

The California Current Marine Bird Conservation Plan Chapter 2

Current Seabird Status, Conservation, and Management in the California Current



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Version 1.0

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CHAPTER 2. CURRENT SEABIRD STATUS, CONSERVATION, AND MANAGEMENT IN THE CALIFORNIA CURRENT

For a seabird conservation plan to be successful, several factors first need to be identified, including (1) the status of breeding and migratory marine birds in the CCS (population estimates, distribution, and main threats at the colony and at sea); (2) current conservation status of seabirds in the U.S., Canada, Mexico, and globally; (3) current habitat protection, both on land and at sea; and (4) management jurisdiction for seabirds and their habitats. This type of information is required before recommendations can be made regarding conservation of marine birds.

In this chapter we highlight the status of seabirds in the CCS (appendices 2 and 3) and their current conservation status at the state, federal, and global levels. In addition, we describe current habitat protection. Protecting the habitats where marine birds breed, roost, and feed, limiting disturbance therein, and protecting seabird prey bases from fishing pressures are essential measures for conservation of these animals.

There are currently many protected terrestrial and marine habitats throughout the California Current region; however, enforcement is often difficult because of lack of personnel or remoteness of habitat. There are also key feeding sites that currently have no protection. At the end of this chapter we provide a broad overview of the most important agencies, legislation, executive orders, programs, and initiatives established at the federal and state level that can and do influence the welfare of seabird species in the CCS. The agencies and programs listed here affect marine birds directly through impacts to their populations, their breeding success, and their habitat and/or indirectly through impacts to their prey base and predators.

2.1 CONSERVATION STATUS OF SEABIRDS

Many species that breed and/or feed in the California Current have special conservation status because of specific threats to the population or decreasing trends. Each species may be listed under several different lists, briefly explained below (see Appendices 4 and 5 for listings).

Each U.S. state has its own process for listing, independent of the federal listing. Mexico lists species through the “Norma Oficial Mexicana,” and the entity that is responsible for listing within Canada is the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Since 1977, COSEWIC has been responsible for determining the national status of species on an annual basis. IUCN–The World Conservation Union (formerly the International Union for the Conservation of Nature and Natural Resources) generates the annually updated Red List, which identifies globally threatened flora and fauna, www.redlist.org.

Of the 38 species that breed within the California Current, three are listed as endangered in California (Brown Pelican, Least Tern, and Marbled Murrelet), two in Oregon (Brown Pelican and the Least Tern), and one in Washington (Brown Pelican) (Appendix 4). The Brown Pelican and the California Least Tern are also federally listed as endangered (207).

The Brown Pelican was severely impacted by the use of pesticides in the late 1960s and early 1970s (52, 54) and was listed in 1970. The California Least Tern was federally listed in 1970, mainly because of habitat loss, predation, shooting, and egg collection (132, 133).

Many of the species that historically nested in coastal estuaries and marshes now nest on artificial habitats such as dredge-spoil islands and salt pond dikes. Several of these species are listed under the federal Endangered Species Act (California Least Tern), as Birds of Conservation Concern (Gull-billed, Caspian, and Elegant terns), or on state threatened/endangered species lists. The Ancient Murrelet is listed as a Species of Special Concern by COSEWIC in British Columbia, www.speciesatrisk.gc.ca.

Coastal development and logging of old growth forests has impacted seabirds along the west coast of North America; in particular, Marbled Murrelet habitat was reduced by 90% as a result of logging in the 1800s (208). Loss of habitat to timber harvest resulted in the listing of this segment of the population as threatened under the Endangered Species Act in 1992, and as threatened in British Columbia in 2000. This species is also state listed as threatened in Oregon and Washington.

In Mexico, the Guadalupe Storm-Petrel was endemic to Guadalupe Island, Baja California. This species was reported as abundant on Guadalupe Island as late as 1906 (122), but by 1922 it was declared extinct (121).

Amongst the migrant species, one is globally listed as endangered, Cook's Petrel, four are listed as vulnerable (Short-tailed Albatross, Black-footed Albatross, Buller's Shearwater, and Pink-footed Shearwater), and two are listed as low risk/near threatened (Mottled Petrel and Murphy's Petrel) (Appendix 5).

2.2 CURRENT HABITAT PROTECTION

Many key seabird sites (especially breeding colonies) have been designated and protected as national wildlife refuges (NWR), national parks, national monuments, state parks, private ecological reserves, and natural preserves. In the marine realm, national marine sanctuaries (NMS) and marine protected areas (MPA; including marine reserves, marine conservation areas, and marine parks) near important seabird roosting and breeding sites offer important benefits for seabird conservation.

The largest seabird colonies in California, the Farallon Islands and Castle Rock, are both national wildlife refuges and, thus, under the protection of the U.S. Fish and Wildlife Service. Five of the seven Channel Islands (San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara) are protected as part of the Channel Islands National Park, and the waters around these islands (1,252 square nautical miles) are designated as a national marine sanctuary. The eastern region of Santa Cruz Island (encompassing 24% of its area) is included in the national park, and the western section is owned and managed by The Nature Conservancy (76% of the area).

The California Coastal National Monument includes 883 acres of rocks, islands, and pinnacles in California (R. Hanks, pers. comm.) and are protected and managed by the U.S. Bureau of Land Management, in partnership with the California Department of Fish and Game and California State Parks. The Channel Islands Marine Reserve was established in 2002 by a vote of the California Fish and Game Commission. Their action created the largest system of marine reserves off the U.S. West Coast. Effective January 1, 2003, the decision set aside 132 square nautical miles within the Channel Islands National Marine Sanctuary in 13 separate areas closed to most or all fishing.

In Oregon, all of the ocean rocks and islands are included within the Oregon Islands National Wildlife Refuge and the Oregon Islands Wilderness Area. The wildlife refuge provides breeding grounds for 13 seabird species numbering approximately 1.2 million individuals (more than Washington and California combined).

In Washington, there are five national wildlife refuges, all within the Olympic Coast National Marine Sanctuary on the outer coast. This NMS encompasses 217 km of coastline, from the Canadian border to the Copalis River. According to the U.S. National Fish and Wildlife Service, four of these national wildlife refuges (Flattery Rocks, Quillayute Needles, Protection Island, and Copalis) contain 80-90% of the state's seabirds, corresponding to 12 species. The Protection Island NWR includes one of the largest Rhinoceros Auklet breeding colonies in the world and the largest Glaucous-winged Gull colony in Washington. The majority of the nesting seabirds are found in the northern half of the state on the islands of the Maritime National Wildlife Refuge and the San Juan Islands.

The San Juan Islands NWR, originally established to protect colonies of seabirds, encompasses 84 rocks, reefs, grassy islands, and forested islands in the San Juan Islands and northern Puget Sound. This northern coast is more rugged and rocky, with numerous offshore rocks. Washington has 600-800 offshore rocks and islands, approximately 550 of which are in the national wildlife refuge system (Kevin Ryan, pers. comm.).

Along the Pacific coast in the Baja California region all of the islands are federal property, although only three are explicitly protected as a natural reserve (Natividad, Asunción, and San Roque islands in the Vizcaino Biosphere Reserve). Even these "protected" islands receive virtually no management to protect the breeding seabirds. Actions to remove introduced species, stop future introductions, and limit human disturbance by non-governmental organizations are the only conservation actions currently undertaken on these islands.

The Pacific Islands Biosphere Reserve plan is a proposal to protect all of the Pacific Baja islands; however, progress has been made for only one island thus far, Guadalupe Island, which is only awaiting the signature of the president to be officially designated as a reserve. The remaining islands (Cedros north to Los Coronados) are included in a proposal that was submitted to the Mexican government and is currently under consideration. The Mexican Federal Congress has shown support for the reserve, and it is likely to be decreed in 2004. If successful, reserve status will provide legal protection for all of the islands, but it is unknown whether there will be funds available to actually monitor and patrol them.

In Canada, habitat protection is also of great concern, although many colonies that are important seabird breeding areas are currently protected within national parks, national park reserves, ecological reserves, and wildlife management areas. However, several areas currently have no protection status, although protection planning processes for marine and terrestrial habitat are ongoing (1).

The Canadian Wildlife Service, in consultation with partners including First Nations, other levels of government, and various NGOs, is in the process of trying to establish Canada's first marine wildlife area (MWA). This MWA would help protect seabirds that breed on the Scott Islands as well as the thousands of migrants that use the waters in this region. Delineation of the boundaries has yet to be completed, but will be based largely on at-sea seabird studies (telemetry and surveys). There is currently a moratorium on offshore oil and gas exploration in the region; however, the moratorium may be lifted in the near future. It is therefore a crucial time to establish protection of the marine habitat used by seabirds in British Columbia, CA.

2.3 MANAGEMENT JURISDICTION FOR SEABIRDS AND THEIR HABITATS

Within all three nations that can lay claim to waters of the CCS (Canada, the United States, and Mexico), there exists an overall schism between agencies and laws regulating the use and management of terrestrial versus marine resources. Seabirds, which nest on land but spend the majority of their lives in the waters that provide their food, are often caught in the middle in terms of management of their habitat (nesting and feeding). Furthermore, the wildlife agencies with a mandate to protect seabirds are never the same as the agencies mandated to manage fisheries, because fish are managed as exploitable resources rather than as wildlife.

Protection and management of seabirds' terrestrial habitats (breeding and roosting sites) is relatively centralized in Canada, Washington, Oregon, and Mexico. Along the coast of California, however, terrestrial jurisdiction is more fragmented and includes the U.S. Fish and Wildlife Service (FWS), U.S. National Parks Service (NPS), state parks, U.S. Bureau of Land Management (BLM), and The Nature Conservancy (TNC).

A. Summary of Agencies, Laws, and Programs Related to Canadian Management of Seabirds

The management of wildlife in Canada is shared by the federal, provincial, and territorial governments. Different agencies have jurisdiction through different legislation for (1) the management and protection of seabirds, (2) their land-based habitats, and (3) seabirds' foraging habitats (i.e. the ocean and fisheries).

The land where seabird colonies are located is primarily under provincial management or occasionally under Parks Canada management (as either national parks or national park reserves). The food that seabirds eat and the oceans in which they spend much of their lives are managed by the Department of Fisheries and Oceans (DFO).

Description of Jurisdiction and Legislation by Agency in Canada

The Canadian Wildlife Service (CWS) is an agency within Environment Canada (EC), a federal department that also includes related water and environmental protection, climate science, and climate change, among others. CWS handles wildlife matters that are the responsibility of the federal government. These include the protection and management of migratory birds as well as nationally significant wildlife habitat. Other responsibilities are endangered species, control of international trade in endangered species, research on wildlife issues of national importance, and international wildlife treaties and issues.

Some bird species, both migratory and non-migratory, are specifically reserved for management by provincial governments. CWS authority for protecting seabirds only extends to the birds themselves and the contents of their nests, not to their habitat (whether land or sea). For example, CWS can limit activities that would involve the taking of eggs and birds or the disturbance of, or damage to, nests, but not activities that threaten breeding, nesting, or foraging habitats. The only exception would be where lands are federally held, but not as national parks.

Under the authority of the Canada Wildlife Act, CWS does manage two types of wildlife areas for the benefit of migratory birds. These are migratory bird sanctuaries (MBS) and national wildlife areas (NWAs are roughly equivalent to U.S. national wildlife refuges).

Migratory bird sanctuaries were originally established to prevent hunting of migratory birds – to afford protection of birds, eggs, and young, under the authority of the Migratory Bird Convention of 1917. CWS can limit hunting and disturbance in an MBS, but not the use of the land. National wildlife areas protect all habitats within their boundaries. The process of defining NWAs starts by prohibiting all activities and uses and then developing a plan that will allow limited permitted activities as appropriate, depending upon the ecological needs of the area. The Canada Wildlife Act also gives the CWS authority to establish protected marine areas.

Parks Canada, another federal agency, has authority to manage the land and nearshore marine habitats of seabirds through park reserves, such as in the Queen Charlotte Islands. Parks Canada also has authority to designate a representative system of marine protected areas under the National Marine Conservation Areas Act.

The Department of Fisheries and Oceans (DFO or Fisheries and Oceans Canada) has jurisdiction over protection and management of marine mammals and fish, including regulating fisheries. DFO has the authority and jurisdiction to manage fisheries under the Oceans Act, which requires sustainable development, integrated management, and a precautionary approach. The Oceans Act also gives the DFO the mandate to establish a network of marine protected areas.

The provincial government of British Columbia has jurisdiction over certain species of birds, including crows, blackbirds, cormorants, and upland game birds. Provincial governments also have authority to protect and manage land habitats through the designation of ecological reserves. Many reserves in B.C. protect islands that are important seabird colonies (reserves are also established to protect other components of biodiversity).

Most such reserves have been designated in the past few decades. The provincial government also has authority to protect and manage non-bird species, with the exception of the recently passed Species At Risk Act (SARA), Canada's newly passed endangered species law. EC is accountable for recovery actions on all listed species except marine mammals and fish, for which DFO takes the lead.

The B.C. government also governs activities in provincial waters, which are defined in a more complex way than are state waters in the U.S. Provincial waters are generally defined as "from headland to headland." For example, inside bays and estuaries would be 100% provincial waters as well as waters internal to the province such as the Strait of Georgia. There is, however, some disagreement between the federal and provincial governments about the extent of B.C. provincial waters, including areas such as Hecate Strait, between the B.C. mainland and the Queen Charlotte Islands, and Queen Charlotte Sound, on the central coast of B.C.

First Nations (i.e. native peoples) constitute another layer of government, as they are semi-autonomous. First Nations in Canada have land claims that extend into the ocean (potentially as far as the entire EEZ). There are approximately 10-12 First Nations groups in B.C. with marine interests. First Nations are working towards agreements with the federal government to obtain coverage of claims on waters within the EEZ. It will therefore be essential to work with First Nations in any process to establish an MPA or reserve.

Description of Key Canadian Seabird Conservation Programs

Marine Protected Areas

DFO, EC, and Parks Canada all have different pieces of legislation that establishes their authority to create marine protected areas. The Oceans Act governs DFO, and it states that DFO is to be the federal "lead" on establishing MPAs. However, the other two departments have their own legislation for establishing MPAs, but that legislation does not include explicit authority over fisheries.

For this reason, any fishing limitations or marine reserves designated by EC or Parks Canada would have to be undertaken in cooperation with DFO, which tends to have less of an ecosystem management perspective than the other two agencies, although this is changing.

Currently there is a precedent-setting effort by the CWS to use their authority under the Canada Wildlife Act to establish a marine wildlife area, the Scott Islands. These islands, located off the northern tip of Vancouver Island, include B.C.'s most important seabird colony on Triangle Island. The Scott Islands are already protected as an Ecological Reserve. The idea is to establish a "sanctuary" for seabirds, where both their land and marine habitats are protected and under conservation management. This process would involve overlapping jurisdictions and, at a minimum, require the cooperation of the CWS, DFO, First Nations, and the British Columbia provincial government.

A provincial/federal strategy was drafted in B.C. to agree on a process for designating MPAs. While it has not yet been formally ratified, its intent is being upheld by the agencies involved. For this reason, it is assumed that the B.C. provincial government will not be a stumbling block in any CWS-led marine wildlife area designation processes. DFO would undoubtedly retain jurisdiction over all fisheries within the proposed marine wildlife area.

Generally, there is a small area of water surrounding coastal terrestrial ecological reserves. In addition, some reserves, such as Chucklesit Bay on the west coast of Vancouver Island, are totally marine. None are currently protected from fishing, although a slow process for designating them as no-take reserves is underway. For most, the marine area is usually small (from low tide line up to several hundred yards from shore); nevertheless, there is a question over who has final say on fishing within this reserve buffer zone.

Bycatch Reduction/Mitigation

Nationally, and locally in B.C., the CWS works with DFO to assess the level of seabird bycatch from fisheries. DFO has been helpful in the past by collaborating with CWS in training fisheries observers on how to collect seabird data (especially in longline fisheries). The program raised enough awareness among fishermen that representatives of the halibut fishery came to DFO to request that all halibut boats exceeding a certain length use seabird avoidance devices as a condition of licensing. Ken Morgan, CWS, is lead for these bycatch programs.

Another project, developed by the National Audubon Society, seeks to further educate fishers on how to remove longline hooks from live seabirds. A poster explaining this process has been produced in multiple languages (Spanish, Korean, Japanese, Chinese, and English). CWS and DFO are collaborating on finding the funds to have the poster translated into French and distributed among fishing associations operating off the west and east coasts of Canada.

Oil Pollution Assessment

CWS is conducting studies to determine the level and seasonality of chronic oiling to predict mortality and population effects of such oiling on seabirds. One study considers trajectory models for spills, ship traffic, and at-sea distribution of birds. The goal is to establish a baseline of the “background” level of oiling off the B.C. coast. Baseline is needed because of the prospect of lifting the current moratorium on oil and gas exploration and development off the B.C. coast.

The moratorium was a joint provincial and federal agreement covering the entire EEZ. If the moratorium were lifted, protections would extend only to 20 km from shore. Ken Morgan is the lead contact for this program.

B. Summary of Agencies, Laws, and Programs Related to U.S. Management of Seabirds

In the U.S., findings of the Pew Oceans Commission include recognition that a plethora of overlapping and sometimes conflicting laws, agencies, and regulations inhibits the efficient and effective management of marine ecosystems. These many overlapping mandates may inhibit ecosystem management.

Whereas the U.S. Fish and Wildlife Service has primary responsibility for the management of migratory birds, including seabirds, National Oceanic and Atmospheric Administration (NOAA) Fisheries, formerly the National Marine Fisheries Service or NMFS, has primary responsibility for the management of the marine environment and fisheries (i.e. a significant portion of the seabird prey base).

Description of Jurisdiction and Legislation by Agency in the U.S.

The U.S. Fish and Wildlife Service (USFWS) is the primary federal agency responsible for the conservation and management of migratory birds, including seabirds.

Several international treaties, domestic laws, and executive orders have been enacted that provide protection for migratory birds. The most important pieces of legislation are: Migratory Bird Treaty Act, Fish and Wildlife Conservation Act, Endangered Species Act, National Wildlife Refuge System Administration Act, and National Wildlife Refuge System Improvement Act.

Other more narrowly focused laws, with respect to seabirds, include those governing oil spill response and damage assessment (e.g., Oil Pollution Act) and other maritime contaminant issues (e.g., Federal Water Pollution Control Act); regulation of commercial and sport fisheries (e.g., Magnuson-Stevens Fishery Conservation and Management Act, High Seas Driftnet Fishing Moratorium Protection Act, and the High Seas Fishing Compliance Act); management of coastal habitats (e.g., Coastal Zone Management Act and Fish and Wildlife Coordination Act); and the management of introduced plants (e.g., Federal Noxious Weed Act).

Within USFWS, the different divisions have defined, and often overlapping, responsibilities concerning the conservation and management of seabirds. Migratory Bird and Habitat Programs has the lead in implementing the Service's responsibilities with regards to migratory birds. Ecological Services includes several key components: Endangered Species, Environmental Contaminants, and Habitat Conservation.

Endangered Species has primary responsibility for seabirds listed under the Endangered Species Act (ESA).

Environmental Contaminants encompasses the Service's Damage Assessment and Spill Response Division – the primary FWS contact in the event of an oil, or other contaminant spill. The Habitat and Conservation Branch includes the Coastal Program, Habitat Conservation, and Partnerships programs. The Office of Law Enforcement enforces federal wildlife and habitat laws that affect migratory birds.

In addition to these broad responsibilities, the USFWS also has site-specific management responsibilities associated with the National Wildlife Refuge (NWR) System. The largest U.S. seabird colonies in the Pacific are located on refuges and the majority of the region's seabirds nest on refuge lands.

Other federal and state agencies, tribes, non-governmental organizations, and private individuals that own seabird colony sites in the CCS include: Bureau of Land Management, National Park Service, Department of Defense, state parks, and The Nature Conservancy.

U.S. Fish and Wildlife Service-related Legislation and Executive Orders:

a) The Fish and Wildlife Conservation Act of 1980 created a program to help states emphasize non-game species, thereby avoiding the need to list them under the ESA. This legislation resulted in the development of the Birds of Conservation Concern (B.C.C.) list, which the Migratory Bird office uses to prioritize actions. In 1989, the act was amended to require the USFWS to identify lands and waters in the United States and other nations in the Western Hemisphere whose protection, management, or acquisition will foster the conservation of migratory non-game birds.

b) The North American Wetlands Conservation Act of 1989 provides funding and direction for the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S., and Mexico. A North American Wetlands Conservation Council was created to recommend projects to be funded under the act to the Migratory Bird Conservation Commission. Currently \$30 million per year is available under the act for wetland and waterbird conservation.

c) The Neotropical Migratory Bird Conservation Act of 2002 provides grants to countries in Latin America, the Caribbean, and the United States for the conservation of neotropical migratory birds that winter south of the border and summer in North America. Currently \$5 million per year is available. At least 75% of the funds must be spent outside of the United States and the non-federal match is 3 to 1. The law encourages habitat protection, education, researching, monitoring, and capacity building to provide for the long-term protection of neotropical migratory birds.

d) Executive Order 13186 of 2001 mandates greater federal coordination to meet the requirements of the Migratory Bird Treaty Act and specifically calls for heeding recommendations of the continental bird conservation plans. The USFWS is developing memorandums of understanding (MOUs) with other federal agencies to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds.

NOAA Fisheries (formerly the National Marine Fisheries Service or NMFS) is an agency within the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce. NOAA Fisheries and respective state agencies manage the prey of seabirds and marine habitats

where they forage. In 2001, NOAA Fisheries staffed a position for a national seabird coordinator as well as identified staff in each of its regions, science centers, and headquarter offices to address issues associated with seabird/fishery issues. The NOAA staff work in collaboration with regional representatives from the USFWS and the Department of State as part of an Interagency Seabird Working Group.

NOAA Fisheries has jurisdiction over fisheries management and regulation in U.S. federal waters (from 3 to 200 miles offshore), in coordination with the eight regional fisheries management councils. The management councils help to develop fishery management plans, but NOAA Fisheries approves the plans and then develops and enforces fishing regulations. In the Pacific, the Pacific Fisheries Management Council (PFMC) has jurisdiction over CCS waters, the Western Pacific Management Council has jurisdiction over Hawaiian and western Pacific waters, and the Northern Pacific Management Council has jurisdiction over Alaskan EEZ waters.

NOAA also has important responsibilities in conjunction with oil spill response. NOAA established the Damage Assessment and Restoration Program (DARP) in 1990 to fulfill natural resource trustee responsibilities assigned in the Clean Water Act (CWA), the Superfund Act, the Oil Pollution Act of 1990 (OPA), and the National Marine Sanctuaries Act (NMSA).

DARP provides a single focus for natural resource damage assessment and restoration. Protracted and costly litigation to recover damages often is avoided because NOAA, other co-trustees, and the responsible parties are provided an opportunity to agree to a settlement that restores injured resources.

In addition, NOAA's National Ocean Service addresses important responsibilities associated with oil spill response through its Office of Response and Restoration (OR and R). OR and R is the focal point in NOAA for preventing, planning for, and responding to oil spills, releases of hazardous substances, and hazardous waste sites in coastal environments and restoring affected resources. OR and R protects and restores coastal resources through the application of science and technology. On behalf of the public, OR and R addresses environmental threats from catastrophic emergencies, to chronic releases, to vessel groundings in sanctuaries.

NOAA-related Legislation and Executive Orders:

a) Executive Order 13158: Marine Protected Areas 2000, calls for an expanded and strengthened comprehensive system of MPAs throughout the U.S. marine environment and institutes a number of mechanisms to achieve this (NOAA Fisheries and USFWS are lead agencies).

b) The 1994 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Act first passed 1976), asserts U.S. jurisdiction over fisheries in the EEZ, over all anadromous species (fish, like salmon, that spawn in freshwater and then migrate to the sea) throughout their migratory range (except when in waters of a foreign nation), and over continental shelf fishery resources that extend beyond the EEZ. The act established eight regional fishery management councils to implement provisions of the act, including development of fishery management plans (FMP), reviews of foreign fishing applications, and public hearings.

Under the Magnuson-Stevens Act, the fisheries management councils have authority over all species from 3 to 200 nautical miles offshore, but each council can move directly to recommend regulations only for those species that have a federal FMP approved by NOAA Fisheries. For the West Coast (Washington, Oregon, and California), federal FMPs have been approved for groundfish, salmon, coastal pelagic species, and highly migratory species. To restrict harvest of other species, the appropriate council or NOAA Fisheries would have to develop FMPs for those other species before proceeding with restrictions, although it may be possible for the council to impose restrictions on the take of FMP species in non-FMP fisheries.

While a council can recommend the creation of marine reserves under its Magnuson-Stevens Act authority, it has limited ability to protect fish and habitat in the marine reserve from anything other than fishing impacts. Thus, councils do not control dredging, dumping, or other potentially damaging activities. However, councils can comment to other state and federal agencies about actions that may harm marine reserve areas. For example, a council could comment if an agency wanted to issue a permit for dumping dredge materials in fish habitat.

c) The 1996 Sustainable Fisheries Act (amendments to Magnuson), includes new requirements for reversing decline in marine fish populations. These include FMPs that designate essential fish habitats and steps to protect habitat from non-fishing as well as fishing impacts. FMPs must specify objective and measurable criteria to determine whether a fishery is overfished. If overfished and rebuilding, the act requires reduced harvests, the impacts of which must be fairly allocated among harvesters. The act requires that both bycatch and the mortality of unavoidable bycatch be minimized.

d) The 2000 reauthorization of the National Marine Sanctuaries Act identifies and designates national marine sanctuaries (NMS) (of special national significance); for designated NMS, the act provides for comprehensive and coordinated resource protection, management, monitoring, conservation, and public education while facilitating all public and private uses of sanctuary resources that are not prohibited by other authorities. Sanctuaries, frequently described as national parks of the sea, are managed according to site-specific management plans prepared by NOAA's National Marine Sanctuary Program (NMSP), within NOAA's Ocean Service. The primary activities currently prohibited within NMS are oil and gas exploration and development. At present, the five west coast NMSs are updating their management plans.

Native American tribes in the U.S. constitute another layer of government. The U.S. government deals with Native American tribes as sovereign nations. They have claims and ownership to certain islands that have seabird colonies, as well as some shoreline areas with colonies. Tribes also have subsistence hunting and traditional rights, which extend to fishing prey species and possibly even hunting of seabirds. For example, Washington State regulatory changes instituted to reduce seabird bycatch from salmon gillnets do not apply to tribes.

Description of Initiatives by State in the U.S.

Washington

The Northwest Straits Marine Conservation Initiative was established by Congress in 1999. The goal of the initiative is to restore and protect the marine resources and environment of the Northwest Straits of Washington. The initiative was established in 1999 and must report to Congress in 2004 on progress towards specific benchmarks for environmental restoration and public process.

The Northwest Straits Commission (NWSC) and seven Marine Resource Committees (MRCs) were established under the NWS Initiative. Taken together, they represent a “bottom-up” local approach to protecting, restoring, and managing resources that cross many jurisdictions.

The MRCs are citizen-based committees appointed by locally-elected officials in each of the seven northwestern counties of Washington. The NWSC is a 13-member body that represents the MRCs as well as the Indian tribes and the state of Washington. The role of the MRCs is to determine local needs and to carry out habitat restoration, rehabilitation of marine populations, and outreach to citizens on marine environmental concerns and solutions. The NWSC provides technical assistance, planning, and coordination for the Initiative.

The Initiative is funded by Congress through NOAA and through various local sources and competitive grants. Source: <http://www.pacificmpa.org/>

Accountability is key to the Northwest Straits Initiative. A series of *performance benchmarks* have been crafted to measure progress in protecting and restoring degraded resources and habitats of the Northwest Straits. In addition, the program is authorized for a limited period. After the initiative's six-year term, Congress must approve any further support of program activities. Source: <http://www.nwstraits.org/aboutnsi.html>

Oregon

The Oregon Coast National Wildlife Refuge Complex is comprised of six national wildlife refuges that protect a variety of coastal habitats spanning 320 miles of the state's rugged coastline. Stretching from Tillamook Head south to the California border, three of the six are marine refuges (Oregon Islands, Cape Meares, and Three Arch Rocks) that protect coastal rocks, reefs, islands, and several headland areas. These habitats support some of the most important seabird nesting colonies in the United States. More than a million seabirds, including Common Murres, Tufted Puffins, cormorants, and storm-petrels, nest there.

Oregon Ocean Policy Advisory Council (OPAC) (2002) was established by the governor of Oregon. After nearly two years of study of marine reserves and protected areas in the U.S. and worldwide, the Oregon Ocean Policy Advisory Council (OPAC) found that sufficient evidence existed to recommend that: a) Oregon establish a limited system of marine reserves in order to test and evaluate their effectiveness in meeting marine resource conservation objectives; and b) before designating any specific marine reserves, Oregon must obtain additional information and conduct further study, analysis, and deliberation through an open, public process with extensive stakeholder involvement.

The OPAC made no recommendation about either a specific system of reserves or area locations or the use of marine reserves for fishery management. (Roy Lowe is involved in an effort to establish an MPA buffer around seabird colonies in Oregon.)

California

California's Marine Life Management Act (MLMA) became law on January 1, 1999, marking the beginning of science-based fisheries management within an ecosystem context for California state waters.

The Act includes the following requirements:

- The MLMA applies not only to fish and shellfish taken by commercial and recreational fishermen, but to all marine wildlife.
- Rather than assuming that exploitation should continue until damage has become clear, the MLMA shifts the burden of proof toward demonstrating that fisheries and other activities are sustainable (precautionary principle).
- Through the MLMA, the legislature delegates greater management authority to the Fish and Game Commission and the Department of Fish and Game.
- Rather than focusing on single fisheries management, the MLMA requires an ecosystem perspective including the whole environment.
- The MLMA strongly emphasizes science-based management developed with the help of all those interested in California's marine resources.

At the time of this writing, the Nearshore Fishery Management Plan had been completed for the nearshore finfish fishery, with plans on squid and abalone (among others) in preparation.

The MLMA includes several underlying goals and premises:

- **Conserves Entire Systems:** It is not simply exploited populations of marine life that are to be conserved, but the species and habitats that make up the ecosystem of which they are a part.
- **Non-Consumptive Values:** Marine life need not be consumed to provide important benefits to people, including aesthetic and recreational enjoyment as well as scientific study and education.
- **Sustainability:** Fisheries and other uses of marine living resources are to be sustainable so that long-term health is not sacrificed for short-term benefits.
- **Habitat Conservation:** The habitat of marine wildlife is to be maintained, restored, or enhanced, and any damage from fishing practices is to be minimized.

- **Restoration:** Depressed fisheries are to be rebuilt within a specified time.
- **Bycatch:** The bycatch of marine living resources in fisheries is to be limited to acceptable types and amounts.
- **Fishing Communities:** Fisheries management should recognize the long-term interests of people dependent on fishing, and adverse impacts of management measures on fishing communities are to be minimized.

To meet these standards, the MLMA calls for using scientific information and constituent involvement in the development of fishery management plans. A master plan will prioritize fishery management needs and an annual "Status of the Fisheries Report" will be produced to assess the status of California's fisheries and management effectiveness. Source:

<http://www.dfg.ca.gov/mrd/mlma/index.html>.

California's Marine Life Protection Act (MLPA) is a pioneering piece of legislation passed in 1999, which requires that the California Department of Fish and Game develop a plan for establishing networks of marine protected areas in California waters to protect habitats and preserve ecosystem integrity, among other things. The following information describes the process and work accomplished to date.

The MLPA states that "marine life reserves" (defined as no-take areas) are essential elements of an MPA system because they "protect habitat and ecosystems, conserve biological diversity, provide a sanctuary for fish and other sea life, enhance recreational and educational opportunities, provide a reference point against which scientists can measure changes elsewhere in the marine environment, and may help rebuild depleted fisheries."

The act requires that a comprehensive Master Plan of proposed MPAs be developed to both establish a conservation-based network as well as improve the conservation design and value of the small reserves already in existence.

The MLPA establishes six overarching goals:

1. To protect the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems.
2. To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.

4. To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.

5. To ensure that California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.

6. To ensure that the state's MPAs are designed and managed, to the extent possible, as a network. Source: <http://www.dfg.ca.gov/mrd/mlpa/index.html>

The vote by the commission to establish no-fishing zones is aimed at helping to reverse the alarming drop over the past decade in the population of several marine species that were once plentiful off the California coast, including red snapper, angel sharks, and abalone. Source: <http://www.flmnh.ufl.edu/fish/InNews/CIreserve2002.htm>

I. Description of Key Federal Seabird Conservation Programs

Conservation Planning

The U.S. Fish and Wildlife Service Pacific Region Seabird Conservation Plan is a major initiative on behalf of seabirds within the CCS (and U.S. Pacific islands). The intent of the plan is to define FWS priorities for action and the long-term expenditures required to implement them. In particular, increases in the federal budget needed to implement the plan will be sought.

For example, a high priority that the plan has identified is the need for a program of standardized monitoring for seabirds, including standardized protocols and a comprehensive design. FWS will contract with USGS and collaborate with Oregon State University, Patuxent, and others to develop a detailed waterbird monitoring protocol. The plan is currently undergoing internal review within the agency and will subsequently be sent out for peer review.

The FWS is the lead in an interagency working group (also including NOAA Fisheries and the Department of State) to develop a “National Plan of Action for the Reduction of Seabird Bycatch in Longline Fisheries,” required under the International Plan of Action (IPOA) for the Reduction of Seabird Bycatch (see Chapter 11 for a more detailed explanation of this). The plan of action will apply to all U.S. vessels regardless of where they fish.

Fisheries Management Interface

NOAA Fisheries hires or subcontracts observers on fishing vessels. FWS liaises with NOAA Fisheries concerning the observer program. There is a delicate relationship between FWS and NOAA Fisheries with respect to sharing and analysis of data on seabird bycatch and ensuring sufficient coverage of the observer program. FWS provides technical assistance to NOAA Fisheries concerning training observers to monitor seabirds and seabird bycatch. (M. Naughton, pers. comm.).

FWS has also been regularly consulting with NOAA Fisheries and the PFMC concerning the Highly Migratory Species Fishery Management Plan, providing technical assistance with respect to bycatch of seabirds and other listed species.

Seabird colony monitoring

FWS has recently completed a catalogue of seabird colonies in Oregon, and has contracted services to develop a similar catalogue for California. They are also working closely with the Bureau of Land Management (BLM) in Oregon and California to ensure that their global information system (GIS) is compatible with BLM’s system. The plan is to keep the catalogue updated and accessible via the web, rather than compiling and publishing a catalogue each year.

Oil Pollution

FWS interfaces with NOAA on oil spills through their Ecological Services, Environmental Contaminants branch. NOAA’s Damage Assessment and Restoration Program (DARP) was shaped by over a decade of assessing injuries to coastal and marine resources that reached a peak following the Exxon Valdez oil spill in March 1989.

NOAA’s program provides a single focus for natural resource damage assessment and restoration. Protracted and costly litigation to recover damages often is avoided because NOAA, other co-trustees, and the responsible parties are provided an opportunity to agree to a settlement that restores injured resources.

This approach of working cooperatively with responsible parties to collect data and conduct assessments minimizes costly duplication of effort.

NOAA’s trust resources include:

- commercial and recreational fishery resources;
- anadromous species;
- endangered and threatened marine species and their habitats (sea turtles, for example);
- marine mammals (such as whales, dolphins, and seals);
- marshes, mangroves, seagrass beds, coral reefs, and other coastal habitats; and
- all resources associated with national marine sanctuaries and national estuarine research reserves (e.g., coral reefs).

C. Summary of Agencies, Laws, and Programs Related to Mexican Management of Seabirds

Description of Jurisdiction and Legislation by Agency

In the northern Pacific off the coast of Mexico, there are three primary agencies with responsibility for managing and regulating use of seabird habitat: the Secretaría de Gobernación (Secretary of Governance); the Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca, y Alimentación, also known as SAGARPA (Secretary of Agriculture, Grazing, Rural Development, Fisheries, and Food); and the Secretaría de Medio Ambiente y Recursos Naturales or SEMARNAT (Secretary of Environment and Natural Resources).

The Secretaría de Gobernación governs activities on the islands located off the Pacific coast of Baja California (the southern limit of the CCS), primarily through the issuance of island use permits to fishery cooperatives and others. In addition, all the waters off the coast of Mexico (from the high tide line +20 meters out to the 200-mile Exclusive Economic Zone boundary) are considered federal waters under their jurisdiction. For example, infrastructure in support of oil and gas prospecting or processing would require approval from Gobernación.

SAGARPA governs fisheries management, primarily through the issuance of permits to all fishermen for their fishing rights, and also through the development of Fishery Management Plans. These plans are supported by information from fisheries research centers located in each state (Ensenada, Baja California and La Paz, Baja California Sur).

SEMARNAT houses three agencies with the responsibility to protect and manage marine bird terrestrial habitats (i.e. islands and coastal areas). These agencies are the Comisión Nacional de Areas Naturales Protegidas or CONANP (Natural Protected Areas Commission), the Dirección General de Vida Silvestre (Wildlife Agency), and the Instituto Nacional de Ecología or INE (National Institute of Ecology).

Most impacts to marine birds of Mexico occur as a result of the terrestrial developments and activities of fisheries cooperatives, particularly the lucrative abalone and lobster fisheries. Such cooperatives, along with other visitors and users of the islands, have over the years been responsible for the introduction of exotic mammalian herbivores and predators to islands with important marine bird colonies.

Such introductions have significantly reduced the seabird populations of these islands.

For example:

- Cats on Asunción and cats and rats on San Roque were mostly responsible for the extirpation of one of the two known colonies of Cassin's Auklet in the Baja Pacific, as well as other seabird species.
- Cats and dogs on Natividad, together with lights and roads built by residents, significantly reduced the Black-vented Shearwater colony, which harbors 95% of the world's nesting population of this species.
- Rabbits brought by co-op members to San Benito Islands devastated the flora and competed for burrows with seabirds.
- Fishing co-ops also disturb birds, especially pelicans and cormorants, as a result of having people on the islands walking around.
- Direct habitat loss from the development of fisheries co-ops also occurs, although this impact is comparatively minimal.
- Guano mining has displaced birds on San Roque and San Jeronimo.

Within SEMARNAT, CONANP is the primary land management agency with jurisdiction over the designation, conservation planning, and management of four different types of protected areas: biosphere reserves (e.g., the Vizcaíno Biosphere Reserve located in Baja California Sur), national parks (such as Loreto Bay National Park), wildlife protected areas (such as the Gulf of California Islands), and natural resource protected areas.

Vida Silvestre has responsibility for managing protected species and their habitats designated under the Norma Oficial Mexicana (roughly the Mexican equivalent of the Endangered Species Act). This includes the generation of protected species plans and designation of critical habitat. Vida Silvestre also has jurisdiction over all wildlife hunting on federal, state, and private lands under the Ley General de Vida Silvestre. INE is responsible for conducting applied research to aid in the management and protection of natural systems in Mexico.

**Description of Key Seabird
Conservation Programs in Mexico**

At this writing, Mexican Pacific islands in the southern CCS do not have any official protected status; however, a proposal to create a Pacific Coast Baja California Island Biosphere Reserve has been sponsored by the Grupo de Ecología y Conservación de Islas (GECI).

If successful, such a proposal would permanently protect the islands from future development; require the creation of comprehensive management plans for the resources; and result in greater oversight of fishing activities on the islands. Guadalupe Island, which was originally a part of the GECI proposal, has since been officially proposed by the Mexican government as a Biosphere Reserve, with the proposal undergoing review in fall 2003.

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The California Current Marine Bird Conservation Plan Appendix 2

Species Accounts – Breeding Seabirds of the California Current

Version 1.0

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APPENDIX 2: SPECIES ACCOUNTS – BREEDING SEABIRDS OF THE CALIFORNIA CURRENT (References located in Chapter 2)

Ancient Murrelet *Synthliboramphus antiquus*

The world population of Ancient Murrelets (ANMU) is likely between 1-2 million birds, with the core of this population in British Columbia (with 540,000 breeding individuals, (1)), and Alaska (2). South of British Columbia (B.C.), the only documented breeding was in 1924 at Carroll Island, Washington (3). It is not known if ANMU currently nest in Washington, but it is considered probable based on observations of staging adults between Carroll Island and Jagged Island in early April (U. Wilson, pers. comm.). Based on frequent observations of ANMU in protected waters of Washington and adjacent Canadian waters, it appears that these areas are important wintering habitat for this species (4, 5). ANMU are also recorded in low numbers in Oregon and California waters during winter and early spring (6).

Data indicate declines throughout the range, primarily due to introduced mammalian predators on colony islands (2, 7). Given the post-breeding southern dispersal, at-sea threats are the highest concern for this region. Introduced mammals are currently considered the greatest threat to populations in the eastern Pacific, and programs to remove them from nesting islands have been initiated in B.C. and Alaska (8-10). At sea, ANMU may be negatively impacted by oil pollution and interactions with fisheries (8, 9). The magnitude of the interaction between ANMU and fisheries is currently unknown, although it may be especially important in the foraging habitat in the inshore waters of Washington.

Arctic Tern *Sterna paradisaea*

Arctic Tern (ARTE) population size estimates from 1980 suggest that more than 30,000 ARTE pairs breed in south to south-central Alaska and in the Russian Far East (11). The breeding population in the CCS region is limited to a small colony (10-20 pairs) discovered on Jetty Island in Puget Sound, Washington in 1977 and 1978 (12, 13), although it is unknown if they currently breed there (13). ARTE have an extensive non-breeding migration, often covering 11,000 miles, moving along the west coast of the Americas and wintering in Antarctic and sub-Antarctic waters (14, 15).

Globally, most breeding populations and sites are currently not at risk, although population trends for this species are poorly known (14). The pelagic nature of this species makes it particularly vulnerable to oil spills and fisheries bycatch. The small breeding population in this region, which has been completely absent at times (13), is extremely susceptible to impacts from human disturbance. ARTE may be vulnerable to changes in their food supply since they appear not to shift to other foods when their principal prey is not available (13, 16).

Ashy Storm-Petrel *Oceanodroma homochroa*

The Ashy Storm-Petrel (ASSP) is endemic to the CCS, breeding on at least 16 islands or offshore rocks from northern California south to Los Coronados in Baja California, Mexico. The largest breeding colonies are on the Farallon Islands and the Channel Islands, which together support approximately 98% of the breeding population (15, 17). The world population is estimated at approximately 10,000 breeding birds (18). On the Farallon Islands, the breeding population declined 42% between 1972 and 1992 (19). This significant decline is mainly attributed to predation of adults by Western Gulls (*Larus occidentalis*), owls, and possibly mice (20, 21). Population trends at other colonies are not known, although there is no apparent trend in the at-sea numbers in Monterey Bay (22).

Small population, restricted distribution, concentration at a few colonies, extended chick-rearing period, slow growth rates, and low reproductive rates make the ASSP especially vulnerable to threats. A more recent conservation issue is the potential negative impact of bright lights used by squid boats in the vicinity of the Channel Islands and the Farallon Islands, which may disorient storm-petrels, affect their behavior, or enhance avian predation (23). Plastic ingestion can potentially be of concern to ASSP, although this is not documented (22). Eggshell thinning was of concern in the late 1960s and early 1970s (24), and, recently, relatively high levels of DDT and PCB were found in ASSP nesting on Santa Cruz Island, California (25). Oil spills can have devastating effects on seabird populations (26), although documentation of ASSP mortality in oil spills is poor (27), most likely because affected birds die at sea and their bodies sink or are scavenged.

Black Skimmer *Rynchops niger*

The estimated North American breeding population of Black Skimmers (BLSK) is between 65,000 and 70,000 individuals (28). The first California breeding record was in 1972, at the Salton Sea (29). Since then, there has been an expansion of their range, although many of these colonies have poor reproductive success. Currently, there are small, isolated colonies along the California coast from San Francisco to San Diego. In 1995 the state's total was estimated at 1,200 pairs (21). In addition, BLSK sightings have been reported in Baja California, in Estero Punta Banda, Bahía San Quintín, Laguna Ojo de Liebre, and Bahía San Ignacio, though there is no indication they breed in any of these locations (30).

Current threats are those common to all of the coastal terns nesting in southern CA: flooding of nest sites, bird and mammal predation, human disturbance, and potential loss of habitat due to development. The proximity of colonies to urban areas makes them especially vulnerable to disturbance by humans, pets, and feral animals that can disrupt breeding of these southern California colonies and may have contributed to low reproductive success in the past.

Black Storm-Petrel *Oceanodroma melania*

The Black Storm-Petrel (BLSP) is endemic to the California and Gulf of California islands. As is the case for most nocturnal, burrow or crevice nesting species, population estimates are extremely limited and there are few colony-based data to provide a population trend. The current population is estimated at approximately 600,000 breeders, most of which breed on Islas San Benito, Mexico (approx. 95% of the world's population) (S. Wolf and B. Keitt, pers. comm.). Approximately 300 individuals breed at Santa Barbara Island and associated Sutil Island, California (17). Breeding is also possible at Prince (San Miguel), Anacapa, and San Clemente islands (31). Little information is available on historical numbers or trends, but introduced predators on many breeding islands suggest populations have declined from historic levels (32). Although most breeding islands are now free of introduced mammals, it is unlikely that populations have recovered to historic numbers.

Eradication of feral animals has occurred on several islands and is under way at other islands within the range (B. Tershy, pers. comm.). Predation of eggs by the native deer mouse on Santa Barbara Island is likely to occur, given that they prey on Xantus's Murrelet eggs (S. Wolf, pers. comm.). Owls and Peregrine Falcons are also likely predators at most breeding sites (33). Storm-petrels are inherently vulnerable to ingestion of plastics and other marine debris (34), although it is unknown to what degree this occurs in BLSK. There is evidence of eggshell thinning in Ashy Storm-Petrel eggs at Santa Cruz Island, Channel Islands, California, caused by recent high levels of DDT and PCBs (25); thus, this issue is likely to be a threat for this species as well.

Black-vented Shearwater *Puffinus opisthomelas*

The Black-vented Shearwater (BVSH) is the only shearwater that breeds in the CCS. Historical population estimates are not available for this species; however, it is likely current populations are considerably reduced (35). On Natividad Island, where 95% of the world's population currently nests, habitat destruction has reduced the colony area by at least 15% (36). Presently this species nests on Natividad, the three San Benito Islands, and islets Afuera and Negro off Guadalupe Island and has likely been extirpated by introduced cats or rats from Guadalupe, Asunción, and San Roque islands (37). Reliable population estimates are available only for Natividad Island (75,000 pairs, (38)). For the San Benito Islands (150-500 pairs) and islets Afuera and Negro (150-250 pairs), population estimates are based on cursory site visits or numbers of birds observed at sea around the colonies.

Brandt's Cormorant *Phalacrocorax penicillatus*

The Brandt's Cormorant (BRCO) is endemic to the west coast of North America and reaches the southernmost extent of its range on Santa Margarita Island, Baja California Sur. The most recent surveys indicate a global population of approximately 121,500 breeding birds (bb), 87% of which breed along the Oregon and California coasts. Small numbers of BRCO breed in B.C. (190 individuals, (1)), and small populations of BRCO breed on most of the Mexican islands (39). Overall, the BRCO population appears to be relatively stable or increasing; however, individual colony size (40, 41) and productivity (42-44) vary interannually in response to changing oceanographic conditions (e.g., ENSO) (42, 44, 45).

Breeding populations in Mexico have most likely declined in the past century due to severe reductions of historically large colonies on Los Coronados, San Martín, San Jerónimo, San Roque, and Asunción islands, principally from the impacts of human disturbance and introduced species (46). The most serious conservation concern for BRCO is human disturbance at breeding colonies, resulting in nest abandonment and increased predation by gulls and ravens (42, 47, 48). Exploitation of the prey base by human fisheries (49) is also an important concern. Relatively small numbers of BRCO are killed as a result of oil contamination and gillnet fisheries, though the impacts of these events on populations are not well-studied (50). It is unknown if contaminants currently pose a serious problem for BRCO.

Brown Pelican *Pelecanus occidentalis*

The North American Brown Pelican (BRPE) population size is estimated at approximately 194,000 breeders (51), most of which are found along the coasts of southern California and Baja California, Mexico. Only two colonies are in California, on Anacapa and Santa Barbara islands (Channel Islands) (52-56). North American populations underwent dramatic declines during the 1960s and early 1970s due primarily to eggshell thinning induced by pesticide use (57, 58). Although populations have recovered somewhat from these declines (54, 58, 59), they continue to show substantial interannual variation in productivity as related to prey availability (60), disturbance at colonies, and disease outbreaks (F. Gress, pers. comm.). Current populations are mostly stable (39). Only the Los Coronados and San Martin Islands are thought to now support fewer breeders than historic maximums (55, 61).

Although DDE and other eggshell thinning contaminants were banned in the U.S. in the early 1970s, their continued use in Mexico may still be causing problems for colonies in the Gulf of California (54, 57). Adult mortality occurs through introduced mammal predation, oil pollution, entanglement in fishing gear (62), and light disturbance from the squid fishery in the Channel Islands, causing nest abandonment and low reproductive success (F. Gress, pers. comm.). Populations may also be affected by disturbances to breeding and roosting sites and declines in prey stocks due to overfishing or general environmental degradation (54). Substantial die-offs of BRPE due to domoic acid intoxication from phytoplankton blooms (63), bacteriological outbreaks at sewage outflows (64), and botulism (e.g., at the Salton Sea) contribute to local population declines.

California Gull *Larus californicus*

The North American breeding population of California Gull (CAGU) was estimated at 276,000 birds in 1980, of which about 75,000 bred in Washington, Oregon, and California (75). As with other gull species, populations of CAGU likely increased throughout the mid-1900s in response to increased human-related food availability and decreased harvest of eggs and feathers (75-77).

Populations may be leveling off at the turn of the 21st century due to changes in dumping practices, especially on the wintering grounds along the coast (77, 78).

Human impacts on CAGU tend not to be serious due to remote localities of many breeding colonies, abundance of breeding individuals within colonies, and the resilience of gull individuals and populations. Minor impacts include shooting and trapping, ingestion of plastics and other toxins from garbage dumps, and the effects of contaminants and oil spills at the wintering grounds (76, 79). The most serious potential impacts involve disturbance to breeding colonies, resulting in increased intra-specific predation of chicks, and water-use practices that reduce water levels, allowing formation of land bridges that create access to breeding colonies by mammalian predators (77, 80, 81).

Caspian Tern *Sterna caspia*

In North America there are an estimated 32,000-34,000 breeding pairs (BP) of Caspian Terns (CATE) (51, 82). The largest CATE colony in the world (9,933 BP in 2002) is in the Columbia River estuary on East Sand Island (ESI), Oregon (82). CATE are a common resident along both coasts of Mexico (83), however this species does not breed on any of the Mexican Pacific islands. It is reported to breed in small numbers in Laguna Ojo de Liebre (160 pairs) (30), Estero San Quintin (10 pairs) (30), and Laguna San Ignacio (150 pairs) (30). There has been a general increase in the Pacific population of CATE since the 1960s, which is probably due, in part, to the terns' colonization of human-enhanced nesting sites on the coast in close proximity to abundant fish resources (82, 84). Concomitant with this general increase and shift to ESI has been a decline in the number of colonies over the past 20 years (82).

CATE colonies are highly susceptible to habitat loss or degradation from vegetative succession, erosion, or inundation and from human-caused management actions (82). Colony loss from tidal action and high water levels has occurred at several colonies in Washington and California (82). The greatest conservation concern for CATE is the large population concentration at one colony. This concentration results in increased risk from stochastic events such as disease, contaminant and fuel spills, natural disasters, introduced predators, and human disturbance. Additionally, there have been conflicts with other species' management, namely endangered salmon near the Columbia River estuary colonies. Human activity (including researcher disturbance) at or near nesting sites can greatly reduce reproductive success (85). There is evidence that organochlorine pollutants, such as PCB and DDE, continue to impact some CATE colonies (86, 87).

Cassin's Auklet *Ptychoramphus aleuticus*

Current population size of the Cassin's Auklet (CAAU) is estimated at 3.6 million breeding birds (51, 65) with the core of the population in British Columbia (2.7 million, (1)). The largest colony in the world is at Triangle Island, Canada with 548,000 breeding pairs, although this population is declining at an alarming rate (66). The U.S. Pacific region encompasses <5% of the global population: 63% of the U.S. breeding population in Washington (87,600), 37% in California (50,600), and <1% in Oregon (500) (17, 65, 67). In the Channel Islands, large colonies of Cassin's Auklets breed on Prince Island and Castle Rock, which lie offshore of San Miguel Island, and on Santa Cruz Island. CAAU were extirpated from Santa Barbara Island by introduced cats, but a small population continues to breed on an offshore islet, Sutil (17, 68). CAAU currently breed on six Mexican islands and were extirpated by introduced cats on four other islands during this century (39). The San Benito Islands are the only active colony of the CAAU subspecies *P. a. australe*, which formerly bred on San Roque and Asunción Islands (65). Recent population estimates of 75,000 breeding birds on the San Benito Islands (39) and 68,000 breeding birds on San Jerónimo (unpublished estimate, B. Keitt, S. Wolf, 2002) indicate that the CAAU population is much larger than the 20,000–40,000 breeding individuals previously reported for Mexico (65).

Populations of CAAU appear to be declining throughout most of the species' range, and several historic colonies have disappeared, mainly due to introduced predators (65). Reasons for the declines may be a result of predation by Peregrine Falcons and gulls (69) as well as changes in planktivorous food resources between 1978–1999 (44, 70–72). In conjunction with low adult survival at some of the main breeding colonies (66, 73), CAAU face several threats, including the introduction of mammalian predators to breeding grounds (65), entanglement in gillnets and other fishing gear (74), and effects of oil spills (62, 65). An indirect human effect involves increased chick predation by gull populations that have been artificially inflated due to human practices (69). A possible human-related effect relates to global warming and warming of the oceans, which appears to be correlated with declines in the prey resources of CAAU (70–72).

Common Murre *Uria aalge*

The total Pacific breeding population of Common Murres (COMU) is estimated at 4.3 million birds (51), although these numbers are confounded due to overlap with the similar Thick-billed Murre (*Uria lomvia*) at many colonies in the subarctic (88, 89). The core of the COMU breeding population in the CCS region is in Oregon (712,000 breeders, 66% of total). California has approximately 352,000 breeders (34%), and Washington, 7,000 (<1%) (90). There is a comparatively small population of breeders in B.C. (8,400) (1). In recent decades, the central California population has been drastically reduced (by at least 50%) due to gillnet fisheries and oil spill mortality (90, 91), but has started to recover since the adoption of tighter restrictions on these fisheries and active restoration work at some colonies (92–94). In Oregon, population trends appear relatively stable since 1988, when surveys became more standardized, and in Washington, a combination of anthropogenic and natural factors has resulted in overall declines in the population (90).

While the widespread global distribution of COMU makes them less susceptible as a species, local populations can be significantly impacted by oil contamination, gillnet mortality, and human disturbance. Fisheries can cause direct mortality and reduce prey availability, and new or developing fisheries may pose a serious threat. COMU are highly susceptible to oiling, given their tendency to form large rafts on the water, and are especially vulnerable during the period from July to October, when chicks fledge and adults may be flightless during portions of this time. COMU are the most numerous species affected in many spills (62, 95).

Craveri's Murrelet *Synthliboramphus*

The majority of the world's population of Craveri's Murrelet (CRMU) breeds on islands in the Gulf of California. Observations of Craveri's Murrelets during the breeding season suggest they do nest on the Baja California Pacific islands. Jehl and Bond (96) report 31 murrelet observations off southern Baja California (between Punta Eugenia and Cabo San Lucas) of which all identified individuals were ascribed to Craveri's. At the San Benito Islands, Delong and Crossin (97) collected 19 murrelets of which 5 were Craveri's; all had enlarged gonads. No data on population size at the San Benito Islands or for the Gulf of California exist. Very little is known of the breeding biology or natural history of this species besides data from egg collections and a few observations of nests (98, 99). Presumably, threats to this species are the same as those described for other alcid species.

Double-crested Cormorant *Phalacrocorax auritus albociliatus*

The current estimated breeding population of Double-crested Cormorant (DCCO) in the CCS region is approximately 62,000 individuals (1, 51, 100). In Washington, 3,300 breeding birds were estimated in 1989, concentrated mostly in Grays Harbor, the San Juan Islands, and the outer coast, with numbers apparently increasing (13). A total of 10,037 breeding birds were estimated in California in both marine and estuarine habitats (1989-1991), and 12,500 were estimated in Oregon (1988-1992), both states showing increasing trends (17, 100). Approximately 4,000 individuals breed in B.C. (1). In Mexico, small populations of DCCO currently breed on the majority of islands (39). However, historically large colonies on Mexican islands have most certainly declined during this century due to severe population reductions. During the early to mid-1900s, populations on Santa Cruz and Santa Catalina were extirpated due to human disturbance (41) and populations on Prince, West Anacapa, and Santa Barbara/Sutil islands declined to 350 individuals by the 1970s as a result of human disturbance and eggshell thinning produced by DDE contamination in the Southern California Bight (41). However, populations in the Channel Islands have since increased, largely as a result of reduced pesticide use, a reduced level of disturbance (17), and the creation of artificial breeding and foraging habitat (33, 100, 101). In 1999, DCCO re-occupied San Martín Island, which is the largest historic colony in North America (102), after suffering disturbance from feral cats, domestic dogs, and humans (103).

Human disturbance of nesting and roosting birds, pollution, habitat conversion, and introduced predators currently pose the largest threats to DCCO populations (101). Commercial and sports fisheries view the DCCO as a pest species and a competitor (104). Aquaculture practices are currently expanding and will become of increasing importance in the near future.

Elegant Tern *Sterna elegans*

The Elegant Tern (ELTE) has the most restricted breeding distribution of any tern in North America with 90-97% of the global breeding population (<30,000 pairs) concentrated at Rasa Island, Mexico (105). Historically, their distribution included small colonies on San Roque Island (106) and Asunción Island (107), in addition to colonies in the Gulf of California. Egg collecting and introduced species are most likely responsible for historic ELTE extirpations from the Gulf Islands (108). Only five colonies are currently active, two in Mexico and three in southern California (105). There has been a general range expansion into southern California, although attendance at these breeding sites fluctuates among years in response to ENSO conditions, habitat changes, and disturbance events. Population size at Rasa Island increased following the establishment of the island as a reserve in 1964, but recent trends are unclear (109). ELTE breeding range and population size have not recovered to known historical levels, when colonies were more widespread than at present (14, 105).

The world population is vulnerable due to its restricted range, concentration of >90% of the population at one colony, sensitivity to disturbance, and major loss of breeding habitat. Continued northern expansion is potentially limited due to dense human development along most of the coast. Current threats to ELTE populations include habitat conversion via development, introduced species, disturbance at breeding colonies, egg harvesting, entanglement in fishing gear, and military activity (105). Contaminant concerns include oil spills and other chemical pollutants at breeding and wintering sites.

Fork-tailed Storm-Petrel *Oceanodroma furcata*

Population estimates for the Fork-tailed Storm-Petrel (FTSP), as for other storm-petrels, are difficult to obtain due to their nocturnal attendance at colonies and their burrow/crevice-nesting habits (17). There are an estimated 305,000 individuals in the CCS, with the bulk of the population in B.C. (1, 51). Five confirmed colonies have been identified in Washington, all along the outer coast, with an estimated 3,900 breeding birds (209). In Oregon, 1,000 birds were estimated to breed on several offshore rocks and islands (209), with 410 birds estimated at six colonies in central and northern California (17). Little information exists concerning population trends of FTSP (13, 17), although populations in California may have shown a decrease since historical times as a result of changes in vegetation and soil at some of the main FTSP colonies, thereby reducing nesting habitat (17). Numbers of FTSP at sea in California waters also appear to have diminished since the 1960s (209).

Threats to FTSP include loss of nesting habitat, predation, interactions with fisheries, oil spills, and contaminants. Plastic ingestion is common for storm-petrels and can potentially be of concern to FTSP, although this is not known. Shell thinning of seabird eggs was of concern in the late 1960s-early 1970s (24), and is likely of major concern at present times, as shown by relatively high levels of DDE found in the eggs of FTSP breeding on the Queen Charlotte Islands, Canada (111). Oil spills, both chronic and catastrophic, can have devastating effects on seabird populations (26), although documentation of FTSP mortality in oil spills is low, most likely because affected birds die at sea and their bodies sink or are scavenged.

Forster's Tern *Sterna forsteri*

The population estimate for Forster's Tern (FOTE) for the coastal portion of the CCS region is 3,550 breeding birds (in 1989-1990) at 21 colonies in California (17), representing approximately 7% of the North American breeding population (51). Since 1980, FOTE populations appear to have declined in the San Francisco Bay and Monterey Bay areas due to human disturbance and predation (17). Inland colonies have also declined due to increases in agricultural and water developments which have decreased FOTE nesting and feeding habitats (17).

Documented and potential threats to the FOTE populations include exposure to pesticides and contaminants, habitat degradation, and predation (23, 110). Levels of organochlorine pollutants (DDE) have been correlated with eggshell thinning in FOTE breeding in California (87). In addition, development in wetland areas can degrade breeding habitat through draining, filling, or flooding riparian areas (17, 110). Nests are vulnerable to wave action and a suite of mammalian, avian, and reptilian wetland predators (110). FOTE have been known to nest on salt pond levees in San Francisco Bay; however, many colonies have been displaced or reduced in numbers because of human disturbance and predation from the introduced red fox (*Vulpes vulpes*) (17).

Glaucous-winged Gull *Larus glaucescens*

Because of the extensive hybridization between the Glaucous-winged Gull (GWGU) and the Western Gull (WEGU) in Washington and Oregon, estimating population size is difficult. In Washington, 39,923 GWGU and WEGU birds (combining both species) were estimated (13). There are an estimated 4,000 breeders in Oregon (41), and 58,000 in B.C. (1). As with other gull species, populations of GWGU have increased throughout the mid-1900s in response to increased human-related food availability and decreased harvest of eggs and feathers, but may be leveling off at the turn of the 21st century due to changes in dump management, especially on the wintering grounds (78, 114, 115).

Minor impacts on the population include ingestion of plastics and other toxins from garbage dumps (116) and the effects of contaminants and oil spills on the wintering grounds. The most serious potential impact involves disturbance to breeding colonies, resulting in increased intra-specific predation of chicks (117), although effects on the overall population appear to be minimal (118-120).

Guadalupe Storm-Petrel *Oceanodroma macrodactyla*

The Guadalupe Storm-Petrel (GUSP) was endemic to Guadalupe Island. This species was reported to be a winter breeder that nested in the cypress forest on top of the island (121). As late as 1906, GUSP was reported as abundant on Guadalupe Island; however, at that time feral cat predation was described as heavy (122). August 1912 was the last observation of the GUSP on the breeding grounds, and it was declared extinct in 1922 (121).

Gull-billed Tern *Sterna nilotica*

The total number of Gull-billed Terns (GBTE) is not well documented, and systematic surveys are needed to determine if more colonies exist in Mexico. The estimate from all known *S. n. vanrossemei* colonies is less than 600 pairs, with the small U.S. colonies (at the Salton Sea and South San Diego Bay) accounting for approximately 30%. Currently, the U.S. population is small but relatively stable. A recently described colony of 150 to 200 pairs exists on Montague Island at the mouth of the Colorado River (112) and 200 pairs reportedly breed in the Ensenada de La Paz (30) area. Population size and trends in Mexico are unknown.

A primary conservation concern is the small population size and limited breeding distribution, with most birds concentrated at a few sites. As with many species of terns along the Pacific coast, GBTE suffer from loss of nesting habitat, predation, human disturbance, and organochlorine contamination (113). GBTE appear to be more vulnerable to disturbance than other terns, and during the breeding season disturbance can cause chick and adult mortality from predation and early dispersal of young (113).

Heermann's Gull *Larus heermanni*

The majority (95%) of the world population of Heermann's Gulls (HEEG), estimated at fewer than 450,000 breeding birds, nests on a single island, Rasa Island, in the Gulf of California (123). Small colonies of HEEG currently breed on 11 additional islands in Mexico, two of which are located on the Pacific coast of Baja California. The colony on Middle San Benito Island was first reported in 1971 with 9 pairs, and increased to 100 pairs in 1993, 2000, 2001 (46, 123). A small breeding population of 35 pairs was reported on San Roque Island in 1927 (124) and subsequently 33 in 1993 and 42 pairs in 1994 (B. Tershy, pers. comm.). HEEG currently nest at 12 of the 19 colony sites in which they have been historically reported, suggesting that the population may be experiencing a downward trend (123).

Commercial eggging in Mexico, which frequently caused complete breeding failure on Rasa Island until the island was protected in 1964, has been banned (123). However, prey depletion by fisheries, mortality from fisheries bycatch, pollutants, disturbance, habitat conversion, introduced predators, exploitation, and oceanographic changes pose significant threats to current populations (123).

Horned Puffin *Fratercula corniculata*

The total world population of Horned Puffins (HOPU) is estimated at 1.2 million birds (88), but this estimate is considered unreliable due to difficulties associated with censusing crevice-nesting seabirds (125). In the CCS region, HOPU are considered a rare and local summer visitor and occasional breeder, with only one confirmed breeding location on a tiny, unnamed islet off Anthony Island in the Queen Charlotte Islands, Canada (126). Breeding is suspected at up to 11 additional locations in British Columbia, including Triangle and Kerouad Islands (126), though their current breeding status in B.C. is unknown. The total estimated breeding population in British Columbia is 25 pairs (126). HOPU are not thought to breed south of B.C., but their non-breeding range extends to the offshore waters of central California (126).

HOPU suffered widespread population declines between the '70s and '90s due to changes in forage fish stocks, bycatch mortality, and the introduction of mammalian predators to breeding colonies (127). Oil pollution and ingestion of plastics are also considered a concern for this species (128). HOPU are not routinely monitored at any sites in the north Pacific so current trends and threats to this species are not well understood.

Laysan Albatross *Phoebastria immutabilis*

Laysan Albatross (LAAL) breed primarily in the northwest Hawaiian Islands. Colonization of Mexican islands was first reported in 1983 (129) at Guadalupe Island and this species has now been reported to breed at San Benedicto (20 pairs) and Clarion Islands (130). At Rocas Alijos, birds have been reported alighting on the water near the rocks and touching down on top of the rocks. Observed breeding displays by birds near the rocks suggest they may start breeding there in the future (131). On Guadalupe Island the population is growing rapidly, from only 4 birds in 1976, to 138 birds in 1993, to 198 birds in 2001 (Pitman unpublished data). LAAL are doing surprisingly well on Guadalupe despite the proximity of their colony to the Navy base and the presence of feral cats and dogs on the island. On Clarion Island the breeding colony was reported extirpated by feral pigs; however, pigs were removed in 2001 and a small, but unknown, number of LAAL were reported breeding in 2001.

Leach's Storm-Petrel *Oceanodroma leucorhoa*

Leach's Storm-Petrel (LHSP) is the most widespread procellariiform in the Northern Hemisphere, breeding and migrating in both the Atlantic and Pacific Oceans (138, 139). Four subspecies are generally recognized: *O. l. leucorhoa* breeds in the North Atlantic Ocean and eastern North Pacific Ocean, from the Aleutian Islands, Alaska south to the Farallon Islands, California (138, 139); *O. l. beali* on San Miguel and Santa Barbara islands in the Channel Islands; *O. l. chapmani* on Los Coronados and San Benito Islands; *O. l. socorroensis* and *O. l. cheimommestes* on Guadalupe Island (140). Overall population trends are unknown, (138) and no historical population numbers are available for *O. l. chapmani*. Current population estimates are 200 birds on Los Coronados (141) and 1,200,000 on San Benito (39), both of which are based on little more than educated guesses.

Many individual colonies have been extirpated by introduced animals or habitat alteration, including changes in vegetation and soil (138). The main cause of mortality at breeding colonies is predation by introduced foxes, cats, dogs, rats, pigs, and mice (on newly hatched chicks and eggs) (19, 138, 142). Native predators such as river otters, gulls, raptors, and corvids also cause adult mortality (138). On Coronado Norte and Sur predation by feral cats has likely caused a population decline. The Guadalupe subspecies has never been adequately surveyed and their nomenclature remains a matter of discussion. It has been suggested that all colonies on the main island were extirpated by cat predation and habitat loss (122). Other threats include eggshell thinning due to organochlorine contamination from pesticides (143). While at sea, oil pollution or oil-dispersant emulsions may affect LHSP, as well as ingestion of plastics and other man-made products (138).

Least Storm-Petrel *Oceanodroma microsoma*

The only documented breeding location of Least Storm-Petrels (LTSP) in the CCS region is on the San Benito Islands, where it is abundant on all three islands. The LTSP is considered the most abundant marine bird in the Gulf of California (144). Recent estimates suggest the population to be approximately 270,000 birds (39). However, this is not considered an accurate population estimate as it is based on short stays on the islands rather than on reproducible surveys. Population estimates range from 100,000 (145) to 500,000 (146) individuals. There are no data on population trends.

Least Tern *Sterna antillarum*

The Least Tern (LETE) subspecies *Sterna antillarum browni* is distributed along the Pacific coast of California and Baja California. In California, LETE breed coastally and have increased from 600 pairs in 1973 to 2,750 pairs in 1994 (132), and 3,511 pairs in 2002 (CDFG unpublished data). In Baja California, small populations totaling 400 breeding pairs nest coastally in the Gulf of California (112). On the Pacific coast of Baja California Sur, an additional 35 pairs have been documented breeding on Magdalena, Margarita, and Creciente Islands since the early 1990s (30) (E. Palacios, pers. comm.). The population has contracted remarkably from historical distribution due to loss of habitat, predation, and some losses due to shooting and egg collecting (132, 133). There are no reliable historical estimates, but qualitative reports from the late 1800s and early 1900s indicated that LETE were abundant in southern California (133). California LETE was federally listed in 1970 (133) and the population has increased almost 8-fold in California since 1973.

Predation, human disturbance, off-road vehicle and recreational disturbance, coastal development impacting nesting habitat, and pesticides pose the largest threats to LETE populations (112, 132). Other potential concerns to the recovery of this species include reduced prey availability due to environmental conditions that reduce prey, such as El Niño events (134), potential (yet unknown) issues at wintering grounds (132, 133), and contaminants such as heavy metals and PCBs (135-137). The potential of domoic acid poisoning from contaminated prey (D. Robinette, pers. comm.) is also of concern.

Magnificent Frigatebird *Fregata magnificens*

The Magnificent Frigatebird (MAFB) breeds on only one island in the Mexican islands, Santa Margarita, which is the northernmost breeding location for this species. Current breeding population is estimated at 40,000 birds (39). No accurate historical information is available to indicate whether this population is stable or otherwise. Cats have been observed to depredate frigatebird chicks on the island (39).

Marbled Murrelet *Brachyramphus marmoratus*

Population estimates for the Marbled Murrelet (MAMU) indicate 60,000 individuals in B.C. (1), 5,500 in Washington, 5-15,000 in Oregon, and 6,450 in California (51, 88, 147). Most population estimates of MAMU have involved ground-based detection surveys (148), though the power of these surveys to detect trends is low (149). Numbers of MAMU encountered on the ocean have declined across the CCS in the last two decades (147), and the Alaskan population decreased by 50% between 1972 and 1992 (150). Quantitative demographic estimates of population status in Desolation Sound, British Columbia, suggest a stable or slightly decreasing sample population (151).

The key conservation concern is loss of breeding habitat through removal of old-growth forests (88, 148, 152); this is most evident in the southern part of the species' range (147, 148). Management action to preserve habitat is underway. Nest site predation is another conservation concern for nesting success (148), and direct human activity and artificial sources of food appear to increase numbers and diversity of nest predators (153). Threats in the marine environment include oil pollution (154) and bycatch in gillnets (33).

Mew Gull *Larus canus*

The Mew Gull (MEGU) is nearly circumpolar in its distribution, breeding in the Pacific from central Alaska and northwestern Canada, south to interior northern and coastal western B.C. (126, 155, 156). The only breeding area within the CCS is on Vancouver Island and coastal B.C., where they generally form small colonies (2-400 pair) (157) often mixed with Herring and Bonaparte's Gulls (126). The global population is not well known, but is estimated to exceed one million pairs (M and B). MEGU generally form small colonies (2-400 pair) (157), often mixed with Herring and Bonaparte's Gulls (126). The non-breeding range extends south along the west coast of North America to southern California. MEGU are generalist predators and scavengers (158) and are not considered threatened in any part of their range.

Northern Fulmar *Fulmarus glacialis*

The total estimated worldwide population of the Northern Fulmar (NOFU) is 10-12 million, with only approximately 2.8 million breeding in North America (159). Although not known to breed anywhere within the CCS, it is suspected that a few pair breed on Triangle Island in B.C. Adults have been observed on cliffs there since 1974, and have regularly attended nest sites throughout the breeding season, though no eggs or chicks have ever been recorded (126).

NOFU have relatively low vulnerability to bycatch, oil pollution, pesticides, and other identifiable threats compared to other seabirds, although longlining (160) and the ingestion of plastics (128) could become a concern if conservation measures are not taken. NOFU are not considered threatened in North America or elsewhere but the concentration of the Pacific population at few colonies presents some risks in the case of catastrophic events.

Pelagic Cormorant *Phalacrocorax pelagicus*

The Pelagic Cormorant (PECO) reaches its southernmost range limit on Todos Santos Island, Baja California (161). Breeding sites are generally dispersed along the coast, making accurate surveys difficult. The global population of this species is estimated at approximately 400,000 birds (161). Of the 69,000 breeders found in North America (51), 45% breed within the CCS. Overall numbers have remained stable or increased (17, 41, 161), although PECO colony size and reproductive success appear to be sensitive to El Niño conditions, and year-to-year variability is high (17, 43, 67, 142, 162). Individual colonies can experience significant declines (i.e., at the Farallon Islands) as a result of human disturbance and other unknown factors, potentially related to climate change (44).

PECO are highly sensitive to human disturbance at breeding colonies, although human disturbance is not of high conservation concern for this species because of their tendency to nest on steep cliffs. There is a history of mortality from pesticide use and oiling events (161, 163), but the species' vulnerability to oiling is considered moderate (95). Contamination may have a significant impact on local colonies of PECO (161), but their broad range and patchiness of breeding sites makes them less susceptible on a population-wide scale (17). Shooting and trapping by fishermen, who view them as competitors, and gillnet mortality are also concerns (161), although they currently do not appear to be major factors.

Pigeon Guillemot *Cepphus columba*

The global population of Pigeon Guillemots (PIGU) is estimated at 235,000 (164), with 69,000 breeders in North America (51). The population size in the CCS has been estimated at 35,000 birds (1, 17, 41, 164). The majority of the population in the CCS breeds in California (16,000 birds, (17)). Population trends are unknown, hampered by differences in census methodology and access to colonies (13); however, there has been significant growth and the establishment of new colonies in the southern part of the range (17). PIGU are extremely sensitive to changes in oceanographic conditions, with population size and reproductive success fluctuating in response to warm and cold water events (41, 43, 44, 142).

PIGU's widespread distribution along the Pacific coast makes them less vulnerable as a species to threats from human disturbance, conflicts with fisheries, and mortality from oil spills. Local and regional populations, however, can be significantly impacted by these threats (26, 89), especially since PIGU tend to form large rafts on the water. Vulnerability to oil contamination is considered high (95) and gillnet fisheries can cause significant local mortalities (17), but is not considered a threat to the species as a whole (164). Another important concern for this species is human disturbance and the introduction of mammalian predators to breeding colonies (142).

Rhinoceros Auklet *Cerorhinca monocerata*

World population estimates of Rhinoceros Auklets (RHAU) are extremely rough at 1.5 million breeding birds, with approximately 1 million in the North American region (172). Most (>95%) of the North American breeding population is concentrated at eight colonies on islands in southeast Alaska (12%), British Columbia (73%) and Washington (13%) (172). RHAU were extirpated from California circa 1860, but population numbers have increased and birds have re-colonized the historic range over the past 50 years (172, 173). RHAU is the only non-larid seabird with an increasing population that breeds in the California Current System (49).

Documented and potential threats to the RHAU populations include predation, oil contamination, fisheries interactions, and habitat degradation. Historically, extirpations were caused, at least in part, by introduced mammals such as rabbits, that may have outcompeted RHAU for nesting space in California and Washington (142). Mortality due to Peregrine Falcons, Bald Eagles, and other avian predators has been documented at breeding colonies (174-176). Such natural predation pressure, when combined with other threats, may affect a colony's long-term sustainability. Disturbance and trampling of burrows by humans, pinnipeds, surface nesting or roosting birds, or introduced animals can cause nest loss and lowered reproductive success. Additionally, mortalities have been documented in the California and Washington gillnet fisheries (177, 178), and declines observed since the 1980s at some Washington colonies may be due to this fishery (172).

Ring-billed Gull *Larus delawarensis*

The overall North American population of Ring-billed Gulls (RBGU) is estimated at 1,700,000 breeders, with <1% breeding in the California Current region (51). RBGU have been recorded nesting in Willapa Bay, Washington since 1976 (13, 165) and in the Columbia River estuary, Oregon. There is no current information on breeding activity in Washington (U. Wilson, pers. comm.), although in 1976 it was estimated at 106 individuals (13). As with other gull species, overall populations of RBGU have increased throughout the mid-1900s in response to increased human-related food availability and decreased harvest of eggs and feathers (75, 76, 166-168). However, western populations of RBGU may be leveling off at the turn of the 21st century due to changes in dumping practices (169), especially on the wintering grounds along the coast (78, 168).

Human impacts on RBGU tend not to be serious due to remote localities of many breeding colonies, abundance of breeding individuals within colonies, and the resilience of gull individuals and populations. Minor impacts on the coastal breeding populations and wintering birds in this area include ingestion of plastics and other toxins from garbage dumps, and the effects of contaminants and oil spills. The most serious potential impacts involve disturbance to breeding colonies, resulting in increased intra-specific predation of chicks (170, 171), although given the large continental populations, disturbance to these colonies on the western extent of the range would have little effect on the overall population.

Royal Tern *Sterna maxima*

Approximately 125,000 Royal Terns (ROTE) breed in North America, Central America, and the West Indies (179). Breeding of ROTE in the CCS region is restricted to small and recent colonies in southern California and a few scattered colonies along the Pacific coast of Baja California (Laguna Ojo de Liebre, Laguna San Ignacio, Punta Banda, San Quintin, Bahia Magdalena, Ensenada de La Paz, and Delta del Rio Colorado) (30). In southern California, ROTE were first reported breeding in San Diego Bay in 1959 (180), where a small group of 35 pairs bred in 1999 (181). Nesting has also been attempted on the salt ponds at the south end of San Diego Bay (182). Breeding has also been reported at Bolsa Chica Ecological Reserve (Orange County, California) in 1988-1990 (4-20 birds) (183). ROTE were once more common in California, (184); however, numbers have declined during the past 30 years, which may be a result of a range expansion of the Elegant Tern (185).

ROTE populations appear to fluctuate in response to changes in abundance and distribution of their main prey, sardines and anchovies, which in turn respond to changes in oceanographic conditions (186). These small breeding populations are extremely vulnerable to the effects of disturbance from humans and animals. Colonies are often destroyed by natural disturbance, high tides, and storms (181). It is unknown if fisheries interactions are a threat to ROTE.

Thick-billed Murre *Uria lomvia*

The total worldwide breeding population of Thick-billed Murres (TBMU) is estimated at 15-20 million birds, of which only 4.7 million are estimated to occur in the Pacific (187). In the CCS, they breed in only one location, on Triangle Island, where an estimated 35 pair are intermixed with several thousand pairs of Common Murres (*Uria aalge*) (126).

While their widespread global distribution makes this species less vulnerable, various anthropogenic factors can have a significant impact on local populations. Murres are particularly vulnerable to oil spills because of their tendency to form large rafts on the water (95). Fisheries interactions and prey depletion due to overharvesting or climate variability may also pose a threat. Hunting, fisheries bycatch (especially gillnet mortality), and oiling are known causes of decline in the Atlantic population, as well as for populations in the Pribilof Islands and western Aleutians (163).

Tufted Puffin *Fratercula cirrhata*

The North American Tufted Puffin (TUPU) breeding population has been estimated at approximately 3 million breeders (51), though accurate estimates are difficult to obtain, as in most crevice-nesting seabirds (17). Approximately 78,000 birds breed in B.C. (1), 23,000 in Washington (13), 5,000 birds in Oregon (6), and 276 in California (17). Overall, the population appears to be relatively stable, despite population declines from historical numbers at several locations and potential colonization of new areas (17, 142, 188).

TUPU are vulnerable to oil pollution (95), entanglement in fishing gear (189), and predation from introduced mammals (88). Introduced species, such as rabbits, may also compete for burrow space (142, 190). Populations may decline at some locations as a result of the re-establishment and recovery of Rhinoceros Auklets because of competition for available breeding habitat (142). Competition with commercial fisheries (191) and high losses in gillnet fisheries (189) have also contributed to their decline in some areas. There is a general lack of information available for TUPU because of the inaccessibility of nests, their small populations at some locations, and variability in colony attendance between days and years (17, 142).

Western Gull *Larus occidentalis*

The Western Gull (WEGU) is a CCS endemic with a restricted breeding distribution extending from southern Washington to Santa Margarita Island, Baja California Sur, and a small world population size of fewer than 40,000 pairs nesting at fewer than 200 colony sites (192). The majority of the population is concentrated in California (50-77%) (17, 51), and the largest single colony is found on Southeast Farallon Island, with approximately 20,000 to 22,000 birds (17, 67). WEGU nest on most of the Mexican Pacific islands; however, population sizes are not known on Los Coronados, Cedros, San Roque, or Asunción (39). Historically, WEGU populations were reduced as a result of human efforts to reduce gull numbers in the 1800s (142). However, the population appears to be increasing due to the restriction of human activity at many of the important breeding sites (41) and increased food availability at dumps (192) but may be leveling off at the turn of the 21st century due to changes in dumping practices (193). Population sizes and trends in Oregon and Washington are not well known and are further complicated by the high degree of hybridization with GWGU (13).

The relatively small population size and limited range make the WEGU highly susceptible to threats such as introduced predators, human disturbance, oil and pesticide contamination, other toxins, and the spread of avian diseases. Disturbance to breeding colonies may result in lowered reproductive success and increased intra-specific predation of chicks (194). Organochlorine concentrations in eggs in central California have decreased since the 1970s, most likely as a response to DDT restrictions (195). Other concerns are the spread of avian botulism within colonies. Egg collecting and human disturbance continues to impact populations on the Mexican islands (39).

Xantus's Murrelet *Synthliboramphus hypoleucus*

Current global population estimates for Xantus's Murrelet (XAMU) are less than 10,000 pairs (196). The majority nest on Santa Barbara Island, California (approximately 60% of the California population), with smaller numbers breeding on San Miguel, Santa Cruz, Anacapa, Santa Catalina, and San Clemente islands (all in the Channel Islands) (196, 197). The size of the population on Santa Barbara declined by 30-50% between 1977 and 1991 (198, 199). There are some indications that populations in California have increased from the 1900s due to the removal of introduced mammals from breeding islands, including cats and rabbits from Santa Barbara and Anacapa islands (196). However, introduced cats and rats on islands in Mexico have significantly reduced breeding populations on Los Coronados North, Todos Santos, San Martin, and San Jeronimo and may have extirpated breeding colonies of the southern subspecies, *Synthliboramphus hypoleucus hypoleucus*, from Natividad, Asunción, and San Roque islands (32, 200).

The limited breeding distribution and small population make XAMU vulnerable to threats such as oil pollution, organochlorine contaminants, incidental bycatch from fisheries, and mortality caused by attraction to bright lights on ships and platforms (197, 198). In the colonies, native predators, such as owls and falcons, can have a substantial impact on the population (39, 201), and native deer mice (*Peromyscus maniculatus*) prey on XAMU eggs (20). Non-native predators on eggs, chicks, and adults include feral cats and black rats (196). XAMU are also threatened by human activities in the southern part of their range, where colonies and fishing villages overlap (200). Changes in oceanographic conditions, including El Niño events and large-scale regime shifts, may affect XAMU food supply (20, 202). The Island Conservation and Ecology Group (ICEG) has initiated the removal of introduced predators on the islands west of Baja California.

The California Current Marine Bird Conservation Plan Appendix 3

Species Accounts – Migratory Seabirds of the California Current

Version 1.0

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APPENDIX 3: SPECIES ACCOUNTS – SPECIES THAT MIGRATE TO THE CALIFORNIA CURRENT

Each summer hundreds of thousands of seabirds migrate to the CCS to feed in its rich waters. Over 100 species of seabirds have been recorded migrating to the CCS (see appendix A). The abundance and species composition of migrants in the CCS is correlated with short and long-term changes in ocean temperature (203-205), discussed in greater detail in Chapters 3 and 5.

The density of migrants at sea is highest during the spring and fall and is also higher in the summer than in the winter. By far the most numerous seabird (and most numerous migrant) during the summer months is the Sooty Shearwater (*Puffinus griseus*) (206), which breeds between September and May in New Zealand and the southern tip of South America (15). The other two shearwater species that can be found in the CCS are the Pink-footed Shearwater (*Puffinus creatopus*) and the Buller’s Shearwater (*Puffinus bulleri*). Both species also breed in the Southern Hemisphere, in New Zealand (Buller’s) and on islands off Chile (Pink-footed) (15). The Northern Fulmar (*Fulmarus glacialis*) is considered a “breeder” in the CCS, although numbers of breeding individuals are unconfirmed and likely small (see species account).

Mean density (birds/km²) at sea of predominant migrants to the CCS in July, December, and total. (Table modified from Tyler et al. 1990).

SPECIES	JULY	DECEMBER	TOTAL
Sooty Shearwater	33.81	0.01	33.82
Phalarope spp.	5.61	0.9	6.51
Northern Fulmar	3.04	3.39	6.43
Pink-footed Shearwater	2.5	0.02	2.52
Black-legged Kittiwake	0	2.41	2.41
Herring Gull	0.01	2.36	2.37
Pacific Loon	0	1.44	1.44
Black-footed Albatross	0.86	0.1	0.96
Bonaparte’s Gull	0.02	0.86	0.88
Buller’s Shearwater	0.23	0	0.23
Common/Arctic Tern	0.19	0	0.19
Pomarine Jaeger	0.03	0.11	0.14
TOTAL	46.3	11.6	57.9

The California Current Marine Bird Conservation Plan Appendix 4

Conservation status of species that breed in the California Current

Version 1.0

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APPENDIX 4: CONSERVATION STATUS OF SPECIES THAT BREED IN THE CALIFORNIA CURRENT

COMMON NAME	CALI-FORNIA ¹	ORE-GON ²	WASH-INGTON ³	FED-ERAL ⁴	CANADA ⁵	MEXICO ⁶	NAWCP ⁷	IUCN ⁸
Northern Fulmar <i>Fulmarus glacialis</i>								
Laysan Albatross <i>Diomedea immutabilis</i>						T		
Black-vented Shearwater <i>Puffinus opisthomelas</i>						E		VU
Leach's Storm-Petrel <i>Oceandroma leucorhoa chapmani</i>						T	L	
Leach's Storm-Petrel <i>O. l. socorroensis</i>						E		
Leach's Storm-Petrel <i>O. l. cheimomnestes</i>						T		
Black Storm-Petrel <i>Oceanodroma melania</i>	SC					T	H	
Ashy Storm-Petrel <i>Oceanodroma homochroa</i>	SC			BCC		T	HI	LR/nt
Fork-tailed Storm-Petrel <i>Oceanodroma furcata</i>	SC							
Least Storm-Petrel <i>Oceanodroma microsoma</i>						T		
Guadalupe Storm-Petrel <i>Oceanodroma macrodactyla</i>						EXT		CR
Magnificent Frigatebird <i>Fregata magnificens</i>								
Brown Pelican <i>Pelecanus occidentalis</i>	E	E	E	E			M	
Double-crested Cormorant <i>Phalacrocorax auritus</i>								
Brandt's Cormorant <i>Phalacrocorax penicillatus</i>			C				H	
Pelagic Cormorant <i>Phalacrocorax pelagicus</i>							H	
Heermann's Gull <i>Larus heermanni</i>						SP		LR/nt
Ring-billed Gull <i>Larus delawarensis</i>								

APPENDIX 4: Conservation Status of Species That Breed in the California Current

(cont.) - Conservation status of species that breed in the California Current.

COMMON NAME	CALI-FORNIA ¹	ORE-GON ²	WASH-INGTON ³	FED-ERAL ⁴	CANADA ⁵	MEXICO ⁶	NAWCP ⁷	IUCN ⁸
Mew Gull <i>Larus canus</i>								
California Gull <i>Larus californicus</i>	SC						M	
Western Gull <i>Larus occidentalis</i>							L	
Glaucous-winged Gull <i>Larus glaucescens</i>							L	
Gull-billed Tern <i>Sterna nilotica</i>	SC			BCC			H	
Caspian Tern <i>Sterna caspia</i>	SM			BCC			L	
Royal Tern <i>Sterna maxima</i>	SC						M	
Elegant Tern <i>Sterna elegans</i>	SC			BCC		SP	M	LR/nt
Arctic Tern <i>Sterna paradisaea</i>			SM	BCC				
Forster's Tern <i>Sterna forsteri</i>			SM				M	
Least Tern <i>Sterna antillarum</i>	E	E		E		E	H	
Black Skimmer <i>Rynchops niger</i>	SC			BCC			H	
Common Murre <i>Uria aalge</i>			C				M	
Thick-billed Murre <i>Uria lomvia</i>								
Pigeon Guillemot <i>Cepphus columba</i>							M H in BCR 5	
Marbled Murrelet <i>Brachyramphus marmoratus</i>	E	T	T	T, BCC	T		H	VU
Xantus's Murrelet <i>Synthliboramphus hypoleucus</i>	C, SC			BCC		E	H	VU
Craveri's Murrelet <i>Synthliboramphus craveri</i>						T		

APPENDIX 4: Conservation Status of Species That Breed in the California Current

(cont.) - Conservation status of species that breed in the California Current.

COMMON NAME	CALI-FORNIA ¹	ORE-GON ²	WASH-INGTON ³	FED-ERAL ⁴	CANADA ⁵	MEXICO ⁶	NAWCP ⁷	IUCN ⁸
Ancient Murrelet <i>Synthliboramphus antiquus</i>					SC		H HI in BCR 5	
Cassin's Auklet <i>Ptychoramphus aleuticus</i>	SC		C	BCC		T	M H in BCR 5	
Rhinoceros Auklet <i>Cerorhinca monocerata</i>	SC						L	
Tufted Puffin <i>Fratercula cirrhata</i>	SC		C				L	
Horned Puffin <i>Fratercula corniculata</i>								

State, Federal, Canada, and Mexico Rank Codes: BCC = Bird of Conservation Concern; C = State Candidate; SC = Special Concern; SM = State Monitor; T = Threatened; E = Endangered

NAWCP Codes: HI = highly imperiled; H = high; M = moderate; L = low

IUCN Rank Codes: CR = Critically Endangered; VU = Vulnerable; LR/nt = Lower Risk/Near Threatened

¹ State and Federally Listed Endangered and Threatened Animals of California, Dept. of Fish and Game, Habitat Conservation Division, July 2003; and Draft (2003) California Bird Species of Special Concern List, www.prbo.org/BSSC/index.htm

² List of Threatened and Endangered Species, Oregon Dept. of Fish and Wildlife, March 2003, www.dfw.state.or.us

³ Threatened and Endangered Species System (TESS), Oct. 2003, www.ecos.fws.gov/tess_public, and www.pacificbio.org/ESIN/Infopages/Washingtonlist.html

⁴ Birds of Conservation Concern 2002. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA.

⁵ Committee on the Status of Endangered Wildlife in Canada (COSEWIC), www.cosewic.gc.ca

⁶ Norma Oficial Mexicana, NOM-059-ECOL-2000.

⁷ North American Waterbird Conservation Plan, 2002.

⁸ 2002 IUCN Red List of Threatened Species, www.redlist.org.

The California Current Marine Bird Conservation Plan Appendix 5

*Global conservation status of the most common species
that migrate to the California Current*

Version 1.0

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APPENDIX 5: GLOBAL CONSERVATION STATUS OF THE MOST COMMON SPECIES THAT MIGRATE TO THE CALIFORNIA CURRENT

IUCN Rank Codes: 1 = Endangered; 2 = Vulnerable; 3 = Lower Risk/Near Threatened
(2002 IUCN Red List of Threatened Species, www.redlist.org).

Red-throated Loon <i>Gavia stellata</i>	Manx Shearwater <i>Puffinus puffinus</i>	Parasitic Jaeger <i>Stercorarius parasiticus</i>
Pacific Loon <i>Gavia pacifica</i>	Short-tailed Shearwater <i>Puffinus tenuirostris</i>	Pomarine Jaeger <i>Stercorarius pomarinus</i>
Arctic Loon <i>Gavia arctica</i>	Sooty Shearwater <i>Puffinus griseus</i>	South Polar Skua <i>Stercorarius macconnicki</i>
Common Loon <i>Gavia immer</i>	Wilson's Storm-Petrel <i>Oceanites oceanicus</i>	Little Gull <i>Larus minutus</i>
Yellow-billed Loon <i>Gavia adamsii</i>	Red-billed Tropicbird <i>Phaethon aethereus</i>	Bonaparte's Gull <i>Larus philadelphia</i>
Red-necked Grebe <i>Podiceps grisegena</i>	Red-tailed Tropicbird <i>Phaethon rubricauda</i>	Black-headed Gull <i>Larus ridibundus</i>
Horned Grebe <i>Podiceps auritus</i>	Red-faced Cormorant <i>Phalacrocorax urile</i>	Franklin's Gull <i>Larus pipixcan</i>
Eared Grebe <i>Podiceps nigricollis</i>	Masked Booby <i>Sula dactylatra</i>	Thayer's Gull <i>Larus thayeri</i>
Western Grebe <i>Aechmophorus occidentalis</i>	Brown Booby <i>Sula leucogaster</i>	Glaucous Gull <i>Larus hyperboreus</i>
Clark's Grebe <i>Aechmophorus clarkii</i>	Blue-footed Booby <i>Sula nebouxii</i>	Slaty-backed Gull <i>Larus schistisagus</i>
Short-tailed Albatross - 2 <i>Phoebastria albatrus</i>	Red-footed Booby <i>Sula sula</i>	Sabine's Gull <i>Xema sabini</i>
Black-footed Albatross - 2 <i>Phoebastria nigripes</i>	Surf Scoter <i>Melanitta perspicillata</i>	Black-legged Kittiwake <i>Rissa tridactyla</i>
Mottled Petrel - 3 <i>Pterodroma inexpectata</i>	Black Scoter <i>Melanitta nigra</i>	Common Tern <i>Sterna hirundo</i>
Cook's Petrel - 1 <i>Pterodroma cookii</i>	White-winged Scoter <i>Melanitta fusca</i>	Black Tern <i>Chlidonias niger</i>
Murphy's Petrel - 3 <i>Pterodroma ultima</i>	Red-breasted Merganser <i>Mergus serrator</i>	Kittlitz's Murrelet <i>Brachyramphus brevirostris</i>
Buller's Shearwater - 2 <i>Puffinus bulleri</i>	Red Phalarope <i>Phalaropus fulicaria</i>	Parakeet Auklet <i>Aethia psittacula</i>
Pink-footed Shearwater - 2 <i>Puffinus creatopus</i>	Red-necked Phalarope <i>Phalaropus lobatus</i>	Crested Auklet <i>Aethia cristatella</i>
Flesh-footed Shearwater <i>Puffinus carneipes</i>	Long-tailed Jaeger <i>Stercorarius longicaudus</i>	