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3.10 SEABIRDS

3.10.1 Affected Environment

The Southern California (SOCAL) Range Complex covers a geographic area located in the center of the California current. One of the world's richest marine ecosystems, the California current flows from southern British Columbia, Canada, to Baja California Sur, Mexico. The abundant food in the California current, resulting from high ocean primary productivity, attracts millions of seabirds that breed and/or migrate throughout the region annually, with nonbreeders outnumbering breeders year-round, two to one (Mills et al. 2005). The biological importance of the California current extends to all marine ecosystems from primary production to marine mammals and is the basis of the diversity of the Southern California marine region.

Due to the mobility of birds, their ranges are not restricted to jurisdictions or boundaries. Populations of birds contained within the SOCAL Range Complex are not accurately documented; however, the importance of the Southern California Bight (SCB) area for both breeding and migratory species has been well established. Currently, more than 195 species of birds use coastal or offshore aquatic habitats in the SCB; that is, the area of the Pacific Ocean lying between Point Conception on the Santa Barbara County coast to a point shortly south of the United States/Mexico border (Dailey et al. 1993). A variety of seabirds use this Southern California coastal region for breeding and wintering. For certain seabird species, the area south of Point Conception, California, is the northern or southern perimeter of breeding and/or migratory ranges.

Coastal habitats and productive offshore waters are important nesting and foraging areas for breeding and migratory seabirds; as pressures on habitats increased, cumulative effects of incremental habitat degradation became noticeable on resources used by seabirds in the latter part of the 20th century. Habitat loss, coupled with pollution and related fisheries impacts, has reduced several seabird populations to vulnerable levels (USFWS, 2005a).

Many of the SCB seabird populations roost on islands and offshore rocks around the Channel Islands (Dailey et al. 1993). The Channel Islands offer nesting sites to seabird species, some of which have extremely scarce suitable habitat elsewhere in Southern California. These islands' positions offshore make them readily available to ocean birds, and predator and human disturbance is less than on the mainland. The southern Channel Islands (San Clemente, Santa Catalina, and Santa Barbara) provide vital habitat to nesting and migratory seabirds. However, the northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, San Nicolas, and Anacapa) contain the majority of seabird breeding colonies considered sensitive. Population status of breeding seabirds on the West Coast has been measured primarily through the determination of, and trends in, population size based on counts of birds and nests at nesting colonies (Sowls et al. 1980).

A variety of seabirds are known to occur within the SOCAL Range Complex with the most numerous groups being shearwaters, storm petrels, phalaropes, gulls, terns, and auklets. Several seabird species are considered particularly important here because of their large population numbers, their limited ranges, the rapid decrease in populations, or their use of critical or unique habitats (Dailey et al. 1993).

Of the 48 seabird species known to occur within the SOCAL Range Complex, several are under the listing authority of the Endangered Species Act (ESA) (Table 3.10-1). Of the species provided protection under the ESA, three are listed as federally endangered (California brown pelican, California least tern, and short-tailed albatross), one is federally threatened (marble murrelet), and one is a candidate for listing (Xantus's murrelet). Additional seabirds identified as species of concern by the state of California, United States (U.S.) Fish and Wildlife Service (USFWS), and

the Audubon Society include several species of tern, auklet, and murrelet, among others. All seabirds occurring within the SOCAL Range Complex are afforded protection under the Migratory Bird Treaty Act (MBTA). The 1988 amendment to the Fish and Wildlife Conservation Act mandated the USFWS to "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." These species, subspecies, and populations are called Birds of Conservation Concern.

Table 3.10-1: Seabirds Known to Occur in the SOCAL Range Complex

Common Name	Genus species	Status
red-throated loon	*Gavia stellata*	
arctic loon	*Gavia arctica*	
common loon	*Gavia immer*	
short-tailed albatross	*Phoebastria albatrus*	*FE*
Laysan albatross	*Phoebastria immutabilis*	
black-footed albatross	*Phoebastria nigripes*	*BCC*
pink-footed shearwater	*Puffinus creatopus*	
sooty shearwater	*Puffinus ariseus*	
black-vented shearwater	*Puffinus opisthomelas*	
leach's storm-petrel	*Oceanodroma leucorhoa*	
ashy storm-petrel	*Oceanodroma homochroa*	*BCC*
black storm-petrel	*Oceanodroma melania*	
least storm-petrel	*Oceanodroma microsoma*	
California brown pelican	*Pelecanus occidentalis californicus*	*CE, FE*
double-crested cormorant	*Phalacrocorax auritus*	
Brandt's cormorant	*Phalacrocorax penicillatus*	
pelagic cormorant	*Phalacrocorax pelagicus*	
surf scoter	*Melanitta perspicillata*	
white-winged scoter	*Melanitta fusca*	
red-necked phalarope	*Phalaropus lobatus*	
red phalarope	*Phalaropus fulicaria*	
pomarine jaeger	*Stercorarius pomarinus*	
parasitic jaeger	*Stercorarius parasiticus*	
long-tailed jaeger	*Stercorarius longicaudus*	
Bonaparte's gull	*Lanus philadelphia*	
Heermann's gull	*Lanus heermanni*	
mew gull	*Lanus canus*	
ring-billed gull	*Lanus delawarensis*	
California gull	*Lanus californicus*	
herring gull	*Lanus argentatus*	
western gull	*Lanus occidentalis*	
glaucous-winged gull	*Lanus glaucescens*	
black-legged kittiwake	*Rissa tridactyla*	
Caspian tern	*Sterna caspia*	
common tern	*Sterna hirundo*	
elegant tern	*Sterna elegans*	*BCC*
gull-billed tern	*Sterna nilotica*	*BCC*
royal tern	*Sterna maxima*	

Table 3.10-1: Seabirds Known to Occur in the SOCAL Range Complex (continued)

Common Name	Genus species	Status
arctic tern	*Sterna paradisaea*	
Forster's tern	*Sterna forsteri*	
California least tern	*Sterna antillarum browni*	*CE, FE*
black skimmer	*Rynchops niger*	*BCC*
pigeon guillemot	*Cepphus columba*	
Xantus's murrelet	*Synthliboramphus hypoleucus*	*BCC*
Craveri's murrelet	*Synthliboramphus craveri*	
marbled murrelet	*Brachyramphus marmoratus*	*CE, FT*
Cassin's auklet	*Ptychoramphus aleuticus*	*BCC*
rhinoceros auklet	*Cerorhinca monocerata*	

BCC – Bird of Conservation Concern, 2002, **FE** – Federally Endangered, **FT** – Federally Threatened
CE – California Endangered
(Adapted from Dailey et al. 1993 with additions)

3.10.1.1 Migratory Bird Treaty Act

The MBTA of 1918 (16 U.S. Code [U.S.C.] 703 et seq.) and the Migratory Bird Conservation Act (16 U.S.C. 715–715d, 715e, 715f–715r) of 18 Feb 1929 (45 Stat. 1222) are the primary legislation in the United States established to conserve migratory birds. These statutes implement the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. Current treaties are with the countries of Great Britain, Mexico, Canada, Japan, and the Soviet Union. The MBTA prohibits the taking, killing, or possessing of migratory birds or the parts, nests, or eggs of such birds, unless permitted by regulation. The species of birds protected by the MBTA appear in Title 50, Section 10.13 of the Code of Federal Regulations (C.F.R.) (50 C.F.R. 10.13) and represents almost all avian families found in North America. In general, there are only three species that are not protected by the MBTA; they include the rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*). On December 2, 2003, the President signed the 2003 National Defense Authorization Act. The Act provides that the Secretary of the Interior shall exercise his/her authority under the MBTA to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. Take under the MBTA is defined to be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof, included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916 (39 Stat. 1702), the United States and Mexico for the protection of migratory birds and game mammals concluded February 7, 1936, the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972 and the convention between the United States and the Union of Soviet Socialist Republics for the conservation of migratory birds and their environments concluded November 19, 1976.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Congress further provided that military readiness activities do not include (A) the routine operation of installation

operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, recreation activities, shops, and mess halls; (B) the operation of industrial activities; or (C) the construction of demolition of facilities used for a purpose described in (A) and (B).

The final rule authorizing the Department of Defense (DoD) to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found at 50 C.F.R. Part 21. The regulation provides that the Armed Forces must confer and cooperate with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a "significant adverse effect" on a population of a migratory bird species.

The requirement to confer with the USFWS is triggered by a determination that the military readiness activity in question will have a "significant adverse effect" on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as "a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

Migratory bird conservation relative to nonmilitary readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order (EO) 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The MOU between DoD and the USFWS was signed on July 31, 2006. DoD responsibilities discussed in the MOU include, but are not limited to:

(1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities;

(2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents;

(3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resource Management Plans;

(4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation;

(5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds;

(6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the USFWS on revisions to these conservation measures.

A number of species covered by the MBTA are found within the SOCAL Range Complex, including various shearwaters, storm petrels, phalaropes, gulls, terns, and auklets. A number of the species covered under the MBTA are also federally and/or state-listed as threatened or endangered. All seabird species found within the SOCAL Range Complex are covered by the MBTA (Table 3.10-1).

3.10.1.2 Existing Conditions

3.10.1.2.1 Natural History and Status of Seabird Groups

Shearwaters (Procellariidae)

Shearwaters are medium-sized, long-winged seabirds most common in temperate and cold waters. Shearwaters come to islands and coastal cliffs to breed. They are nocturnal at the colonial breeding sites, preferring moonless nights to minimize predation (Sibley, D.A., 2001). Outside of the breeding season, they are pelagic (frequent the open waters) and most are long-distance migrants. They feed on fish, squid, and similar oceanic food (Unitt, 2004). Numbers of shearwaters have been reduced due to predation by introduced species to islands, such as rats and cats. Some loss of birds also occurs from entanglement in fishing gear.

Strictly visitors, shearwaters have not been recorded to breed within the SOCAL Range Complex. Shearwaters primarily utilize offshore and coastal waters of the SOCAL Range Complex for foraging and are typically concentrated along upwelling boundaries and other water mass convergence areas.

Storm-petrels (Hydrobatidae)

Storm-petrels are the smallest of seabirds and feed on planktonic crustaceans and small fish picked from the surface, typically while hovering. Storm-petrels have a cosmopolitan distribution, found in all oceans (Sibley, D.A., 2001). They are strictly pelagic, coming to land only when breeding. In the case of most species of storm-petrels, little is known of their behavior and distribution at sea. Storm-petrels nest in colonies on remote islands. Nesting sites are attended nocturnally to avoid predators (Bretagnolle 1990). Storm-petrels typically show a high degree of tenacity to the same nest from year to year; once pairs are established, they would likely continue to breed at the same sites. Several species of storm-petrel including the Ashy and Black storm petrel are threatened by human activities like coastal development and the introduction of none native species to island breeding areas (IUCN 2006, Ainley, 1995, Carter, et al. 1992).

Leach's storm-petrels (*Oceanodroma leucorhoa*) are known to breed only on Santa Barbara Island within the SOCAL Range Complex. Approximately 12,500 individuals currently reside in California, primarily on the central coast. Population trends are currently unknown (USFWS 2005a). They have declined in northern California because of the loss of burrow-nesting habitats due to soil erosion and defoliation by nesting cormorants (Carter et al. 1992). Approximately 200 breeding individuals were estimated to occur on Santa Barbara Island in 1992 (Carter et al. 1992).

Black storm-petrels (*Oceanodroma melania*) have a limited breeding range from the Channel Islands, California, to the Gulf of California and off the west coast of Baja, Mexico (Ainley and Everett 2001). The SOCAL Range Complex supports only isolated breeding colonies of black storm-petrels on Santa Barbara and San Clemente Island (SCI) with larger colonies occurring on Anacapa, Santa Cruz, and San Miguel Island (Carter et al. 1992). Approximately 300 individuals breed on Santa Barbara Island, and associated Sutil Island, California, and breeding individuals have been intermittently sighted on SCI (Carter et al. 1992). The largest breeding colony of black storm-petrels nest on San Benito Island, Mexico.

The ashy storm-petrel (*Oceanodroma homochroa*) is a globally rare seabird species that is endemic to the California islands. In the SOCAL Range Complex area, the ashy storm-petrel is known to breed on Santa Catalina, Santa Barbara, and SCI. The majority of the ashy storm-petrel population breeds in coastal and island areas of central and southern California (McChesney et al. 2000, Ainley et al. 1995). The breeding population has been estimated at 5,200 to 10,000 individuals, with about half on the South Farallon Islands and half in the Channel Islands. Fewer than 50 breeding individuals were present on Catalina Island and SCI in 1999 (Nur et al. 1999), though hundreds are suspected (Carter pers. Comm.). Nearly 1,500 breeding individuals were

documented on Santa Barbara Island in 1992 (Carter et al. 1992) and 2,252 breeding birds or about 1,126 nests in 1996 (Carter, unpubl. data).

Phalaropes (Scolopacidae)

The red-necked phalarope (*Phalaropus lobatus*) and the red phalarope (*Phalaropus fulicaria*) breed circumpolarly in the low Arctic or Subarctic(Sibley, D.A., 2001). These species winter at sea, mostly in tropical waters. Large numbers migrate south along the California coast (probably most of the arctic breeding population) and winter (October to March) off the west coast of South America, as far south as coastal Chile; largest numbers have been reported from the Humboldt Current off Peru (Murphy 1936). Phalaropes are common on an irregular basis in winter off the Pacific coast of southern Mexico, from Colima south to El Salvador (Howell and Webb 1995). The red-necked phalarope has a large global population estimated to be 3,500,000 individuals (Wetlands International 2002). Global population trends have not been quantified, but the species is not believed to approach the thresholds for the population decline criterion of the IUCN Red List (i.e., declining more than 30 percent in 10 years or three generations).

Pelicans (Pelecanidae)

The California brown pelican (*Pelecanus occidentalis californicus)* is listed as federally endangered under the ESA. It is one of two subspecies of brown pelicans residing in the United States and breeds along the Pacific coast from the Channel Islands to Mexico. Their number has increased recently at the two primary nesting colonies in the Channel Islands (West Anacapa and Santa Barbara islands) in Southern California following severe pre-1975 declines primarily due to eggshell thinning from marine pollutants (Anderson et al. 1975; Anderson and Gress 1983; Carter et al. 1992; USFWS 2007). Breeding success is still low and limited recovery may involve immigration of birds out of Mexico. Although California populations have recovered substantially from previous declines, they continue to show inter-annual variation in productivity as related to prey availability (Anderson et al. 1982). Approximately 12,000 brown pelicans breed in Southern California, which represents nearly 12 percent of the western subspecies (Kushlan et al. 2002). The SOCAL Range Complex provides extensive breeding and foraging territory for the California brown pelican including a large breeding population on Santa Barbara Island.

In May 2006, during surveys sponsored by the California Department of Fish and Game (CDFG), 43 pelican nests were discovered on Prince Island near San Miguel Island. This is the first pelican nesting activity recorded at this location since 1939 (CDFG 2006). In 2006, a nesting colony was found, for the first time, on Middle Anacapa Island and breeders were observed on East Anacapa Island for the second time since 1928 (UC Santa Cruz 2006). Breeding populations on Santa Barbara and Anacapa islands have increased annually since 2000 and are approaching 7,000 breeding pairs (CHIS 2005 unpublished). The Department of the Navy (DoN) has conducted long-term monitoring on San Nicolas Island tracking population trends and roosting habitat; approximately 5,000 birds currently roost on the island (Capitolo et al. 2007).

A petition to de-list the California brown pelican from the list of endangered or threatened species under the ESA was recorded in December 2005 and resulted in the initiation of a 5-Year Review of the status of the species. According to the USFWS, “the population has remained stable for at least 20 years within its entire range” (USFWS 2007). On the basis of evidence amassed during recent years and examined during the 5-Year Review, the USFWS recommended de-listing the species throughout its entire range. This species is further discussed in the Federally Threatened and Endangered Species section (Section 3.10.2.5).

Albatross (Diomedeidae)

All the albatross species potentially occurring within the SOCAL Range Complex are considered vagrant migrants and are rarely documented more than once per year (Burr 2007).

The Laysan albatross (*Phoebastria immutabilis*) has a wide range across the north Pacific. Its main breeding colonies are in the Northwestern Leeward Islands of the Hawaiian Archipelago. When away from breeding areas, they range widely from Japan to Alaska, and south to California, usually far offshore.

Short-tailed albatross (*Phoebastria albatrus*) breed on Torishima, an island owned and administered by Japan. The short-tailed albatross' range overlaps with the black-footed and Laysan albatross' covering most of the northwestern and northeastern Pacific Ocean. The world population of short-tailed albatross is currently estimated at 2,000 birds (USFWS 2005b). Short-tailed albatross status is discussed more completely in the Federally Threatened and Endangered Species section (Section 3.10.2.5).

Black-footed albatross (*Phoebastria nigripes*) were found in large numbers in the SCB before this century, but because of the destruction of its colonies in the mid-Pacific its numbers have decreased dramatically worldwide as well as in coastal California (Dailey et al. 1993). Black-footed albatross usually remain at least 10.8 to 16.2 nautical miles (nm) (20 to 30 kilometers [km]) offshore during the nonbreeding months (July to November). During these months birds are distributed throughout the northwestern and northeastern Pacific. In 2000, there were an estimated 278,000 black-footed albatross, the majority of which nested on remote islands and atolls in the Hawaiian archipelago. Because of their propensity for scavenging behind ships, black-footed albatross are often unintended victims of commercial long-line fisheries in the Pacific.

Cormorants (Phalacrocoracidae)

Cormorants are considered coastal rather than oceanic birds, and some have colonized inland waters. Cormorants are colonial nesters, using trees, rocky islets, or cliffs. They range around the world, except for the central Pacific islands, and are primarily fish eaters. All three species occurring within the SOCAL Range Complex have significant breeding populations within the Channel Islands located on rocky headlands and isolated offshore rocks.

The double-crested cormorant is the most numerous and most widely distributed species of the six North American cormorants. In the United States and Canada, it is the only cormorant to occur in large numbers in the interior as well as on the coasts, and it is more frequently cited than the others as conflicting with human interests in fisheries. Double-crested cormorants (*Phalacrocorax auritus*) have increased dramatically in coastal regions of California and Oregon because of reduced human disturbance, reduced levels of marine pollutants in Southern California, and recent use of artificial nesting areas in San Francisco Bay and Columbia River estuaries (Gress et al. 1973; Carter et al. 1992). The Pacific population breeds between southern British Columbia and Sinaloa, Mexico. In these coastal areas, the double-crested cormorant is generally outnumbered by other cormorants.The Southern California population has still not recovered to historical levels (Weseloh et al. 1999). The breeding population of double-crested cormorants was estimated to be 1,191 individuals on Santa Barbara Island, in 1991 (Carter et al. 1992). Historical records of breeding colonies on Santa Catalina Island have been cited but no confirmed colonies are currently documented.

Populations of both pelagic cormorants (*Phalacrocorax pelagicus*) and Brandt's cormorants (*Phalacrocorax penicillatus*) appear stable although comprehensive surveys of their entire range are lacking. The pelagic cormorant, the smallest and most widely distributed of six cormorant species inhabiting the North Pacific, ranges from the Arctic waters of the Chukchi and Bering seas south through temperate waters along the North American Pacific Coast to Baja California and along the Asian coast to southern China. The North American population totals about 130,000 birds, the majority of which occur in Alaska. Local populations often fluctuate considerably because of movement among breeding sites (Hobson 1997). The breeding

population of pelagic cormorants within the SOCAL Range Complex was estimated to be 46 individuals on Santa Barbara Island in 1991.

Brandt's cormorant is endemic to North America, where it occurs only in marine and estuarine environments. It breeds along the West Coast of North America, reaching Alaska in the north and Mexico in the south. In the main part of its range, from California to Washington, its life history and populations are tied to the rich upwelling associated with the California Current (Wallace and Wallace 1998). In the nonbreeding season, when the effects of this current diminish, populations redistribute along the coast in concert with changing water and feeding conditions. Current breeding populations within the SOCAL Range Complex occur on San Nicolas Island and Santa Barbara Island. The most current population estimate for SBI is 288 breeding individuals in 1991. San Nicolas Island has one of the largest breeding colonies in California, estimated at 5,000 breeding pairs in 2006 (Capitolo et al. 2007).

Overall, numbers of cormorants have increased in Southern California, but regional populations have suffered from gill net and oil-spill mortality as well as human disturbance at several colonies. Pacific coast colonies fluctuate annually, with low reproduction and population numbers influenced by El Niño events (Ainley and Boekelheide 1990). Worldwide populations of all three cormorant species range in the millions (IUCN 2006).

Gulls, terns, and skimmers (Laridae)

Most gulls are ground-nesting carnivores which will take live food or scavenge opportunistically. The only nesting gull within the SOCAL Range Complex is the western gull (*Larus occidentalis*). The western gull is a large white-headed gull that inhabits the Pacific Coast of North America, breeding from central Baja California north to Washington. In winter, this gull may be found throughout its breeding range, north to Vancouver Island, south into Baja California, and in adjacent offshore waters of these areas. Although a familiar and well-known species on the Pacific Coast, the western gull is limited in distribution and has a smaller population size than most other North American gulls, with a total population of only about 40,000 pairs nesting at fewer than 200 colony sites (Pierotti and Annett 1995). Numbers have increased, especially in California, probably because of the bird's use of human and fishing refuse and reduced human disturbance (USFWS 2005a). Numbers have reached saturation at the world's largest colony at the South Farallon Islands, California (Ainley et al. 1994), and expansion is occurring at other major colonies in central and southern California (Carter et al. 1992). Western gulls have been documented breeding at various levels on each of the four islands within the SOCAL Range Complex. Santa Barbara Island and San Nicolas Island sustain the largest colonies estimated to number 7,678 and 6,038 breeding individuals, respectively, in 1991 (Carter et al. 1992). Western gulls are known predators of eggs and fledglings of other seabird species and may limit the ability of certain sensitive species, such as the ashy storm petrel and the Xantus's murrelet, from recolonizing historical breeding areas.

Similar population trends exist for other year-round resident gulls, including the ring-billed gull (*Larus delawarensis*) and California gull (*Larus californicus*). Population statuses of gulls primarily utilizing inland areas of North America for breeding and wintering are not well documented within the SOCAL Range Complex.

Several gull species such as Bonaparte's gull (*Larus philadelphia*), Heermann's gull (*Larus heermanni*), mew gull (*Larus canus*), herring gull (*Larus argentatus*), and glaucous-winged gull (*Larus glaucescens*) are transient and opportunistic, foraging in a variety of habitats spanning coastal areas and the open ocean.

Jaegers are arctic and boreal seabird members of the gull family of the genus *Stercorarius* that harass smaller birds and snatch the food they drop. Jaegers winter in productive regions of

tropical and subtropical oceans and concentrate over upwellings and boundaries of currents. They may be seen around large fishing vessels.

Three species of jaegers occur within the SOCAL Range Complex and are primarily observed offshore. The pomarine jaeger (*Stercorarius pomarinus*) winters at sea in the tropical oceans and is a fairly common pelagic migratory visitor of the SOCAL Range Complex. Parasitic jaegers (*Stercorarius parasiticus*) are more often found nearer shore and in estuaries compared to other jaegers. They spend most of the year on the ocean within a few miles of land. In the Pacific, parasitic jaegers winter at sea from Southern California to southern Chile and Australia (Birdweb 2005). The long-tailed jaeger (*Stercorarius longicaudus)* is a migrant, wintering in the south Atlantic and Pacific.

Thousands of Caspian terns, Forster's terns, least terns, elegant terns (*Sterna caspia, S. forsteri, S. antillarum, S. elegans*), and black skimmers (*Rynchops niger*) now occur in the SCB region. Their numbers have increased, especially along the Southern California coast, due to colony protection and use of artificial nesting sites (Speich and Wahl 1989; Carter et al. 1992). Increasing numbers (< 100 breeding birds) of gull-billed and royal terns (*S. nilotica* and *S. maxima*) recently colonized the Southern California coast, although gull-billed terns have nested inland at the Salton Sea for a few decades.

Elegant terns (*Sterna elegans)* breed on islands in the Gulf of California (90 percent of the known population on Isla Rasa), along the west coast of Baja California, and near San Diego, California (Audubon 2005). No breeding colonies exist within the boundaries of the SOCAL Range Complex. Individuals within the range complex utilize coastal waters for foraging or migrating. Postbreeding birds commonly occur north to the central California, Oregon, and Washington coast from midsummer through fall. They are seen only on the coast, frequenting estuaries and beaches along the California coast in summer and fall. They forage on a variety of different schooling fish, with northern anchovy being their most important prey item. Threats to current populations consist of urban development, disturbance at breeding colonies and roost sites, and the introduction of nonnative mammalian predators. There is no population trend data for this species.

Gull-billed terns (*Sterna nilotica*) breed along the Atlantic Coast from New Jersey to Florida, along the Gulf Coast from Florida to Mexico, and locally in Southern California in San Diego Bay and at the Salton Sea. San Diego County's first gull-billed tern showed up in south San Diego Bay in 1985, and the species began nesting in the south bay two years later (Unitt 2004). It has nested there annually since, with the population growing to 32 to 37 pairs by 2003 (Unitt 2004). Today the species is limited by the availability of suitable undisturbed habitat, winter food, flooding, predation, and human disturbance. These terns seem both less tolerant of disturbance and less faithful to nest sites than most other tern species (Audubon 2005). This species is capable of exploiting locally abundant prey including many kinds of terrestrial and aquatic species. Specific prey preferences include invertebrates and worms in plowed fields, fish, and crustaceans. The gull-billed tern primarily forages in estuarine and nearshore waters. The California population is under 200 pairs, and the future of the colony at the Salton Sea is unclear given the current status of the habitat (Unitt 2004).

California least terns (*Sterna antillarum browni*) traditionally frequent isolated sandy beaches close to estuaries and coastal embayments for nesting sites. Today few beaches are utilized by this species with the majority of nesting areas occurring on manufactured (inadvertently and intentionally) substrates or fills within bays and estuaries. This exclusive fish-eater typically feeds on topsmelt, northern anchovy, and jacksmelt. Feeding is carried out both in the calm waters of narrow estuaries or large bays and for a short distance (i.e., usually within 1.62 nm [3 km] off beaches in the open ocean; USFWS 2006). At the time of endangered species designation the

least tern breeding population was estimated to be about 600 pairs. The statewide breeding population has increased considerably within the last 5 years and has exceeded 4,500 pairs since 2000. California least tern status is discussed more completely in the Federally Threatened and Endangered Species section (Section 3.10.2.5).

Black skimmers (*Rynchops niger)* are considered rare within the SOCAL Range Complex. They are not known to breed within the Range Complex and only transit through small portions of the SOCAL Range Complex during migrations and occasional foraging. Unrecorded in California prior to 1962, black skimmers are documented to breed in coastal and inland areas of California. The western population breeds from Southern California (inland at the Salton Sea, along coasts in San Diego and Orange counties) south to Nayarit, Mexico (AOU 1983). The species primarily utilizes estuaries and coastal lagoons for foraging and breeding. Their limited breeding range in Southern California occurs at only three to four colonies and has resulted in the black skimmer being listed as a bird species of special concern in California. During the last three decades, black skimmers have become increasingly common along the Southern California coast.

Alcids (Alcidae)

Alcids are marine birds with a stout bill, short wings and tail, webbed feet, a large head and heavy body, and thick, compact plumage. Confined to the northern parts of the Northern Hemisphere, alcids include auklets, guillemots, murres, and puffins. True seabirds, they come to land to breed in large colonies and then disperse to the open ocean for most of their lives. Important southern breeding colonies historically occurred on the Channel Islands of California, and continue to exist at mostly unknown levels. Current population levels of various alcids known to occur within the SOCAL Range Complex are not comprehensive.

The pigeon guillemot (*Cepphus columba*) is found along rocky coastlines between Alaska and California. This alcid nests in burrows or in rock cavities, mostly on small islands that provide protection from predators; small colonies often form, although this bird does nest as isolated pairs. A significant population and new nesting areas have been found recently in Southern California, although higher numbers may reflect both better survey techniques and population increases (Carter et al. 1992). Unlike other alcids that fly 32 to 54 nm (60 to 100 km) out to sea to find fish schools, the pigeon guillemot stays close to the rocky coast and searches for fish prey in relatively shallow waters and within approximately 5.4 nm (10 km) of their nest. The estimated population of this species is about 235,000, with the largest breeding concentrations on Farallon Island, California, and in the Chukot Peninsula, Siberia, with about 2,200 birds at each locale. Pigeon guillemot populations have remained stable overall, but major fluctuations have occurred in response to El Niño events at the south Farallon Islands and on the Oregon coast (Hodder and Graybill 1985; Ainley and Boekelheide 1990). The most current population estimate for the SOCAL Range Complex is 284 breeding individuals at Santa Barbara Island (Carter et al. 1992). Its widespread distribution along most north Pacific coastlines significantly decreases this species' vulnerability at the population level.

Cassin's auklets (*Ptychoramphus aleuticus*) breed from the western Aleutians to central Baja California, Mexico (Gaston and Jones 1998). Current global populations are in the millions with the majority of the breeding populations centered on Vancouver Island, Canada. Nesting has recently extended to the Channel Islands (Carter et al. 1992). Postnesting dispersal is variable, with the Southern California population mostly resident (USFWS 2005a). Cassin's auklet populations in California have declined and several historical colonies have disappeared altogether, mainly from predation (Manuwal and Thorensen 1993). Individuals usually breed at the same nest site in successive years (87 percent of cases; Nelson 1991). The most recent population estimate for the SOCAL Range Complex is 156 breeding individuals on Santa Barbara Island (Carter et al. 1992). Availability of suitable nest sites directly limits the size of breeding

populations, but food supply is probably the main factor influencing total population size (Emms and Verbeek 1989; Ainley and Boekelheide 1990). Overall, it is unclear what the relative importance is of nest-site availability and summer and winter food supply in regulating total population size.

Tufted puffins (*Fratercula cirrhata*) can be found throughout the northern Pacific Ocean. They have recently recolonized Southern California where they had not nested since the early 1900s (Carter et al. 1992). The largest tufted puffin populations occur along the west coast of the Olympic Peninsula, Washington (Speich and Wahl 1989), but their status there is not well known. Several million of these birds live in the north Pacific, from California to Japan. However, populations in California and Japan are in long-term decline, and no colonies outside of Alaska contain more than 10,000 birds (USGS 2005). The total world colony population estimate is 2,970,000 birds, of which 82 percent (2,440,000) breed in North America, only a small proportion of the North American population in California (0.01 percent; Piatt and Kitayski 2002).

Common murres (*Uria aalge*) are circumpolar and number in the millions worldwide. Primarily utilizing California offshore waters for feeding, common murres breed on open ledges and rocky cliffs of exposed coastline (Sibley 2000). Common murres are the dominant member of the breeding seabird community on the West Coast but they have declined substantially in central California and Washington because of the combined effects of high mortality from gillnet fishing, oil spills, and poor reproduction during intense El Niño events (USGS 2005). The estimated world breeding population is 13 to 20.7 million birds. No documented breeding colonies have been sighted within the SOCAL Range Complex or south of Point Conception, California.

Craveri's murrelet (*Synthliboramphus craveri*) is a small seabird, closely related to the Xantus's murrelet. Craveri's murrelet breeds on offshore islands in both the Pacific Ocean and the Gulf of California off the Baja peninsula of Mexico, but is not documented on the southern Channel Islands. It wanders fairly regularly as far as central California, primarily during postbreeding dispersal. Craveri's murrelet breeding colonies are threatened by oil spills, tanker traffic, and predators introduced to its breeding colonies. Increasing tourism development and commercial fishing fleets also further threaten the species. With an estimated population of 6,000 to 10,000 breeding pairs, its population is listed as a species of high concern (Birdlife 2006). Very little information is available on breeding colony locations and population trends.

Marbled murrelet *(Brachyramphus marmoratus)* populations range along the Pacific coast from southern Alaska to central California**.** This species can also be found wintering south of its breeding range, along the coast of Southern California to extreme northwestern Baja California. Its populations have declined substantially throughout the region largely because of the direct loss of most (90 to 95 percent) of old-growth forest nesting habitat to large-scale logging since the mid-1800s (Carter and Morrison 1992). Marbled murrelets appear to have very low reproductive rates (based on nests examined and at-sea counts of juveniles), probably because of high avian nest predation in fragmented forests and possibly lower breeding success during intense El Niño events. This species is discussed in depth in the Federally Threatened and Endangered Species section (Section 3.10.2.5).

Xantus's murrelet (*Synthliboramphus hypoleucus*) populations persist in very low numbers throughout their range, with 2,000 to 5,000 of the breeding birds documented in Southern California. A significant portion of the world population of this species nests in Southern California, while the remainder nests on the northwest coast of Baja California, Mexico. Although more careful surveys are needed on the Baja California islands, available data indicate that the world population of Xantus's murrelet is much lower than estimated in recent reports (e.g., 16,000 to 30,000 by Springer et al. 1993). Numbers breeding in the largest colony at Santa Barbara Island probably declined between the mid-1970s and 1991 (Carter et al. 1992). The

decline may have occurred because of many factors, including census differences. Larger numbers of nesting birds are now suspected in Southern California. The most recent population estimates for the SOCAL Range Complex are 1,544 breeding individuals at Santa Barbara Island (Carter et al. 1992). One breeding individual was sighted at SCI near Seal Rock on the west shore in the mid-1990s (Carter et al. 1992). Xantus's murrelet is discussed in detail in the Federally Threatened and Endangered Species section (Section 3.10.2.5).

Rhinoceros auklets (*Cerorhinca monocerata*), medium-sized auks, closely related to the puffins (*Fratercula*), breed along the Pacific coast of North America from the Aleutian Islands, Alaska, south to Southern California (Gaston and Dechesne 1996). Most of the North American population breeds on a small number of islands in British Columbia and adjacent parts of Washington and southeast Alaska (Gaston and Dechesne 1996). The current status of the Southern California breeding population is not well known and is likely restricted to the northern Channel Islands. Population estimates are generally unreliable because of the difficulty in establishing burrow occupancy where burrows are long and nest chambers difficult to access. World population estimates are about 1 million breeding birds, this implies 1 to 2 million, including prebreeders (Byrd et al. 1993). California numbers remain low; the most recent counts estimate approximately 1,700 individuals now breeding in California (Carter et al. 1992). During the nonbreeding season, it ranges widely at sea from southern Alaska south to Southern California and southern Japan. Concentration of population in a few large colonies suggests that population may be limited by availability of suitable colony sites. Competition for burrows with puffins may also be limiting in places and has been suggested as an important factor in determining populations and behavior at Farallon Island, California (Ainley et al. 1990a).

Loons (Gaviidae)

Loons are typically referred to as "divers" outside of North America, are large, bulky waterbirds with wingspans that range from 3 to 4 feet. Superficially they resemble certain grebes, or even small geese, but the combination of a dagger-like bill, short neck, long wings, and legs set far back on the body give them a distinctive shape. Loons mainly feed on a wide variety of medium-size fish up to about 10 inches long. Loons hunt primarily from the water's surface, peering down with bill and eyes submerged. Loons prefer to nest on undisturbed lakes from boreal to Arctic zones and typically winter in coastal waters as far south as central Mexico (Sibley, D.A., 2001)

All living species of loons are members of one genus (*Gavia*) in a family (*Gaviidae*) and order (*Gaviiformes*) of their own. All three species of loons known to occur within the SOCAL Range Complex are migratory visitors and breed in northern latitudes. Red-throated loons (*Gavia stellata*) have a large range, with an estimated global extent of occurrence of 54,000 nm^2 (10,000,000 km^2). A large global population is estimated to be 490,000 to 1,500,000 individuals (Birdlife International 2004a). Common loons (*Gavia immer)* have a global population estimated to be 580,000 individuals (Birdlife International 2004b). Arctic loons (*Gavial arctica)* have a global population estimated to be 130,000 to 2,000,000 individuals (Birdlife International 2004b). Global population trends have not been quantified, but the species is not believed to approach the thresholds for the population decline criterion.

Scoters (Anatidae)

Scoters are large, mostly black or dark gray sea ducks. Scoters spend the nonbreeding part of the year in large rafts on the ocean or in open bays and inlets. They forage almost exclusively by diving, taking prey from the ocean floor and also taking mussels from man-made structures. Surf scoters nest on freshwater lakes and wetlands in the Arctic, in sparsely forested and semi-open regions. They winter in open coastal environments, favoring shallow bays and estuaries with rocky substrates. Continent-wide, surf scoters may have gone through a serious decline early in the 20th century but now appear to be numerous with a stable population. There is evidence of a

long-term decline in the west, and large die-offs were observed in the early 1990s at coastal reefs in southeastern Alaska. The cause of these die-offs is unknown, but pesticides or other contaminants are the suspected cause. The population is vulnerable to oil spills on the wintering grounds and disturbance and habitat destruction as a result of oil drilling on breeding grounds.

3.10.1.2.2 Birds of Conservation Concern

Birds of Conservation Concern (BCC) listed in this section are seabirds found in the SOCAL Range Complex that are protected under the MBTA and identified by the USFWS as warranting additional recognition as species of concern by conservation associations and state and federal agencies. Of the seven species listed as BCC (Table 3.10-2), three have active breeding populations within the SOCAL Range Complex (ashy storm-petrel, Xantus's murrelet, and Cassin's auklet), one is a vagrant migrant (black-footed albatross), and three utilize primarily bay and estuarine habitat adjacent to the SOCAL Range Complex (elegant tern, gull-billed tern, and black skimmer).

The ashy storm-petrel, Xantus's murrelet, and Cassin's auklet have well-documented, important, isolated breeding populations on Santa Barbara Island. Breeding populations on SCI and Santa Catalina Island have not been accurately enumerated since Carter et al. 1992, and their current status remains unknown as of the date of this research. The species' breeding populations within the SOCAL Range Complex represent important subpopulations of relatively small global populations, providing a species-wide avoidance of potential mortalities at breeding colonies located elsewhere. All three of these seabird species occupy similar habitat and utilize similar breeding, foraging, and prey avoidance techniques.

Table 3.10-2: U.S. Fish and Wildlife Service, Birds of Conservation Concern (2002) Known to Occur in the SOCAL Range Complex

Common Name	Scientific Name	Range Complex Use
black-footed albatross	*Phoebastria nigripes*	Migrant
elegant tern	*Sterna elegans*	Limited Foraging
gull-billed tern	*Sterna nilotica*	Limited Foraging
black skimmer	*Rynchops niger*	Limited Foraging
Xantus's murrelet	*Synthliboramphus hypoleucus*	Breeding
Cassin's auklet	*Ptychoramphus aleuticus*	Breeding
ashy storm-petrel	*Oceanodroma homochroa*	Breeding

The presence of floating populations of ashy storm-petrels suggests that availability of nesting space limits the size of breeding populations. Nesting islands are limited in number, and densely nesting gulls and auklets and other factors may limit further the availability of storm-petrel nesting habitat. Storm-petrels are sensitive to disturbance, including that generated by researchers, especially during the incubation period (Ainley et al. 1990). All known nesting sites in the United States (and one site in Mexico) are protected from development and incursions by humans. The large number of sites and their protected designation may lend some measure of protection to the species. Whether the now densely nesting gulls at most of these sites, and introduced rodents at some (e.g., the Farallon Island) (Ainley and Boekelheide 1990), interfere with population stability of storm-petrels to a significant degree is not known. Introduced mammalian predators remain a significant concern at many of the island breeding colonies.

The world population of Xantus's murrelets is concentrated in four major breeding colonies. Santa Barbara Island and Los Coronados Islands support the great majority of *S. h. scrippsi* in Southern California and northern Baja California. Most Xantus's murrelets off the Baja California coast breed on San Benito Island (*S. h. scrippsi*) and Guadalupe Island (*S. h. hypoleucus*) (Everett and Anderson 1991). The species has been extirpated on some of the Baja

California islands by introduced cats and other predators, and it is threatened on other islands. Although the colony at Santa Barbara Island has maintained numbers in the low thousands since the mid-1970s, it is very localized and subject to several threats, including oil spills and other pollution as well as avian and mammalian predation. Xantus's murrelets are discussed further in the Federally Threatened, Endangered, and Candidate Species section (Section 3.10.1.2.3).

Cassin's auklets breed on islands from middle Baja California to the Aleutian Islands, Alaska. The current worldwide population is estimated between 3 and 4 million breeding birds centered at British Columbia, Canada (Sowls et al. 1980). Less than 4 percent of the world population breeds in California. The majority of breeding birds in California (105,000) are on south Farallon Island. San Miguel Island supports an estimated population of nearly 20,000 breeding birds and additional small isolated colonies are thought to exist at Santa Cruz Island and Anacapa Island. Santa Barbara Island supports the only breeding colony within the SOCAL Range Complex and its population was estimated to be 156 breeding individuals in 1992 (Carter et al. 1992). Crevice nesting and nocturnal foragers, Cassin's auklets are susceptible to predation by gulls, raptors, ravens, and mammals. The California populations are thought to be sedentary while northern populations migrate as far south as northern Baja Mexico during winter months. Populations are regulated by predation, food availability, and territorial behavior. Land-based conditions including erosion, exotic mammal predation, and poor burrowing soil are the greatest factors limiting breeding habitat expansion or recolonization of historical colony sites.

The black-footed albatross is considered rare among coastal waters of California and most commonly occurs far offshore foraging for prey species along debris lines and current interfaces. In summer (i.e., nonbreeding season) individuals appear to disperse widely throughout the historical range of the temperate and subarctic North Pacific Ocean (Sanger 1972), with observations concentrated in the northern Gulf of Alaska, Aleutian Islands, and Bering Sea (McDermond and Morgan 1993).

The elegant tern, gull-billed tern, and black skimmer depend on inland lakes and coastal estuary and bay habitat for nesting and foraging. All three species have isolated active breeding colonies in various Southern California mainland lakes, bays, and estuaries and are considered stable, if not increasing in population size, within areas adjacent to the SOCAL Range Complex. The SOCAL Range Complex does not encompass the breeding habitat utilized by these species and provides only migratory and foraging habitat on a limited basis.

3.10.1.2.3 Federally Threatened, Endangered, and Candidate Species

Information is presented below on federally listed species known to occur within the SOCAL Range Complex. Federally listed species are the short-tailed albatross, marbled murrelet, California brown pelican, and California least tern (Table 3.10-3).

Table 3.10-3: Federally Listed Seabird Species Known to Occur in the SOCAL Range Complex

Common Name	Scientific Name	Federal Status	Range Complex Use
short-tailed albatross	*Phoebastria albatrus*	Endangered	Migrant
marbled murrelet	*Brachyramphus marmoratus marmoratus*	Threatened	Limited Foraging
Xantus's murrelet	*Synthliboramphus hypoleucus*	Candidate [1]	Breeding
California brown pelican	*Pelecanus occidentalis californicus*	Endangered	Breeding
California least tern	*Sterna antillarum browni*	Endangered	Limited Foraging

[1] This candidate species may be considered for federal listing in the near future. The California Fish and Game Commission has determined that the Xantus's murrelet should be listed as a threatened species under the California Endangered Species Act (CESA). As part of the normal listing process, this decision is currently under review by the California Office of Administrative Law (CDFG 2005a).

Short-tailed Albatross (*Phoebastria albatrus*)

The short-tailed albatross is one of the world's rarest albatross. It is listed as endangered under the ESA. No critical habitat is designated for this species (USFWS 2000). Currently, an albatross recovery program is taking place at Midway Atoll, where scientists hope to establish a viable colony. Recent breeding success has been reported at Midway (NPS unpublished data). The short-tailed albatross nests on isolated, windswept, offshore islands that have restricted human access (USFWS 2000). Birds at Japanese breeding sites use steep land characterized by soils that contain loose volcanic ash for nesting. Plants help stabilize the soil around the nest, provide protection from weather, and minimize mutual interference between nesting pairs. Foraging occurs over open offshore ocean waters. Very little is known of its marine habitat requirements.

The short-tailed albatross disperses throughout the North Pacific when it is not breeding. Historical records indicate frequent use of nearshore and coastal waters in the eastern North Pacific, including California (COSEWIC 2003). This species is highly mobile with a large marine range that is currently known to extend from Siberia south to the China coast and from the Bering Sea and Gulf of Alaska south to Baja California, Mexico, including the northwestern Hawaiian Islands (Farrand 1983; Roberson 2000; COSEWIC 2003). Current sightings in the eastern North Pacific are mainly concentrated off the shores of Alaska and British Columbia. As gradual recovery of the population began after 1950, sporadic sightings (11 from 1977 to 2002) were recorded off of California (Unitt 2004).

Based on the number of sightings during the past 25 years, the short-tailed albatross is incidental off the coast of Southern California. Roberson (2000) reported a sighting approximately 78.2 nm (144.8 km) west of the San Diego area, seaward of the SOCAL Range Complex. McCaskie and Garrett (2002) reported a sighting near Santa Barbara Island. Sightings of short-tailed albatross have the potential to increase in frequency if the population continues to recover.

Marbled Murrelet (*Brachyramphus marmoratus*)

The marbled murrelet is listed as a threatened species under the ESA and is considered endangered by the State of California. Critical habitat for the marbled murrelet has been designated at sites from central California near Santa Cruz and San Francisco and north to Oregon (USFWS 1997).

Marbled murrelets are unique among alcids in their use of old growth forest stands near the coastline for nesting. Stands of 500 acres (2 km^2) or larger appear to be preferred (USFWS 1997). Large trees with a moderate to high canopy closure generally characterize these forests (Singer et al. 1991; USFWS 1997). Stand size is an important factor for this species since it uses trees with large branches or deformities for nest platforms. Marbled murrelets are generally found foraging

in nearshore waters, mainly within 0.53 to 1.08 nm (1 to 2 km) of the shore (Kuletz and Marks 1997; USFWS 1997).

The marbled murrelet occurs only in the north Pacific. It ranges from Attu and other islands of the Aleutian archipelago across southern Alaska and south as far as Santa Cruz County in central California (USFWS 1997). Nesting occurs from the Aleutian Islands of Alaska south through British Columbia, Washington, Oregon, and into central California. The marbled murrelet is more likely to occur in northern California than in southern or central California due to its dependence on old-growth timber for nesting. The closest documented nesting site to the SOCAL Range Complex is Half Moon Bay, located in Santa Cruz County, California (CDFG 2005a). This site is located about 200 nm (370 km) north of the northernmost boundary of the SOCAL Range Complex. The species' wintering range is poorly documented but includes most of the Pacific coast marine area used in the breeding season, and extends south into Southern California (Nelson 1997). The normal winter, spring, summer, and fall ranges for the marbled murrelet occur within 1.08 nm (2 km) of the coast north of the Santa Barbara County line. The marbled murrelet is considered rare along the coast from the Santa Barbara County line south to the border with Mexico and is considered to be incidental from the United States/Mexico border south along the Mexico coastline. Within the SOCAL Range Complex, occasional sightings have been reported along the coast in San Diego County. All sightings were during late fall, winter, or early spring.

Xantus's Murrelet (*Synthliboramphus hypoleucus*)

Both subspecies of Xantus's murrelet are designated federal candidate species to be considered for listing under the ESA. The listing of Xantus's murrelet as a threatened species by the California Fish and Game Commission is being considered. Xantus's murrelet breeding season is from December through January and the nesting season is February through June. Xantus's murrelet nests on islands, utilizing crevices and caves less than 20 centimeters in height, as well as areas under boulders (Murray et al. 1983). It has also been known to use shrubby vegetation, cliffs, and sites on steep slopes adjacent to the sea. Xantus's murrelets are nocturnal birds, limiting all land-based activities except incubation to hours of darkness (Murray et al. 1983). During the breeding and nesting season, Xantus's murrelets forage in waters surrounding the nesting island.

The known breeding range for Xantus's murrelets is from San Miguel Island, California, to San Benito Island, Baja California, Mexico. Breeding and nesting have been documented on islands within the SOCAL Range Complex. Breeding Xantus's murrelets were found up to 9.72 nm (18 km) from Santa Barbara Island. They have been observed over the open ocean within the SOCAL Range Complex and have been reported off of Newport Beach, La Jolla, and San Diego. They are known to nest at Cat Canyon and Sutil Island on Santa Barbara Island, Landing Cove on Santa Catalina Island, and at Seal Cove and China Point on SCI.

The largest Xantus's breeding colony in Southern California is at Santa Barbara Island (Murray et al. 1983; Burkett et al. 2003) and is considered the largest and most important breeding colony in California. Surveys were conducted from 1991 to 1996 at Cat Canyon (southern tip of the island) and on the nature trails south of the landing cove (northeastern part of the island). The population of Xantus's murrelets was estimated at 2,000 to 4,000 birds in 1980 and fewer than 2,000 were estimated in 1992 (CDFG 2003). Additional surveys performed from 1991 to 1997 place the population estimate at 2,252 breeding individuals or about 1,126 nests during this period (Carter unpublished data). The highest numbers of individuals during at-sea surveys were found between 1.08 to 7.6 nm (2 to 14 km) from the island. The number of individuals is also noticeably higher over shelf waters ranging from 131 to 328 feet (40 to 100 meters) in depth. The highest numbers of Xantus's murrelets are seen close to Santa Barbara Island in the early morning hours. As the

day progresses the number of individuals becomes more evenly distributed further from the island. Xantus's murrelets have been known to use sea stacks (offshore rock outcrops) on the island for roosting and as a takeoff point for foraging.

Two confirmed nesting sites for this species are known on SCI: Seal Cove and China Cove. In 1992, 20 individuals were documented during the breeding season on SCI (Carter el al. 1992). Additional sightings and nests exist on San Miguel, Santa Cruz, and Anacapa islands northwest of the SOCAL Range Complex.

During the nonbreeding season (June through December), most Xantus's murrelets occur offshore in the warm pelagic waters of the California current. Nonbreeding distribution for this species ranges from the waters of southern British Columbia, Canada, to Baja California, Mexico. During systematic coastal aerial surveys the highest numbers of murrelets, Xantus's and probably smaller numbers of Craveri's murrelets (*Synthliboramphus craveri*), were found between 10.8 and 54 nm (20 and 100 km) offshore (Briggs et al. 1987). This offshore limit of the species' distribution might not reflect its actual distribution, since very few offshore surveys have been conducted for this species (Drost and Lewis 1995).

The number of suitable, predator-free nesting islands is the major factor limiting the world population of Xantus's murrelet. Several former nesting islands currently support few or no murrelets because of introduced predators. Moreover, on some of the large islands (e.g., Guadalupe Island) introduced predators have restricted the murrelets to small, predator-free islets offshore, where nesting birds appear to be very crowded (Green and Arnold 1939, Jehl and Bond 1975). Prey availability may limit recruitment at times; delayed nesting and reduced nesting effort in some years have been linked to lower populations of prey (anchovies) in area waters (Hunt and Butler 1980). Even though barn owl predation on murrelets at Santa Barbara Island may be high, there is no evident effect on long-term population size; numbers in years following heavy predation are not significantly different from numbers in years following light predation (Drost 1989). Thus suitable, undisturbed, predator-free offshore island habitat remains the cornerstone to sustained populations of this species.

California Brown Pelican (*Pelecanus occidentalis californicus*)

The brown pelican is one of two pelican species found in North America. The California brown pelican is one of six recognized subspecies of brown pelican. The California brown pelican is listed as endangered under the ESA and by the State of California. There is no designated critical habitat for the California brown pelican (USFWS 1983).

The California brown pelican is found in estuarine, marine subtidal, and marine pelagic waters along the California coast. In Southern California, the brown pelican is common along the coast from June to October, especially within 16.2 nm (30 km) of the shore (Briggs et al. 1981). The California brown pelican usually breeds on small coastal islands within 16.2 to 27 nm (30 to 50 km) of a consistent and adequate food supply. Nesting occurs on the middle or upper parts of steep rocky slopes of small islands off California and Baja California. Foraging occurs in shallow waters within 10.8 nm (20 km) of nesting islands during breeding season and up to 40.5 nm (75 km) from the closest land during the nonbreeding season.

Four breeding populations of California brown pelican have been identified: (1) the SCB, (2) the lower west coast of Baja California, (3) the Gulf of California, and (4) the coastal estuaries along the western Mexico mainland coast south to Colima. The SCB population consists of breeding birds on the Channel Islands (West Anacapa Island and Santa Barbara Island) and several islands off Baja California (Middle Los Coronados Island and North Los Coronados Island) (USFWS 1983). Recently, additional breeding populations have been observed at Prince Island, Middle Anacapa, and East Anacapa (UC Santa Cruz 2006). Brown pelicans are present at nesting islands from March to early August. In general, the brown pelican in California migrates northward in

July or August after breeding and returns in December or January to breed (Shields 2002). Some individuals are present year-round in central and southern California, which is also part of its winter range. Nonbreeding California brown pelicans range northward along the Pacific Coast from the Gulf of California to southern British Columbia (Johnsgard 1993).

Along the coast and on some islands, the brown pelican is a year-round resident. It is frequently seen in the open ocean within the SOCAL Range Complex. Several California brown pelican colonies occur within or near the SOCAL Range Complex with the largest breeding colony located on Santa Barbara Island, approximately 3,000 breeding pairs (CHIS unpublished data). Brown pelicans are commonly seen roosting year-round at SCI, Santa Catalina Island, and San Nicolas Island; however, there are no breeding records. Brown pelicans use sea stacks at SCI for roosting and foraging. Aerial surveys conducted in 1992 and 1993 documented 92 and 358 roosting brown pelicans, respectively (DoN 2002a). California brown pelican day-roosting areas are scattered along the coastline, particularly along the eastern end of San Nicolas Island (DoN 2002b). Nearly 5,000 California brown pelicans roost on San Nicolas Island (Capitolo et al. 2007). Brown pelican numbers increase in the SOCAL Operating Area (OPAREA) during the summer as breeders from the Baja California population migrate north after nesting. Numbers off of San Diego peak from August to October and then decline from November on as some brown pelicans continue south to winter along the Mexican coast (Unitt 2004).

California least tern (*Sterna antillarum browni*)

The California least tern is listed as endangered under the ESA and by the State of California. No critical habitat is designated for this species.

California least terns are neotropical migratory birds, spending the breeding season (April through August) along the central and southern California coast, as well as along the west and southwestern coast of Mexico. The California least tern historically nested on coastal beaches of Monterey, California, to Cabo San Lucas, Baja California. Nesting is currently limited to San Francisco Bay and areas along the central and southern California coast from San Luis Obispo County to San Diego County (Massey and Fancher 1989).

The preferred nesting habitat for the California least tern consists of beaches, dunes, sand bars, and spits on the ocean shore (USFWS 1985). The California least tern nests in areas generally free of vegetation above the high tide mark (some nests have potential between the high tide and high-high tide mark). Colony sites are often located in the vicinity of estuaries, lagoons, rivers, or the seacoast (USFWS 1985). This species also nests in human-modified areas including agricultural fields, parking lots, bare land at airports, and gravel rooftops (Thompson et al. 1997). If atypical nesting sites are used, they are almost always adjacent to a bay, estuary, or the ocean (Burr 2007). Atwood and Minsky (1983) noted that, prior to the species decline, at least 82 percent of known California nesting sites were located within 1.08 nm (2 km) of a river mouth or estuarine habitat.

Foraging habitats include nearshore ocean waters, river mouths, salt marshes, marinas, river channels, lakes, and ponds (Thompson et al. 1997). The presence of eelgrass is important for several small fish that are prey species of the least tern (DoN 2002c). Foraging activity occurs within 2.7 nm (5 km) of the shore, with most activity in water less than 59 feet (18 m) deep. Researchers report that the California least tern in coastal colonies foraged up to 3.2 nm (6 km) from shore; however, up to 75 percent of foraging occurred within 0.65 nm (1.2 km) of nesting areas in Southern California (Atwood and Minsky 1983). Areas used for foraging will often vary from year to year, depending upon stage of breeding and prey species availability.

Foraging activity changes during the breeding/nesting season. During courting and incubation of eggs, California least terns forage farther from the nest site over open/deep water. When the chicks hatch, foraging takes place in nearshore/shallow water habitat. Foraging time and peak

foraging behavior occur from the end of May through mid-July after chick hatching. Foraging behavior adjacent to naval facilities structures was studied in San Diego Bay in 2002 (DoN 2002d); this study focused on determining foraging activity in areas adjacent to naval facility piers and in open water. The study did not find a definitive pattern of foraging between piers (0 to 33 ft [10 meters] from the pier) and open water (>246 ft [75 m] from pier), but did verify changes in foraging activity previously discussed for the California least tern. Foraging activity was highest in mid-July and was located near the two largest colonies (DoN 2002d). In San Diego County, Unitt (2004) reports that some birds forage at inland locations during the middle of the breeding season, more birds forage inland in northern than southern San Diego County, and more California least terns go inland to forage after the young have fledged in late July and August.

Migration routes and wintering range for the California least tern are not well known. During spring (late April and early May), Howell and Engel (1993) reported sighting least terns 1.08 to 16.2 nm (2 to 30 km) offshore of western Mexico, with the majority sighted less than 9.7 nm (18 km) offshore. Specific spring/fall distribution data offshore of Southern California or fall distribution data off western Baja California, Mexico, were not found. During late summer and fall, migrating California least terns often concentrate in coastal lagoons (CDFG 1998). Fall migration begins in August, with most terns leaving California by September. Late migration may occur with some individuals lingering until October (CDFG 1998). The terns migrate along the coast to their wintering grounds south of the United States.

It is thought that the California least tern winters along the Pacific coast of Central America (USMC 2001). Unitt (2004) reports that California least terns banded in San Diego Bay were found wintering along the Pacific coast of Guatemala, southern Mexico (Chipas), and western Mexico (Colima).

3.10.1.3 Current Mitigation Measures

SOCAL Range Complex training activities encompass a wide array of operations that include aircraft, oceangoing vessels, and land-based operations. Currently, the majority of aircraft operations are concentrated at the Naval Auxiliary Landing Field (NALF) SCI. In accordance with Chief of Naval Operations' (OPNAV) Instruction 5090.1C CH-22, the Environmental Division or Natural Resource Section of a Naval Air Station (NAS) is responsible for preparing and implementing a Bird Aircraft Strike Hazard (BASH) plan. Following the outcome of an ecological study (wildlife hazard assessment) complete in 2002, several recommendations were made to increase aircraft safety by limiting bird strikes (DoN 2007). General measure CBP-M-1 (See Terrestrial Biology Section 3.11.4) states that the operators should ensure that the California brown pelican is not in proximity to the overblast pressure prior to underwater demolition activities. Monitoring of seabird populations and colonies by conservation groups and researchers is conducted intermittently within coastal areas and offshore islands with limited support from various military commands.

3.10.2 Environmental Consequences

3.10.2.1 Approach to Analysis

This section evaluates how and to what degree the activities described in Chapter 2 interface with seabird communities known to occur within the SOCAL Range Complex. In this section an effects analysis has been conducted for potential mortality, habitat destruction, or breeding and roosting disturbance. Migratory and breeding seabirds utilize portions of the SOCAL Range Complex to differing degrees depending on species' foraging and breeding requirements. The alternatives for SOCAL Range Complex training were examined to determine if the Proposed Action would produce one or more of the following effects:

- A direct or indirect effect on seabird populations from mortality attributed to military training activities taking place within the range complex.
- A direct or indirect effect on seabird populations from destruction or disturbance of foraging habitat attributed to military training activities taking place within the range complex.
- A direct or indirect effect on seabird populations from destruction or disturbance of seabird breeding colonies or habitat attributed to military training activities taking place within the range complex.

The SOCAL Range Complex encompasses a vast area from coastal beaches (up to the mean high tide line) to approximately 600 nm (1,111 km) offshore including approximately 120,000 square nautical miles (nm^2) (411,588 square kilometers [km^2]). Coastal islands are key to seabird life history; they provide a unique habitat for breeding and migratory seabirds that is relatively free of human disturbance. Based on numerous biological studies, the temporal and spatial fluctuations of productive nearshore marine ecosystems and offshore water masses with a concentration of prey species have a major influence on seabird productivity and habitat preference. Complicating the effects analysis is the fact that the population status of many SCB seabird species is not well understood due to their remote breeding locations and vast migratory ranges.

Potential impacts to seabirds from human activities include loss of habitat, introduction of nonnative species, commercial fishing, and disturbance. Disturbance is propagated by noise and light as well as physical presence. The potential for conflict with seabirds centers primarily over islands and adjacent waters, although offshore foraging areas do represent a potential area of effect. The spatial and temporal variability of SOCAL Range Complex training and the seasonal changes in seabird foraging locations complicate the evaluation of direct or indirect effects.

The SOCAL Range Complex consists of three primary components: Ocean Operating Areas, Special Use Airspace, and SCI. A large part of the training within the SOCAL Range Complex is centered on the SCI terrestrial ranges and includes aircraft, missiles, electronic equipment, motorized and passive vessels, and land-based vehicles and artillery. The analysis of each alternative for potential environmental consequences with regard to seabirds is divided into three categories: aviation operations, ocean operations, and land-based operations. Certain exercises combine these operation types; and although these exercises will be described in a specific section, they will be analyzed in this section for all potential consequences, regardless of media (air, water, or land). Analysis of seabird usage patterns in the SOCAL Range Complex further divides the analysis into seabird species that breed on offshore islands, forage in nearshore waters of the mainland or offshore islands, and forage or migrate in only offshore waters (> 15 km offshore).

Thresholds of effect by disturbance differ by type and species. Noise disturbance from motorized vehicles including land-based vehicles, aircraft, and oceangoing vessels likely differs significantly from explosions that create pressure waves or earth movements. Point Reyes Bird Observatory recommends that recreational boaters maintain at least a 500-foot (ft) (160-meter [m]) distance from nesting or roosting seabirds and also advise a 2,000 ft above ground level (AGL) height for aircraft (PRBO 2003). Considering the differences between private and military aircraft, boats, and land-based vehicles, a buffer distance of 0.13 nm (0.25 km) will be utilized as the threshold distance of potential disturbance related to all types of disturbance from operational activities.

As mentioned in Section 3.10.1.2, Existing Conditions, military readiness activities are exempt from the take prohibitions of the MBTA provided they do not result in a significant adverse effect on a population of a migratory bird species. A number of migratory bird species covered under the MBTA are listed as endangered or threatened, and are discussed in detail in Section 3.10.2.5,

Federally Threatened and Endangered Species. Other species (not listed) covered under the MBTA occur within the SOCAL Range Complex and are not limited to, but are included, in Table 3.10.1. A remote possibility exists that individuals may be directly impacted if they are in close proximity to the target area at the point of physical impact during inert/active ordnance delivery or from pressure waves associated with detonations in offshore ranges. Regardless, populations of migratory birds would likely not be affected by the implementation of the common elements of the Proposed Action. The temporary degradation of habitat or mortality of young (if species breed within the range complex and a fire occurred during breeding season) could occur due to ordnance-ignited wildfires. Overall, however, ordnance-ignited and prescribed fires, as well as protection from urban development, have maintained the habitat for such species within the range complex. Noise impacts would also potentially affect breeding seabirds, but likely only negligibly affect migratory birds. Although a BASH exists, no adverse impacts to seabird populations are likely to occur do to the relatively low frequency of interaction documented in the wildlife hazard assessment performed for SCI NALF in 2002.

3.10.2.2 No Action Alternative

Under the No Action Alternative military training activities and Research, Development, Test, and Evaluation (RDT&E) are performed throughout the SOCAL Range Complex.

3.10.2.2.1 SOCAL Operating Areas

Aviation Operations

Effects to seabirds attributed to aircraft training activities within the SOCAL OPAREAs can be compartmentalized into specific categories regardless of the aircraft or operational exercise. The categories are the basis of the approach to analysis and include destruction or degradation of known seabird breeding colonies; disturbance of seabirds foraging, roosting, or breeding; and destruction or degradation of foraging habitat. Disturbance of seabirds is quantified by examining the proximity of aviation operations (elevation), location of operational exercises (range), and the activity performed during flight activities (observational/bombardment). Considering the parameters used to evaluate disturbance effects, effects would most likely be concentrated around takeoff and landing points on SCI, San Nicolas Island, and NAS North Island.

Aviation training involving lower elevation flight paths, tactical maneuvering, or ordnance deployment in airspace less than 1,000 ft (305 m) AGL presents potential for seabird impacts. Aviation training performed within the SOCAL OPAREAs primarily involves fixed-winged aircraft flying at elevations above 1,000 ft (305 m) AGL and occurs offshore of coastal areas and islands. Approximately 32,000 aviation operations take place within the SOCAL Range Complex of which 25,120 are attributed to NALF SCI. Rotary blade aircraft that typically operate at below 1,000 ft AGL and in close proximity to the mainland and offshore islands account for less than 1,000 operations per year, but have the greatest potential to interact with seabirds. Many breeding and migratory seabirds utilizing coastal and offshore waters within the SOCAL Range Complex are roosting or foraging for specific prey species concentrated at current boundaries, nearshore, or near underwater structures that place the seabirds below 1,000 ft (305 m) elevation so they can identify prey.

Aviation training activities actively avoid Santa Catalina Island because the residential population places additional restrictions upon maneuvers. Additionally, Santa Catalina Island has a public airfield that is used daily, with associated airspace restrictions, for approach and takeoff of public and commercial aircraft. Santa Barbara Island is managed by Channel Islands National Park and aircraft are required to maintain an elevation of 1,000 ft AGL when in proximity of the island. San Nicolas Island is not utilized for flight training activities below 1,000 ft AGL, according to the operations handbook, and has only limited logistical aircraft traffic.

Effects of aviation training involving lower elevation flight paths, tactical maneuvering, or ordnance deployment in airspace less than 1,000 ft AGL would be limited to impacts on species that roost, forage, or breed on or within 0.54 nm (1 km) of the islands, rather than direct mortality from collision or disruption of foraging behavior of seabirds utilizing offshore waters. Seabird species most likely to be affected by aviation training are those that are resident on offshore islands: specifically, those known to have breeding and roosting colonies on SCI. The western gull (*Larus occidentalis*) is documented to breed in relatively low numbers (< 300) on SCI, medium numbers (>1000) on Santa Barbara Island, and extensively (>6000) on San Nicolas Island and is a ground nester near coastal bluffs. Regional populations are expanding rapidly and it appears likely that this gull species will continue to expand its use of the SOCAL Range Complex islands. Western gulls are gregarious and not easily disturbed or impacted by human encroachment or activities. Aviation operations concentrated at SCI NALF and in offshore ranges would not have adverse impacts on western gull populations.

Aviation activities in the proximity of Santa Barbara Island and Santa Catalina Island are restricted to elevations greater than 1,000 ft AGL and have minimal potential to effect seabird foraging or foraging habitat. Ashy storm-petrels, Xantus's murrelets, pigeon guillemot's, and Cassin's auklets have been consistently documented to breed on Santa Barbara Island to varying extents and are afforded greater protection there, due to the absence of terrestrial predators (feral cats and Island fox) and the conservation status of the island.

Brandt's cormorants are documented to nest at the southern Channel Islands, primarily on offshore rocks and seamounts. Brandt's cormorants are susceptible to noise disturbance and could be impacted by coastal low elevation aircraft operations. The majority of SOCAL Range Complex aircraft operations conducted less than 1,000 ft AGL are concentrated at SCI NALF landing strip and in offshore ranges. Considering the greatest amount of primary roosting and nesting habitat for cormorants within the SOCAL Range Complex is on Santa Barbara Island, Santa Catalina Island, and on San Nicolas Island, regional Brandt's cormorant populations would not be affected. Breeding colonies of Brandt's cormorants on SCI are comparatively small in relation to the other islands, with only 56 breeding individuals in 1991 (Carter et al. 1992). Potential effects from low flight aircraft training on the west shore of SCI within 0.13 nm (0.25 km) of the island or offshore rocks may have isolated and temporary disturbance effects to individual colonies.

OPAREA 3803 and Shore Bombardment Area (SHOBA) have boundaries that are either adjacent to, or overlap, SCI. Air strikes with birds are recorded and reported as mandated by the Federal Aviation Administration (FAA). A Wildlife Hazard Assessment conducted at NALF SCI between February 2002 and January 2003 documented 12 bird/aircraft strikes (Cummings and Sheffer 2007). The most numerous birds observed during the assessment period were, in descending order, horned larks, European starlings, house finches, and western meadowlarks.

Aviation training in the proximity of mainland coastal areas has a greater potential for interaction with seabirds as a greater number of species and individuals reside or transit the mainland coastal zone compared to offshore or island areas. The current number of military aviation exercises near the mainland coast within the SOCAL Range Complex is relatively low when compared to commercial and private aviation operations. Exceptions are rotary winged aircraft (helicopters) that operate at low elevation for extended time periods both in close proximity of the mainland coast and offshore islands. For example, Helicopter Anti-Submarine Warfare (ASW) Tracking Exercise (TRACKEX) flies 544 operations averaging 1.8 hours in duration in the waters near SCI (20 percent) and Helicopter Offshore Training Area (HCOTA) (60 percent), both areas of known seabird breeding and foraging activity. Seabirds actively avoid interaction with aircraft; however, disturbances of various seabird species may occur from aviation operations on a site-specific basis. Coupled with the large geographic size of the training ranges and the relatively slow air

speeds of rotary aircraft (less than 100 knots) across these training ranges, effects from aviation operations would remain temporary and isolated.

Consequently, direct and indirect effects resulting from the destruction or degradation of seabird populations or their habitat from SOCAL Range Complex aviation training activities would be infrequent and temporary under the No Action Alternative.

Ocean Operations

Vessels performing training exercises within the SOCAL Range Complex are primarily large oceangoing ships and submarines operating in waters greater than 328 ft (100 m) and small fast-moving vessels. Large oceangoing vessels (greater than 100 ft [30.4 m] in length) include a host of tactical military ships performing live firing, electronic monitoring, and avoidance maneuvering. Considering the complexity of the training operations and the required logistical mobilization and demobilization requirements, the majority of all ocean operations involve passive transit of vessels within the SOCAL Range Complex. Of the 7,000 ocean operations currently performed within the SOCAL Range Complex, approximately 2,500 are related to amphibious landing operations. Ninety percent of all amphibious landings take place in the Camp Pendleton Amphibious Assault Area (CPAAA). Other than amphibious landing operations the primary ocean operation components are ASW TRACKEX (847 exercises), Electronic Combat (EC) Exercises (748 exercises), Air Defense Exercises (ADEX) (502 exercises), and Surface-to-Air Gunnery Exercises (GUNEX S-A) (262 exercises). Large ships operating in offshore waters move at approximately 20 knots at full speed; however, these often operate at significantly slower speeds while engaged in training activities. Breeding and roosting seabird species, particularly those species that nest or roost on cliffs or offshore rocks, are highly susceptible to human disturbances. The potential to harm or disturb breeding seabirds can come from various sources including: popular coastal area recreational activities such as kayaking, boating and hiking; planes and helicopters; water-based tourism/recreation such as wildlife watching or diving; and fisheries operations that fish or anchor near breeding colonies (NOAA 2006). Artificial nightlighting can also be a problem for several seabird species that are nocturnal in colony or foraging habits. The concern over the potential impacts of artificial lights on seabirds in the Channel Islands arose in 1999 when large increases in artificial light intensity levels associated with night-time squid fishery boat activity extended throughout the seabird breeding season. Breeding seabirds in California susceptible to inflight strikes include Xantus's murrelet, Cassin's auklet, rhinoceros auklet, all of the storm-petrel species (ashy, black, fork-tailed, and Leach's), and the fledgling chicks of tufted puffins. Additionally, California brown pelicans, cormorants, and other seabirds are affected by the ancillary fishing activities. (e.g., vessel proximity, motor noise, generators, lights, human voices, seal bombs, gunshots, radios) of the market squid fishery near roosting and breeding sites (CDFG 2005b). Seabirds attracted to oceangoing vessels for various reasons; thus provide increased potential for additional interactions between vessels operating in seabird foraging areas and seabirds roosting, migrating, or foraging in SOCAL Range Complex waters. Since training activities attempt to simulate war like conditions, vessels do not typically utilize large deck lights or strobes in an attempt to remain visually disguised, reducing the potential attraction of nocturnal foraging seabirds. NOAA National Marine Sanctuary (NMS) program, in conjunction with Point Reyes Bird Observatory (PRBO), and associated researchers recommend that motorized vessels remain 1000 ft from seabird colonies to reduce disturbance (PRBO 2008) & (Carter et al. 1998). Current Channel Islands National Marine Sanctuary regulation 15CFR922a requires that aircraft, maintain a minimum altitude of 2000' AGL when flying within one-quarter mile of the coast, over offshore rocks and islands, or within California National Marine Sanctuary.

Effects attributed to ocean operation activities on seabirds breeding in the SOCAL Range Complex are confined to activities that operate within 0.25 km of known breeding seabird

colonies on SCI and associated offshore rocks. Ocean operations do not take place within 0.25 km of Santa Barbara Island, Santa Catalina Island, or San Nicolas Island. Seal Cove and China Cove on SCI have documented breeding populations of ashy storm-petrels (50) and Xantus's murrelets (20) that are susceptible to ground and noise disturbance during their breeding season. Naval Surface Fire Support (NSFS) and Expeditionary Firing Exercise (EFEX) expend high explosive ordnance within SHOBA Impact Area II. Detonations from ocean operations occurring within 0.25 km distance of nest sites during breeding season would have potential adverse effects to breeding success.

Amphibious landing vehicles and small vessel operations taking place within the Northern Air Operating Area (NAOPA), Kingfisher Training Range (KTR), Mine Training Range (MTR), Naval Special Warfare Training Areas (SWATs), SHOBA, and Naval Special Warfare (NSW) Training Areas and Ranges (TARs) include advanced special operations by Navy and Marine Corps units as well as mine detection and electronic monitoring. Some operations involve live-fire explosive detonations and high speed maneuvering. The potential for interaction between amphibious and small vessels and foraging or breeding seabirds involves training activities operating in close proximity of beaches, offshore rocks, and island areas where roosting or breeding seabirds are concentrated. Amphibious vehicles and small vessel operation is dependent on suitable weather and sea surface conditions, limiting the number of days each year such operations occur. Small vessel operation within the SOCAL Range Complex is concentrated around SCI and Camp Pendleton where suitable locations exist for nearshore activities. Using buffer distances developed for roosting or foraging seabirds within adjacent marine sanctuary habitat, seabird disturbance or injury from small vessel operation could occur during vessel movement and explosions occurring within close proximity (500 m) of seabird populations. Ingress and egress of amphibious vehicles and live-fire and explosive detonations around SCI are typically confined to Northwest Harbor, Wilson Cove, and SHOBA impact areas. Camp Pendleton Ingress/Egress training activities have a greater potential of affecting a wider variety of species due to their mainland location and the use by a greater variety of seabird and shorebird species. SCI amphibious landings and raids at SCI occur at Northwest Harbor, West Cove, Horse Beach Cove, and Pyramid Cove on large sand beaches bordered by rocky headlands on either end. Populations of breeding seabirds within close proximity to the landing beaches are only sparingly documented and similar habitat is available throughout much of SCI. Species most likely to be impacted are roosting cormorants and pelicans. Any effects on foraging, roosting, or breeding seabird populations related to amphibious landings or small vessel operation would be localized and temporary.

Considering nearshore water within 0.54 nm (1 km) is the primary foraging habitat for many of the described seabird species, this area is most likely to incur negative effects from ordnance explosions. Lethal exposure to birds from pressure waves varies, not only from size of the explosive and distance from impact, but also on the water depth at which the detonation occurs, overall depth, bottom substrate, and location of the bird both in distance from the detonation and whether the bird is on the surface or underwater. The only offshore island contained within the SOCAL OPAREAs where Ingress/Egress, live fire, and detonations occur is SCI. The majority of nearshore habitat, within 0.54 nm (1 km), adjacent to SCI is rocky bottom less than 100 ft (30 m) deep containing persistent kelp forests.

Excluding the east shore of SCI, where few nearshore training activities take place, some species of seabirds are likely to be disturbed to some degree during amphibious vehicle and small boat operations. In-water detonations, planned and targeting error, both underwater and at the surface would affect seabirds in adjacent waters at various distances depending on the size of the ordnance. Several of the sensitive species are nocturnal foragers roosting on steep cliff faces on the west shore, not adjacent to live fire ranges, and utilizing waters greater than 1 km offshore.

Xantus's murrelet, ashy storm-petrel, and black storm-petrel are not likely to be affected during roosting or foraging, but California brown pelicans and all three cormorant species are likely to suffer some adverse disturbance effects from littoral activities due to their preferred roosting and foraging locations.

Both single charge and mat weave underwater detonations take place at Northwest Harbor. All Mine Warfare and Mine Countermeasures Operations involving the use of explosive charges must include exclusion zones for marine mammals and sea turtles to prevent physical and/or acoustic effects to those species. These exclusion zones shall extend in a 700-yard arc radius around the detonation site. Although there are not specific range clearance procedures for birds, personnel are instructed to not detonate when birds are in proximity to ordnance activities. Operations are primarily single charges or spaced closely together to allow for minimal time between detonations and to avoid seabird ingress.

Potential effects to seabird species from detonations at Northwest Harbor could occur if seabirds are in close proximity on or under the water at the time of the operation. In-water ordnance detonations would have lethal effects on foraging seabirds if pressure waves exceed 36 pounds per square inch (psi)/millisecond (ms for birds underwater and 100 psi/msec for birds at the surface (Yelverton et al. 1973). Northwest Harbor is a sandy beach bordered by a rocky headland to the west where seabirds are documented to roost. The Northwest Harbor area is part of a larger complex utilized by NSW and live-fire including small arms, rifle, grenades, and underwater explosives take place within the complex regularly. Though adequate habitat for seabird roosting is adjacent to the facility, frequent noise events likely redistribute transient seabird species to less disturbed locations on SCI.

Bombardment within SHOBA impact areas I and II encompasses the coastline of SCI including rocky headlands and sandy beaches. Errors in targeting represent a reasonable chance that detonations would occur in the nearcoastal waters adjacent to impact areas I and II. In-water detonations from incoming ordnance discharged by ocean operation vessels within SHOBA have the greatest potential of eliciting lethal effects to seabirds. No site-specific data is available with regards to roosting or foraging seabird populations within the SHOBA impact areas but primary roosting and foraging habitat associated with rocky headlands and outcroppings is abundant within both areas. Considering the regular and persistent use of SHOBA impact areas I and II as target areas for ocean operations bombardment, the likelihood of detonations occurring in nearcoastal waters is nearly certain. Whether seabird species are present at the time of bombardment is uncertain. The probability that lethal effects, attributed to ocean operations, would impact overall seabird population is low. Lethal effects to seabirds from in-water ordnance detonations have a low potential to occur considering the infrequency of targeting errors resulting from in-water detonations and the low potential for seabird species to be foraging or roosting in close proximity to explosions.

Potential effects to seabird species attributed to entanglement from debris or materials resulting from ocean operations is low considering the majority of material is negatively buoyant and large in size (i.e., rockets, ordnance, sonobuoys).

Information regarding the effects from sonar on seabirds is virtually unknown. One may be able to extrapolate to aquatic birds from temporary threshold shift (TTS) and permanent threshold shift (PTS) data on terrestrial birds; however, the exposure to anthropogenic underwater sounds by aquatic birds, other than diving species such as penguins, is likely to be limited due to their short time under water. Of course, if the sound levels are sufficiently intense, even a short exposure could be problematic. In general, birds are less susceptible to both TTS and PTS than are mammals (Saunders and Dooling, 1974). Moreover, relatively severe acoustic overexposures that would lead to irreparable damage and large permanent threshold shifts in mammals are

moderated somewhat in birds by subsequent hair cell regeneration. Reviewing the probability of explosions or sonar occurring within close proximity of seabirds, and specifically diving seabirds, effects to seabird species would be infrequent.

Large vessels operating within the SOCAL Range Complex could temporarily disturb seabirds actively foraging in offshore surface waters. Seabirds foraging in offshore waters have an ability to identify approaching vessels well in advance of a potential collision. They would then reposition to avoid contact and resume foraging. Any effect on seabirds foraging in offshore waters would be localized and temporary, and thus not expected to impact the seabirds' energy expenditure or foraging success. Foraging areas near ocean current boundaries and debris lines that contain a concentration of seabird prey are large features extending over miles of open ocean water. The potential for interaction between transiting or stationed large oceangoing ships and foraging seabirds in offshore waters would be low. Any effects from ocean operations on migratory or breeding seabirds related to reduced foraging success or direct mortality in offshore waters would likely be infrequent and minimal.

Overall, direct and indirect effects resulting from the destruction or degradation of seabird populations or their habitat from SOCAL Range Complex ocean training activities would be infrequent and temporary under the No Action Alternative.

3.10.2.2.2 San Clemente Island

Aviation Operations

Breeding habitat critical to seabird species within the SOCAL Range Complex is limited to terrestrial areas located on the mainland or on offshore islands. Of the 48 species identified within the SOCAL Range Complex, only 12 are known to breed on offshore islands within the complex; of those species only 5 are known, or thought to breed on, SCI, 2 are known to breed on San Nicolas Island, 2 are known to breed on Santa Catalina Island, and 12 are known to breed, or thought to breed on Santa Barbara Island. SCI is the primary location of potential breeding seabird impacts within the SOCAL Range Complex because aviation operations over Santa Catalina and Santa Barbara Island are restricted to operations above 1,000 ft (305 m) AGL. Historically, long term persistent aviation operations at established airfields have not been shown to have a significant effect on resident or migratory seabirds. Terns and gulls regularly nest and forage in close proximity to NAS North Island in San Diego Bay where air traffic is extensive and consistent. Air traffic at NALF SCI has persisted for nearly 40 years; flights occur daily numbering over 25,000 per year. Species most likely to be affected by NALF SCI aviation operations are California brown pelicans and the three cormorant species. Only the Brandt's cormorant is documented to breed on SCI, but not in the immediate proximity of the landing field. There appear to be two different types of birds around airports: resident birds and non-resident birds. There is evidence that mature resident birds have habituated to the presence of human activity and, like domestic animals, try to avoid hazardous situations. They engage in a variety of identifiable actions which seem designed to help them fit into the 'traffic pattern' at the airport (Kelly et al. 1999). Non-resident birds and young resident birds, however, seem to have little or no awareness as to the hazard of aircraft. These birds react to aircraft as if they are immovable obstacles to be avoided, such as trees, buildings, etc. As a result they often are late attempting to maneuver away from aircraft, resulting in a collision. In colonies where aircraft overflights are frequent, guillemots do not usually react to them, which the authors attribute to habituation (Fjeld, et al. 1988). Considering the resident nature of the most common sea bird species gulls, cormorants and pelicans. In all likelihood the resident seabirds in the immediate area have either habituated to the physical and noise disturbance from the airfields or have relocated to expansive adjacent habitat over the years. Crevice nesting seabirds, such as the ashy storm-petrel, black storm-petrel, and Xantus's murrelet have breeding populations historically documented on SCI near steep cliff areas on the west shore; however, population estimates have

been extremely low (< 20 breeding individuals) and consistent evaluations have not been done (Carter et al. 1992). The ashy storm-petrel, black storm-petrel, and Xantus's murrelet have high site fidelity and forage almost exclusively at night in nearcoastal waters (1-10 km). Interactions with SOCAL Range Complex aircraft would be rare due to these species' foraging and flight patterns in relationship to aircraft training operations. Exceptions are activities within SHOBA Impact Area II, and SWAT 6 training areas that expend ordnance ashore or nearshore (within 500 m) of known breeding habitat at Seal Cove and China Cove. Additionally, activities that transit within 0.13 nm (0.25 km) of coastal headlands or offshore rocks or utilize extensive lighting in close proximity to these breeding locations could have potential harmful disturbance effects to breeding population of ashy storm-petrels and Xantus's murrelets by potentially inducing nest abandonment or disorientation when the seabirds return from foraging offshore. Considering the population size (20), their foraging patterns (night), and the time of day and size of the operational areas that encompass their breeding and foraging habitat it is unlikely that effects from operational activities would affect resident breeding populations.

The expenditure of ordnance by aviation training activities that impact terrestrial areas on SCI are primarily within the SHOBA impact areas; targets are positioned at various locations, from nearshore waters to well inland of the shoreline, within both Impact Areas I and II. Seabird breeding locations for ashy storm-petrels and Xantus's murrelet at China Cove within impact area II are likely to be affected during breeding season (April to December) from high explosives detonating within 0.13 nm (0.25 km) of breeding colonies. The significance of the effects on these seabirds from high explosive ordnance activities is unknown due to the fact that the frequency and proximity of explosions within the 0.25 km zone is unknown. Moreover, the current population status and nesting locations are not well documented. Incidental mortalities related to direct impacts from ordnance in flight, on land, and in the water could occur; however, the probability remains low considering the spatial and temporal variability of bombardment activities and the low abundance of seabirds within the SHOBA area. Considering the size of impact area II and assuming all nest sites are on the offshore rocks outside China Cove, adverse disturbance effects would only arise from ingress and egress of low elevation aircraft and exploding ordnance within 0.13 nm (0.25 km) of nesting sites during breeding season. Effects from pressure waves on birds have been previously documented in relationship to the size and proximity of detonations of various magnitudes (Yelverton et al. 1973). Lethal exposure to birds from pressure waves varies, not only from the size of the explosive and distance from impact, but also on the water depth at which the detonation occurs, overall depth, bottom substrate, and location of the bird both in distance from the detonation and whether the bird is on the surface or underwater. In-water ordnance detonations would have lethal effects to foraging seabirds if pressure waves exceed 36 psi/ms for birds underwater and 100 psi/msec for birds at the surface (Yelverton et al. 1973).

Land Operations

Land-based operations evaluated within the SOCAL Range Complex are limited to areas on SCI; land-based training operations at Camp Pendleton are not evaluated in this document. Training associated with Santa Catalina Island, Santa Barbara Island, and San Nicolas Island are strictly aircraft or ocean related according to the operations data book and are addressed previously in Section 3.10.2.2.1. Onshore operations within SCI are divided into three categories: operations onshore within the SHOBA, operations outside SHOBA, and other island operations. Operations performed within SHOBA are typically live-firing training activities and include joint training explosive or landing exercises simulating live combat situations. Approximately 500 such operations are performed within SHOBA, of which 176 are Bombing Exercises (BOMBEX), 156 are NSW Direct Action, and 47 are NSFS operations. The remainder consist of various joint force training exercises that encompass land, air, and ocean activities, including EFEX and U.S. Marine

Corps (USMC) Battalion Landing. The area delineated by SHOBA consists of the southern third of SCI and includes impact areas I and II. The eastern coastal area of SHOBA is inaccessible from the ocean with steep canyons terminating into mostly deep nearshore waters. The primary coastal areas used in SHOBA are Pyramid Cove, Horse Beach Cove, and China Cove located on the southern end of the island. Impact area I contains both Pyramid Cove and Horse Beach Cove and consists of sandy beaches and rocky headlands. The western portion of SHOBA, impact area II, includes China Cove and encompasses a wide variety of available roosting and breeding habitat for resident and migratory seabirds.

The greatest potential impact to seabird populations from land operations is disturbance of roosting or breeding colonies within SHOBA. Land-based activities within SHOBA related to artillery operations are located in close proximity to access roads and do not typically incorporate coastal areas, other than with noise and ordnance transit. Amphibious landing exercises take place at Horse Beach Cove, China Cove, and Pyramid Cove within SHOBA and present potential disturbance for seabird colonies at adjacent headlands and rocky cliffs. Impacts attributed to direct mortality from collisions or explosions of ordnance from land-based operations would be low, because of the location of the described land operations in relation to potential seabird colonies as well as the temporal and spatial distribution of transiting ordnance. High explosive land-based training activities are concentrated near the bomb box in SHOBA impact area II, Assault Vehicle Maneuvering Areas (AVMA), and TAR 16 (Missile Impact Area). The chance of an explosion near seabird colonies located at headlands or sea cliffs would represent a significant error in targeting or a misfire. The greatest potential disturbance to roosting or breeding seabirds is related to noise. Seabird populations located within SHOBA would be resident or migratory seabirds utilizing breeding or foraging areas on SCI, or directly adjacent to the island on offshore rocks.

Foraging activities are related to the availability of prey species and are therefore dynamic in both time and space. The western side of SCI, including the western portion of SHOBA, contains extensive coastal habitat available to roosting and breeding seabirds. Excluding the southwest corner of SHOBA, which contains Impact Area II, the western side of SCI incurs minimal disturbance or impact from land operations due to its remote location. Seabirds displaced from foraging and roosting areas attributed to operations within the southern portion of SHOBA are in close proximity to similar habitat. Considering the extensive nearshore foraging habitat available to resident and migratory seabirds along the south and west shore of SCI, including SHOBA, effects to seabird foraging or foraging habitat would be infrequent and temporary.

Land operations unrelated to logistical support that involves live-fire or utilization of intertidal area on SCI outside SHOBA is centered at Northwest Harbor and includes amphibious landings at West Cove. Additional operations at Northwest Harbor include underwater demolition and Navy Sea, Air, Land (SEAL) training, including small arms fire. Land operations taking place at inland areas not adjacent to coastal areas present a minimal threat to seabird populations. Of the seabird species that occur within the SOCAL Range Complex, only the gull is known to forage in inland areas on coastal islands. Land operations including small arms training and explosive ordnance disposal would present a low probability of effect on gull populations as gulls are opportunistic and populations are not known to be susceptible to localized disturbance. Seabird species located on adjacent headlands or transiting the area during foraging or migration would incur only temporary and isolated effects from operations.

Additional land-based operations on SCI include RDT&E and NALF operations that are focused in support of other SOCAL Range Complex activities and present minimal threats to seabird populations because of their inland location and limited overlap with seabird activities.

Overall, direct and indirect effects resulting from the destruction or degradation of seabird populations or their habitat from SOCAL Range Complex land-based training activities would be infrequent and temporary under the No Action Alternative.

3.10.2.3 Alternative 1

3.10.2.3.1 SOCAL Operating Areas

Aviation Operations

Aviation training activities within the SOCAL Range Complex would be approximately 20 percent greater under Alternative 1 than under the No Action Alternative. The majority of the increase in aviation training exercises would be related to Mine Neutralization (0 to 732), Helicopter ASW TRACKEX (544 to 1690), SEAL Platoon Operations (340 to 512), and air combat maneuvers (3,608 to 3,970) occurring in offshore ranges.

Additionally, increases in low elevation helicopter training activity within the CPAAA at Camp Pendleton and HCOTA range, offshore of NAS North Island, have an increased potential for effect to migratory and resident seabird species transiting known avian flyways associated with the Los Coronados islands, the southern Channel Islands, and the mainland of California and Mexico.

Direct and indirect effects resulting from the destruction or degradation of seabird populations or their habitat from SOCAL Range Complex aviation training activities under Alternative 1 could be potentially greater than under the No Action Alternative. The increase in potential effects to seabird species attributed to increased operational frequency within the SOCAL OPAREAs is related to disturbance of roosting and foraging seabird species. Effects to migratory seabird species utilizing offshore ranges for foraging is difficult to assess as very little data is available on foraging patterns and there is a lack of exact coordinates of training activities within expansive range areas. The likelihood of lethal effects to seabirds in offshore ranges from direct aircraft strikes and in-water detonations remains low due to the relatively small change in operational frequency, low concentration of seabird species in offshore ranges, and high elevation flight patterns of aircraft operating within offshore ranges. Roosting seabirds inhabiting SCI and the mainland coastal areas near Camp Pendleton and NAS North Island utilize nearshore waters of the SOCAL Range Complex for foraging on a daily basis. Increases in low elevation helicopter and fixed-wing aircraft operations in nearshore waters would result in an increase in the probability that seabirds would be disturbed during foraging activity. Primary foraging habitat is expansive near SCI and the mainland between Camp Pendleton and San Diego Bay. Disturbance to foraging seabirds from aviation operations within the SOCAL OPAREA is likely to increase from increased operations but would not alone contribute to a reduction in individual seabird population success.

Ocean Operations

Ocean operations within the SOCAL Range Complex would increase nearly 20 percent under Alternative 1 with respect to the No Action Alternative. The area of greatest potential for adverse effect to breeding seabirds from ocean operations remains SCI, the same as the No Active Alternative. Increases in ocean training activities accessing areas that overlap with those currently frequented by resident and migratory seabirds from Amphibious Landings (7 to 34 exercises) or NSW Direct Action (156 to 163 exercises) increases the potential for adverse effects on breeding seabirds located on SCI and nearshore rocks.

Increased training activities utilizing amphibious vehicles within the CPAAA has the potential to directly and indirectly affect seabird breeding, roosting, or foraging. Species most likely to be affected within the CPAAA are California brown pelicans and California least terns foraging in nearshore waters. Any effect contributed by increased operational activity within the CPAAA

would be infrequent and temporary. Considering that ocean operations have limited potential for causing seabird mortality, the focus of the effect is centered on disturbance as it relates to foraging. California brown pelicans or California least terns that forage in the vicinity of the CPAAA would not suffer reduced foraging success attributed to ocean operations to a degree that would impact breeding success.

Increases in ocean training activities within nearshore waters that would include SHOBA Impact area II account for only 20 percent of the increase in ocean training events, although they represent the majority of live-fire and ordnance related activities. Increases in operational frequency increase the probability of interaction between ocean operations and seabirds, especially those operations in close proximity to roosting and breeding sites. Though detailed information on the exact location of SCI seabird breeding colonies and specific training activity detonation sites is lacking, the chance that seabird populations near China Cove incur some lethal and sublethal effects from detonations is most probable from targeting errors in the SHOBA impact areas.

Nearshore waters (within 3 nm) adjacent to the mainland and offshore islands remain the primary foraging habitat for the majority of seabird species within the SOCAL Range Complex. Ocean operations do not destroy foraging habitat and would only sporadically and temporarily disturb foraging of seabird species in nearshore water. Some operational expansion occurs within the nearshore (within 3 nm) of SCI, but considering the primary operations are tracking activities performed by large ships, no additional effect from increased operations would occur. Increases in small boat operations throughout the SOCAL Range Complex would not measurably increase the potential for effect to breeding seabirds located on SCI or Camp Pendleton.

The increase in ocean operations distributed across the offshore ranges Fleet Training Area HOT (FLETA HOT), Warning Area 291 (W-291), and Area 3803 includes Surface-to-Surface Gunnery Exercises (GUNEX S-S) (315 to 350, 11 percent), GUNEX S-A (262 to 350, 34 percent), and ASW TRACKEX (544 to 1690, 210 percent). All three operations take place in offshore waters primarily utilized by foraging seabirds that are seasonably variable and concentrated along current interfaces. Breeding seabirds that forage in offshore California current waters could potentially be adversely affected by increases in ocean operation. However, impacts to such species would be low due to the operational frequency and likelihood of overlap of foraging areas and weapon discharge or impact. Any decrease to foraging success attributed to the training activity would not have a measurable effect on the affected seabird populations. Direct mortality to seabirds from ocean operations is unlikely due to the relatively slow speed of vessels and the ability of seabirds to avoid interaction. Little or no data is available on foraging activities within these areas with only general foraging activities assumed for this analysis.

The increased operational frequency would not increase the potential for effect on the seabird populations because the distribution of training activities is within a large geographical area in conjunction with relatively few breeding seabird populations. The overlap of range activities and the variability of foraging locations make the likelihood of any interaction low. Direct and indirect effects resulting from the destruction or degradation of seabird populations or their habitat from SOCAL Range Complex ocean training activities under Alternative 1 would be similar to the effects described for the No Action Alternative.

3.10.2.3.2 San Clemente Island

Aviation Operations

NALF SCI activities would increase 5 percent from 25,120 to 26,400. Increases to aviation training activities in Alternative 1 are primarily associated with NALF SCI. Increases in potential seabird effect from the No Action Alternative include up-tempo activity of low altitude (less than 3,000 ft AGL) rotary aircraft performing searches or ingress/egress support during training

operations. Aircraft-related effects to roosting, breeding, and foraging seabirds would increase with increased aviation operations taking place below 1,000 ft (305 m) in close proximity (500 ft [163 m]) to seabird colonies. The extent to which increased low elevation aviation activity affects seabird colonies is unknown due to the lack of current data on SCI seabird population numbers and locations. Sensitive seabird breeding colonies and areas remain the same as discussed in the aviation operations effects analysis of the No Action Alternative.

Bombing exercises to land-based impact areas located within SHOBA would increase 12 percent from 176 to 197. The increased operational frequency would not increase the potential of effect on seabird populations unless new land-based impact areas were utilized or foraging seabirds are present in nearshore waters at the time of detonation. The limited increase in operational frequency doesn't change the probability of effect sufficient to overcome the limitations of the data on targeting accuracy or seabird occurrences. Seabird breeding, roosting, and foraging is documented to take place near China Cove and considering the variable presence of seabirds during foraging activity there is a low probability that lethal or sublethal effects could occur to seabird populations. Ordnance targeting within SHOBA impact areas is not defined for any of the specific operational activities; thus it can only be assumed that detonations occur throughout 100 percent of the area and occasionally impact nearshore waters due to targeting error.

Land Operations

Land operations within the SOCAL Range Complex are confined to SCI and would increase 30 percent under Alternative 1, with respect to the No Action Alternative. The increase in land operations would be concentrated in the NSW areas located both inside and outside of SHOBA. NSWG-1 SEAL Platoon Operations (340 to 512), as would SCI Amphibious Landing and Raids (7 to 34), Land Demolitions (354 to 674), and NSW Direct Action (156 to 163) would increase. Platoon operations access the island at distinct beach access points (Horse Beach Cove, West Cove, and Northwest Harbor) and primarily take place in inland areas able to accommodate large group movements utilizing vehicles and support staff. The land-based activities do not access known sensitive seabird roosting or breeding areas and would not significantly increase the potential for effect to seabird populations. Seabird population effects from training-related land operations within the SOCAL Range Complex under Alternative 1 would be similar to the effects described for the No Action Alternative.

3.10.2.4 Alternative 2

3.10.2.4.1 SOCAL Operating Areas

Aviation Operations

Aviation training within the SOCAL Range Complex would be about 31 percent greater under Alternative 2 than under the No Action Alternative. The majority of the increase in aviation training would remain related to NALF SCI operations (26,400 to 27,400).

The minimal increase of operational frequency in Alternative 2 compared to Alternative 1 would not increase the potential effect to seabird populations unless new land-based areas were utilized for takeoff and landing or bombardment. Increases in aviation training activities in the proximity of San Nicolas Island, Santa Catalina Island, and Santa Barbara Island are associated with high elevation (> 3,000 ft AGL) flight that would not account for any additional effects to breeding, foraging, or roosting seabirds. The NALF SCI is not located near any known sensitive seabird roosting or nesting areas and has limited potential to interact with resident and migratory seabird species.

Adverse effects to breeding and foraging seabirds by aviation operations have been previously categorized into direct mortality and disturbance related impacts. Small increases from Alternative 1 to Alternative 2 do not markedly change the probability of direct or indirect effects

discussed previously under the No Action Alternative. Increases in low elevation and bombardment aviation operations in close proximity to the mainland coast, SCI, or offshore rocks provide the greatest degree of potential effect. Increased operational frequency was reviewed in Alternative 1 and does not appreciably change for Alternative 2.

SCI includes suitable habitat adjacent to aviation operational areas providing potentially impacted seabirds alternate habitat locations to avoid interaction with aircraft and persist relatively unaffected. Increases to aviation operations adjacent to the mainland, most notably low elevation helicopter training activity within the HCOTA range, offshore of NAS North Island, and CPAAA, has an increased potential for effect to migratory and resident seabird species transiting known avian flyways associated with the Los Coronados islands, the southern Channel islands, and the mainland of California and Mexico.

The proposed Shallow Water Training Range (SWTR) encompasses a large area known to support various breeding and foraging seabird colonies including Brandt's cormorants, ashy storm-petrels, and Xantus's murrelets. Depending on the parameters of training activities and their proximity to seabird colonies, potential effects to seabirds could occur.

The increase in potential effects to seabird species attributed to increased operational frequency and expansion of the SWTR range within the SOCAL OPAREAs is related to noise and motion disturbance of roosting and foraging seabird species. Effects to migratory seabird species utilizing offshore ranges for foraging is difficult to assess as very little data is available on foraging patterns and there is a lack of exact coordinates of training activities within expansive range areas. The likelihood of lethal effects to seabirds in offshore ranges from direct aircraft strikes and in-water detonations remains low due to the relatively small change in operational frequency, low concentration of seabird species in offshore ranges, and high elevation flight patterns of aircraft operating within offshore ranges. Roosting seabirds inhabiting SCI and the mainland coastal areas near Camp Pendleton and NAS North Island utilize nearshore waters of the SOCAL Range Complex for foraging on a daily basis. Increases in low elevation helicopter and fixed-wing aircraft operations within nearshore waters would result in an increase in the probability that seabirds would be disturbed during foraging activity. Primary foraging habitat is expansive near SCI and the mainland between Camp Pendleton and San Diego Bay. Disturbance to foraging seabirds from aviation operations is likely to increase within the SOCAL OPAREAs from increased operations but would not alone contribute to a reduction of individual seabird population success.

Seabird population impacts from related aviation training within the SOCAL Range Complex under Alternative 2 would be similar to the effects described for the No Action Alternative. Impacts to seabird populations from aviation operations under Alternative 2 would not be different than under the No Action Alternative.

Ocean Operations

Ocean-based training within the SOCAL Range Complex would increase nearly 25 percent under Alternative 2 with respect to the No Action Alternative. The increase in ocean operations would be distributed across the offshore ranges FLETA HOT, W-291, and Area 3803, presenting a relatively small increase of operational tempo compared to Alternative 1. Breeding seabirds that forage in offshore water near SOCAL Range Complex islands could sustain potential effects from disturbance; however, current information on foraging patterns within the range complex is inadequate to make a comprehensive evaluation.

The expansion of the SWTR extends the training range to the shoreline of SCI from near Eel Point south to the SHOBA boundary. The new SWTR boundary line encompasses a large area known to support various breeding and foraging seabird colonies including roosting and breeding Brandt's cormorants, ashy storm-petrels, and Xantus's murrelets. Depending on the parameters of

ocean training activities and their proximity to seabird colonies, potential disturbance effects to seabirds could occur.

Construction related to SWTR and the shallow water mine field (SWM) involves the installation of moorings, cables, and hydrophones in waters more than 250 ft (80 m) in depth. Potential effects to seabird species would be minimal and would not appreciably change from the No Action Alternative. Potential effects from construction would be related to disturbance from vessel traffic and noise during drilling. Occurrences of seabirds foraging within the proposed construction footprint are not well documented and any effect attributed to construction would be temporary and localized.

The increased operational frequency would not alone increase the potential of effect on seabird populations because the distribution of training activities over a large geographical area in conjunction with the variability of foraging locations makes the likelihood of any interaction low. Seabird population effects from ocean related training within the SOCAL Range Complex under Alternative 2 would be similar to the effect described for Alternative 1.

3.10.2.4.2 San Clemente Island

Aviation Operations

The minimal increase of operational frequency in Alternative 2 compared to Alternative 1 would not increase the potential effect to seabird populations unless new land-based areas were utilized for takeoff and landing or bombardment. Increases in aviation training activities in the proximity of San Nicolas Island, Santa Catalina Island, and Santa Barbara Island are associated with high elevation (> 3,000 ft AGL) flight that would not account for any additional effects to breeding, foraging, or roosting seabirds. The NALF SCI is not located near any known sensitive seabird roosting or nesting areas and has limited potential to interact with resident and migratory seabird species.

Land Operations

Land operations within the SOCAL Range Complex are confined to SCI and would increase about 35 percent under Alternative 2 with respect to the No Action Alternative. The increase in land operations would be concentrated in the NSW areas north of SHOBA. NSWG-1 SEAL Platoon Operations would increase from 512 to 668, amphibious operations from 34 to 66, and NSW Direct Action from 163 to 190. Platoon operations take place in primarily inland areas able to accommodate large group movements utilizing vehicles and support staff. The increased land-based activities do not physically access known sensitive seabird roosting or breeding areas and would not increase the potential effect on seabird populations.

Training that involves firing artillery from the island to offshore locations presents additional potential for seabird effects from noise disturbance. However, without the expansion of current firing positions, the increase in frequency of operations alone would not provide sufficient disturbance to seabird populations at a level to affect breeding or foraging success. Impacts to seabird populations from land exercises under Alternative 2 would not be different than under the No Action Alternative.

3.10.2.5 Federally Threatened and Endangered Species

3.10.2.5.1 Short-tailed Albatross (*Phoebastria albatrus*)

Short-tailed albatross (*Phoebastria albatrus*) are rare vagrant migrants that forage in offshore open ocean waters 20 to 30 nm (37 to 55.6 km) offshore. Albatross forage near the sea surface, utilizing pressure differences created by ocean swells to aid in soaring; they are known to land on islands or offshore rocks. Aviation, ocean, and land training within the SOCAL Range Complex that overlaps with areas potentially containing a short-tailed albatross include vessels traveling

offshore, ordnance impacting foraging locations, and airspace below 1,000 ft (305 m). The described operations would present no measurable chance for interaction with this species.

Short-tailed albatross remain one of the world's most endangered birds (Unitt 2004); the last documented sighting within the SOCAL Range Complex was described near Santa Barbara Island in February 2002. Considering the rarity of this species in general and the lack of recent sightings, chances for its potential interactions with SOCAL Range Complex exercises would be extremely low. Although albatross follow a ship's wake, which slightly increases a potential for interaction with aircraft carriers, especially during the launching or landing of aircraft, the probability of direct effects to individuals or populations remains low. The spatial and temporal variability of both the occurrence of a short-tailed albatross and the operations conducted within offshore locations near foraging areas presents an improbable chance that a direct or indirect effect would occur to this species. SOCAL Range Complex operations would have no effect on short-tailed albatross.

3.10.2.5.2 Marbled murrelet (*Brachyramphus marmoratus*)

Marbled murrelets (*Brachyramphus marmoratus)* breed in northern California and the Pacific Northwest. Classified as rare migrants within the SOCAL Range Complex, individuals have been infrequently sighted along coastal regions as far south as northern Baja, Mexico. This small bird flies close to the sea surface during nonbreeding migrations between June and December and does not utilize land areas within the SOCAL Range Complex.

In coastal areas, foraging takes place within SOCAL Range Complex waters. Limited foraging overlap with SOCAL Range Complex activities does not measurably increase the bird's chance to interface with ocean operations because of the species' limited time spent in the water and the infrequency of operations in nearshore waters. Marbled murrelets fly close to the sea surface and have limited potential of conflicting with aircraft transiting the SOCAL Range Complex. The spatial and temporal variability of both the occurrence of a marbled murrelet and the operations within the SOCAL Range Complex (conducted within nearshore locations or at low elevation levels) combines to produce low probability that a direct or indirect effect would occur in relation to this species. The SOCAL Range Complex operations would have no effect on marbled murrelet.

3.10.2.5.3 Xantus's murrelet (*Synthliboramphus hypoleucus*)

Xantus's murrelets (*Synthliboramphus hypoleucus*) fly close to the sea surface and have limited potential for conflicting with aircraft transiting the SOCAL Range Complex. Potential effects from range operations during the breeding season are most likely to occur from low elevation aviation and land-based operational activities associated with offshore islands rather than open ocean training activities. Low elevation aviation training activities and land-based training activities are not performed near Santa Barbara Island or Santa Catalina Island. Santa Barbara Island, home of the largest documented breeding colony in Southern California (2,264 in 1996), is part of Channel Island National Park and Channel Island National Marine Sanctuary. Santa Catalina Island is privately owned and supports private residents, vacation resorts, and a commercial airport. The FAA restricts air flight to 1,000 ft AGL for both islands.

Considering the limited number of individuals at SCI (20 in 1992), the isolated location of their nests (Seal Cove and China Cove), and their nocturnal foraging habits, only a few training operations have a limited potential to affect Xantus's murrelets. Conversely, the small size of the SCI Xantus's murrelet population makes any mortality a substantial impact to the island population. Nesting sites near Seal Rock are afforded some level of protection from operations since no live-fire activities are described to occur in that area and only recently has the SWTR expanded the nearshore extension to include the shoreline near Seal Cove. Nesting sites near China Cove and Seal Cove are not specifically identified by location and were estimated only by

nighttime mist net captures and vocalizations documented by researchers performing population estimates in adjacent nearshore waters (Carter et al. 1992). Considering the species' high susceptibility to predation from introduced species, and the fact that no nests have been documented in the last two decades on SCI or Santa Catalina Island, it is possible that Xantus's murrelet only actively nest on remote isolated sea cliffs in this area.

China Cove is located within the SHOBA Impact Area II and is regularly targeted by ordnance launched from aviation and ocean platforms. Any explosion in close proximity (distance depends on size of the ordnance) to nesting sites during breeding season could cause mortality or nest abandonment. Low elevation aircraft transiting the area of Seal Cove or China Cove are not likely to have adverse effects to Xantus's murrelets unless the described aircraft hovers nearby for an extended time or emits bright lights at night.

Ocean or aviation operations would have a low chance of directly or indirectly affecting breeding populations due to the species' habits, low elevation foraging, and the Navy's infrequent use of training areas adjacent to potential nesting sites. Impacts from ocean or aviation operations taking place in offshore waters utilized by foraging Xantus's murrelets during nonbreeding season would probably not occur due to the sheer size of potential foraging habitat and the bird's ability to avoid such disturbance. The SOCAL Range Complex operations would have no effect on the Xantus's murrelet.

3.10.2.5.4 Californian brown pelican (*Pelecanus occidentalis californicus*)

Californian brown pelicans (*Pelecanus occidentalis californicus*) use the SOCAL Range Complex for breeding, roosting, and foraging. Within SOCAL Range Complex, all documented breeding colonies occur only at Santa Barbara Island, a conservation management zone; thus, operations conducted within the SOCAL Range Complex would likely have no effect on the California brown pelican breeding colonies. Brown pelicans roosting or foraging within SOCAL Range Complex boundaries utilize rocky headlands and nearshore waters at SCI, San Nicolas Island, Santa Barbara Island, and Santa Catalina Island; no previously displayed adverse effects from range operations have been documented. Any disturbance impacts during foraging or roosting away from the breeding colony would not be sufficient to affect breeding success. The relatively undisturbed habitat available to roosting or foraging brown pelicans at SOCAL Range Complex offshore islands provides a degree of protection to this species that is greater than the potential negative effect of localized range operations on the population. Overall effects attributed to range operations would be temporary and localized but may affect California brown pelican populations.

3.10.2.5.5 California least tern (*Sterna antillarum browni*)

California least terns (*Sterna antillarum browni*) use the SOCAL Range Complex for foraging only. Nesting colony sites are located in areas adjacent to the SOCAL Range Complex, including Camp Pendleton and San Diego Bay, but do not occur on offshore islands. California least terns are known to forage up to 5.56 km (3 nm) offshore in coastal waters; however, they primarily forage in estuarine and bay waters in close proximity to nesting and roosting sites. SOCAL Range Complex training associated with oceangoing vessels and aircraft present the only potential for effect to foraging of this species. Aircraft operating in close proximity to coastal areas fly above 1,000 ft (305 m) Mean Sea Level (MSL) with the exception of landing and takeoff events and some specialized training using helicopters near Camp Pendleton. Oceangoing vessels present a minimal potential effect on foraging terns in coastal waters, as terns forage in nearshore waters and vessel operations within the SOCAL Range Complex are concentrated in waters greater than 3 nm (5.5 km) off of the United States mainland. Californian least terns are agile, low-flying seabirds capable of avoiding interactions with SOCAL Range Complex vehicles and would adjust foraging locations accordingly. Overall, California least terns are provided greater protection in

and around military installations than in surrounding areas due to the urbanization and disturbance taking place within their preferred habitat locations. Overall effects attributed to range operations would be temporary and localized and would have no effect on California least tern populations.

3.10.2.6 Migratory Bird Impacts

As mentioned in Section 3.10.1.1, Migratory Bird Treaty Act, military readiness activities are exempt from the take prohibitions of the MBTA provided they do not result in a significant adverse effect on the population of a migratory bird species. Regardless, populations of migratory birds would not be affected by the implementation of the Proposed Action or alternatives. A remote possibility exists that individuals may be directly impacted if they are in the locale of the target area at the point of physical impact during inert/practice ordnance delivery. The temporary degradation of habitat or mortality of young (if the species breed at SCI and a fire occurred during the breeding season) could occur due to ordnance-ignited wildfires. Noise impacts would also potentially, but likely negligibly, affect migratory bird individuals. Although a BASH exists, no adverse impact to bird populations is expected. The Navy has concluded that there would be no significant adverse effects on migratory birds.

3.10.3 Mitigation Measures

Current mitigation measures are described in Section 3.10.1.3. Since impacts are negligible no additional mitigation is required.

3.10.4 Unavoidable Adverse Environmental Effects

There are no unavoidable environmental effects.

3.10.5 Summary of Effects by Alternative

The SOCAL Range Complex encompasses a critical area for foraging and breeding seabirds. Resident seabird populations depend on coastal islands relatively free from human disturbance and close to important foraging grounds. Additionally, migratory seabirds utilize the productive offshore waters associated with the California Current to forage during wintering and migratory movements. Although the importance of the SCB waters and Channel Islands is well described, current specific locations of bird species (aside from some island nesting populations), population estimates, and the effect of spatially diffuse military training activities on these values is not well known. While it is possible that military training activities that come within close proximity to shore, such as on SCI, could have an adverse impact on nesting and nearshore foraging species, the spatial extent of the activity is so small and the surrounding available habitat so wide that seabird species have ample opportunity to move to adjacent quality habitat, thereby lessening effects. Breeding seabirds have high nesting fidelity and most require some degree of isolation from disturbance and predation to maintain viable breeding success. Without the expansion of new land-based impact areas for air-to-surface and surface-to-surface ordnance or an increase in nearcoastal flight paths near currently documented roosting and breeding seabird colonies, increased training activities should not be expected to increase direct or indirect effects to seabird populations, as compared with the No Action Alternative. Based on the analysis of the spatial area available, the limited available data on seabird populations, personal communications with those who study seabirds in Southern California, and discussions with military operational professionals, it is thought that effects to protected and migratory seabirds would be minimal. The sheer size of the SOCAL Range Complex, as well as the temporal and spatial variability of operations superimposed on temporal and seasonal distributions of seabird species, poses minimal effect potential to seabird populations.

The DoD manages large tracks of land throughout California that provide mostly protected habitat for various species of birds, mammals, plants, and fish. Considering the extensive loss of

terrestrial and aquatic habitat from human development, military installations provide critical open space for many endemic and migratory species. Stewardship of natural resources has been a focus of DoD agencies while they successfully fulfill their mission to maintain military readiness and they have remained a working partner in avoiding sensitive areas and species when such conditions are identified.

Table 3.10-4: Summary of Effects by Alternative

Alternative	NEPA (On-Land and U.S. Territorial Waters)	EO 12114 (Non-U.S. Territorial Waters)
No Action Alternative	• Training activities would have temporary and spatially distinct short-term impacts. • No long-term effects are apparent.	• Training activities would have temporary and spatially distinct short-term impacts. • In addition, effects would be lower in Non-U.S. Territorial Waters because they are farther from seabird nesting and breeding locations. • No long-term effects are apparent.
Alternative 1	• Impacts generally the same as No Action Alternative.	• Impacts generally the same as No Action Alternative.
Alternative 2 (Preferred Alternative)	• Impacts generally the same as No Action Alternative.	• Impacts generally the same as No Action Alternative.
Mitigation Measures	• Operators should ensure that the California brown pelican is not in proximity to the overblast pressure prior to underwater demolition activities. See Section 3.10.1.3.	• Operators should ensure that the California brown pelican is not in proximity to the overblast pressure prior to underwater demolition activities. See Section 3.10.1.3

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