense competition for resources—such as land, airspace, sea space, and frequency spectrum—that are needed for military uses. For example, urban growth has exacerbated the depletion and degradation of biodiversity by converting the natural landscape to developed hardscape (SRS Technologies 2003). The same depletion and degradation of biodiversity that is creating encroachment pressure on the Base has also helped to place 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 U.S. Indirectly, this too has created a form of encroachment pressure for Camp Pendleton, with an increasing dependence on the Base and any remaining off-Base natural areas for habitat for these species.

Throughout its 60-plus years in the region, Camp Pendleton has endeavored to work closely with surrounding communities, local jurisdictions, and private entities. However, Base lands have been, and continue to be, subject to both direct and indirect pressures from surrounding communities and the region for land use (e.g., leases and easements) and mission restrictions (e.g., noise). Moreover, Camp Pendleton is concerned that as regional development continues to deplete the region's natural landscape, Base lands will become increasingly and disproportionately important to regional habitat and sensitive species conservation. As more species in the region are federally listed as threatened or endangered (regardless of whether the species have thrived locally on Base), the Base is faced with becoming burdened with additional regulatory requirements and management needs. For example, while there are no historic reports or museum records that show the Quino checkerspot butterfly was ever located on Camp Pendleton lands and it has not been found during any recent general or specific surveys, the Base is required to conduct surveys for this species, and has been identified as part of the Proposed Northwest San Diego Recovery Unit (USFWS 2003). The recovery plan justifies the proposed recovery unit because "the possible future recovery units are within the only remaining large, undeveloped coastal areas of Orange and San Diego Counties (USFWS 2003)."

Such encumbrances are viewed as encroachment threats to the military mission because they affect how Marines train and potentially degrade military readiness. As regional populations increase, the Base wants to ensure that its training lands do not become viewed as opportunities for further development expansion (e.g., for commercial airports, and 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, natural areas 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 of the Base's land as open space for regional projects and species recovery has the potential to jeopardize the long-term sustainability of the military mission. Ironically, it has been Camp Pendleton's military mission for over sixty years that has kept most of the Base as natural areas, while growth throughout the coastal southern California region has resulted in scarcity of available land and displacement of large tracts of species habitat.

During the spring of 2001, Camp Pendleton's Commanding General (CG) discussed encroachment and its impact on military training in testimony before the Congress (Senate Armed Services Committee, and the Armed Services Committee and Government Oversight, and Reform Committee of the House of Representatives). His testimony illuminated several examples of encroachment impacts on training at Camp Pendleton. As follow-on to this testimony, the Base developed supporting information, in addition to anecdotes and examples, through an analytical quantification of the impacts of encroachment. This quantification assessment was initiated in October 2001 with a final report provided in March 2003.

The purpose of the assessment was to identify, analyze, and document factors that constitute an encroachment on Camp Pendleton's mission, particularly those that adversely

impact or have the potential to impact ranges, training, and operations. As part of this process, metrics were developed to measure and quantify the impacts of encroachment on training operations. The assessment used subject-matter experts to assess over 730 tasks, as established by USMC directives governing training Marine Corps-wide – Individual Training Standards and Training and Readiness Standards – for a combination of eight units, individual military occupational specialties, and/or weapon systems that are organic to a MEU. The MEU is the foundational combat unit of the Marine Corps Air/Ground Task Force, and members are continuously deployed around the globe in support of specific contingencies and other national security objectives.

The assessment noted that over time a number of factors, both environmental and manmade, have encroached upon the ability to train at Camp Pendleton. Environmental factors include: the presence of 16 threatened and endangered species and their habitat, cultural resources (generally archaeological sites), wetlands, and air quality. Manmade factors include: airborne noise, airspace restrictions, land use, and urban growth and development in the vicinity of Camp Pendleton. Competing land uses, for example the presence of I-5 and a nuclear power plant on military land, prevent military activity in these areas. Urban growth and development around Camp Pendleton has the effect of constraining military activity as the result of citizen complaints about noise, dust, smoke or other by-products of training.

The following sections briefly discuss encroachment issues identified in the Base's Encroachment Quantification Assessment or those concerns recognized by Base staff and training units as the most significant impediments to Camp Pendleton's training capabilities.

2.6.1. Public Interstate Freeways, Railroad Rights-of-Way, and Future Transportation Corridors

The I-5 easement (see Section 2.3.3.5.) presents an artificial barrier between the beach area and inland portions of the Base. Running the length of Camp Pendleton, its presence restricts the transition of amphibious training operations to the Base's interior training areas where the majority of field training occurs. Small tunnels provide a limited capability to cross under the I-5. These underpass crossings, though, were constructed to support the movement of troops and equipment used at the time the freeway was built in the 1960s. While not totally preventing training operations, today's larger amphibious and general-purpose vehicles, weapons systems, and large-scale movements of troops and equipment are greatly hindered due to the small size of these freeway underpasses. As a result of the increasing size of upgraded and modernized Marine Corps equipment over the last 40 years, only one of the 11 underpasses remains capable of supporting passage of all military vehicles and equipment. 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 U.S. and as such this interstate highway will remain a permanent fixture on the 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 (see Section 2.3.3.6.). Like I-5 does for vehicles, this rail line provides the only direct rail linkage between the cities of Los

Angeles and San Diego. This rail corridor, located parallel and adjacent to I-5, creates an access barrier between the beach landing areas of the Base and Camp Pendleton's inland training areas just as I-5 does. 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, in a manner that is not normally consistent with the tactical exercise or training requirements.

The Southern Orange County Transportation Infrastructure Improvement Program (SOCTIIP) was a proposed 4-lane toll road (with potential expansion to 8 lanes), approximately 16 miles in length, deemed to run along the northern boundary of the Base. The SOCTIIP was planned and developed by the Transportation Corridor Agencies, a Joint Powers Agency in Orange County, to serve as a transportation alternative to I-5, to help alleviate existing traffic gridlock and mitigate the increased traffic growth forecast to occur in southern Orange County by the year 2010. It was intended to connect the inland portion of central Orange County with the northern portion of San Diego County. If built, the SOCTIIP would be the last of three new toll roads constructed in Orange County by the TCA. The TCA has already completed 51 miles of its planned 67 mile toll-way system.

In 1988 the Marine Corps agreed that the TCA could evaluate an on-Base alignment of the proposed SOCTIIP 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 4) most importantly, that any on-Base alignment must not impact the Marine Corps' mission nor interfere with the Base's operational flexibility. The Marine Corps has remained steadfast on this position and continues to monitor and participate in TCA's planning efforts for this proposed transportation improvement project, as needed.

On 18 December 2008, the United States Commerce Department surprised both detractors and supporters of the proposed SOCTIIP toll road project when it decided to uphold the California Coastal Commission's decision to halt the project. Federal officials could only override the State's decision if the project had no alternatives or was necessary to national security, and neither of those criteria were met. The appeal to the Bush Administration drew more than 35,000 written comments following a hearing that attracted more than 6,000 attendees (Rosenblatt 2008).

Since the pending traffic problem isn't going to disappear, TCA is currently reaching out to stakeholders on all sides of the issue to find a viable solution on a new route for the 241.

2.6.2. 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 (see Sections 2.3.3.3. and 2.3.3.4.). While each easement may not seem significant in its own right, when taken in aggregate they restrict or constrain amphibious, ground and aviation training opportunities. The physical structures located in these easements (e.g., power poles

and telephone poles) pose restrictions on ground and/or air movement and create artificial restrictions for maneuvers inland from the coast.

2.6.3. 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 San Diego County Regional Airport Authority that by the year 2030, air travel passenger volume at San Diego International Airport will double (San Diego County Regional Airport Authority 2004). The San Diego County Regional Airport Authority, San Diego County's regional aviation planning agency, is continuing 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 future 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.

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. An even greater negative effect than mere occupation of land by the airport would be the loss of control of airspace above Camp Pendleton, which is mandated to maintain aviation and combined arms training requirements (see Section 2.3.1.6.). The relatively level coastal plain, where a commercial airport is most often proposed, 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 Pacific pocket mouse.

2.6.4. Recreational Use and Access

Camp Pendleton receives numerous requests every year from outside agencies, business entities, and individuals for access to 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 and beach 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 non-military land uses along the coastal area or beach 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, and because most of the Base's northern beaches are already limited by the lease to the State Parks for the San Onofre State Beach (see Section 2.3.3.2.).

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

2.6.5. Environmental Encroachment Issues (See also Section 4.5.6.)

The Marine Corps and Camp Pendleton are committed to the conservation of natural resources, particularly sensitive biological resources, conservation planning and natural resource management efforts. The Base also 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. However, many environmental laws and regulations have not considered the military's unique use of resources and, as written, create conflicts between congressionally mandated military training and congressionally mandated resource conservation.

The Federal ESA is a significant environmental law for Camp Pendleton because of the presence of many federally threatened and endangered species on the Base. In compliance with ESA Section 7(a)(2), the Base has established management programs, protocols, and regulations so that training activities and Base operations avoid and minimize adverse impacts to federally listed species and their habitats, provide compensatory mitigation for impacts that do occur, and ensure that Base actions do not jeopardize the continued survival of the species. Under ESA Section 7(a)(1), the Base as a federal agency utilizes its management programs in furtherance of the purposes of the ESA by including in those programs conservation measures to further the recovery of endangered species and threatened species. Most of these programs focus on protecting, expanding and improving occupied and unoccupied ecosystems used by these species. However, these actions in support of ESA compliance also have been identified as the leading encroachment factors impacting military training and operations at Camp Pendleton (SRS Technologies 2003).

Critical habitat designation identifies geographic areas that are important for the conservation of 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 (see Section 3.2.5. for additional information). The designation of critical habitat for federally threatened or endangered species on Base is viewed by the Marine Corps as a potential increase in the effect of ESA encroachment issues, since the addition of several thousands of acres of critical habitat (currently unoccupied) would require similar protection as those areas that are occupied by the species. As a result, this could potentially delay or restrict an increased number of training activities and impede the flexibility that is required to accomplish Camp Pendleton's military mission.

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