

3.4.3 Birds

Birds are another important resource relevant to the MSRP. Top predators such as the bald eagle (*Haliaeetus leucocephalus*) continue to be injured by the DDTs and PCBs that are the subject of the case. Also, seabirds were dramatically impacted by the past discharges of these contaminants and are in various states of recovery since the discharges were stopped. Bald eagles and peregrine falcons consume certain seabird species; thus, the impact of contamination on seabirds is important to understand not only for the potential for adverse impacts on their populations but also as a causative factor in the injury of top predators. DDT and PCB contamination in bald eagles, peregrine falcons, and seabirds, as considered in the case history, is addressed in Section 2.

Over 200 species of birds use coastal and/or offshore habitats within the SCB (Baird 1993). The number of birds fluctuates seasonally with migratory patterns. Seabirds (e.g., auklets, cormorants, gulls, pelicans, phalaropes, shearwaters, storm-petrels, skimmers, and terns) and grebes, loons, and sea ducks account for the greatest biomass of birds within the SCB. The distribution and relative abundance of selected species and groups of birds are described in the following subsections.

Bald Eagles

The bald eagle is currently federally listed as a threatened species. However, the U.S. Fish and Wildlife Service (USFWS) has proposed to de-list the bald eagle, as the birds have made a substantial recovery within their range, particularly on the mainland of the United States. The Pacific Bald Eagle Recovery Plan indicates that the most suitable habitat for recovery in Southern California is on the Channel Islands, particularly Santa Catalina and Santa Cruz Islands (USFWS 1986, Jurek 2000).

Historically, bald eagles occupied all of the Channel Islands in the SCB. From the 1800s to 1950, bald eagle nesting areas were reported from a minimum of 35 different locations on the islands, making the Channel Islands a stronghold for this species in Southern California (Kiff 2000). However, by the early 1960s, bald eagles had disappeared from the Channel Islands. The extirpation is believed to have resulted from a combination of factors, including egg collecting, hunting, urbanization, and DDE contamination (see Section 2.1).

Bald eagles reside along seacoasts, lakeshores, and major rivers. They are large birds, weighing between 10 and 14 pounds, with females typically weighing more than males. Bald eagles that breed in the southern United States are smaller in size than those that reside in the northern United States and Canada. They are a monogamous species, mating for life; however, if one partner dies, the other will select a new mate. The breeding season generally occurs between January and August. Bald eagles do not always breed every year. Nests are built in large trees and are often re-used year after year. Bald eagles lay from one to three eggs, which are incubated for 35 days. The length of time from when the eggs are laid to when all chicks are fledged (first flight) is 16 to 18 weeks. Hatched eagle chicks have a 50 percent survival rate during their first year. Bald eagles reach sexual maturity between the ages of 4 and 5 years, at which time they develop their distinctive white feathers on the head and tail. In the wild, the lifespan of a bald eagle is approximately 30 years.

Bald eagles are only partially migratory. In the winter, migration from their breeding grounds to nearby coastal areas only occurs if their fishing areas freeze over. They have also been known to

migrate during the winter from northern breeding grounds to warmer southern regions. The bald eagle is a scavenger and predator of a variety of species. The diet of eagles on Santa Catalina Island consists mainly of pelagic fish snatched from the ocean surface; however, bald eagles also eat birds, mammals (mainly carcasses of sea lions and seals), and invertebrates as well (Garcelon 1994b). Diet is probably similar among individuals on all the Channel Islands (Sharpe and Garcelon 1999a, Valoppi et al. 2000). Adult bald eagles spend more time hunting and killing prey, whereas juveniles are more likely to scavenge and steal food due to their undeveloped hunting skills.

In 1980, the Institute of Wildlife Studies, the USFWS, and the CDFG initiated a program to reintroduce bald eagles to Santa Catalina Island (Figure 3.4-3). The MSRP Trustee Council has funded recent years of this program. Between 1980 and 1986, 33 chicks from wild nests were brought to the island, reared on artificial nest platforms, and released (Sharpe 2003). Several of these eagles have survived and formed nesting pairs. However, none of their eggs have been hatched normally to date, as the eggshells have been too thin for normal incubation, and would have broken under the weight of the adults. Also, the embryos have suffered water loss through the thin eggshells. From 1989 to 2005, the population was maintained by collecting the eggs, transporting them to the San Francisco Zoo for artificial incubation, and re-introducing the chicks back to the nests. In 2005, an incubation facility was built on the island, and the eggs were hatched on-site.

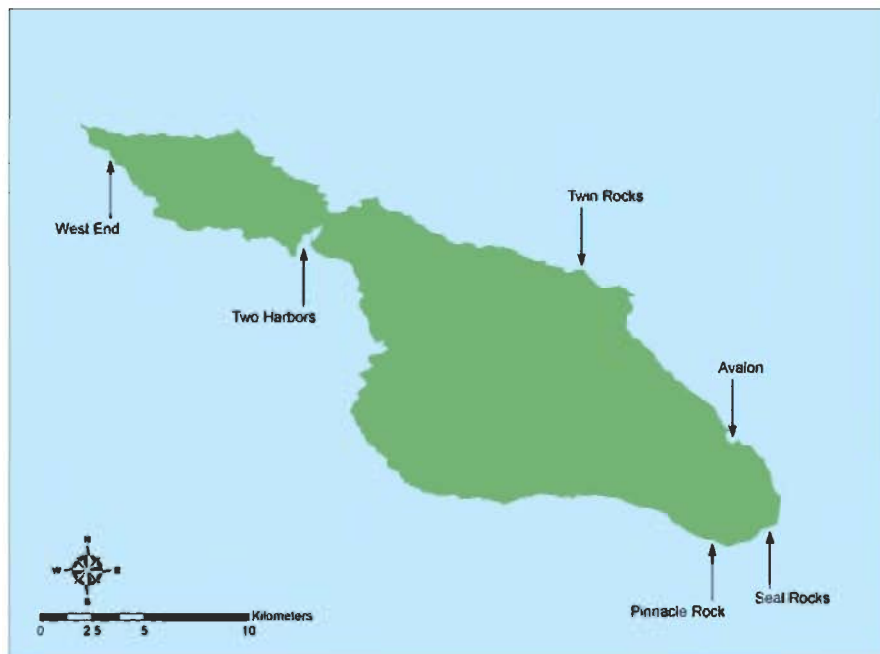


Figure 3.4-3. Active bald eagle territories and points of reference on Santa Catalina Island, California.

Golden Eagles

Prior to the 1990s, golden eagles (*Aquila chrysaetos*) were never known to be year-round residents of the Channel Islands. The species increased in abundance on the Northern Channel Islands because feral pigs provided an abundant food source. With little competition from bald

eagles, golden eagles took up residence on several of the Northern Channel Islands. Feral pigs have since been eradicated from Santa Rosa Island, and the eradication of pigs from Santa Cruz Island began in 2005.

Golden eagles became a specific issue of concern on the Northern Channel Islands beginning in the 1990s, when they began preying on the endangered Santa Cruz island fox. In 1999 a program was initiated to capture golden eagles on Santa Cruz and Santa Rosa Islands and relocate them to the mainland in cooperation with the National Park Service and other agencies. From 1999 through September 2005, 19 males, 9 females, and 7 nestlings were removed from Santa Cruz Island and relocated, and 2 males, 1 female, and 3 nestlings were removed from Santa Rosa Island and relocated. As of September 2005, the best estimates are that 1 to 2 adult females, 1 adult male, and 2 to 3 sub-adults remain on Santa Cruz Island and only 1 adult female remains on Santa Rosa Island (Sharpe, pers. comm., 2005).

Peregrine Falcons

Peregrine falcons once numbered in the hundreds in Southern California, and between 20 and 30 pairs nested on the Channel Islands prior to 1945 (Kiff 1980, Hunt 1994). However, peregrine falcons had disappeared from the Channel Islands by 1955, and only two pairs were located in California in 1970 (see Section 2). The peregrine falcon has made a dramatic recovery since 1975, in large part due to an active release program conducted by the Santa Cruz Predatory Bird Research Group. Incubation of thin-shelled eggs removed from wild nests and a captive breeding program provided source birds for the release program. At least 719 peregrine falcons were released in California between 1978 and 1993 (Hunt 1994). Between 1985 and 1993, six peregrine falcon hatchlings were released at sites on San Miguel Island, and 17 hatchlings were released on Santa Catalina Island.

The minimum breeding age for peregrine falcons is 2 years. In 1987, the first reestablished peregrine falcon pair was recorded on San Miguel Island. In 1989, active nests were recorded on Anacapa and Santa Cruz Islands (Hunt 1994). Between 8 and 10 pairs were noted on the Northern Channel Islands between 1992 and 1994 (Hunt 1994). In 2004, approximately 21 peregrine falcon pairs were occupying breeding territories on six of the eight Channel Islands (PBRG 2004). The majority of the pairs (18 of 21) occur on the Northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa Islands), and 3 pairs occur on the Southern Channel Islands (2 pairs were recently confirmed on Santa Catalina Island and 1 on Santa Barbara Island). Peregrine falcons nest almost exclusively on cliff ledges that are associated with suitable foraging areas; they also have been observed nesting on man-made structures in urbanized areas (CINMS 2000).

The release program has had substantial success in increasing the population of peregrine falcons in California and the rest of the United States. The number of peregrine falcons in California increased from an estimated low of 5 to 10 breeding pairs in the early 1970s to a minimum of 167 occupied sites in 1998 (Herman et al. 1970, USFWS 1999). The Pacific Coast Recovery Plan for the peregrine falcon outlined a recovery goal of 120 pairs in California, including 5 pairs for the Channel Islands (USFWS 1982).

The peregrine falcon was de-listed from the List of Threatened and Endangered Species on August 25, 1999 (USFWS 1999). At the time of de-listing, the recovery goals had been met in California, though full recovery in some areas of California was impeded by ongoing elevated

levels of DDTs (Jarman 1994, Walton 1997). Eggshells measured in 1992–1993 averaged 19 percent thinner than eggshells measured before 1947 and had elevated concentrations of DDE (Hunt 1994, Kiff 1994). Productivity rates are substantially lower when eggshells range between 17 and 20 percent thinner than normal (Peakall and Kiff 1988). It has been estimated that 1 ppm of DDE in the diet of peregrine falcons is sufficient to cause the eggshells to be 16 percent thinner, and 3 ppm of DDE results in eggshells that are 10 to 28 percent thinner (Enderson et al. 1982, Dewese et al. 1986, Hunt 1994). Peregrine falcons prey almost exclusively on other birds. Data collected in 1992 indicated that contamination in the food web was still at sufficient levels to result in substantial eggshell thinning on the Channel Islands.

As mentioned above, the peregrine falcon is a highly specialized feeder, concentrating almost entirely on other birds. Kiff (1980) reports that peregrine falcons prey on at least 22 species of birds on the Channel Islands and Coronado Islands. Dietary studies of peregrine falcons in 1992 and 1993 showed that gulls, alcids, and land birds constituted between 73 and 82 percent of their diet, depending on season (Hunt 1994). Grebes, shorebirds, and phalaropes constituted a smaller but still substantial part of their diet. Within these groups of birds, the species that accounted for 5 percent or more of the prey biomass included the California gull (*Larus californicus*), western gull (*Larus occidentalis*), Cassin's auklet (*Ptychoramphus aleuticus*), Xantus's murrelet (*Synthliboramphus hypoleucus*), unidentified grebes, red phalarope (*Phalaropus fulicaria*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), and European starling (*Sturnus vulgaris*).

In 1998, eggs from eight peregrine falcon territories on the Northern Channel Islands were sampled to determine eggshell thinning. The average eggshell thinning for all territories on the Channel Islands was slightly below 17 percent. In most coastal Channel Island territories, eggshell thinning exceeded the 17 percent level, whereas the results in most inland Channel Island territories were less than this level (Walton 1999). These differences are likely a reflection of the higher levels of DDE in marine-oriented prey (i.e., seabirds) than terrestrial prey (i.e., land birds) (Walton 1999).

Seabirds

A total of 43 species of seabirds have been reported in the SCB (Baird 1993). These include albatrosses, alcids, cormorants, gulls, jaegers, pelicans, phalaropes, shearwaters, storm-petrels, skimmers, and terns. A total of 14 species of seabirds breed on the Channel Islands (Table 3.4-3). The following sections provide brief profiles of the different types of seabirds within the SCB. Foraging areas for selected seabirds are shown in Figure 3.4-4.

Alcids

This group of seabirds includes the common murre (*Uria aalge*), Xantus's murrelet, Cassin's auklet, Rhinoceros auklet (*Cerorhinca monocerata*), pigeon guillemot (*Cephus columba*), and the tufted puffin (*Fratercula cirrhata*).

Common murres spend most of their time on the open ocean; they nest on sea cliffs and protected seacoasts (Baird 1993). They build no nests and lay their eggs on narrow rock ledges. They dive to depths of up to 100 meters (328 feet) and feed primarily on fish, shrimp, and squid. They have been extirpated from the Channel Islands, but were observed in 2004 in breeding plumage on Prince Island (Whitworth, pers. comm., 2004). Common murres may also be

observed in the SCB in offshore areas. They are particularly vulnerable to entanglement in gill nets due to their underwater foraging behavior, oil spills because they spend long periods sitting on the water, and El Niño events that affect their food supply.

**Table 3.4-3
List of Seabirds with Breeding Colonies on the Channel Islands**

Common Name	Scientific Name	Status	Channel Islands							
			San Miguel	Santa Rosa	Santa Cruz	Anacapa	Santa Barbara	San Nicolas	Santa Catalina	San Clemente
Ashy storm-petrel	<i>Oceanodroma homochroa</i>	SSC	X		X	S	X		S	X
Black storm-petrel	<i>Oceanodroma melania</i>	SSC	S			S	X			S
Leach’s storm-petrel	<i>Oceanodroma leucorhoa beali</i>		X				X			
California brown pelican	<i>Pelecanus occidentalis</i>	FE, SE	E		E	X	X			
Brandt’s cormorant	<i>Phalacrocorax penicillatus</i>		X	X	X	X	X	X		X
Double-crested cormorant	<i>Phalacrocorax auritus</i>	SSC	X		E	X	X		E	
Pelagic cormorant	<i>Phalacrocorax pelagicus</i>		X	X	X	X	X			
Western gull	<i>Larus occidentalis</i>		X	X	X	X	X	X	X	X
Common murre	<i>Uria aalge</i>		E							
Pigeon guillemot	<i>Cephus columba</i>		X	X	X	X	X			
Cassin’s auklet	<i>Ptychoramphus aleuticus aleuticus</i>		X		X	X	E		X	
Rhinoceros auklet	<i>Cerorhinca moncerata</i>	SSC	X							
Tufted puffin	<i>Fratercula cirrhata</i>	SSC	S		E	E	E			
Xantus’s murrelet	<i>Synthiboramphus hypoleucus scrippsi</i>	SSC, ST	X		X	X	X		S	X

FE = Federal endangered
 SE = State endangered, ST= State threatened
 SSC = Species of Special Concern
 Notes: X- Breeder; S- Suspected Breeder; E = Extirpated
 Sources: Carter et al. 1992, Wolf 2002, Carter, pers. comm., 2003.

Xantus’s murrelets are small, burrow-nesting seabirds (Unitt 1984) that establish colonies on crevices, ledges, and sometimes under dense vegetation. They are particularly vulnerable to nest predation by deer mice and introduced rats on some of the Channel Islands. This species is nocturnal and feeds mostly on fish such as anchovies, the larvae of other fish, and aquatic invertebrates (CINMS 2000). The worldwide breeding range of Xantus’s murrelet is restricted to the Channel Islands and the west coast of Baja California, Mexico. Currently, this range consists of only 12 nesting islands scattered along 500 miles of coastline (Burkett et al. 2003). Historical accounts and literature from the 1940s indicate that Xantus’s murrelet numbers have declined substantially. At present, the murrelet is considered an uncommon species, with approximately

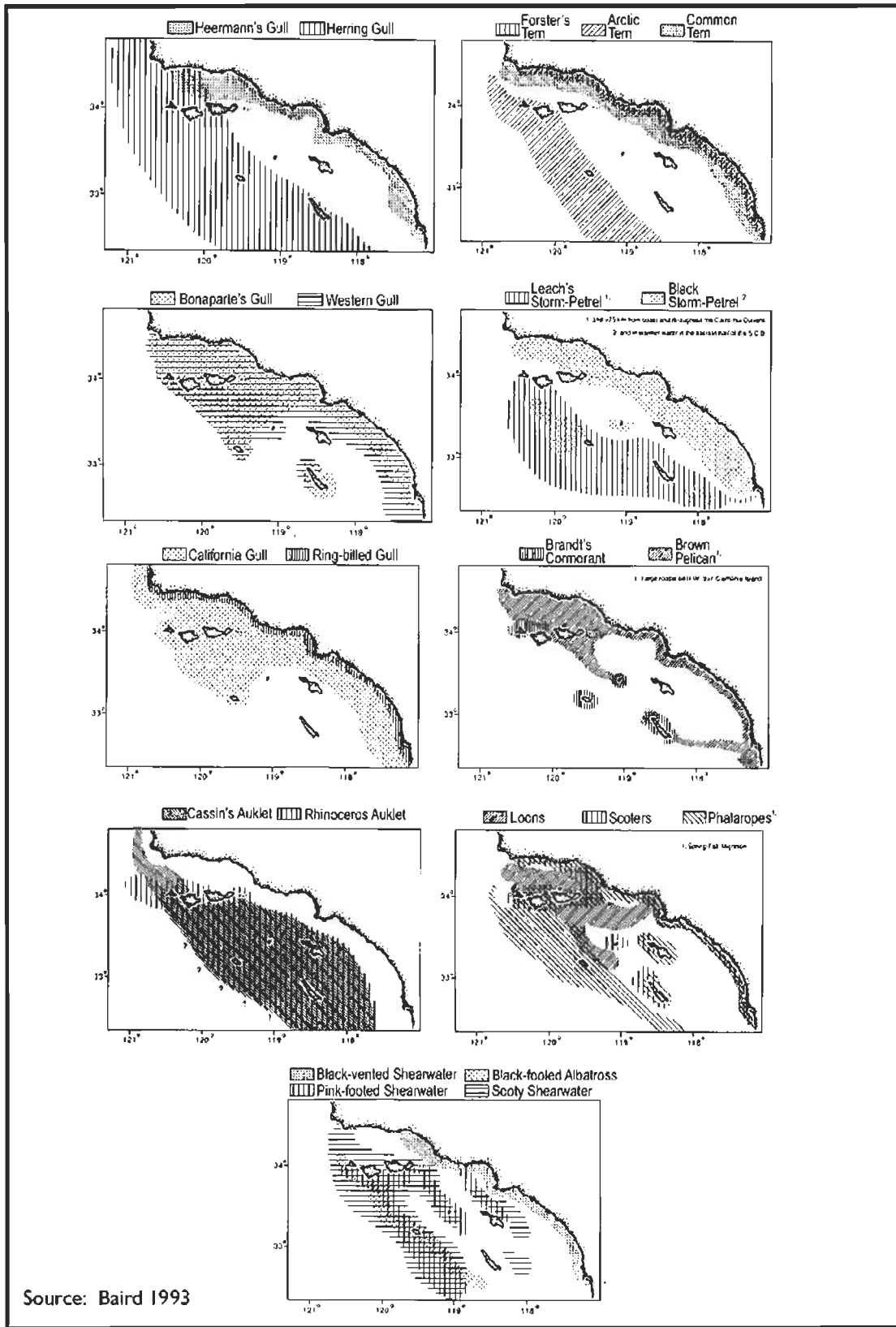


Figure 3.4-4. Most heavily used foraging areas for selected seabirds in the SCB.

3,000 breeding birds in California and less than 10,000 birds worldwide (Burkett et al. 2003). The California Fish and Game Commission made a finding in February 2004 to list the Xantus's murrelet as a threatened species under the California Endangered Species Act. This listing was finalized in June 2004 (CDFG 2004a).

In May 2004, the Xantus's murrelet was also listed as a candidate species for listing as a federally threatened species.

Cassin's auklets breed primarily on Prince Island (near San Miguel Island) and have been observed and may be breeding on other Channel Islands (Carter et al. 1992, Wolf 2002). During the breeding season, Cassin's auklets are dispersed from the midshelf seaward to 150 kilometers (93 miles) offshore. From August through October, following the nesting season, they are observed throughout the SCB (Briggs et al. 1987, Baird 1993). Cassin's auklets are small, burrow-nesting seabirds that are nocturnal and feed diurnally (mainly on copepods and euphasids) at sea, mainly offshore around the Channel Islands. The species is listed as a second priority Species of Special Concern (PRBO 2005).

Rhinoceros auklets are abundant during the winter months on offshore waters along the California coastline concentrating seaward of the shelf break, where they spend their time resting and foraging (Briggs et al 1987, Baird 1993). No historical data exist on breeding populations prior to 1991; however, in 1994, this species was recorded breeding on San Miguel Island (Carter, pers. comm., 2003). The species breeds colonially in burrows in maritime and inland grassy slopes, occasionally on flat ground on forest floors (CINMS 2000). It feeds mainly on small fish, and sometimes squid. Auklets are particularly vulnerable to oil spills because they spend a considerable amount of time sitting on the water (Briggs et al. 1987, Baird 1993).

The pigeon guillemot is more abundant north of Point Conception, but breeding colonies are located on San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands, which form the southern limit of their breeding range (Baird 1993). This species can breed either in colonies or solitarily on cliffs and slopes, occasionally excavating a burrow; eggs are laid in natural crevices or holes (CINMS 2000). It feeds on small demersal fish (blennies and sculpins) and nearshore schooling fish.

Tufted puffins bred on the Channel Islands (Anacapa, Santa Barbara, and San Miguel Islands), the southernmost part of their breeding range, until they were extirpated in the mid-1900s. Recently, this species has been observed in small numbers on Prince Island near San Miguel Island (McChesney et al. 1995, Wolf 2002). The tufted puffin is listed as a first priority Species of Special Concern (PRBO 2005). It builds its nests in holes or crevices; it feeds by diving on fish, squid, and crustaceans and catching them while underwater (CINMS 2000).

Cormorants

This group of seabirds include the Brandt's cormorant (*Phalacrocorax penicillatus*), the double-crested cormorant (*Phalacrocorax auritus*), and the pelagic cormorant (*Phalacrocorax pelagicus*). These species spend most of their time on land roosting and typically forage within 1 kilometer (0.6 miles) of the shore (McChesney et al. 2000).

Brandt's cormorant is considered to be one of the most abundant seabirds in the SCB (Baird 1993). It breeds on all of the Channel Islands with the exception of Santa Catalina Island. This cormorant species is typically found within 10 kilometers (6.2 miles) of the shore and no further than 25 kilometers (15.5 miles) from the mainland or island roosts and colonies. It breeds on

islands and gently sloping hillsides (CINMS 2000). The most heavily used foraging areas are around the Channel Islands (Briggs et al. 1987, Baird 1993). It feeds by diving and capturing fish. Although not listed, the Brandt's cormorant has been affected by human disturbance, habitat destruction, and DDE in their eggshells, which causes nesting failure (Gress et al. 1973, Hunt et al. 1980, Baird 1993).

Double-crested cormorants breed on San Miguel, Anacapa, and Santa Barbara Islands; they have been extirpated on Santa Cruz and Santa Catalina Islands (Carter et al. 1992, Wolf 2002). These cormorants were once abundant in the SCB; however, habitat destruction, the presence of DDE in their eggshells, and human disturbance have led to nesting failure and have contributed to population declines (Remsen 1978, Gress et al. 1973, Hunt et al. 1980, Baird 1993). Populations have increased since the 1980s; and breeding populations on the Channel Islands have numbered approximately 2,500 birds in the 1990s (Carter et al. 1992, Gress 1994, McChesney et al. 2000). Double-crested cormorants also have been observed roosting and foraging in the winter in the open water habitats of Bolsa Chica wetlands (Chambers Group 2000). It feeds on schooling fish, aquatic invertebrates, and (rarely) small invertebrates. It builds a nesting platform of sticks, seaweed, and other material and nests along the coast, around marshes or lakes, or on coastal cliffs (CINMS 2000).

Pelagic cormorants are found year-round in the SCB. They breed in small colonies primarily on the Northern Channel Islands and Santa Barbara Island. They are found along the north coast of the SCB, near Point Conception. Peak numbers occur in mid-winter (McChesney et al. 2000).

Gulls

This group of seabirds includes Bonaparte's gull (*Larus philadelphia*), Heermann's gull (*Larus heermanni*), the ring-billed gull (*Larus delawarensis*), the California gull, the herring gull (*Larus argentatus*), the western gull, and the black-legged kittiwake (*Rissa tridactyla*).

Bonaparte's gulls overwinter in the SCB from December through March, congregating along the coastal shores (Briggs et al. 1987, Baird 1993). These gulls forage along the mainland coast and around the Channel Islands.

Heermann's gulls are found in large numbers in San Diego County and along the beaches in the Santa Barbara Channel (Briggs et al. 1987, Baird 1993). Only small numbers of these gulls can be found over open water or near the Channel Islands; most forage within a few kilometers of the mainland shore.

Ring-billed gulls congregate in sheltered bays and estuaries along the mainland coast of the SCB. In winter, they rarely venture further than 1 kilometer (0.6 miles) offshore, and during late spring they migrate to the Rocky Mountain states to begin breeding (Baird 1976).

California gulls are abundant in the SCB along the shallow waters of the coast during the fall and winter months (Briggs et al. 1987, Baird 1993). They typically forage along the mainland coast and around the Northern Channel Islands. Peak numbers occur in the SCB from January through March. During the spring the birds migrate inland to begin breeding.

Herring gulls are found throughout the SCB on island and mainland beaches. During the winter, smaller populations are found on the beaches of San Diego and the eastern portion of the Santa Barbara Channel, and larger populations are found foraging west of the Santa Rosa-Cortes Ridge. Peak numbers occur from January through March (Briggs et al. 1987, Baird 1993).

Western gulls are found extensively throughout the SCB. They are one of the most abundant breeding seabirds in the SCB (McChesney et al. 2000). These birds breed during the months of April through August on all of the Channel Islands. Anacapa Island currently hosts approximately 5,000 breeding pairs (Martin, pers. comm., 2005), and from 1994–1996 western gull populations on Santa Barbara Island ranged from 2,500 to 4,100 breeding pairs. Western gulls also occasionally breed in small numbers along the Southern California mainland at North San Diego Bay, the La Jolla cliffs in San Diego County, Lower Newport Bay in Orange County, and Vandenberg Air Force Base in Santa Barbara County. Western gulls breed colonially, and nests are located on rocky cliffs or headlands on the ground. Western gulls are also found foraging year-round along the shallow waters of the SCB, such as in Anaheim Bay and Upper Newport Bay (MEC Analytical Systems 1995, MEC Analytical Systems 1997). They seldom venture further than 25 kilometers (15.5 miles) offshore of the shelf break. Periods of storms and ocean warming have contributed to population declines (Briggs et al. 1987, Baird 1993).

Black-legged kittiwakes are a Northern California resident species that occasionally migrates to the SCB during the winter. During this time large numbers of kittiwakes can be found on the open ocean, inshore waters, and along beaches and estuaries. A few individuals can be seen in the SCB throughout the year (Briggs et al. 1987, Baird 1993).

California Brown Pelicans

The California brown pelican (*Pelecanus occidentalis*) largely breeds on Anacapa Island in the Channel Islands. A smaller colony also exists on Santa Barbara Island. In 2002, the number of nests and fledglings produced by the Southern California nesting population was estimated at 6,440 and 3,220 individuals, respectively, though the number of nest attempts and fledglings produced is variable by year (the range is 628 to 6,440 and 372 to 6,390, respectively, during the past twenty years [1983–2002]) (Gress et al. 2003).

The Channel Islands also provide important nocturnal and diurnal roosting sites for this ground-nesting bird. High numbers of pelicans (up to 6,000) roost on Santa Barbara Island compared to other areas in the SCB (Baird 1993). Pelicans also roost on a variety of shoreline structures (such as offshore rocks and islands) where human disturbance and predation from mammals is limited. Along the coast of the SCB, pelicans primarily use artificial structures such as breakwaters or jetties. Some important mainland roosting sites are the breakwaters of Long Beach Harbor and Marina del Rey due to the length of the structures, which provide unlimited capacity and protection from winter surf (Strong and Jaques 2003). Higher numbers of pelicans roost on the mainland coast during the months of June through October, as the pelicans move away from their nesting sites. Abundances at roosting sites are affected not only by the time of the year but also by pulses of migration, large storm events (such as El Niño), or high localized abundances of prey. Non-existing or limited roosting habitat occurs from Point Dume to the Santa Monica breakwater (Strong and Jaques 2003). Figure 3.4-5 shows California brown pelican roosting sites along the Southern California coast.

California brown pelicans primarily forage in shallow waters residing within 20 kilometers (12.4 miles) of the mainland coast (Briggs et al. 1987, Baird 1993). These birds have a preference for warmer waters and have been known to concentrate at sea during the months of August through October, when surface temperatures are higher. The California brown pelican is listed as state and federally endangered and is further discussed in Section 3.4.6 of this report.

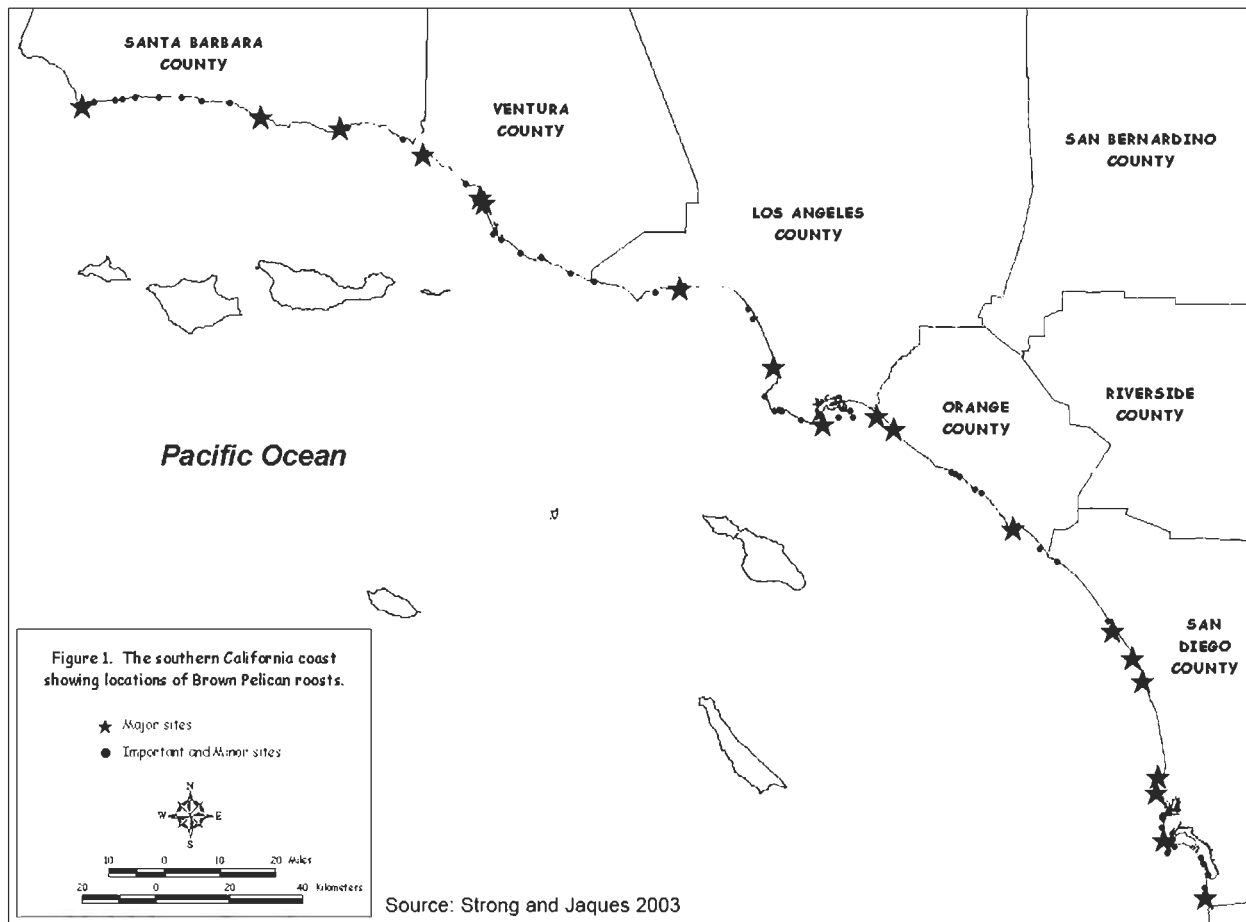


Figure 3.4-5. California brown pelican roosting sites along the Southern California coast.

Storm-petrels

This group of seabirds includes Leach's storm-petrel (*Oceanodroma leucorhoa*), the black storm-petrel (*Oceanodroma melania*), the ashy storm-petrel (*Oceanodroma homochroa*), and the least storm-petrel (*Oceanodroma microsoma*).

Leach's storm-petrels can be found nesting in small numbers on Prince Island (near San Miguel Island) and Santa Barbara Island in the SCB (Figure 3.1-5). A highly pelagic species, this storm-petrel is most numerous offshore of the central continental slope, where they spend most of their time foraging for food. Non-breeding Leach's storm-petrels are found more than 75 kilometers (46.5 miles) offshore during their mid-summer migration (Briggs et al. 1987, Baird 1993). Although the majority continue to migrate northwest, a few can be found during the winter months 100 kilometers (62 miles) offshore of Point Conception (Crossin 1974).

Black storm-petrels are found year-round in the SCB, preferring to forage in waters with warm surface temperatures. Small numbers of this species nest on Santa Barbara Island and Sutil Island; these constitute the entire breeding population of California (Pitman and Speich 1976, Baird 1993) (Figure 3.1-5). Peak numbers occur during the late summer months through the fall. The black storm-petrel is listed as a third priority Species of Special Concern (PRBO 2005).

The ashy storm-petrel is a sparrow-sized seabird endemic to California islands and a few adjacent mainland sites (Ainley 1995). Ashy storm-petrels are restricted to the northeast Pacific Ocean, breeding on islands from central to Southern California (with a few small colonies in Baja California and Northern California). Unlike most other storm-petrels, ashy storm-petrels are non-migratory, residing within the California Current system year-round. Approximately half of the world's population of ashy storm-petrels, which is estimated at less than 10,000 individuals, nest at the Farallon Islands, and half at the Channel Islands, primarily at San Miguel, Santa Barbara, and Santa Cruz Islands (Carter et al. 1992). During the past 20 years, this species has undergone a dramatic decline in abundance at its largest colony on the Farallon Islands (Sydeman et al. 1998). In the Channel Islands, ashy storm-petrels nest at scattered locations among talus, within rocky crevices in sea caves, and on steep, inaccessible cliffs (Hunt et al. 1979, Carter et al. 1992). The ashy storm-petrel is a globally rare seabird species. Currently, it has the following listings: "near threatened" by the World Conservation Union (Bird Life International 2000), Category 2 Candidate Species under the Endangered Species Act (USFWS 1994), and a Species of Management Concern by USFWS and CDFG.

Least storm-petrels are found in the SCB during the fall months. In the late 1980s, approximately 200,000 birds could be found during this time of year, usually in the warmer waters of the SCB (Briggs et al. 1987).

Skimmers and Terns

Skimmers and terns are seabirds that breed in coastal areas of the SCB. This group of seabirds includes the royal tern (*Sterna maxima*), elegant tern (*Sterna elegans*), common tern (*Sterna hirundo*), arctic tern (*Sterna paradisaea*), Forster's tern (*Sterna forsteri*), Caspian tern (*Sterna caspia*), black skimmer (*Rynchops niger*), and the California least tern (*Sterna antillarum browni*). Tern populations have been greatly reduced since the early part of the twentieth century due to human disturbance and destruction of their habitat. Human population growth has infringed on their nesting sites, which mainly occur on mainland beaches, estuaries, and lagoons

(Baird 1993). The California least tern has been listed as a federally Endangered Species and is discussed under threatened and endangered species (Section 3.4.6).

Royal terns nest in San Diego Bay and in Bolsa Chica Lagoon (Baird 1993). They are found in small numbers (a few hundred) along the shores of San Miguel, Santa Rosa, and San Clemente Islands during their non-breeding season. They are rarely found greater than 1 kilometer (0.6 miles) offshore preferring areas of warmer waters. Peak abundance is during the month of September. Royal terns are listed as a third priority Species of Special Concern (PRBO 2005).

Elegant terns have been observed nesting in San Diego Bay, Bolsa Chica Lagoon, and along the western riprap of Pier 400 in the Port of Los Angeles (Baird 1993, Chambers Group 2000). They have also been sighted courting along the Santa Margarita River estuary at Camp Pendleton. Non-breeding elegant terns are found on mainland beaches throughout Southern California, and are rarely sighted more than 4 kilometers (2.5 miles) offshore of the mainland, preferring areas of warmer waters. Numbers range in the several thousands and are on the increase. Northward migration to Northern California occurs during the late summer and fall (Baird 1993). The elegant tern is listed as a Species of Special Concern (PRBO 2005).

Common terns and arctic terns are migratory species and do not breed in the SCB. They are typically found west of the Santa Barbara channel to the Cortes Bank during their fall migration to South America, where they spend the winter. Common terns in the SCB usually occur within 25 kilometers (15.5 miles) of the mainland on coastal beaches and estuaries and forage close to shore. Arctic terns are more numerous than common terns over 25 kilometers (15.5 miles) offshore. Peak abundance for both species in the SCB occurs during their spring migration (April to May). Approximately 30,000 to 50,000 common and arctic terns were reported in the early 1990s (Briggs et al. 1987, Baird 1993) and these species today remain common visitors to the SCB.

Forster's terns are typically found throughout the SCB foraging along mainland beaches, coastal bays, and estuaries during the late spring and summer (Baird 1993). They have been observed nesting in Upper Newport Bay and Bolsa Chica (MEC Analytical Systems 1997, Chambers Group 2000). This species can also be found up to 15 kilometers (9.3 miles) from the mainland shore. Approximately 500 Forster's terns were found along the beaches and 80 at Bolsa Chica Lagoon during the early 1990s (Baird 1993).

Caspian terns are observed year-round in the SCB. They typically nest along the coast and in marshes, rivers, and inland lakes (NGS 1987). Nesting sites have been recorded at San Diego Bay (less than a thousand breeding pairs) and Bolsa Chica Lagoon (around two hundred breeding pairs) (CDFG 1980, Baird 1993, Chambers Group 2000). They also have been observed nesting in the Port of Los Angeles along Pier 400 (over 300 nests) (Port of LA 2005).

Black skimmer nesting sites are located at Bolsa Chica Lagoon (more than 300), Anaheim Bay, and San Diego Bay (Baird 1993, Chambers Group 2000). They are relatively common in the Bolsa Chica lowlands during migration and winter periods and have been observed nesting in the Port of Los Angeles along Pier 400 (183 birds) (Chambers Group 2000). The black skimmer is listed as a Species of Special Concern (PRBO 2005).

Other Seabirds

Other seabird species that are occasionally found in the SCB include the black-footed albatross (*Phoebastria nigripes*), Laysan's albatross (*P. immutabilis*), and the short-tailed albatross (*P. albatrus*); the northern fulmar (*Fulmarus glacialis*); the pomarine jaeger (*Stercorarius pomarinus*) and the parasitic jaeger (*S. parasiticus*); the red phalarope (*Phalaropus fulicaria*) and the red-necked phalarope (*P. lobatus*); and the pink-footed shearwater (*Puffinus creatopus*), sooty shearwater (*P. griseus*), Buller's shearwater (*P. bulleri*), black-vented shearwater (*P. opisthomelas*), and the short-tailed shearwater (*P. tenuirostris*). Water birds found in the SCB include the western grebe (*Aechmophorus occidentalis*) and Clark's grebe (*A. clarkii*); the Pacific loon (*Gavia pacifica*), common loon (*G. immer*) and the red-throated loon (*G. stellata*); and the surf scoter (sea duck) (*Melanitta perspicillata*) and the white-winged scoter (sea duck) (*M. fusca*).

3.4.4 Marine Mammals

The waters off the coast of California support numerous species of marine mammals, including sea lions and seals (pinnipeds), dolphins, whales, porpoises (cetaceans), and sea otters. Thirty-four species have been recorded in the SCB. Many of these species are common to the area, having established breeding populations or foraging grounds. Other species migrate through the SCB at certain times of the year, and many species are infrequent or rare (Bonnell and Dailey 1993). These marine mammals have varied diets, including pelagic and demersal fish, cephalopods, and crustaceans.

The following subsections summarize the more common marine mammals that occur in the SCB. This discussion covers species distribution, breeding populations (if they exist in the SCB), migratory patterns, and relevant dietary information. The last subsection reviews marine mammal strandings in Los Angeles County and Orange County based on the most recent data available.

Sea Lions and Seals

Six pinniped species are known to inhabit the SCB: the California sea lion (*Zalophus californianus californianus*), Pacific harbor seal (*Phoca vitulina richardsi*), northern elephant seal (*Mirounga angustirostris*), northern fur seal (*Callorhinus ursinus*), northern or Stellar sea lion (*Eumetopias jubatus*), and the Guadalupe fur seal (*Arctocephalus townsendi*). Of these, the California sea lion, Pacific harbor seal, northern elephant seal, and the northern fur seal have breeding populations within the SCB. Pacific harbor seals and northern elephant seals breed throughout the Channel Islands (Stewart et al. 1994, Bonnell and Dailey 1993). The breeding range of the California sea lion extends from the Channel Islands south to the Gulf of California in Mexico (Bonnell and Dailey 1993). Northern fur seals breed on San Miguel Island (USD1 et al. 2002 [2003]). Although northern sea lions and Guadalupe fur seals once ranged extensively along California, they are rarely seen today in the SCB (Bonnell and Dailey 1993) and are not discussed further in this report.

Sea Otters

The normal range of the sea otter (*Enhydra lutris*) in California extends from the Santa Maria River north to Point Año Nuevo. In 1987, 69 sea otters were translocated to San Nicolas Island,

within the SCB, in an attempt to rebuild the California population, which had greatly declined due to commercial hunting into the early 1900s. In recent years, it has been estimated that approximately 20 sea otters remain around the island. Quite a few of the sea otters died or were unaccounted for after a winter storm. Others migrated to the mainland and subsequently were returned to their range in central California (Bonnell and Dailey 1993).

It is estimated that sea otters in California can live up to 12–16 years (Pietz et al. 1988). Females usually have one pup every one or two years and give birth in the water. They care for their young for about six months. The pups reach sexual maturity in about 3 to 4 years. Dietary preferences are primarily macroinvertebrates, including mussels, crabs, clams, tunicates, abalone, and sea stars. Sea otters also prey on octopus (Estes et al. 1981, Ralls et al. 1988). They live in kelp beds and seldom forage more than 1 to 1.5 miles from shore.

Whales, Dolphins, and Porpoises

Several species of baleen and toothed whales may be seen offshore of Southern California. The whale species commonly seen in the SCB include grey (*Eschrichtius robustus*), blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*), minke, and humpback (*Megaptera novaeangliae*) whales. Uncommon whale species include beaked whale species, sperm (*Physeter macrocephalus*), killer (*Orcinus orca*), false killer (*Pseudorca crassidens*), pygmy sperm (*Kogia breviceps*), dwarf sperm (*Kogia simius*), northern right (*Balaena glacialis*), sei (*Balaenoptera borealis*) and Bryde's whales (*Balaenoptera edeni*).

Dolphins and porpoises belong to the same order as toothed whales (*Odontocetes*). Common species within the SCB include common (*Delphinus delphis*), bottlenose (*Tursiops truncatus*), northern right-whale (*Lissodelphis borealis*) and Risso's (*Grampus griseus*) dolphins as well as Dall's porpoise (*Phocoenoides dalli*). Two species, the harbor porpoise (*Phocoena phocoena*) and the striped dolphin (*Stemella coeruleoalba*, a tropical delphinid), mainly occur offshore on the outer continental shelf and are infrequent or rare visitors to the SCB.

3.4.5 Terrestrial Mammals

Three native terrestrial mammal species are found on the Channel Islands: the island fox (*Urocyon littoralis*), which is federally endangered, the deer mouse (*Peromyscus maniculatus*), and the island spotted skunk (*Spilogale gracilis*).

The island fox, a diminutive relative of the mainland gray fox is distributed as six subspecies, one on each of the six largest California Channel Islands. Three of the subspecies occur on the Northern Channel Islands, within the boundaries of Channel Islands National Park: the San Miguel island fox, Santa Rosa Island fox, and the Santa Cruz Island fox. The latter occurs on both National Park Service (NPS) lands and lands owned by The Nature Conservancy on Santa Cruz Island. On the Southern Channel Islands, the San Nicolas Island fox and San Clemente Island fox occur on lands managed by the U. S. Navy, and the Santa Catalina Island fox occurs on lands managed by the Catalina Island Conservancy.

Island foxes have undergone a catastrophic decline on San Miguel, Santa Rosa, and Santa Cruz Islands (Coonan et al. 1998, Roemer 1999), as well as an unrelated catastrophic decline on Santa Catalina Island. The decline in populations on the Northern Channel Islands was caused by the recent appearance of golden eagles as a resident species on the island. Golden eagles are aggressive predators of terrestrial mammals and were never known to be year-round residents on

the islands prior to the 1990s. A captive breeding program, designed to protect the subspecies from elimination by enhancing breeding, was initiated on all the Northern Channel Islands where fox populations declined. Efforts are currently under way to remove golden eagles on the Northern Channel Islands by live trapping and translocating the birds.

The fox decline on Santa Catalina Island was due to the introduction of distemper to the island, probably by a domestic dog. The Santa Catalina Island fox population has largely recovered, and the Catalina Island Conservancy is working to educate the public about the threat that domestic dog diseases pose to island foxes.

All of the Channel Islands (including Prince Island and Sutil Rocks) have native deer mice. Separate subspecies have been identified on each of the major islands, but the mice on Prince Island and Sutil Rocks are not known to be separate subspecies from the mice on San Miguel Island or Santa Barbara Island, respectively.

Island spotted skunks occur only on Santa Cruz and Santa Rosa Islands, having been extirpated from San Miguel Island. Little is known about the ecology of the Channel Islands spotted skunk. Skunk populations on Santa Cruz and Santa Rosa Islands appear to have increased substantially in conjunction with the decline of fox populations.

3.4.6 Threatened and Endangered Species

Several threatened and endangered species occur within the study area. Several of these species are associated with habitats that have become limited within the ranges of these species (e.g., coastal wetlands, riparian forests, or dune habitats). Other species are endemic to the Channel Islands and have been impacted by feral and/or exotic animals and human disturbance. In a few cases, the species were put into jeopardy by DDT contamination, human disturbance, and/or overexploitation.

Table 3.4-4 lists the threatened and endangered (federally and state-listed) plants of the Channel Islands. Table 3.4-5 presents the threatened and endangered (federally and state-listed) animals of the study area and the parts of the study area where they occur.

**Table 3.4-4
Threatened and Endangered Plants of the Channel Islands**

Common Name	Scientific Name	Status	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island	San Nicolas Island	Santa Catalina Island	San Clemente Island
Hoffmann’s rock cress	<i>Arabis hoffmannii</i>	FE		X	X	X				
Santa Rosa Island manzanita	<i>Arctostaphylos confertiflora</i>	FE		X						
Island barberry	<i>Berberis pinnata</i> ssp. <i>Insularis</i>	FE		X	X	X?				
San Clemente Island	<i>Castilleja grisea</i>	SE/FE								X

**Table 3.4-4
Threatened and Endangered Plants of the Channel Islands**

Common Name	Scientific Name	Status	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island	San Nicolas Island	Santa Catalina Island	San Clemente Island
Indian paintbrush										
Soft-leaved Indian paintbrush	<i>Castilleja mollis</i>	FE	X	X						
Catalina Island mountain-mahogany	<i>Cercocarpus traskiae</i>	SE/FE							X	
San Clemente Island larkspur	<i>Delphinium variegatum</i> ssp. <i>Kinkiense</i>	SE/FE								X
Beach spectaclepod	<i>Dithyrea maritima</i>	ST	X					X		
Santa Cruz Island dudleya	<i>Dudleya nesiotica</i>	FT			X					
Santa Barbara Island dudleya	<i>Dudleya traskiae</i>	SE/FE					X			
San Nicolas Island buckwheat	<i>Eriogonum grande</i> var. <i>timorum</i>	SE						X		
Box bedstraw	<i>Galium buxifolium</i>	FE								X
San Miguel Island bedstraw	<i>Galium californicum</i> ssp. <i>Miguelense</i>	FE	X		X					
San Clemente Island bedstraw	<i>Galium catalinense</i> ssp. <i>Acrispum</i>	SE								X
Hoffmann's slender-flowered gilia	<i>Gilia tenuiflora</i> ssp. <i>Hoffmannii</i>	FE		X						
Island rush-rose	<i>Helianthemum greenei</i>	FE	X?	X	X				X	
Santa Cruz Island woodland star	<i>Lithophragma maximum</i>	SE/FE			E					X
San Clemente Island bird's-foot trefoil	<i>Lotus argophyllus</i> var. <i>adsurgens</i>	SE								X
Santa Cruz Island bird's-foot trefoil	<i>Lotus argophyllus</i> var. <i>niveus</i>	SE			X					
San Clemente Island lotus	<i>Lotus dendroideus</i> var. <i>traskiae</i>	SE/FE								X
San Clemente Island bush mallow	<i>Malacothamnus clementinus</i>	SE/FE								X
Santa Cruz Island bush mallow	<i>Malacothamnus fasciculatus</i> var. <i>nesioticus</i>	SE/FE			X					
Santa Cruz Island malacothrix	<i>Malacothrix indecora</i>	FE		X	X					
Island malacothrix	<i>Malacothrix squalida</i>	FE	X	X	X	X				

**Table 3.4-4
Threatened and Endangered Plants of the Channel Islands**

Common Name	Scientific Name	Status	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island	San Nicolas Island	Santa Catalina Island	San Clemente Island
Lyon's pentachaeta	<i>Pentachaeta lyonii</i>	SE/FE							X	
Northern Channel Islands phacelia	<i>Phacelia insularis</i> var. <i>insularis</i>	FE	X	X						
Santa Cruz Island rock cress	<i>Sibara filifolia</i>	FE			E				E	X
Santa Cruz Island fringe-pod	<i>Thysanocarpus conchuliferus</i>	FE			X					

Notes:

E=Extirpated in these localities as reported by Philbrick 1980.

FE=Federally endangered

FT=Federally Threatened

SE=State Endangered

ST=State Threatened

X= extant

X?=location uncertain

**Table 3.4-5
Threatened and Endangered Wildlife within the Study Area**

Common Name	Scientific Name	Status	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island	San Nicolas Island	Santa Catalina Island	San Clemente Island	Coastal/Mainland
Invertebrates											
El Segundo blue butterfly	<i>Euphilotes battoidea allyni</i>	FE									X
Palos Verdes blue butterfly	<i>Glaucopsyche lygdamus palosverdesensis</i>	FE									X
White abalone	<i>Haliotis sorenseni</i>	FE	E	E	E	E	E	E	E	X	E
Fish											
Southern steelhead trout	<i>Oncorhynchus mykiss</i>	FE									X
Tidewater goby	<i>Eucyclogobius newberryi</i>	FE									X
Reptiles											
Island night lizard	<i>Xantusia riversiana</i>	FT					X	X		X	
Green sea turtle	<i>Chelonia mydas</i>	FT									M
Leatherback sea turtle	<i>Dermochelys coriacea</i>	FE	M	M	M	M	M	M	M	M	M
Loggerhead sea turtle	<i>Caretta caretta</i>	FT	M	M	M	M	M	M	M	M	M
Olive ridley sea turtle	<i>Lepidochelys olivacea</i>	FT									M
Birds											
Bald eagle	<i>Haliaeetus leucocephalus</i>	SE,FT	X	X	X	X	E	E	X	E	X
Belding's savannah sparrow	<i>Passerculus sandwichensis beldingi</i>	SE									X
California black rail	<i>Laterallus jamaicensis coturniculis</i>	ST									E
California brown pelican	<i>Pelicanus occidentalis californicus</i>	SE,FE	X	X	X	X	X	X	X	X	X
Coastal California gnatcatcher	<i>Polioptila californica californica</i>	FT									X
California least tern	<i>Sterna antillarum browni</i>	SE,FE									X
Least Bell's vireo	<i>Vireo bellii pusillus</i>	SE,FE									X
Light-footed clapper rail	<i>Rallus longirostris levipes</i>	SE,FE									X
Marbled murrelet*	<i>Brachyramphus marmoratus</i>	SE,FT									
Peregrine falcon	<i>Falco peregrinus anatum</i>	SE	X	X	X	X	X	X	X	X	X

**Table 3.4-5
Threatened and Endangered Wildlife within the Study Area**

Common Name	Scientific Name	Status	San Miguel Island	Santa Rosa Island	Santa Cruz Island	Anacapa Island	Santa Barbara Island	San Nicolas Island	Santa Catalina Island	San Clemente Island	Coastal/Mainland
San Clemente loggerhead shrike	<i>Lanius ludovicianus mearnsi</i>	FE								X	
San Clemente sage sparrow	<i>Amphispiza belli clementeae</i>	FT								X	
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	SE,FE									X
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FT	X	X	X			X		X	X
Xantus's murrelet	<i>Synthliboramphus hypoleucus</i>	ST	X	X	X	X	X	X	X	X	
Mammals											
Pacific pocket mouse	<i>Perognathus longimembris pacificus</i>	FE									X
Island fox	<i>Urocyon littoralis</i>	ST,FE	X	X	X			X	X		
Southern sea otter	<i>Enhydra lutris nereis</i>	FT	E	E	E	E	E	X			
Guadalupe fur seal*	<i>Arctocephalus townsendi</i>	ST,FT									
Stellar sea lion*	<i>Eumetopias jubatus</i>	FT									
Sei whale	<i>Balaenoptera borealis</i>	FE	M	M	M	M	M	M	M	M	M
Blue whale	<i>Balaenoptera musculus</i>	FE	M	M	M	M	M	M	M	M	M
Fin whale	<i>Balaenoptera physalus</i>	FE	M	M	M	M	M	M	M	M	M
Humpback whale	<i>Megaptera novaeangliae</i>	FE	M	M	M	M	M	M	M	M	M
Right whale	<i>Balaena glacialis</i>	FE	M	M	M	M	M	M	M	M	M

Notes:

*Rarely seen throughout study area.

E=Extirpated in these localities

FE=Federally endangered

FT=Federally Threatened

M=Migratory

SE=State Endangered

ST=State Threatened

X=Extant

X?=location uncertain

3.5 LAND USE AND RECREATION

3.5.1 Coastal Land Use and Recreation

The coastal study area encompasses sixteen cities and a number of unincorporated communities in Los Angeles and Orange Counties (Figures 3.5-1 and 3.5-2). The cities are as follows (generally from north to south):

- City of Malibu
- City of Santa Monica
- City of Los Angeles
- City of El Segundo
- City of Manhattan Beach
- City of Hermosa Beach
- City of Redondo Beach
- City of Torrance
- City of Palos Verdes Estates
- City of Rancho Palos Verdes
- City of Long Beach
- City of Seal Beach
- City of Huntington Beach
- City of Newport Beach
- City of Laguna Beach
- City of Dana Point

Generally, the land uses along the coastline include public beaches, marinas, and/or harbors. Inland from the immediate coastline, the land use pattern is typically mixed, with residential and supporting commercial uses. Two key industrial ports (Port of Los Angeles and Port of Long Beach) are situated in Coastal Reach 4, and several parks are located in various reaches. The state, county, and local beaches that are within each of the six coastal reaches are identified in Figures 3.5-3 and 3.5-4. The beaches are often operated by a jurisdiction different from the adjacent city or community. Restoration projects on the immediate coastline require consultation with and approval by both jurisdictions, if applicable.

The Los Angeles, and Orange County coastlines have abundant recreational facilities. Much of the shorelines have been preserved as open space and/or for recreational uses. Favored recreational resources include state and county parks and beaches. Other recreational facilities include piers, golf courses, and small neighborhood parks.

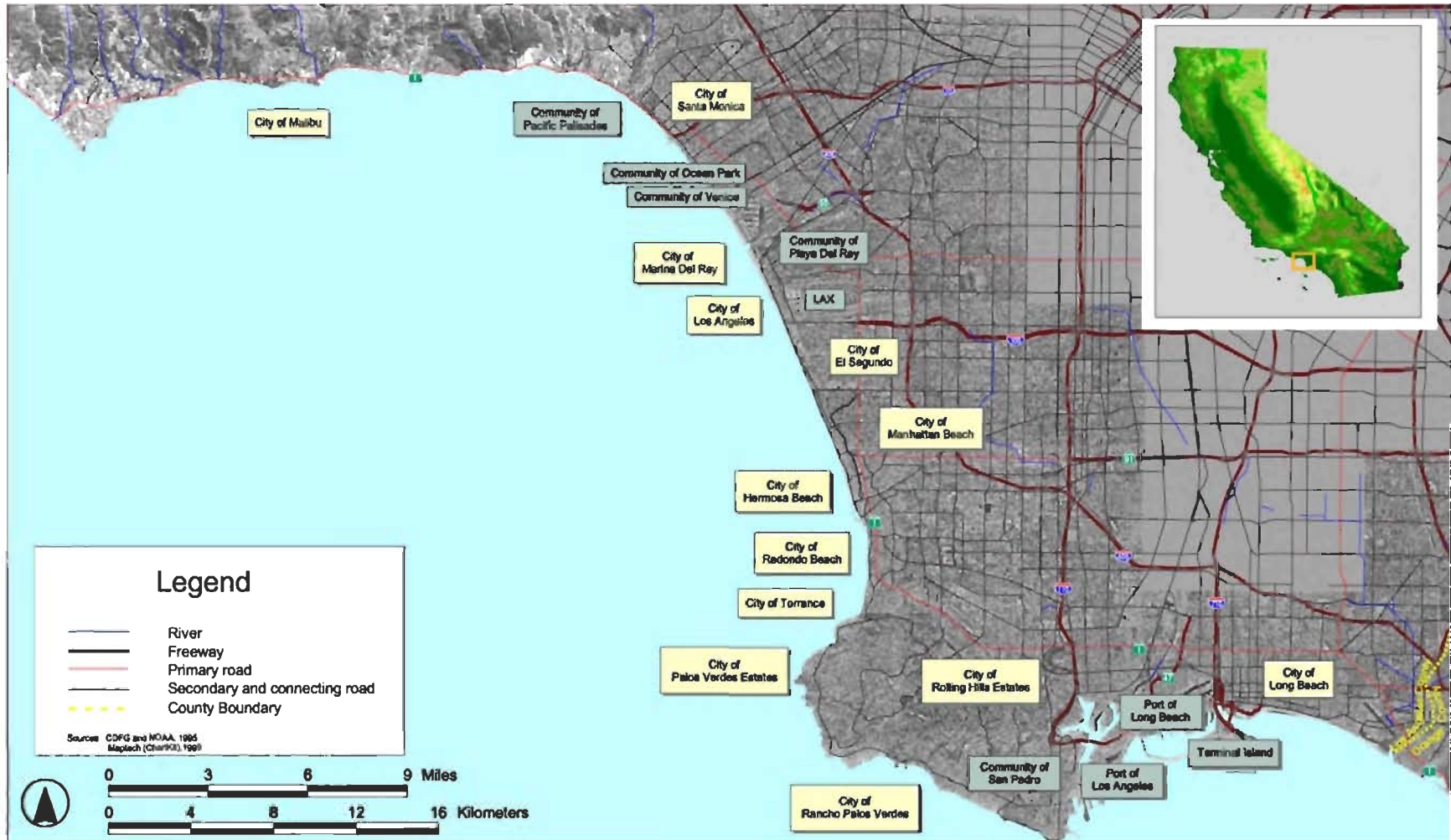
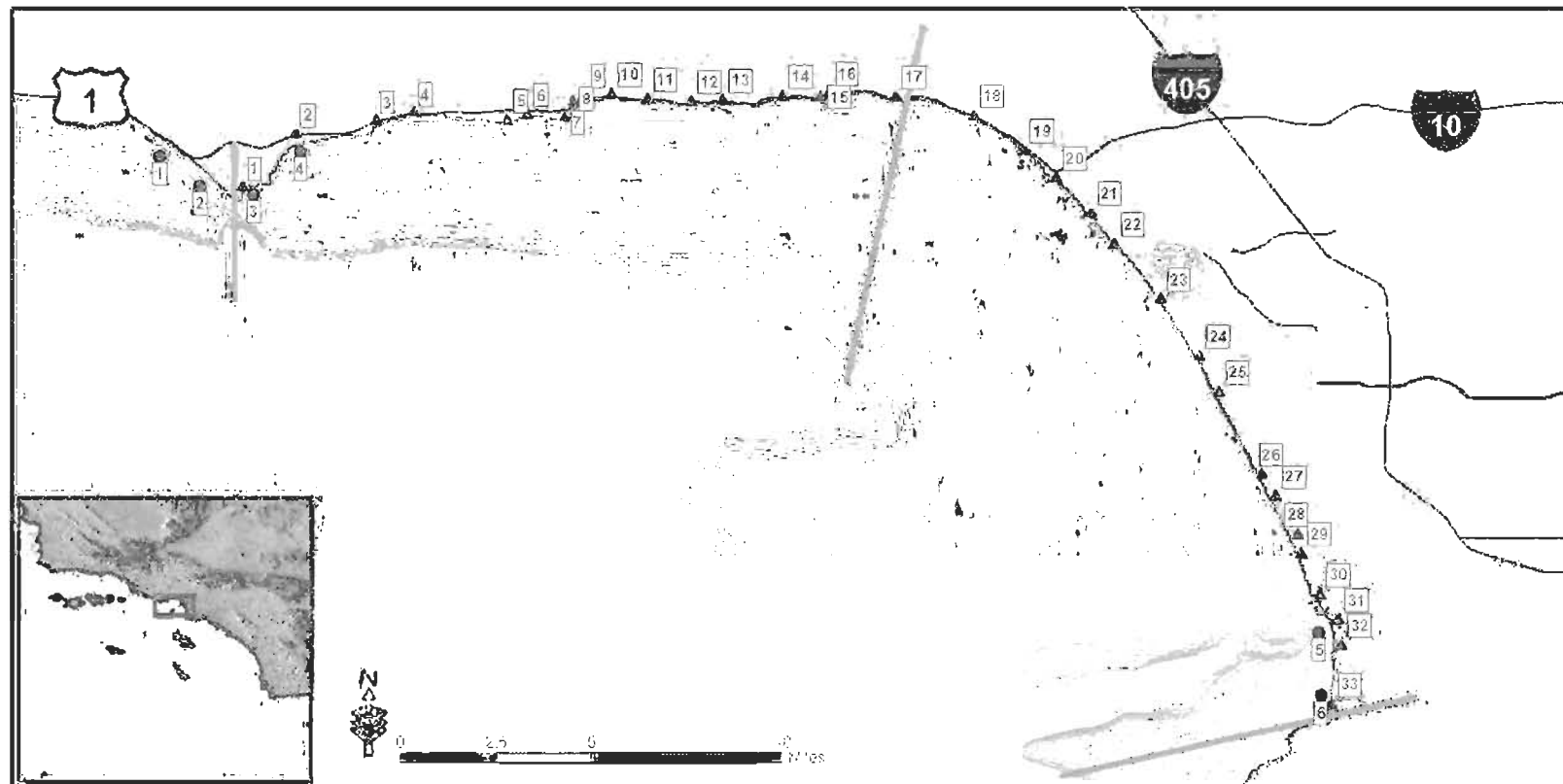


Figure 3.5-1. Coastal cities and communities, Los Angeles County.

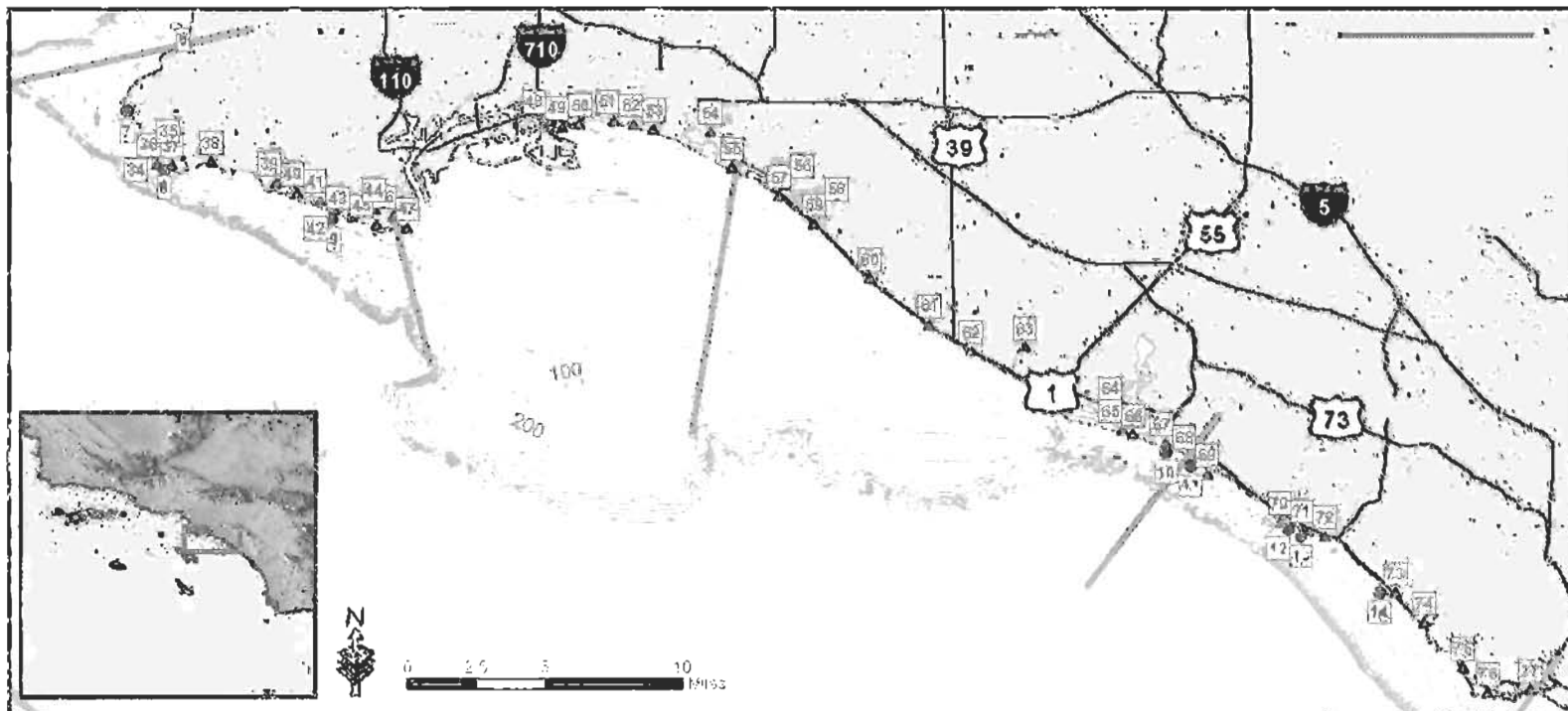


Figure 3.5-2. Coastal cities and communities, Orange County.



Legend		Recreational Locations		
Bathymetry (ft)	Beach lines	1. Point Dume (Santa Barbara)	8. Malibu Pier	16. Torrance County Beach
Dike Sites		2. Eureka Beach	9. San Marcos County Beach	17. Will Rogers State Beach
1. Los Angeles State Beach		3. Dana Point (Orange County) Beach	10. Lido Beach	18. Santa Monica State Beach
2. El Matador Beach		4. Pismo Beach	11. La Jolla Beach	19. Palisades Park
3. Point Dume (Free Zone)		5. Arroyo Beach	12. Los Flores Beach	20. Santa Monica Municipal Pier
4. Paradise Cove		6. Malibu Beach	13. Big Rock Beach	21. Venice City Beach
5. Redondo Submarine Canyon		7. Malibu Laguna County Beach	14. Los Lunas County Beach	22. Venice Fishing Pier
6. Old Redondo Pier			15. Torrance State Pier	23. Marina del Rey
				24. Dockweiler State Park
				25. El Segundo Beach
				26. Manhattan County Beach
				27. Manhattan Beach Pier
				28. Hermosa Beach
				29. Hermosa Beach Pier
				30. King Harbor
				31. Redondo Beach Pier
				32. Redondo Coast Beach
				33. Torrance County Beach

Figure 3.5-3. Generalized locations of recreational resources, Coastal Reaches 1 and 2.



Legend		Recreational Locations			
— Bathymetry (ft)		▲ 34. Point Vicente Interpretive Center	▲ 44. Angels Gate Park	▲ 55. Miraflores Pier	▲ 66. Pico Point Park
— Beach Lines		▲ 35. Boca Grande Park	▲ 45. Point Fermin Historic Lighthouse	▲ 56. Sunset Magazine Park	▲ 67. Coronado del Mar State Beach
Dive Sites		▲ 36. Point Vicente Lighthouse	▲ 46. Cabrillo Beach	▲ 57. Sanibel County Beach	▲ 68. Crystal Cove State Park
① 7. Christmas Tree Cove		▲ 37. Point Vicente Fighting Access	▲ 47. Catalina Beach Fishing Pier	▲ 58. Huntington Harbor	▲ 69. Starbuckles Point
② 8. Point Vicente Fishing Access		▲ 38. Abasco Green Sandstone Park	▲ 48. Golden Shore Marine Preserve	▲ 59. Boca Vista State Park	▲ 70. Caspers Cove State Underwater Park
③ 9. White Point		▲ 39. Green Trail Golf Course	▲ 49. Shoreline Park	▲ 60. Huntington City Beach	▲ 71. Casanova Bay Point Park
④ 10. Little Corona		▲ 40. Park Marine Shoreline Park	▲ 50. Marine Green Park	▲ 61. Huntington Beach Pier	▲ 72. Preston Park
⑤ 11. Stockmen's Cove		▲ 41. Royal Palms County Beach	▲ 51. Bedouin Park	▲ 62. Huntington State Beach	▲ 73. Argo Beach
⑥ 12. Shaker Cove		▲ 42. White Point County Beach	▲ 52. Bird Park	▲ 63. Talbot Regional Park	▲ 74. Miraflores County Beach
⑦ 13. Rocky Beach		▲ 43. Point Fermin Park	▲ 53. Belmont Pier	▲ 64. Mission Bay	▲ 75. San Creek Beach Park
⑧ 14. Moss Grove			▲ 54. Marine Spectrum Park	▲ 65. Balboa Pier	▲ 76. Dana Point Park
					▲ 77. Doheny State Beach

Figure 3.5-4. Generalized locations of recreational resources, Coastal Reaches 3, 4, 5, and 6.