

PACIFIC SEABIRDS



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PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

The Pacific Seabird Group (PSG) was formed in 1972 due to the need for better communication among Pacific seabird researchers. PSG provides a forum for the research activities of its members, promotes the conservation of seabirds, and informs members and the public of issues relating to Pacific Ocean seabirds and their environment. PSG holds annual meetings at which scientific papers and symposia are presented. The group's journals are *Pacific Seabirds* (formerly the *PSG Bulletin*), and *Marine Ornithology* (published jointly with the African Seabird Group, Australasian Seabird Group, Dutch Seabird Group, and The Seabird Group [United Kingdom]; www.marineornithology.org). Other publications include symposium volumes and technical reports. Conservation concerns include seabird/fisheries interactions, monitoring of seabird populations, seabird restoration following oil spills, establishment of seabird sanctuaries, and endangered species. Policy statements are issued on conservation issues of critical importance. PSG members include scientists, conservation professionals, and members of the public from both sides of the Pacific Ocean. It is hoped that seabird enthusiasts in other parts of the world also will join and participate in PSG. PSG is a member of the International Union for Conservation of Nature (IUCN), the Ornithological Council, and the American Bird Conservancy. Annual dues for membership are \$25 (individual and family); \$15 (student, undergraduate and graduate); and \$750 (Life Membership, payable in five \$150 installments). Dues are payable to the Treasurer; see Membership/Order Form next to inside back cover for details and application.

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Pacific Seabirds

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PSG POLICY STATEMENT

The following statement was prepared at the request of, and approved by, the Pacific Seabird Group's Executive Council. It is an update of the 1974 Pacific Seabird Group Policy Statement on Seabird Conservation in the Gulf of California, which is included as Appendix 1.

PACIFIC SEABIRD GROUP SEABIRD CONSERVATION POLICY STATEMENT FOR THE GULF OF CALIFORNIA AND WATERS OFF WESTERN BAJA CALIFORNIA, MEXICO

Summary and List of Recommendations (and addendum to the Pacific Seabird Group Policy Statement of 1974)

Update: Threats to seabird populations in the Gulf of California and in waters off the Pacific Coast of Baja California have continued to increase and change. Notable among these have been: (1) a proposal to develop a huge network of marinas, called the "Escalera Nautica" (www.escaleranautica.com/index.html) and related activities; (2) the approval of a proposal by Chevron/Texaco to build a liquified natural gas offloading and re-gassification platform near the Islas los Coronados off northwestern Baja California within the next few years (as well as proposals for LNG terminals and facilities at other areas in the region). Other impending issues that will need further consideration in the future will likely include: the effects on seabirds of fishing and trawling activities, increasing aquaculture operations off the coasts and in nearby estuary habitats (important colonial bird nesting and feeding sites), and the introductions of exotics organisms (including such diseases as West Nile Virus, Newcastle Disease, etc.).

Of particular immediate concern are the continuing threats of introduction of exotic species on the islands, many of which potentially cause declines of nesting seabird populations. This issue will likely be most critical on the islands in the Gulf of California itself because of the high diversity and densities of potential users in the future. Recognition of this conservation issue also brings up an important need to educate local fishermen as well as incoming users such as tour-guides and eco-tourists, as well as other recreationists. Unregulated use of islands and the ongoing disturbances by island users (fishermen, tourists, and in some instances even researchers) might significantly limit the quality of roosting and nesting habitat for seabirds, thereby reducing breeding success. This continues to be one of the most important, albeit easily mitigated impact for seabirds on all islands in the area. Further discussion of the threats to Baja California seabirds is provided by Wolf (2002).

In addition, several coastal areas along the Gulf of California, including San Felipe, Bahía de los Angeles and areas around the cape of Baja, are undergoing intensive development of hotels and planned communities for tourists and retirees. In addition, over the past 20 years, tourists and their all-terrain vehicles (ATVs) have destroyed large areas that formerly supported natural beach and wetland vegetation (e.g. Laguna Percebu south of San Felipe), including several former nesting areas of the California Least Tern near San Felipe (Kathy Keane, personal observation). Ongoing residential developments in coastal areas will result in further pressures on seabirds that nest on beaches and adjacent islands, due to increased visitation and recreation by tourists and new residents.

Meanwhile, greatly significant conservation actions have occurred throughout the region, especially in the Gulf of California, but rapidly spreading to other coastal areas of Baja California and the Sonora/Sinaloa coasts. Notable among these activities have been the establishment of a large Mexican federal government network of Biosphere Reserves and conservation program for the islands in the Gulf of California (SEMARNAP 2000) and several more involving the Vizcaino Desert area and Colorado River Delta, for example; several established or proposed National Parks (Loreto area and Bahía de los Angeles); and a less publicized but still significant conservation program on

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islands mostly off western Baja California (see Island Conservation, www.islandconservation.org, and California Institute of Environmental Studies; see also the updates on conservation in Ezcurra et al. 2003 and Anderson et al. 2003).

Conservation advances on the Pacific side of the Baja California also include the following activities: Guadalupe Island Biosphere Reserve proposal (final acceptance and declaration pending), Pacific Island Biosphere Reserve proposal (Islas Los Coronados, Todos Santos, San Martin, San Jeronimo, Isla Cedros, Islas San Benitos, and Isla Adelaida; under review). These proposals will increase protection for seabird roosting and nesting habitat, but should be maximized by active management programs.

New Recommendations: The Pacific Seabird Group fully supports and endorses the following specific conservation activities and outlined protected areas of growing importance in the region:

(1) We highly commend and support the SEMARNAT Island Conservation Program (Islas del Golfo de California, Area de Protección de Flora y Fauna; SEMARNAP 2000, www.conanp.gob.mx), especially protection, enforcement, enhancement, management, and monitoring programs.

(2) We also highly commend and support the PRONATURA Noroeste proposal for a National Park System for the Bahía de los Angeles area (www.pronatura-nmc.org), and similar important areas to be determined in the future.

(3) We support the continuing activities of Island Conservation (Tershey et al. 2002; www.islandconservation.org) and the California Institute of Environmental Studies, especially in the control and management of introduced predators and other decimating factors on seabird nesting islands, helping formulate conservation and management plans for specific areas and islands, as well as establishing and conducting essential and continuing long-term monitoring programs.

(4) We support the delineation of “zones of sensitivity and protected zones” as defined by the Coalición para la sustentabilidad del Golfo de California, prioridades de conservación para la región Golfo de California, Mazatlán, México, 2001 (Barrera *et al.* 2004).

(5) We recommend the further development and implementation of island-specific management plans by appropriated agencies and organizations such as those listed above.

(6) PSG strongly supports and recommends continued and expanded active and rigorous *research* programs on the islands and wildlife of the region, including a commitment of strong support from appropriate educational and governmental agencies, such as CONACYT, including programs of support for graduate students in Mexican universities, supervised by Mexican professors.

(7) PSG also supports and recommends continued active encouragement of researchers in the area from other areas outside Mexico along with the education and support of Mexican students in their graduate programs. Several programs which illustrate viable models for cooperation are the various programs and collaborations carried out by the University of California Institute for Mexico and the United States (<http://ucmexus.ucr.edu/>) and the University of Arizona Udall Center for Studies in Public Policy (<http://udallcenter.arizona.edu>).

(8) PSG supports studies of the effects of aquaculture operations on the habitat and nesting substrate of colonial-nesting birds and their food sources and the development of recommendations for their amelioration.

(9) We recommend continuing and increased efforts to restore wetland habitats in the entire Colorado River Delta area, considering both sides of the US/Mexican border as a contiguous system, integrating activities on both sides of the political borders.

(10) Mexican governmental agencies that utilize islands with seabird (and other) resources should adopt laws/guidelines/regulations to minimize impacts of their activities, and should solicit review of proposed activities such that they can be planned to minimize impacts on seabirds and other island resources. This is especially crucial for the SCCT, Secretary of Communications, who maintains lighthouses on islands; SEMARNAT/PESCA who oversee fishing cooperatives

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that use the islands to support their fishing activities; and SEMAR, the Secretary of the Navy, who maintains many military garrisons on some of the islands and conducts operations in the island areas. SEMAR is also an important enforcer of island rules and regulations and transport of scientific expeditions to the islands, and PSG heartily commends the Mexican Navy for their past and future cooperation in scientific and enforcement endeavors to protect and manage marine bird resources in the region. They should be encouraged to increase and continue such vital activities in the future.

(11) PSG strongly supports continued and renewed embodiment of Baja California/Gulf of California seabird issues within the North American Colonial Waterbird Conservation Plan, the U.S. Fish and Wildlife Service Region 1 Seabird Monitoring/Conservation Plan, and the Sonora Joint Venture seabird/shorebird monitoring and conservation programs (www.sonorajv.org/).

(12) PSG also supports and recommends the continuance of the long-term and pioneering activities conducted by the University of California, University of Arizona, and other universities and institutions since at least the late-1960s and early-1970s, as well as more recently-conducted seabird monitoring activities in northwestern Baja California by the California Institute of Environmental Studies in cooperation with Mexican biologists, professors, and students.

(13) PSG strongly supports continued cooperative exchanges of Mexican, U. S., and biologists from other institutions and organizations, as well as strong annual attendance of Mexican biologists at annual PSG meetings.

(14) PSG encourages the Mexican government to initiate and continue ongoing discussions with local biological experts and local governments in those communities that are under intense pressure from residential development and tourism, so that the natural resources near these communities, including seabird nesting areas, can be protected. Many less-sensitive areas and those already severely damaged by overuse can be designated as ATV-use areas; other areas can be protected. Mainland beaches and islands that support nesting seabirds can be designated as preserves during the nesting season, and closures can be enforced by local governments, assisted by groups of concerned residents (Mexican, Americans, and others). Education programs are recommended to enhance the success of these programs.

Background and More Detailed History:

In 1974, the Pacific Seabird Group issued the first policy statement by any conservation organization on seabirds and islands in the Gulf of California. Called "Seabird Conservation in the Gulf of California" (Appendix 1; Ainley et al. 1974), this statement basically followed from earlier, more encompassing works and recommendations by G. Lindsay and R. T. Orr of the California Academy of Sciences, the writings of L.W. Walker of the Arizona-Sonora Desert Museum, and from Bernardo Villa-Ramírez from the National University of Mexico. Villa-Ramírez's work on Isla Rasa, the "epicenter" of conservation in the Gulf of California, was originally put forward by the National Audubon Society (see reviews by Anderson et al. 1976, Anderson 1980, Velarde and Anderson 1994, and Ezcurra et al. 2002). Another important event was a meeting of Gulf of California conservationists at Bahía de Kino, Sonora, 4-6 March 1976. This little-known meeting, organized by the Instituto Mexicano Matias Romero de Estudios Diplomáticos, the University of Sonora, the Arizona-Sonora Desert Museum, the American Society of International Law, and the *Natural Resources Journal* (proceedings in volume 16, July 1976) was an important step in providing the necessary international framework for a conservation plan. PSG currently acknowledges also the individual fortitude and boldness of the late Charles A. Lindberg, who literally walked into the office of the President of Mexico in 1974, to "shake" high officials of the Mexican Presidential Office into formalizing something (Ocean Oasis 2000; E. Ezcurra 2003 and plenary address at PSG meeting, 23 January 2004). The National Audubon Society also issued an early conservation review of birds in Mexico (Schaeffer and Ehlers 1980) including another review on island conservation in the Gulf of California that emphasized seabirds (Anderson 1980). These activities helped form the basis of a "strategy to produce a plan" expanded to offshore islands and marine ecosystems in general, further resulting in one of the earliest basic conservation plans for the Gulf islands (Velarde, Anderson, and Beebe 1985; reviewed in Velarde and Anderson 1994). The Gulf of California region was popularized in the original book entitled "Islas del Golfo de California" (Secretaría de Gobernación/UNAM 1988) and conservation activities originating in the original federal governmental commitment and earlier actions in 1964 to establish Isla Rasa as the Gulf's first sanctuary have blossomed since the late-1980s (Ocean Oasis

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2000, E. Ezcurra, personal communication), and have taken on a wider ecosystem perspective (reviewed by Ezcurra et al. 2003), now with a multi-office governmental conservation program (SEMARNAP 2000).

The Pacific Seabird Group and its members have played an important role in publicizing problems that have helped bring about increased conservation efforts for the Gulf of California seabird islands. In the spirit of that original and insightful PSG policy statement in 1974 (Appendix 1) and from further comments and discussion arising from the annual meeting in La Paz, Baja California (January 21-24, 2004), we have provided this updated summary as an addendum to that policy statement PSG presents it to interested and involved parties, in the hope that this statement will reflect the continuing interest and involvement of PSG in seabird conservation of the Gulf of California and the west coast of Baja California. We hope that our updated and renewed policy statement will further stimulate responsible agencies to continue to promote and to *increase* support for conservation efforts of that region, and also to further expand conservation activities and efforts on the Pacific side of Baja California.

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APPENDIX 1

[ORIGINAL] PACIFIC SEABIRD GROUP POLICY STATEMENT, 1974
Seabird Conservation in the Gulf of California

Introduction

The Pacific Seabird Group is composed of scientists and others interested in the study and preservation of marine birds in waters of the Pacific Region. The group is an international organization with members from Canada, the United States, Mexico and other countries around the world. Statements such as this one reflect the professional opinions (based on direct observation) of the members and are intended to inform responsible agencies and individuals about critical situations involving seabirds and their conservation. In presenting this statement we hereby also offer our assistance in correcting the situation outlined below.

The Problem

The Gulf of California has in recent years been subjected to increased visits by fishermen, recreationists, and educational tours. The increases in numbers of people has resulted in increased disturbances of marine birds at their nesting colonies, resulting in decreased reproductive success.

In this particular situation, we first wish to commend those persons and agencies in Mexico who have made such a great success in protecting the seabird breeding colony at Isla Raza. In the following points we are suggesting that such protection be extended to other islands in the Gulf of California and that steps be taken to protect the extensive and unique marine bird populations there from decline in the face of development.

The Gulf of California has one of the most diverse and rich subtropical marine ecosystems in North America, and as yet it is relatively undisturbed; that is, the ecosystem is at present in a natural, healthy balance. The marine bird populations which play such an important part in maintaining this balance require for their breeding undisturbed islands similar to Isla Raza, which is already a protected sanctuary. The species of birds utilizing these islands are many (storm petrels, Pelicans, Double-crested and Brandt's Cormorants, Brown and Blue-footed Boobies, Magnificent Frigatebirds, Ospreys, Yellow-footed Western and Heermann's Gulls, Elegant and Royal Terns, Red-billed Tropicbirds, murrelets, various ardeids, and others), and several are not known to breed outside of Baja California and the Gulf of California region.

In addition, some of the islands support large populations of sea lions, which interact with seabirds and need protection, as well. The fish-eating bat is almost entirely restricted to Gulf of California islands; and, large numbers of common dolphins, a considerable number of pilot whales and bottle-nosed dolphins, and a small but apparently resident finback whale population reside importantly in the Gulf of California—not to mention other important species such as the endemic *Phocoena sinus*. During the fall and winter, many of the birds leave the Gulf of California and migrate to the north, while many others (including many gamebirds) migrate into the Gulf of California from the north. Thus, problems relating to marine bird populations in the Gulf of California are international in scope.

While the conservation of seabirds in the Gulf of California could be justified by many persons on aesthetic reasons alone, there are additional reasons for their protection. The maintenance of a healthy ecological balance in the Gulf of California benefits fishermen because it means that fish will be available for years and years to come. Fishermen watch the birds to determine where good fishing grounds are located. The birds help maintain rich fishing grounds by "fertilizing" areas with their guano. In addition, tourism is a growing industry especially in Baja California. Tourists are attracted to the region because it has good fishing, but most importantly, because the region is still UNSPOILED by tourists and heavy industries. Specifically, there are many thousands of persons in the United States and Canada who will probably visit the Gulf of California and Baja California in order to observe its birdlife. Increasing numbers of people from Mexico, as well, are flocking to the seashores and beaches in order to fish and to enjoy the abundant wildlife and

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solitude. Finally, seabirds are valuable indicators of oceanic pollution and overfishing—two conditions that as yet have not been demonstrated to seriously affect the Gulf of California.

Thus, the health of the Gulf of California and its marine life (including the seabirds) are of great importance to many people—particularly the Mexican people. However, the health of this region is becoming increasingly threatened as the result of an increase in tourism, educational cruises, boating, and human disturbance at and near to seabird breeding islands during the breeding seasons. In addition, in places there are poor attitudes among fishermen, American and Mexican, toward the seabirds that are so important to them, and there is little enforcement of international conservation treaties. Some potentially threatening problems are as follows: increasing pollution by agricultural pesticides from adjacent areas; increasing numbers of tourists with a corresponding increase in tourist facility development on the seacoast (marinas for boats, etc.); overfishing due to an expansion of fleets and improved technology; oil pollution from a proposed deep-water port and pipeline at the head of the Gulf as well as oil pollution from vessel maintenance at sea. All of these factors have the potential to disrupt the healthy balance now present in the Gulf of California.

Recommendations

One aspect of the resources, the seabirds of the Gulf of California, can be protected through the following steps: (1) Establish all important seabird colonies as sanctuaries (similarly to Isla Raza) and make them off-limits to tourists and casual visitors (fishermen, too) during the breeding seasons (January through July each year); (2) Support George Lindsay's recommendations (*Pacific Discovery*, "Some Natural Values of Baja California", Volume 23, No. 2, 1970) on establishment of island sanctuaries in the Gulf of California for all fauna and flora; but add Islas San Lorenzo, San Lorenzo Norte (Animas), San Luis, Salsipuedes, Monserrate, and possibly others as time passes, and as other islands are shown to be threatened; (3) Establish a conservation patrol of the Gulf of California islands during the breeding seasons; and expand Raza policy. We suggest that the United States provide aid to the Mexican authorities to accomplish this, and encourage Mexican participation in seabird research. This should include the encouragement of qualified Mexican students to participate in studies for higher degrees in ecology, ornithology, and conservation at U. S. universities; (4) Tourist boaters should be informed at the border and at harbors of Mexican and international regulations and protection of local and migratory wildlife. A leaflet could be prepared (the Pacific Seabird Group offers aid in writing this up, as well as aiding in any other way) and distributed at the time boat papers are issued or checked; (5) The Mexican authorities should inform fishermen of the protection of seabirds and mammals, and their breeding grounds, as well as the values and benefits they might derive from them.

We feel it is justified, and not too late, to inaugurate these policies.

1974 Statement prepared by: David G. Ainley, Daniel W. Anderson, C. Eugene Knoder, Robert T. Orr, Bernardo Villa-Ramírez, Robert W. Risebrough, and M. D. F. Udvardy.

REPORTS

Pacific Seabirds publishes Reports to provide information on conservation issues and ongoing research. Reports contain preliminary results and have not been peer-reviewed. Therefore they should not be cited without permission of the authors.

COLONY SIZE, NESTING SUCCESS, AND PREDATION ON SALMON SMOLTS BY CASPIAN TERNS AND DOUBLE-CRESTED CORMORANTS IN THE LOWER COLUMBIA RIVER

Dan Roby, Ken Collis, Jessica Adkins, Yasuko Suzuki, Brendan Courtot, Don Lyons, Anne Mary Myers, and Chris Couch

In 2005, research continued to evaluate predation by seabirds on salmon smolts in the Columbia River. The project involves Oregon State University (OSU), the U.S. Geological Survey (USGS)–Oregon Cooperative Fish and Wildlife Research Unit, and their cooperators. Seabirds, including Caspian Terns (*Sterna caspia*), Double-crested Cormorants, Western/Glaucous-winged Gulls (*Larus occidentalis* X *L. glaucescens*), California Gulls (*L. californicus*), and American White Pelicans (*Pelecanus erythrorhynchos*), prey on juvenile salmonids in the Columbia River estuary and lower Columbia River. Some of these fish are listed under the U.S. Endangered Species Act (ESA), and therefore agencies are required to take measures to improve salmonid survival in the river.

One focus of mitigation efforts in the lower Columbia River has been to relocate the principal breeding colony of Caspian Terns in the Columbia River estuary, with the aim of reducing predation by terns on salmonids. The tern colony was induced to move from its former site on Rice Island to an artificially-improved site 21 km closer to the ocean on East Sand Island in the Columbia River estuary. All Caspian Terns nesting in the Columbia River estuary have used East Sand Island during since 2001, and it is now the largest known breeding colony of Caspian Terns. In 2005, the team monitored the size and productiv-

ity of the East Sand Island colony, which has been managed by a group of federal, state, and tribal resource management agencies. In addition, the size and productivity of the largest known colony of Double-crested Cormorants (*Phalacrocorax auritus*), also on East Sand Island, were determined.

In 2005, the onset of upwelling along the coast of the Pacific Northwest was unusually late, resulting in poor ocean conditions and low primary and secondary marine productivity. Seabirds along the coast from British Columbia to Point Conception, California reflected these conditions by exhibiting very low nesting success and high adult mortality. We expected Caspian Terns and Double-crested Cormorants nesting on East Sand Island to experience similar poor nesting success due to food limitations, and we predicted that low availability of marine forage fishes would result in higher predation rates on out-migrating salmonid smolts.

The size of the Caspian Tern colony on East Sand Island was approximately 8820 pairs (compared to approximately 9500 pairs in 2004), and approximately 3290 fledglings were produced. This corresponds to a nesting success of 0.37 young raised per breeding pair, down from 0.92 young raised per breeding pair in 2004. This is the lowest estimate of productivity for Caspian Terns breeding on East Sand Island to date. About 2.6 ha of nesting habitat were prepared for

the terns on East Sand Island prior to the 2005 nesting season, and terns utilized approximately 1.9 ha for nesting, which was similar to 2002 through 2004. Juvenile salmonids comprised 23% of the diet of terns at the East Sand Island colony in 2005, compared to 17% in 2004. Northern anchovy (*Engraulis mordax*), surfperch (Embiotocidae), and clupeids (Pacific sardine [*Sardinops sagax*] and Pacific herring [*Clupea pallasii*]) were the most prevalent prey in the non-salmonid portion of tern diets. Contrary to prediction, Caspian Tern colony size was only slightly lower in 2005, and, despite relatively low nesting success, the colony did not experience reproductive failure. Salmonid smolts were only marginally higher in tern diets.

The size of the Double-crested Cormorant colony on East Sand Island in 2005 was approximately 12,000 nesting pairs, similar to 2004. This is the first year the colony has not grown since annual colony size estimates were initiated in 1997. Nesting success at the East Sand Island cormorant colony was 1.38 young per breeding pair, lower than in 2004 (2.05 young per breeding pair). Juvenile salmonids comprised less than 2% of the diets of cormorants at this colony in 2005, compared to less than 5% in 2004. Northern anchovy, sculpin (Cottidae), and surfperch were the most prevalent prey in the non-salmonid portion of cormorant diets. Contrary to prediction, the cormorant colony on East Sand Island

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did not decline in size during the poor ocean conditions of 2005, although nesting success was lower. Instead of an increased proportion of salmonids in the diet, juvenile salmonids declined in prevalence.

As in 2004, our attempts to use habitat modification, decoys, and audio playback systems to attract cormorants to nest in areas of East Sand Island where no nesting previously occurred were successful. Similar attempts to attract cormorants to nest on islands other than East Sand Island were partially successful; cormorants built nests and laid eggs at a site 23 km upriver from East Sand Island (Miller Sands Spit), but these nesting attempts were not successful in producing fledglings.

Much farther up-river, near the confluence of the Snake and Columbia rivers, the Caspian Tern colony on Crescent Island was estimated to consist of approximately 475 nesting pairs in 2005, down from 530 in 2004. This colony is now the third largest Caspian Tern colony in the Pacific Northwest, after the colonies at East Sand Island and Dungeness Spit, Washington. About 261 fledglings were produced this year, corresponding to a nesting success of 0.55 young raised

per nesting pair, lower than in 2004. Juvenile salmonids comprised 66% of the diet of terns in 2005, similar to diet composition during 2000-2004. Most of the non-salmonids observed being delivered to the Crescent Island colony were centrarchids (i.e., bass, sunfish) and cyprinids (i.e., northern pikeminnow [*Ptychocheilus oregonensis*] and peamouth [*Mylcheilus caurinus*]). Early in the field season two net pens were deployed, one near Crescent Island and one near Ice Harbor Dam. The net pens were stocked, respectively, with approximately 850 and 650 juvenile rainbow trout tagged with a PIT (Passive Integrated Transponder). This will allow us to investigate (1) PIT tag deposition rates at the Crescent Island tern colony, (2) vulnerability of fish in different size classes to tern predation, and (3) gull kleptoparasitism rates on fish captured by terns at the net pen.

Participants in the study included Oregon State University, Real Time Research (RTR), Columbia River Inter-Tribal Fish Commission (CRITFC), USGS, and the interagency Caspian Tern Working Group (CTWG), which includes the National Oceanic and Atmospheric Administration–Fisheries, U.S.

Army Corps of Engineers, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Inter-Tribal Fish Commission, and others. This year's research team included Dan Roby (USGS/OSU), Ken Collis, Allen Evans, and Mike Hawbecker (all of RTR), Jessica Adkins (OSU), Yasuko Suzuki, Brendan Courtot, Rachel Lord, Don Lyons, Anne Mary Myers, Chris Couch, Kim Nelson, Karen Fischer, and Rob Suryan (all of OSU), Bobby Begay (CRITFC), and a number of seasonal technicians and volunteers. This study was funded by the Bonneville Power Administration, the Northwest Power and Conservation Council, the U.S. Army Corps of Engineers, Portland District, and the U.S. Army Corps of Engineers, Walla Walla District. See www.columbiabirdresearch.org for more information.

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BOARDWALK BURROW STUDY, FARALLON NATIONAL WILDLIFE REFUGE: 2005 MONITORING RESULTS AND PROJECT SUMMARY

Jesse Irwin

INTRODUCTION

Dilapidated boardwalks on Southeast Farallon Island (SEFI) were replaced in September 2000. Two hundred forty-eight m of boardwalk were replaced with recycled plastic lumber. The new boardwalks are designed to allow researchers to transverse the island while greatly reducing the incidents of crushed

burrows. Cassin's Auklets (*Ptychoramphus aleuticus*) often dig burrows next to another structure such as rocks or (in this case) other manmade debris. The new boardwalks were constructed with an auklet trough design, which provides abundant areas to facilitate digging new burrows. This design basically skips every fourth plank, leaving space for auklets to excavate

burrows.

Each pair of Cassin's Auklets excavates and maintains its own burrow. Newly formed pairs claim abandoned burrows, dig their own burrows, or use some of the over 400 artificial nest boxes provided by PRBO (formerly Point Reyes Bird Observatory). Auklets readily use the nest boxes, which facilitates population and productivity monitoring.

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Rhinoceros Auklets (*Cerorhinca monocerata*), Tufted Puffins (*Fratercula cirrhata*), Pigeon Guillemots (*Cephus columba*), Ashy Storm-Petrels (*Oceanodroma homochroa*), and Leach’s Storm-Petrels (*Oceanodroma leucorhoa*) are additional birds on the island that nest in burrows and crevices. Only Cassin’s and Rhinoceros Auklets use burrows in areas affected by the boardwalks. There are no burrowing mammals on the island to provide additional burrows.

METHODS

The 248 m of boardwalk are comprised of 18 sections of various lengths. Three of the 18 boardwalks are used for rhinoceros auklet mistnetting; these do not have the auklet trough design, to prevent losing fish diet samples down the cracks. Several of the shortest boardwalks were combined for the purposes of this study to form 15 study units, with numbers 7, 9, and 11 being the mistnet boardwalks. Objectives of the study are (1) document colonization of newly created habitat, (2) survey burrow utilization by auklets, and (3) compare the density of auklet burrows in the “influence zone” of the boardwalk (underneath or within 30 cm on either side) with burrow density in natural habitat (PRBO’s monitored index plots for Cassin’s Auklets).

In June of 2003, every 10th board was sequentially labeled with an aluminum tag that allows us to identify each boardwalk and each burrow along the boardwalk. This was an improvement over the “marker pen” method of labeling boards, which quickly became illegible. All boardwalks were labeled as one long sequence. Each board was identified by its position in the sequence and each burrow was identified by the board that it was closest to. For example, a burrow located at the 95th board in the sequence would be burrow 9.5 (remember every 10th board is marked). Boardwalks were mapped using GPS, and each section of boardwalk was checked for burrows in the boardwalk zone of influence. GPS points were taken for all burrows along the boardwalk. A low-light burrow

camera was used to check burrows for occupancy by nesting auklets. This camera has a 1.8-m flexible shaft that allows the camera head to be guided into the burrow. Censusing was conducted during the new moon during the breeding season. A hole longer than 30 cm was considered a potential burrow, because that is the length of a Cassin’s Auklet.

Surveying in 2002 and 2003 was conducted using a random subset of burrows in the boardwalk zone of influence. As a result of the small number of positive determinations in the 2002 and 2003 surveys, it was decided to conduct a survey of all burrows instead of a subset of burrows, starting with the 2004 survey. All burrows were checked using the low-light camera in June of 2004 and 2005.

RESULTS

Fifty-two burrows were identified at the end of the breeding season in August 2001. A check in February 2002 found the number of burrows had increased only to 53. By the beginning of the breeding season (March 2002), 65 burrows were identified. In July 2002, 31 burrows were randomly selected, of which 7 (22%) were occupied.

In August 2003, 104 burrows were counted. Twenty-five were selected for sampling (chosen by selecting every 4th burrow). Of the 25 burrows, only 18 could be positively identified as either occupied or empty. The remaining seven burrows were too narrow for the camera head. Twelve of the 18 (67%) were occupied. Sampling conducted in 2002 and 2003 was hindered by the 6.3 cm diameter of the camera head. A camera head with a 2.5 cm diameter was purchased to aid surveys in 2004 and beyond.

In June of 2004, 138 burrows were identified along the boardwalk. All of the burrows were sampled with the new camera; 88 of the burrows were occupied by Cassin’s Auklets, one had a Rhinoceros Auklet in it, 43 were unoccupied, and I could not determine occupancy in 6 burrows. Of the 132 burrows for which occupancy was

determined, 89 (67.4%) had birds in them. This is slightly above the occupancy rate in PRBO index plots, where 60-65% is normal.

The burrows were surveyed again in June 2005. The number of burrows was reduced dramatically, as only 60 burrows could be located. Winter rains had filled in burrows, and few birds were around through the winter and early spring to excavate and maintain them. Overall, the Cassin’s are having a very poor reproductive year, including the boardwalk burrows. Cassin’s began breeding in April, then abandoned nests when the sea temperature increased, according to PRBO staff. As of 27 Jun the sea surface temperature at the island was 13° C, about 3-4° higher than expected at this time of year. At-sea surveys have found the waters around SEFI nearly devoid of krill, the Cassin’s main food source for most of the breeding season. Probably as a result of poor sea conditions, the 2005 boardwalk burrow survey found a substantial reduction in nesting activity under the boardwalks for the first time since they were installed. Of the 60 burrows located, 1 burrow had a Cassin’s chick, 1 burrow had an adult Cassin’s, 1 burrow had a Cassin’s egg, 5 burrows had Rhinoceros Auklet adults, and I could not make a positive determination in 9 burrows.

DISCUSSION

The lackluster burrow counts and occupancy in 2005 is consistent with the results of PRBO’s 2005 results in their long-term Cassin’s Auklet studies. This year has seen substantial reduction in nesting activity in over 400 monitored nest boxes and throughout the ten 100 m² index plots. Reductions of over 90% have been observed in both number of nest attempts in boxes and the number of burrows in the index plots.

The boardwalks were constructed within three of the index plots. For comparison, each plot is 100m², while the boardwalks occupy a maximum of about 11m² in the plots (11% of the plot area). Plots S4, S5, and S7 have boardwalks. Although the boardwalks occupy only

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11% of the area in a plot, 36.4 to 44.4% of the burrows in those plots were found in the boardwalk zone of influence. The high percentage of burrows under boardwalks, in comparison with the total area occupied by the boardwalks, support our assumption that boardwalks can provide good nesting habitat.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

- Construction of boardwalks on SEFI can be considered a successful habitat restoration and enhancement project. Boardwalks protected the habitat, and the auklet trough design facilitated nesting by auklets within the first year.
- By year 3, burrow density and occupancy of the boardwalk burrows by nesting auklets equaled or exceeded natural nesting sites.

- Monitoring should continue for burrow density in the boardwalk “zone of influence” in 2006.
- All burrows should be checked for occupancy in June of 2006.
- Continue to compare burrow density between boardwalk’s zone of influence area and PRBO index plots.
- Consider installing more boardwalks, particularly where main trail forks below the cormorant blind. This is an area where many burrows already exist but the soil is prone to collapsing. Other areas on the Marine Terrace may also benefit from additional boardwalks.

ACKNOWLEDGEMENTS

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CONSERVATION REPORT

Compiled by **Craig Harrison**

CONGRESS MAY OVERHAUL ENDANGERED SPECIES ACT

The U.S. House of Representatives has approved broad changes to the Endangered Species Act (ESA). There would be changes in the process for listing species, requirements for critical habitat would be eliminated, and payments to landowners to protect plants and animals on their property would be ended. Protection for species listed as threatened would be reduced; currently these species receive virtually identical protections as endangered species. Congress has amended the act three times since 1973 while keeping its overall structure intact, but the statute has not been reauthorized since 1988. The bill now moves to the full House of Representatives for possible action.

Sponsors of the changes characterize the ESA as mired in litigation, and they say it does more to impair landowners than to help species. Frequent hearings this year have highlighted concerns with the ESA. Opponents claim that it has increased costs for electric utilities, burdened landowners with restrictions on land use, and restricted grazing. They contend that the current statute has allowed the government and the lawsuits of environmentalists to hold their land hostage, without giving them compensation for lost value. They say the ESA has provided little benefit for species—of all species designated as endangered, only 1% have recovered and been removed from the list.

The “best available scientific data” must currently be used by federal when they decide whether to list a species as endangered and during other regulatory activities. The agencies that administer the ESA are USFWS and the National Oceanographic and Atmospheric Ad-

ministration (NOAA)—Fisheries. The new bill defines “best available scientific data” as any information, regardless of source, that the Secretaries of the Interior or of Commerce determine to be “the most accurate, reliable, and relevant for use in that decision or action.” The bill would require the agencies to set the criteria for “best available scientific data” within one year. If information compiled for a listing decision or other action do not meet those criteria, the secretary could seek empirical data from other sources, including property owners, and could form a peer review panel. The bill says the secretaries may reconsider previous decisions or actions that do not meet the new criteria for “best available scientific data.”

The proposed changes to the ESA eliminate the current requirements regarding critical habitat—areas where human activity is restricted in an effort to protect the species. Currently the habitat process involves the collection of extensive map and survey data and scientific and economic analyses. It has been a frequent source of lawsuits. Under the current law, USFWS is required to designate critical habitats at the same time it lists a species as endangered. However, USFWS rarely makes habitat designations until legal action forces them to do so; critical habitat has been designated for only one third of listed species. Environmental groups contend that designating habitat is crucial for species survival, but current and past USFWS officials have said that it actually does little to benefit species. USFWS has said they prefer other federal actions to protect species, such as “endangered” listings and the development of recovery plans. The proposed revision replaces critical habitat with “recovery habitat,” which would have fewer legal restrictions and be linked to the recovery planning pro-

cess. The revision also requires agencies to publish a final recovery plan for species within three years of listing.

The bill provides a package of incentive programs and guarantees for landowners with species on their land, including direct “conservation grants” to pay property owners working to save species. The measure would also require the Interior Department to pay private property owners for the market value of any development they could no longer undertake on their land if it is determined to be habitat for endangered species. Environmental groups criticize this proposal, saying it would protect private property owners to the detriment of species.

Finally, the bill institutes a number of deadlines that the government must meet in during decisions that affect property owners. One provision allows a landowner to proceed with an activity on his land if USFWS fails to respond within 180 days. Environmental groups said the provision could overwhelm federal biologists and allow for development that could harm species. Supporters of the change contend that this provision would stop endless delays by regulators. They also want landowners to gain a clear right to monetary compensation if their rightful use of the land is prevented under the ESA. The landowners say that critical habitat provisions have meant the government is taking their land for regulatory purposes, and that they get mired in legal entanglements if they try to claim compensation.

The proposed changes in the ESA will likely face a tougher challenge in the Senate, where they will be considered first by the Fisheries, Wildlife, and Water Subcommittee. Senators are waiting for a report from the recommendations of the Keystone Group, a gathering of stakeholders, before considering changes to the law. That report is not expected until early 2006.

**USFWS TO PROPOSE
DELISTING OF MARBLED
MURRELET**

The Bush administration may propose removing Endangered Species Act (ESA) protection for the Marbled Murrelet (*Brachyramphus marmoratus*), which has long been at the center of legal battles over logging and ESA protections in the Pacific Northwest. "There is definitely going to be a delisting proposal for the population in the United States," spokesman Chris Tollefson of the U.S. Fish and Wildlife Service (USFWS) said on 21 October 2005. "This year we made the determination that based on the information we have at this point, the population doesn't meet the standard for listing as a distinct population segment." Once the agency makes the formal proposal, a yearlong evaluation and comment process will follow.

Marbled Murrelets in Washington, Oregon, and California are currently listed as threatened under the ESA. Rules now prohibit logging near murrelet nests, during morning hours while murrelets are feeding, and during the fall, winter and spring when birds are present. These restrictions would be lifted if the murrelet were delisted. In addition, the U.S. Forest Service would no longer need to consult with federal wildlife officials to determine whether activities like logging or recreation would harm murrelets in coastal forests. The Forest Service also would probably conduct fewer surveys for murrelets when planning activities in coastal forests, according to Forest Service spokesman Rex Holloway. And loggers operating on private and state forests would no longer need to prevent harm to murrelets when harvesting trees.

The decision to delist the bird hinges on grouping the smaller Pacific Northwest population with the more robust population in Canada and Alaska. But whether the U.S. birds should stand on their own has been an issue of dispute among environmentalists and the administration, as well as between USFWS's Pacific Northwest regional office and

their bosses in Washington, D.C. The USFWS official position, announced a year ago, is that Pacific Northwest population is no different from its cousins in British Columbia and Alaska. The agency claims that murrelets from Alaska to California do not differ enough in their genetics or behavior to be considered distinct populations. However, that statement went against the recommendations of the agency's own regional scientists, whose draft review had concluded the birds indeed constitute a distinct population and warrant ESA listing. Research on population genetics tends to support that view—according to Vicky Friesen of Queens University, multiple peer-reviewed studies show that birds in Alaska's Aleutian Islands, mainland Alaska and British Columbia, and California belong to different populations. "At this point, the data are very clear, and they're solid data—there's good sample sizes and there's three different types of genetic markers that have been analyzed in a number of different ways, both traditionally and with state-of-the-art tools," Friesen said. "For them to say that there's no evidence that the California birds are different is just totally ignoring that data that's out there."

Scientists and environmentalists also are concerned because the species is still declining throughout its range in the lower 48 states. Causes include historic and ongoing loss of breeding habitat in old-growth forests, declining fish stocks, and poor reproductive success due to nest predation, especially near human settlements. Recent studies have established breeding difficulties as a major obstacle to the bird's recovery, according to biologist Steve Beissinger of the University of California-Berkeley. "There seem to be a lot of birds that fail to nest, and then when they do nest, most of them fail to successfully produce young," he said. USFWS's review of the bird last year said that its future in the Pacific Northwest was uncertain.

Environmentalists fear that if the murrelet loses ESA protection and logging rules become more lax as a result, the bird may vanish from the lower 48

states. "Loosening the laws that protect Marbled Murrelets will lead to their extirpation" from the contiguous United States, said Susan Ash of the Portland Audubon Society, noting that in light of this year's poor breeding season, the populations may be plummeting even faster than FWS expected, she said.

Timber industry says that old-growth trees on federal lands would still be protected under the Northwest Forest Plan, and that in any case, Pacific Northwest murrelets never warranted listing. "You have a species that ranges from Russia all the way down to Southern California. There are over a million, probably closer to 2 million, of these birds, and the issue is, is that species threatened with extinction? And the answer is unequivocally no," Ross Mickey of the American Forest Resource Council said. USFWS agrees; the agency says that even if murrelets were extirpated from the lower 48 states, populations in Canada and Alaska would carry on and maintain the species as a whole.

But scientists say murrelets to the north are declining as well. Murrelets have declined by more than 50 percent in the last 20 years in at least three locations in Alaska, according to John Piatt of the U.S. Geological Survey. And nesting habitat is declining rapidly in British Columbia, which has a direct effect on the number of murrelets, according to Alan Burger of the University of Victoria. And although USFWS officials expect Canada's new Species At Risk Act to stem the loss of coastal forests in the province, Burger said the federal law will have virtually no effect because 90 % of British Columbia's coastal forests are owned and managed by the provincial government. "The provincial government in BC is very much in the pocket of the forest industry, and they're not in a hurry to do anything that's going to reduce the logging of Marbled Murrelet habitat," Burger said.

The whole process of reviewing of the murrelet stemmed from a 2002 lawsuit by the American Forest Resources Council, which the agency to perform a long overdue five-year status review on

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the seabird. Such a review is required by ESA for all listed species (*editor's note*: see previous item). USFWS settled with the timber industry plaintiffs and agreed to review the ESA listing and critical habitat designations for the bird. In October 2005, the Coos County, Oregon, Board of Commissions announced that it would sue USFWS if restrictions on logging were not changed to reflect the agency's finding that U.S. murrelets are not a distinct population. The county's legal representative will be the libertarian Pacific Legal Foundation.

—From Web reports by **Allison A. Freeman** for E&E News (21 Oct 2005), and **Natalie M. Henry** for E&E Land Letter (3 Nov 2005).

FWS CONDUCTING MORE STATUS REVIEWS OF ENDANGERED SPECIES

Reviving a neglected provision of the Endangered Species Act, USFWS is reviewing the status of dozens of threatened and endangered species. This effort follows a lawsuit by a coalition of California farmers, ranchers and foresters, who claimed that the status 193 California species lacked up-to-date reviews. The farmers and ranchers argued that recovery plans and critical habitat can place severe restrictions on the use of their land, yet there has been no recent evaluation of whether species are still endangered. The status reviews will assess the classification of the species and could eventually lead to proposals to downgrade, upgrade or delist plants and animals currently protected under the act. The ESA requires status reviews every five years, but of the 1,827 species listed under the act, more than 1,000 are not up to date on status reviews. Some species have never undergone a status review since being listed 30 or more years ago.

USFWS has published notices in the Federal Register to initiate status reviews for 71 species, the bulk of which are in the Pacific region (31 in California and 27 in Hawaii). USFWS notes that this is the first time the agency has initiated a large group of status reviews together. Status reviews have been rare heretofore, mostly one species at a time when they were involved in litigation. The spate of reviews seems partly to be a response to massive lawsuits filed by environmental groups, which were seeking to require critical habitat designation or species listing. FWS is trying to conduct as many status reviews as possible is combining the status reviews with critical habitat assessments, recovery development or other information-gathering processes whenever possible. Most of the reviews are expected to be completed within a year to a year and a half, and funding would come from the act's recovery budget. That budget amounts to almost \$70 million this year and includes funds for developing recovery plans.

SEABIRDS MAJOR SOURCE OF PERSISTENT POLLUTANTS IN ARCTIC

The migration of seabirds spreads anthropogenic pesticides, mercury and other pollutants to Arctic ecosystems, according to a study published in *Science* by Canadian researchers including Jules Blais of the University of Ottawa. The results contradict the long-held belief that wind currents are the major pathway to the Arctic for such chemicals. Scientists examined 33 sediment and water samples from 11 lakes on Devon Island in the Canadian Arctic, which supports colonies of Northern Fulmars (*Fulmaris glacialis*) from late May to September. The study builds on a 2004 Norwegian paper that tied the birds' presence to elevated levels of PCBs in fish near Arctic Bear Island.

Traveling distances of up to 1000 km to feed on fish, squid, and plankton in Jones Sound and Baffin Bay, the fulmars bring nutrients in their guano as they nest on cliffs above the lakes. The authors contend that the fulmars are a keystone species in the ecosystem and sustain the prolific growth of mosses, algae and lichens near the colonies. Apparently they also spread persistent pollutants that accumulate in fatty tissue, damaging the reproductive and immune function of organisms throughout the food chain.

Lakes that support the largest fulmar populations showed the highest levels of nutrients as well as chemicals DDT, hexachlorobenzene and mercury—up to 60 times more DDT than lakes without much bird traffic. Some ponds contained levels of the chemicals greater than Canadian government standards for protecting wildlife. Because the fulmars feed over a wide area and breed in a small area, they serve as funnels to concentrate the chemicals. Of particular concern is the effect the chemical concentration has on Arctic natives, who often practice subsistence hunting and fishing. This study showed that birds are carriers for toxic chemicals and nutrients should be more broadly examined, and the long-held assumption that these substances are spread primarily by the atmosphere merits re-examination.

BIRD NESTING PLATFORMS OFF SANTA BARBARA

The remains of a crumbling 1930s oil pier near Santa Barbara that served as a roost for scores of pelicans and cormorants has been demolished and replaced with roosting platforms. The old pier provided the only safe, water-encircled roosting place along a 75-mile stretch of coastline. The platforms are the first such structures for roosting and nesting seabirds off California's coast. They were paid for by BP American. Officials from the town of Goleta complain that

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the white platforms, which are 40 feet above the ocean and are higher than the old pier, are unsightly and spoil views from a golf course and a resort. The California Department of Fish and Game proposed the platforms, in hopes that Brandt's Cormorants (*Phalacrocorax penicillatus*) and California Brown Pelicans (*Pelecanus occidentalis californicus*) would use them. The project was approved by the California Coastal Commission in February. It cost BP over \$4 million, including creating an artificial fish reef. Some environmental organizations opposed the project, but the Audubon Society and other groups supported it. If seabirds do not use the platform after five years, BP is required to dismantle them.

PSG COMMENTS ON CONSERVATION PLAN FOR WASHINGTON SEABIRD REFUGES

PSG commented on a draft Comprehensive Conservation Plan and Environmental Assessment for Washington Islands Refuges in June. The plan affects Flattery Rocks, Quillayute Needles, and Copalis National Wildlife Refuges. It is intended to guide management of these those refuges by USFWS for the next fifteen years. In general, PSG supported the preferred alternative, which protects 13 species of breeding seabirds. PSG endorsed all six goals in the preferred alternative, especially (1) the protection of migratory birds and other native wildlife and their associated habitats, with special emphasis on seabirds, and (2) the continuation and enhancement of long-term monitoring and applied research. PSG advocated the removal of alien rabbits from Destruction Island (Quillayute Needles NWR), as well as any other alien mammals that may have been introduced to the refuge islands. We agreed that oil spill response training is very important for refuge staff, and we urged the refuge

also to start training staff immediately to contain and remove rodents that might be introduced by shipwrecks. PSG also urged USFWS to work with the Federal Aviation Administration and NOAA to create legal buffer zones around the islands, and to have these legal restrictions placed on all official navigation charts and aeronautical charts covering these refuges.

PSG SUPPORTS NAFTA REVIEW OF MEXICAN LNG PROJECT

PSG has written to the Commission for Environmental Cooperation, an organization of the North American Free Trade Association (NAFTA), to investigate the impacts of Chevron's proposed liquid natural gas (LNG) facility on the threatened and endangered seabird species of the Coronado Islands in Mexico. PSG wrote in support of a petition by other groups requesting an investigation of the true environmental impacts of the facility (*Pacific Seabirds* 31:6, 2004 and 32:15-16, 2005). The petitioners essentially contend that the Government of Mexico is failing to effectively enforce its own environmental laws with respect to this project by approving a defective environmental impact statement, failing to provide adequate notice to the public and failing to preserve biodiversity and natural species habitat. The Commission for Environmental Cooperation has the authority to conduct such an investigation pursuant to the North American Agreement on Environmental Cooperation.

PSG noted its belief that the construction and operation of the LNG facility will have detrimental and unacceptable effects on the threatened and endangered seabirds that nest on the Coronado Islands. The Coronados support at least 4600 breeding birds of 10 seabird species, six of which are listed as threatened or endangered in Mexico and/or the

United States. The islands are recognized as a Priority Conservation Area by the Commission and were declared an "Important Area for the Conservation of Birds" and a "Priority Maritime Region" by the Mexican Federal Commission on Biodiversity.

PSG reiterated the reasons for its concern that has been expressed previously to Mexican officials. Among these are the fact that the islands are home to the largest-known population of the Xantus's Murrelet (*Synthliboramphus hypoleucus*), which is listed as endangered in México, threatened in California, and is a candidate for US federal listing. PSG noted that the environmental review of the facility inadequately addressed impacts to the murrelet and other rare or endangered seabird species, including the effects of light pollution, human disturbance, introduction of chorine into seawater, and potential oil spills.

PSG noted that its concerns were recently echoed by USFWS in May 2005, when it elevated the urgency of listing the Xantus's Murrelet from Category 5 to Category 2 based on the threat from the LNG facility. USFWS described the LNG project as a "threat to the survival of the murrelet" and lists the potential harm from light pollution, noise, human activity, chlorinated water, and spills from the LNG terminal.

In September, the Secretariat of the Commission for Environmental Cooperation determined that the petition merits requesting an official response from the Government of México, and the secretariat has requested such a response.

PSG SUPPORTS NEOTROPICAL MIGRATORY BIRD CONSERVATION IMPROVEMENT ACT

PSG joined with the American Bird Conservancy and numerous other conservation organizations to support the Neotropical Migratory Bird Conserva-

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tion Improvement Act, H.R. 518. The bill has passed the Fisheries & Oceans Subcommittee of the House Resources Committee and action by the full committee is pending. A similar version has been approved by the full Senate Environment and Public Works committee. The Neotropical Migratory Bird Conservation Act, originally enacted in 2000, has been successful in helping to conserve neotropical birds throughout the U.S., Latin American, and the Caribbean. The bill would: (1) increase funding from \$5 to \$15 million per year by 2009; (2) allow projects in Canada to be eligible; (3) reduce the 3:1 matching ratio to 1:1; (4) allow projects based in the U.S. Virgin Islands and Puerto Rico to meet the match requirement through in-kind payments; and (5) require the Secretary of the Interior to convene an advisory group to assist in carrying out the act.

NMFS CREATES NATION'S LARGEST MARINE PROTECTED AREA IN NORTH PACIFIC

The National Marine Fisheries Service (NMFS) is creating a new marine protected area in the Aleutian Islands. Encompassing more than 930,000 km², it will be the nation's largest. Bottom trawling will be prohibited within the new Aleutian Islands Habitat Conservation Area, and other types of seafloor fishing will be restricted to protect coral reefs, sponges, and seamounts. The establishment of the protected area brings NMFS into compliance with the 1996 Sustainable Fisheries Act, which requires each of the eight fishery management councils to identify and protect "essential fish habitat"—ocean areas considered critical for fish species to thrive. Both the fishing industry and conservationists support this action.

While this designation represents little change from existing conditions because trawlers have rarely been going into the affected areas, some conserva-

tionists feared that they would soon expand their activities. The conservation area does include a few rare coral gardens and seamounts that trawlers have frequented, and which NOAA biologists identified as important habitat. In the Bowers Ridge Habitat Conservation Zone, all mobile bottom-tending fishing gear is prohibited. The rules are even more restrictive in six Aleutian Islands Coral Habitat Protection Areas, where all bottom-contact fishing gear, including longlines, will be prohibited. In addition, ten areas in the Gulf of Alaska will be closed to bottom trawling to protect habitat for groundfish and other species. Moreover, all bottom-contact fishing gear will be prohibited in five small areas in southeast Alaska and 15 seamounts throughout the North Pacific. While trawlers will lose some fishing grounds under the plan, the fishing industry hopes the outcome will serve the interests of both fishermen and fish habitat over the long term. According to the North Pacific Fishery Management Council, formal regulations regarding the conservation area will be forthcoming.

In addition to the Aleutian area, NMFS is considering closures off the West Coast of the lower 48 states, and the agency is expected to adopt recommendations from the Pacific Fishery Management Council that would prohibit trawling across 650,000 km².

CHANGES PROPOSED IN MANAGEMENT OF OCEAN FISHING AND MARINE ECOSYSTEMS

The Bush administration has proposed a plan to revise the law that serves as the basis for managing the nation's ocean fisheries. They would include a change in overfishing standards and an attempt to bolster ecosystems-based management of fisheries. The changes are intended to help end overfishing and rebuild fish stocks. At issue is the Magnuson-Stevens Fishery Conserva-

tion and Management Act, which since 1976 (with various amendments) has been the basis of U.S. fishery management in waters between three and 200 miles (322 km) offshore. The proposal would change the definitions of many of the act's current terms, including the "overfished" standard. "Overfished" is used to describe a fish population that has dropped below the target for sustainability. The administration's proposal substitutes "depleted," which would also take into account factors other than fishing that may contribute to a waning fishery. The proposal also adds new requirements for consideration of the potential social and economic effects of fishery management decisions, and it seeks to streamline how the act works with the National Environmental Policy Act. It also encourages management decisions to be made on an ecosystem level. It ramps up the use of market-based mechanisms and creates a registry for saltwater recreational fishermen, so officials can be more aware of their involvement in the fishery.

UNALASKA ISLAND OIL SPILL CLEANUP DEMOBILIZED FOR WINTER

Cleanup of the biggest oil spill in Alaska since the 1989 Exxon Valdez disaster is progressing as planned and has been demobilized for the coming winter. However, several stretches of beach remain oiled, and state officials have yet to decide what to do with the wreckage of the severed cargo ship that caused the incident. The Malaysian freighter *Selendang Ayu* grounded in December 2004 off Unalaska Island in the Aleutian chain. It then split in half and spilled over 330,000 gallons of fuel oil and diesel into the remote subarctic coastal environment. After the grounding, almost 150,000 gallons of oil and diesel were

CONSERVATION REPORT

lightered off the wreckage, but a few hundred gallons may remain trapped in areas that workers could not reach.

Approximately 800 km of shoreline were impacted to greater or lesser degrees. Biological and ecological injury assessment is underway. Pre-assessment surveys, which occurred in the immediate aftermath of the spill through early February 2005, documented some 1600 dead birds and 6 sea otter carcasses. Most carcasses were highly scavenged, so often they could not be reliably identified in the field. Carcass fragments are currently being specifically identified at the University of Alaska Museum (UAM). Modeling will be conducted to estimate total mortality upon completion of the identification effort. At least 32 species of birds were oiled, including cormorants (*Phalacrocorax*), sea ducks (e.g. *Melanitta*, *Somateria*), guillemots (*Cepphus*), murrelets (e.g., *Synthliboramphus*), auklets (e.g., *Aethia*, *Ptychoramphus*), and puffins (*Fratercula*), as well as 3 species of mammals, based on sightings of live oiled animals and carcass identification in the field. The list will probably increase following the identification work at UAM.

The cleanup has been manually intensive; to date workers have shoveled and handpicked oiled debris from more than 100 beach segments, each ranging from 700 meters to 1.6 km in length, and encompassing approximately 110 km of the most heavily impacted coastline. Subsequent inspection surveys have been conducted with the various affected landowners in recent weeks, including native groups and the Alaska Maritime National Wildlife Refuge (USFWS). Remaining oil is expected to weather and attenuate naturally through winter storms and tidal action, and the remaining 26 segments (20 km) that did not achieve acceptable cleanup by this fall will be reevaluated for further treatment next spring. The remnants of more than 60,000 tons of soybeans are still being released into the ecosystem; they initially covered some beaches in a thick layer and presently are

being dispersed by ocean currents. Although a crab fishery was closed in the immediate vicinity of the *Selendang Ayu* oil spill, other Bering Sea commercial fisheries were largely unaffected by the spill.

Officials of the Unified Command (the interagency oversight group) consider cleanup efforts to be successful, excepting the incomplete segments. Conditions at the spill site are extremely challenging and some of the standard response methods can not be used. The bunker-type oil that was spilled in this incident produces very little skimmable oil. In general, the very viscous oil was quickly blown ashore by storms and/or congealed into various-sized tar balls.

—Laurie Daniel and Vernon Byrd

RESEARCH SHIP GROUNDED AND SCUTTLED IN NORTHWESTERN HAWAIIAN ISLANDS

The 145-foot research ship *Casitas* was severely damaged when it went aground in July in a marine reserve in the Northwestern Hawaiian Islands. None of the 23 people aboard, including scientists from NOAA and University of Hawaii Joint Institute for Marine and Atmospheric Research, were injured. The vessel ran aground on Pearl and Hermes Atoll during a NOAA charter to clean up marine debris in the Northwestern Hawaiian Islands (an annual project). The scientists were taken off the vessel and camped on North Island, while the crew members remained aboard to pump out water and try to refloat the ship. The ship contained 30,000 gallons of diesel fuel, 3000 gallons of gasoline and 200 gallons of lubricating oil, but most was removed and very little was spilled. The *Casitas* was judged to be too damaged for successful salvage, so it was scuttled

at sea in 23,600 m of water about six miles north-northwest of its grounding. Wildlife officials found no evidence of harm to endangered Hawaiian monk seals (*Monachus schauinslandi*), green sea turtles (*Chelonia mydas*), or seabirds.

Ironically, during its marine debris voyage last year, the *Casitas* discovered the remains of what were believed to be the whaling ships *Pearl* and *Hermes*, which struck a reef in 1822. The atoll is named after the sunken ships.

INVASIVE RODENT PROGRAM ON THE ALASKA MARITIME NATIONAL WILDLIFE REFUGE

The Alaska Maritime National Wildlife Refuge (AMNWR) was established for the conservation of marine birds and marine mammals that breed and haul out on islands and headlands in Alaska marine ecosystems. One of the most serious threats to accomplishing this mission is introduced rodents—particularly rats (*Rattus* spp.) but also mice (*Mus musculus*), ground squirrels (*Citellus*), and others. These exotic rodents have become established on at least 14 refuge islands over 1000 acres in size, and on dozens of smaller satellite islands near the larger infested islands. Recently the refuge has initiated an increased effort to deal with the threat of additional introductions. Emphasis is particularly on shipwrecks and cargo transfers, which are the two main ways in which rats have been introduced.

A shipwreck-response strike force has been assembled and trained, and land-based prevention programs have been put into place in the Pribilof Islands. In partnership with the state of Alaska and The Nature Conservancy, a statewide outreach effort has been initiated to increase awareness about the seriousness of rodent introductions and to establish an early detection reporting system.

Besides prevention programs, the refuge has begun an effort to remove established rodent populations. In 2003, a restoration plan for removal of rats was drafted, and a workshop was held in 2004 to get peer review of the plan. Attended by experts from New Zealand, Hawaii, Colorado, California, Alaska, and elsewhere, the meeting resulted in an improved plan which includes the prerequisites for a removal project (e.g., studies of the efficacy of rodenticides, issues of effects on non-target organisms, and impacts of rats on native ecosystems). Field studies in 2004-2005 included rat removal from small satellite islands near Adak, and evaluation of the potential for localized rat control at Kiska, where rats are preying on auklets at a large breeding colony. An environmental assessment is now underway. Plans are to have a draft of the EA done by summer 2006, after which efforts will be made to find funding for removal of rats on one of the refuge islands.

Copies of a summary report on the workshop, as well as more detailed accounts are available on request from the refuge office (contact Laurie_Daniel@fws.gov).

SCOTTISH SEABIRD ISLAND FREE OF RATS, GAINS PROTECTION

Ailsa Craig, a tiny island off the Ayrshire coast in western Scotland, is host to more than 40,000 breeding pairs of Northern Gannets (*Morus bassanus*), Atlantic Puffins (*Fratercula arctica*), Common Murres (*Uria aalge*), and Razorbills (*Alca torda*), and other seabird species. The island has been named by the Royal Society for the Protection of Birds (RSPB) as its newest reserve.

A program to rid the island of brown rats (*Rattus norvegicus*) was initiated 12 years ago in an effort to restore its puffin population. Alan Lauder of RSPB Scotland said, "The gannet population is increasing and under the new arrangement, we will continue to monitor that and make sure they are protected."

The island was once a haven for burrow-nesters, including the puffin, Manx Shearwater (*Puffinus puffinus*), and British Storm-Petrel (*Hydrobates pelagicus*). One ornithologist said in the 1860s that the puffin population was at least a quarter of a million pairs. There

were so many that when he disturbed them, they caused "a bewildering darkness" in the sky. But the birds were wiped out by the arrival of rats on to the island in the late 19th century, perhaps from vessels wrecked on the rocks, or from ships bringing coal to the lighthouse that was built in 1889 to prevent shipwrecks. The rats ate eggs and chicks, and by 1934, puffins had become extinct as a breeding species on the island. Lauder said the RSPB would work hard to keep Ailsa Craig rat-free, and hopefully the burrowing seabirds would continue to build up their numbers.

Ailsa Craig is also known as Paddy's Milestone, because it lies equidistant between Belfast, Ireland, and the port of Glasgow, a destination of Irish immigrants during the 19th century. The island also is famed for its high-quality granite, which has been the raw material for the puck-like stones used in the Scottish sport of curling, including in the Olympics.

—From article by **William Lyon** for *The Scotsman* (Edinburgh); <http://news.scotsman.com>, 20 Mar 2004

SEABIRD NEWS

NOTES FROM BEACH SURVEYS

Beached bird surveys in the Monterey Bay National Marine Sanctuary (MBNMS) showed a significant increase in monthly estimates of mortality for several species in 2005. Jim Harvey and Hannah Nevins of Moss Landing Marine Laboratories and volunteers from MBNMS conducted the eighth year of this survey. Mortality was higher for Cassin's Auklets (*Ptychoramphus aleuticus*; Jan-Mar), Rhinoceros Auklets (*Cerorhinca*

monocerata; Jan-Feb), Brandt's Cormorants (*Phalacrocorax penicillatus*; Jan and May-Jul), and Common Murres (*Uria aalge*; May-Jul). Investigation of the event indicated that starvation was the primary cause of death. This region-wide dieoff was probably influenced by oceanographic conditions, including lack of upwelling early in the spring and a resulting reduction in prey availability (e.g., juvenile rockfishes) for many resident seabirds.

Collaborators in this analysis were California Department of Fish and Game (Marine Wildlife Veterinary Care and Research Center, Santa Cruz), beach

survey programs Beach Walk (Gulf of the Farallones National Marine Sanctuary), and COASST (Coastal Observation and Seabird Survey Team, University of Washington).

Among seabirds on Oregon beaches in 2005 was the state's first recorded Short-tailed Albatross (*Phoebastria albatrus*). The hatch-year bird was banded at Torishima on 24 April 2005 by Hiroshi Hasegawa of Toho University.

(Some other news on breeding failures and dieoffs on the Pacific coast in 2005 appeared in *Pacific Seabirds* 32[1]: 27-28, 2005.)

PSG NEWS

PSG'S 2006 MEETING IN ALASKA IS DRAWING A CROWD

The Pacific Seabird Group will host its 33rd annual meeting on 15-19 February 2006 near Anchorage, Alaska. The meeting will be held at the Alyeska Prince Hotel, a world-class ski resort, in the former mining community of Girdwood. There will be an international symposium on Seabirds Indicators of Change in Marine Ecosystems (see the flyer, next page), and special paper sessions on fisheries/seabird interactions, planktivorous alcids, and what chemical analyses can tell us about seabirds. We also welcome papers on any other marine subject.

There will be a pelagic field trip (weather permitting) in Resurrection Bay on the Gulf of Alaska, which a haven for

wintering seaducks and seabirds and promises sightings of sea otters. Other attractions include the Alaska SeaLife Center, races for cross-country skiers and showshoers, downhill skiing, and dog sledding. The meeting also coincides with Anchorage's annual winter festival, the Fur Rendezvous.

For further information, contact Verena Gill (verena_gill@fws.gov) for questions about local arrangements or registration, and Katie O'Reilly (oreilly@up.edu) regarding the scientific program. You can register for the meeting at <http://www.pacificseabirdgroup.org>. For further information on all aspects of the meeting, see the foregoing web site or *Pacific Seabirds* 32(1) 23-24, 2005. The hotel's web site is <http://www.alyeskaresort.com>.

PSG ELECTIONS

The following people are on the ballot for the Executive Council for 2006:

Officers

- Chair-elect: Verena Gill
- Secretary: Ron Ydenberg (incumbent)
- Vice-chair for Conservation: Craig Harrison (incumbent)

Regional Representatives

- Alaska and Russia: Heather Renner, Shiway Wang, Iain Stenhouse
- Washington and Oregon (see below): Don Lyons
- Northern California: Esther Burkett (incumbent)
- Old World: Mark Tasker (incumbent)
- Pacific Rim: Beth Flint (incumbent)

Student Representative: Jo Smith

The Washington and Oregon Representative moved out of the area before her term ended, so it is necessary to elect a replacement, who will serve one year..

PSG MEETING NEWS



Dear Colleague,

An International Symposium on "Seabirds as Indicators of Change in Marine Ecosystems" is being held as part of the 33rd Annual Meeting of the Pacific Seabird Group (PSG), which will occur February 16-18, 2006, at the Alyeska Ski Resort in Girdwood, Alaska, just south of the city of Anchorage.

The PSG Announcement and Call for Papers has been posted on the web: <http://www.pacificseabirdgroup.org/mtg.html>

The purpose of the symposium is to critically examine specific questions about how seabirds indicate conditions in marine ecosystems. We will draw upon the expertise of invited speakers from around the globe, and from PSG members attending the meeting who wish to contribute to the symposium. The symposium will take place over all three days of the PSG meeting, but will include several keynote speakers and a hosted lunch on the first day. There will be a workshop for invited participants on the last day.

We have identified three broad themes in using seabirds as indicators of marine ecosystems: (1) Indicators of forage fish and plankton ecology, (2) Indicators of marine habitat quality, and, (3) Indicators of cyclic climate change and global warming. In addressing these themes, we are asking participants to critically evaluate the role of one or more species of seabirds as indicators.

This symposium is being supported by the North Pacific Research Board (NPRB), and represents one step in their efforts to develop an integrated marine research strategy for Alaska. Our goal is to develop an agenda for research on marine birds and to identify specific research strategies that would contribute to the mission of the NPRB, "to build a clear understanding of North Pacific ecosystems that enables effective management and sustainable use of marine resources". Talks and posters presented at the symposium will help guide us as we develop a research agenda. We plan to publish some of the papers presented at this PSG symposium and important conclusions of the symposium will be incorporated into the NPRB research strategy.

We welcome participation of colleagues in other marine science disciplines, particularly those with interest in fish and wildlife research programs in the Gulf of Alaska and Bering Sea. If you are interested in attending for one or more days, you can register on-line at the PSG address above.



If you have any questions about the Seabirds as Indicators (SAI) symposium, or the PSG Annual Meeting, please call any of the following SAI organizers (SAIo) and collaborators:

John Piatt, (SAIo), USGS Alaska Science Center, 360-774-0516, john_piatt@usgs.gov
Bill Sydeman, (SAIo), PRBO Conservation Science, 415-868-1221 x319, wsydeman@prbo.org
Vern Byrd, (SAIo), USFWS Alaska Maritime NWR, 907-235-6546, Vernon_byrd@fws.gov
Dave Irons, (SAIo), USFWS Migratory Bird Mgmt., 907-786-3376, David_Irons@fws.gov
Alan Springer, (SAIo), Univ. Alaska, Fairbanks, 907-474-6213, ams@ims.uaf.edu
Ann Harding, SAI Local Coordinator, APU/USGS, 907-786-3920, ann_harding@usgs.gov
Katie O'Reilly, PSG Program Chair, Univ. Portland, 503-943-7146, oreilly@up.edu
Verena Gill, PSG Local Committee Chair, USFWS, 907-786-3584, verena_gill@fws.gov
Francis Wiese, NPRB Program Coordinator, 907-278-6772 x6713 francis.wiese@nprb.org

REGIONAL REPORTS

Regional reports summarize current seabird work of interest to PSG members. Regional Reports generally are organized by location of the work, not by affiliation of the biologist. They should not be cited without permission of the authors. The Regional Reports for the Russian Far East and for most of Hawai'i and the Pacific Rim were not received by press time. Missing reports may be submitted for publication in the Spring 2005 *Pacific Seabirds*.

ALASKA

Compiled by **Verena Gill**

BEAUFORT SEA

Research on the breeding biology and feeding ecology of the seabirds of Cooper Island (western Beaufort Sea) remained focused on Black Guillemots (*Cephus grylle*). It also included the remnants of a once-thriving Arctic Tern (*Sterna paradisaea*) colony and the nascent Horned Puffin (*Fratercula corniculata*) population (3 pairs). This year **George Divoky** added a new component to his long-term research, which has been conducted most recently through the University of Alaska Fairbanks (UAF), by initiating collaboration with **Gail Davoren** of the University of Manitoba. Davoren will bring her expertise in interactions of subarctic fish and seabirds to examination of the ongoing changes in the ichthyofauna that support Cooper Island's seabirds. **Britt Harter** spent the summer assisting on the island and will be starting a graduate program this fall with Davoren.

Nora Rojek coordinated monitoring of threatened Steller's Eiders (*Polysticta stelleri*) at Barrow by the U.S. Fish and Wildlife Service (USFWS). She was assisted by **Jewel Bennett**, **Becky Howard**, **Jennifer Jenkins**, **Neesha Wendling**, volunteers **Des Daisuke**, **Cory Gregory**, **Linda Lyon**, **Ram Papish**, **Michelle Rensel**, **Andrew Wu**, and Barrow High School student interns **Andrew Bounyavong**, **Tierra Edwards**, **Maurice Ferdinand**, **Mark Roseberry**, and **Amelia Stankiewicz**. Study components included a breeding

pair survey, nest searches, nest and brood monitoring, and placement of video cameras on active nests to monitor predation or other causes of failure. Nests were found for the first time in Barrow since 2000. Some nesting and fledging success were observed.

Bob Day (ABR, Inc. – Environmental Research and Services) completed his study of the effects of an anti-collision lighting system on migrating birds at Northstar Island, near Prudhoe Bay.

CHUKCHI SEA

Annual seabird monitoring was conducted at Cape Lisburne by Alaska Maritime National Wildlife Refuge (AMNWR). **Dave Roseneau** and **Jim Schneeweis** evaluated reproductive success and population trends of Black-legged Kittiwake (*Rissa tridactyla*) and Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*).

BERING SEA—COLONIES, NEARSHORE

Kim Nelson, Oregon Cooperative Fish and Wildlife Research Unit at Oregon State University (OSU), continued her research on the traditional ecological knowledge of seabirds and marine mammals at Cape Woolley (north of Nome) and King Island in the Bering Sea. Cooperators were **Deanna Kingston** and **Jesse Ford** (OSU) and other scientists from University of Alaska Fairbanks, Bering Straits Foundation, GeoArch Alaska, and Talking Circle Media. Nelson collected information from the Inupiaq elders that grew up on the island about the populations and use of seabirds and marine mammals. She

also conducted boat surveys for murres, guillemots (*Cephus* spp.), puffins (*Fratercula* spp.), gulls (*Larus* spp.), and kittiwakes (*Rissa trydactyla*), and began mapping the auklet (*Aethia* spp.) colonies. From this work she hopes to estimate the numbers of seabirds on the island.

Ed Murphy (UAF) continued seabird monitoring at the Bluff colony on Norton Sound, where he determined rates of reproductive success for Black-legged Kittiwakes and Common Murres.

Ian Rose was on St. Lawrence Island this summer studying the diet, survival and reproductive success of Least Auklets (*Aethia pusilla*), Crested Auklets (*A. cristatella*), Black-legged Kittiwakes, and murres. This was the 6th season of a joint project between OSU (**Daniel Roby**) and USFWS (**David Irons**) to monitor seabird populations in the northern Bering Sea. Current research on the project is centered on the importance of wind forcing in driving the advection of the auklets' zooplankton prey from the Bering Shelf edge to the island. Over the past five years, previous field crew leaders **Adrian Gall** and **Lisa Sheffield** have established that certain prey items, most notably the oceanic copepod *Neocalanus cristatus*, are closely associated with high reproductive success in both auklet species. Large oceanic copepods like *N. cristatus* are not resident on the Bering Sea shelf; they must be advected to that area by the Anadyr Current from deeper waters beyond the shelf edge. The strength of the Anadyr Current varies on a weekly or even daily basis, and it is highly dependent on the northerly winds which

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prevail in the region in early summer. Some climate models predict a weakening of the Anadyr Current and changes in regional wind patterns associated with global climate change. In light of these concerns, development of a model relating current flux, wind forcing, and zooplankton availability has become a high priority, in order to understand the forces driving auklet survival and breeding in the northern Bering Sea.

Art Sowls (AMNWR) coordinated monitoring of seabirds on the Pribilof Islands and continued to oversee the land-based rat prevention program. On St. George, **Greg Thomson** and **Alexis Will** recorded timing of nesting events, reproductive success, and food habits of Red-legged (*Rissa brevirostris*) and Black-legged Kittiwakes and Common and Thick-billed Murres, and survival of kittiwakes. **Nikolai Konyukhov** continued a study of survival of Least Auklets, including banding and resighting birds at the Ulakaia colony. On St. Paul Island, **Sadie Wright**, **Debbie Dykstra**, and **Denny Wynn** monitored timing of nesting events, reproductive success, and food habits of Red- and Black-legged Kittiwakes and Common and Thick-billed Murres. **Sadie Wright** also conducted research on breeding biology of Red-faced Cormorants (*Phalacrocorax urile*), a species known to be declining in some parts of its range.

AMNWR coordinated a 2-week expedition to St. Matthew and Hall Islands in late July. **Heather Renner** (AMNWR) and **Evie Witten** (The Nature Conservancy; TNC) mapped a large auklet colony on Hall Island. **Randy Hagenstein** (TNC), **Margaret Williams** (World Wildlife Fund) and **Mike Boylan** (USFWS) conducted population counts of ledge-nesting seabirds. **Ian Jones** (Memorial University of Newfoundland; MUN) and **Anne Morkill** (AMNWR) mapped two auklet colonies on St. Matthew Island.

A North Pacific Research Council-funded project is looking at stress hormone levels and fatty acids in kittiwakes, auklets, and murres at various

sites on AMNWR in the Bering Sea. Principal Investigators are **Alan Springer** and **Alexander Kitaysky** (UAF) and **Sara Iverson** (Dalhousie University). Samples were collected on Hall Island by Kitaysky and **Mike Schultz** of UAF. (See also the Aleutian Islands report below).

The Seabird, Marine Mammal, and Oceanography Coordinated Investigation (SMMOCI) project was conducted in the Pribilofs this year. Personnel were **Don Dragoo** and **Jeff Williams** (AMNWR), **Deb Rudis** and **Karen Sullivan** (USFWS), **Martin Renner** (MUN), **Martin Robards**, **Marc Romano**, and **John Piatt** (USGS), **Mayumi Arimitsu**, **Kitty Mecklenburg**, and **Jeff Anderson**. This multi-year project involves transects near seabird colonies where simultaneous nest monitoring is being conducted, in order to evaluate the relationship of seabird foraging to breeding success.

Don Dragoo, **Sadie Wright**, and **Jeff Williams** (AMNWR), **John Piatt** and **Marc Romano** (USGS), and **Deb Rudis** (USFWS) conducted skiff-based counts of cormorants on the Pribilof Islands as well.

Diane Calamar Okonek (Alaska Department of Fish and Game), with help from volunteers **Brian Okonek** and **Sandy Kogl**, monitored Black-legged Kittiwake, Common Murre, and Pelagic Cormorant (*Phalacrocorax pelagicus*) populations and productivity at Round Island within the Walrus Islands State Game Sanctuary.

ALEUTIAN ISLANDS—COLONIES, NEARSHORE

Shiway Wang (USGS and UAF), **Alexander Kitaysky** (UAF), and **Mike Shultz** worked on the Regime Forcing and Ecosystem Response (ReFER) project in July on the *Tiglux* on Aiktak, Bogoslof, Kasatochi, and St. Paul Islands. Wang also participated in the collection of trawl samples on the SMOCCI cruise.

Jeff Williams coordinated long-term seabird monitoring for AMNWR at Aiktak, Kasatochi, and Buldir Islands

and other studies in the archipelago.

At Aiktak Island in the eastern Aleutians, **Tyra Zeman** and **Joel Helm** monitored timing of nesting events, reproductive success, food habits, and population size of Glaucous-winged Gulls (*Larus glaucescens*), Black Oystercatchers (*Haematopus palliatus*), Tufted Puffins (*Fratercula cirrhata*), Ancient Murrelets (*Synthliboramphus antiquus*), and Leach's and Fork-tailed Storm-Petrels (*Oceanodroma leucorhoa* and *O. furcata*). There are 3 monitoring sites in the central Aleutians: Kasatochi, Ulak, and Koniuji Islands. On Kasatochi, **Brie Drummond** and **Dara Rehder** primarily studied Least and Crested Auklet productivity, chick growth, food habits, attendance patterns, populations and adult survival rates. They also monitored population levels of Pigeon Guillemots (*Cephus columba*), Pelagic and Red-faced Cormorants, and Leach's and Fork-tailed Storm-Petrels. At nearby Ulak Island, populations and productivity of burrow-nesting seabirds were monitored, and cormorant and murre population levels were recorded.

John Piatt (USGS) and **Tony DeGange** (USFWS) conducted surveys for Kittlitz's and Marbled Murrelets (*Brachyramphus brevirostris* and *B. marmoratus*) around Unalaska Island in the eastern Aleutians.

At Buldir Island in the western Aleutians, technicians **Erik Anderson**, **Trevor Joyce**, **Aaron Stoertz** and **Meredith Barrett** conducted the 18th year of annual seabird monitoring. Species monitored included Red- and Black-legged Kittiwakes, Common and Thick-billed Murres, Least, Crested, Whiskered (*Aethia pygmaea*), and Parakeet (*A. psittacula*) Auklets, Pelagic and Red-faced Cormorants, and Leach's and Fork-tailed Storm-Petrels. For most species, timing of nesting events, productivity, food habits and population levels were monitored.

In the Delarof Islands group, **Vernon Byrd** and **Jeff Williams** (AMNWR), **Doug Causey** (UAF), **Rob Campallone** (USFWS), **Barry Sampson** (Minnesota Department of

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Natural Resources), and **Jason Bryant** (University of South Carolina) counted cormorants in July, repeating surveys that were conducted in the 1970's. Williams, **Heather Renner**, **Martin Renner**, **Judy Alderson** (NPS), **Sampath Seneviratne** (MUN), and **Ron Keefer** conducted population counts of ledgenesting seabirds on Bogoslof Island and assessed productivity for Red-legged (*Rissa brevirostris*) and Black-legged Kittiwakes.

Boat surveys were carried out in the Near Islands (June) and Rat Islands (August), in the far western Aleutian Archipelago, by the team of **Verena Gill**, **Angela Doroff**, **John Haddix**, and **Doug Burn** (USFWS). They surveyed Pigeon Guillemots, Black Oystercatchers, Common Eiders (*Somateria mollissima*), and northern sea otters (*Enhydra lutris*). Although oystercatchers are not present in the Near group, their numbers in the Rat Islands are similar to 2 years ago when the same team conducted these surveys. Both guillemot and eider numbers were up, which has been a trend in these islands for many species since foxes were eradicated by AMNWR.

Control of exotic mammals continues on other islands. **Peter Dunlevy** and **Lisa Scharf** (AMNWR) continued to conduct studies in the Bay of Islands, Adak Island, testing methods that could lead to safe and effective use of rodenticides to address invasive rodent problems on the refuge. **Steve Ebbert** (AMNWR) led projects to recheck Amlia, Avatanak, Adak, Great Sitkin, and Tanaga Islands, where trapping was conducted in previous years to remove introduced arctic foxes (*Alopex lagopus*). **Ebbert** and **Dunlevy** began research on methods for removing introduced ground squirrels (*Citellus* spp.) from Kavalga Island to restore populations of seabirds and other native birds. On Kiska Island, **Cari** and **Chris Eggleston** (MUN) studied Norway Rats (*Rattus norvegicus*) for an ongoing study of the effect of rats on auklet populations.

Nearly the entire staff of the Alaska Maritime NWR was involved in responding to the *Selandang Ayu* oil spill

at Unalaska in December 2004. The refuge took the lead in assessing the injury to seabirds and other wildlife in the area. (See "Conservation News" in this issue for more on the oil spill.)

GULF OF ALASKA—COLONIES, NEARSHORE

Heather Renner coordinated seabird monitoring for AMNWR in the Semidi Islands. **Allyson Larned** and **Slade Sabora** lived on Chowitz Island from May to early September, monitoring timing of nesting, reproductive success, food habits and populations size for Glaucous-winged Gulls, Black-legged Kittiwakes, Common and Thick-billed Murres, and Rhinoceros Auklets (*Cerorhinca monocerata*).

Greg Siekaniec (AMNWR) continued to work with local cattlemen to attempt to remove cows from Chirikof Island, as part of a program to restore that island for seabirds.

At East Amatuli Island in the Barrens Islands group, **Arthur Kettle**, **Joshua Boadway**, **Kelly Ramster** and **Laura Kennedy** (AMNWR) monitored reproductive success, prey, and population trends of Fork-tailed Storm-Petrels, Black-legged Kittiwakes, Common and Thick-billed Murres, and Tufted Puffins. Population data were also gathered for Glaucous-winged Gulls.

Leslie Slater (AMNWR) checked monitoring plots for Tufted Puffins at Chiswell Island south of Resurrection Bay, and she monitored Black-legged Kittiwake productivity at Chisik and Duck Islands in Cook Inlet.

Kathy Kuletz continued summer at-sea surveys in Kachemak Bay, with a focus on Marbled and Kittlitz's Murrelets. **Elizabeth Labunski**, **Karen Breneman**, and **Shawn Stephensen** conducted most of the surveys, with assistance from a variety of volunteers. The primary goal is to compare bird densities, juvenile counts, and population estimates obtained during 2004-2006 surveys with those obtained between 1988 and 1999. In 2005 a series of CTD casts were done in conjunction with the surveys, which will allow

characterization of the water column relative to species' distributions. **Labunski** also collected seabird data during a short oceanographic survey of lower Cook Inlet, conducted by **Scott Pegau** of the Kachemak Bay Research Reserve.

Scott Hatch and **Andy Ramey** (USGS, Alaska) continued long-term research and monitoring on Middleton Island. They were assisted this year by four USGS volunteers (**Darren Doderer**, **Kevin MacDonald**, **Claudia Mischler**, and **Tim van Nus**) from the Lower 48, Canada, and The Netherlands. Rejoining the team in 2005 were **Joel White** and **Hervé Mullard**, along with **Adrien Lambrechts** and **Marion Kryloff** from the Université P. & M. Curie, Paris. **Brian Guzzetti** (UAF) completed the second year of a 2-year MS project on the ecology of Black Oystercatchers on Middleton.

SOUTHEAST ALASKA

Leslie Slater coordinated annual seabird monitoring at St. Lazaria Island. **Leslie** and **Megan MacClellan**, **Lisa South**, and **Stacy Carlson** (AMNWR) monitored the timing of nesting events, reproductive success, prey and populations of Leach's and Fork-tailed Storm-Petrels, Pelagic Cormorants, Glaucous-winged Gulls, Pigeon Guillemots, Common and Thick-billed Murres, and Rhinoceros Auklets.

Scott Newman (Wildlife Trust) and **Kim Nelson** initiated a 3-year study in 2005 with **Darrell Whitworth**, **Harry Carter**, and **Matt Kirchhoff** to study the health, activity patterns, foraging ranges, and habitat use of Marbled Murrelets in the Port Snettisham area of Southeast Alaska. The objectives of the study include capturing and radio-marking 30 murrelets per year, determining daily flight and foraging patterns of radio-marked birds, identifying preferred foraging habitat during nesting, chick rearing, and post fledging periods, and conducting health evaluations for using hematologic and biochemical testing. During 2005 they focused on post-breeding dispersal using aerial flights,

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telemetry, and data loggers. In years 2006 and 2007, we will focus on breeding season behavior and identifying nesting habitat. Field support was provided by **Jonathan Ball, Julie Koehler, Grant Miller, Ayesha Moss, Iain Stenhouse, Gus Van Vliet, Rebecca Walling,** and others. The project is being funded by the Alaska Department of Fish and Game.

OFFSHORE STUDIES

Jim Lovvorn (University of Wyoming) and his students **Jason Kolts** and **Chris North** are continuing studies of processes that affect food webs of Spectacled Eiders (*Somateria fischeri*) on their wintering area in the Bering Sea. They are working with **Jackie Grebmeier** and **Lee Cooper** of the University of Tennessee to measure use by benthic organisms of phytoplankton from the ice-edge spring bloom, and the densities and diets of epibenthic predators such as crabs, fish, seas stars, and snails. It is believed that higher temperatures in the Bering Sea are allowing northward expansion of competing predators into the eider wintering area.

Rob Suryan of Oregon State University (OSU) continued his work on satellite telemetry of Short-tailed Albatrosses (*Phoebastria albatrus*) in the north Pacific. Until now, all tracking has occurred during the non-breeding season; they are cautiously evaluating approaches to tracking Short-tailed Albatrosses during the breeding season but have not yet started this work. The Short-tailed Albatross telemetry project is a collaborative effort with the Japanese Ministry of Environment (**Noriko Moriwake**), USFWS (**Greg Balogh**), and the Yamashina Institute for Ornithology (**Kiyoaki Ozaki**). Another collaborator is **Paul Sievert** (U.S. Geological Survey, Massachusetts Cooperative Fish and Wildlife Research Unit). Sievert also is a member of the Short-tailed Albatross Recovery Team and is responsible for population viability

analyses for the species.

Karen Fischer (OSU) has begun working with Suryan and Balogh on satellite telemetry of Black-footed (*P. nigripes*) and Laysan (*P. immutabilis*) Albatrosses. In August 2005, Fischer, Suryan, Balogh, and **Sievert** deployed satellite transmitters on 10 Black-footed and 10 Laysan albatrosses captured at sea in the central Aleutian Islands. Their goal is to compare the ecology of the three albatrosses, and to assess their spatial and temporal interactions with commercial fisheries in Alaska and elsewhere during the non-breeding season. Portions of this work are being integrated with related studies off California led by **Michelle Hester** (Oikonos), **David Hyrenbach** (University of Washington), **Cheryl Baduini** (The Claremont Colleges); and with research off Hawaii led by **Scott Shaffer** and **Bill Henry** (Tracking of Pacific Pelagics, University of California at Santa Cruz) and **Lindsay Young** (University of Hawaii).

Bob Day completed a study on the at-sea distribution of seabirds and marine mammals wintering in the northern Gulf of Alaska.

OTHER PROJECTS

Ann E. Edwards (postdoctoral fellow with the Alaska Fisheries Science Center, National Marine Fisheries Service) is working with **Shannon Fitzgerald, Doug Demaster,** and **Julia Parrish** (University of Washington) to investigate the population-level effects on seabirds of provisioning by the Alaskan groundfish fishery. Towards this end, Ann is producing a map in space and time of fish parts returned to Alaskan waters, a product that will be used by ecosystem modelers as well as seabird biologists. To link diet and demographics, Ann is using stable isotope analysis of feathers in Laysan and Black-footed Albatrosses (*Phoebastria immutabilis* and *P. nigripes*). If quantifiable relationships are detected between a fisheries diet and demographic change, they will be used to inform

population models that now incorporate only bycatch mortality as an effect of fisheries on albatrosses.

Bob Day completed three studies of movements and flight altitudes of waterbirds near proposed coastal wind farms.

Dave Roseneau (AMNWR) coordinated collection of seabird eggs for the contaminants program of the long-term Seabird Tissue Archival and Monitoring Project (STAMP). He collecting eggs from murre and gulls at more than 20 sites scattered throughout the refuge.

Andy Ramey continued work in the USGS Molecular Ecology Lab in Anchorage to develop population-specific genetic markers for Northern Fulmars (*Fulmarus glacialis*). Several fulmars implanted with satellite transmitters on Chagulak Island (eastern Aleutians) in July 2004 continued to transmit location data throughout the year. Genetic data and telemetry are being used to assess the vulnerability of fulmars to long-line fishery bycatch in Alaska.

Naomi Bargmann (USGS and University of Alaska Anchorage [UAA]) analyzed fatty acid compositions in subcutaneous fat, blood serum, and prey samples of Black-legged Kittiwakes toward completion of her MS in Biology at UAA. **Shiway Wang** is likewise nearing completion of her MS on fatty acid signature analysis in fat tissue and stomach oil of Northern Fulmars.

Kathy Kuletz continued to work with NOAA on the Fisheries Observer Program (including a study of the Kodiak Island set-net fishery) and Plan Team reports (the latter is part of the North Pacific Fisheries Management Council assessment program for fishery stocks). In July Kuletz defended her dissertation on the foraging and productivity of Marbled Murrelets under Alan Burger at the University of Victoria, British Columbia, and in August she completed her PhD.

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CANADA

Compiled by **Ken Morgan**

PACIFIC CANADA (EXCEPT MARBLED MURRELETS—SEE BELOW)

Mark Hipfner of the Canadian Wildlife Service (CWS), Delta, BC, and the Centre for Wildlife Ecology (CWE) at Simon Fraser University (SFU), Burnaby, BC, reports that the summer of 2005 marked the 12th year of operation of the CWE is seabird research and monitoring program on Triangle Island. The field crew consisted of Hipfner, **BriAnne Addison** (University of Missouri), **Mathieu Charete** (University of New Brunswick), **Rob Ronconi** of the University of Victoria (UVIC), CWE contractors **Samantha Franks**, **Jennifer Greenwood**, **Allison Henderson**, **Glen Keddie** and **William Nelson**, and CWE volunteers **Jasmine Freed** and **Sarah Wong**. They monitored breeding chronology success, and related parameters of Cassin's Auklet (*Ptychoramphus aleuticus*), Rhinoceros Auklet (*Cerorhinca monocerata*), Tufted Puffin (*Fratercula cirrhata*), Common Murre (*Uria aalge*), Pelagic Cormorant (*Phalacrocorax pelagicus*), Black Oystercatcher (*Haematopus bachmani*) and Glaucous-winged Gull (*Larus glaucescens*). Breeding success for all species, except Common Murre and Black Oystercatcher, was extremely low in 2005. 2005 was the worst breeding year on record at Triangle Island for a number of species. CWS also put considerable effort into monitoring seabird populations in Haida Gwaii/Queen Charlotte Islands in 2005. Hipfner, Keddie, **Sam Iverson** (CWE contractor) and **Heather Major** (SFU grad student) surveyed Cassin's Auklet and Ancient Murrelet (*Synthliboramphus antiquus*) colonies at Frederick Island in early June, and were joined by **Moira Lemon** (CWS, Delta, BC) to carry out surveys for those 2 species at East Rankine Island. Their data have yet to be analyzed. In addition, that crew carried out population censuses for Black Oystercatchers and Glaucous-winged

Gulls along the east side of Gwaii Haanas National Park. Preliminary examination of those data indicated little change in population for either species since the last comprehensive survey in the mid-1980s.

Jen Rock (Laskeek Bay Conservation Society, Queen Charlotte, BC) noted that from long-term data collected from East Limestone Island (ELI, Haida Gwaii); there is a suggestion that since the 1990s there has been a decline in the number of Ancient Murrelet chicks departing the colony and a reduction in the recruitment of new breeders. There is concern that the capturing of adults may deter prospective breeders and so, for a second consecutive year, there was no adult banding on ELI, in order to give birds respite from human disturbance. The Black Oystercatcher monitoring program was expanded (in 2004) to include areas south of Laskeek Bay in Gwaii Haanas National Park Reserve/Haida Heritage Site. The field team monitored Black Oystercatcher breeding success and chick diet composition at 78 nesting territories in the survey area. In addition, they censused Glaucous-winged Gull colonies in Laskeek Bay and monitored the breeding activity of Cassin's Auklets (*Ptychoramphus aleuticus*) on ELI. And, for the first time, we found Pigeon Guillemot (*Cepphus columba*) chicks in the nest boxes on ELI that were originally installed in 2001.

Jo Smith of Birdsmith Ecological Research and the University of Washington (UW) continues to study the habitat use and foraging behaviors of mergansers (*Mergus* spp.) and petrels (*Pterodroma externa*) for her PhD at UW. Back home in Victoria, BC, Smith is working with **Jake Fraser** (Fraser Research and Development) to design a laminated color guide for coastal and offshore fishermen in Alaska, and is working with **Louise Blight** (Parks Canada, Vancouver, BC) to write a status report of the Black-footed Albatross (*Phoebastria nigripes*) for the Committee on the Status of Endangered Wildlife in Canada.

Peggy Yen, **Chris Rintoul**, **Bill**

Sydeman (PRBO Conservation Science), **Pat O'Hara** (CWS and UVIC), **David Hyrenbach** (Duke University Marine Lab) continued their collaboration with **Ken Morgan** (CWS, Sidney, BC) examining marine bird community structure and habitat associations from seabird surveys at sea. They participate in three annual 1500-km long Line P oceanographic surveys off the west coast of Vancouver Island which are conducted by the Canadian Department of Fisheries and Oceans (DFO). Yen, Rintoul, Sydeman, Morgan, and Hyrenbach also continue their collaboration with **Sonia Batten** (Sir Alister Hardy Foundation for Ocean Science, Nanaimo, BC), **David Welch** (DFO, Nanaimo, BC), and **Mike Henry** (University of British Columbia, Vancouver, BC) on the Continuous Plankton Recorder Project. This involves concurrent plankton sampling and observations of marine birds and mammals along a 6500-km transect from the coast of BC to the coast of Japan, passing through the Bering Sea.

Ken Morgan continues working with **Jo Smith** on seabird bycatch in commercial and experimental fisheries in BC. He notes that their long-awaited summary of the status of bycatch in commercial fisheries in BC will soon be published. He is also developing recovery teams for the Short-tailed Albatross (*Phoebastria albatrus*) and the Pink-footed Shearwater (*Puffinus creatopus*); both species were recently listed as Threatened under Canada's Species at Risk Act (SARA). In addition, Ken is collaborating with **David Hyrenbach** (Duke University Marine Lab) and **Peter Hodum** (UW) to develop tracking Pink-footed Shearwaters once they leave their breeding colonies in Chile (see the regional report for Hawaii and the Pacific).

Pat O'Hara (CWS and UVIC) and **Ken Morgan** continue working on the Birds Oiled At Sea (BOAS) project. The goal of the project is to assess the impact of chronic oil releases (accidental and deliberate) on seabirds off the west coast of Canada. Pat is mapping and analyzing

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vessel distribution (spatial and temporal), currents, winds, locations of observed discharges, and at-sea distribution of seabirds. His goal is to develop a model that will predict in space and time the probabilities of seabird encountering oil.

Harry Carter has returned to BC after 20 years of seabird work in California and is now working as a private consultant in Victoria (Carter Biological Consulting; carterhr@shaw.ca). His projects in 2005 included monitoring program and surveys for Xantus's Murrelets (*Synthliboramphus hypoleucus*) and Ashy Storm-Petrels (*Oceanodroma homochroa*) (see regional report for southern California), restoration of Common Murre colonies, and colony databases (see regional report for northern California). He also organized and is editing the 2005 joint PSG-Waterbird Society symposium on Xantus's Murrelets, and he is busy writing up various past projects from California.

MARBLED MURRELETS

Some of the highest densities of Marbled Murrelets (*Brachyramphus marmoratus*) in Canadian waters are found in the marine component of the West Coast Trail, which is part of the Pacific Rim National Park Reserve (Pac Rim NPR) on Vancouver Island, British Columbia (BC). **Danielle Bellefleur** (Pac Rim NPR) and **Pippa Shepherd** (Parks Canada, Vancouver, BC) have been studying the disturbance of Marbled Murrelets and other seabirds by boat traffic. They are monitoring reactions to vessels and estimating the distance from the boat that elicited the response. In order to determine the level of disturbance, Bellefleur also measures how far the birds flush and how long it takes them to resume feeding and/or return to their original location. The distribution of Marbled Murrelets and boats is also being monitored to determine whether murrelets are being displaced by boat traffic. The park is mandated to protect the murrelet under Canada's SARA legislation. This study

will help with park management to reduce conflicting uses that might otherwise harm the murrelet population, and will aid in protecting critical habitat.

Alan Burger (UVIC) is continuing research on Marbled Murrelets and other seabirds, mainly on Vancouver Island. With the assistance of **Ronan Eustace** and **Kristi O'Brien**, field work in 2005 focused on radar surveys for murrelets to wrap up the 4-year study on southwestern Vancouver Island. **Rick Page** (UVIC) was brought into the project to undertake GIS spatial analysis of murrelet habitat on Vancouver Island; this analysis is ongoing. Burger also worked with **Louise Waterhouse** (BC Ministry of Forests), **Alvin Cober** (BC Ministry of Environment), and **David (Dov) Lank** (Simon Fraser University) on the application of low-flying helicopter surveys to identify and analyze murrelet nesting habitat at several sites in BC.

Anne Harfenist (Harfenist Environmental Consulting) completed the second year of a 2-year baseline radar inventory of Marbled Murrelets in Haida Gwaii/Queen Charlotte Islands. The project was done in partnership with **Alvin Cober** (BC Ministry of the Environment) and the Gwaii Haanas National Park Reserve/Haida Heritage Site, with funding from the South Moresby Forest Replacement Account, Environment Canada, Cascadia, and British Columbia Timber Sales.

Cliff Robinson and **Pippa Shepherd** (both of Parks Canada, Vancouver, BC) have undertaken a GIS-based assessment of critical marine foraging habitats for Marbled Murrelets in the Pac Rim NPR. Data collected from 2003 through 2005 include: (1) at-sea Marbled Murrelet distribution/abundance data, (2) oceanographic and nearshore habitat data (including substrate type, bathymetry, rugosity of the seabed, sea surface temperature and salinity, currents, stratification and relative exposure), and (3) distribution, abundance, and variability data for two major Marbled Murrelet prey fishes: the Pacific sand lance (*Ammodytes*

hexapterus) and the Pacific herring (*Clupea pallasii*). It is anticipated that results of multivariate analyses and habitat suitability modeling will allow Parks Canada to identify and protect critical foraging habitats within the Park Reserve. Results will also be used to make predictions about critical Marbled Murrelet foraging habitats outside the park in areas where sufficient data exist to test the predictions using other databases.

Rob Ronconi has transferred into a PhD program at UVIC with **Alan Burger** (UVIC). Ron completed his second field season studying marine habitat selection of Marbled Murrelets and other alcids in Pac Rim NPR. Working in the field with Rob, **Nathan Hentze** (UVIC) is studying effects of boat disturbance on Marbled Murrelets. **Sarah Wong** also worked with this team and will be analyzing the distribution and habitat use of juvenile murrelets in Pac Rim.

ATLANTIC CANADA

John Chardine of CWS, Sackville, New Brunswick (NB) has been working on a couple of projects of interest to the PSG. Black-legged Kittiwakes (*Rissa tridactyla*) experienced breeding failure in the 1990s in eastern Newfoundland, and colonies have declined as a result. John has been looking at the role of the North Atlantic Oscillation (NAO) in explaining inter-annual variation in kittiwake breeding success and has found a strong negative correlation. When the NAO index is positive, kittiwakes do poorly, and when it is negative they do relatively well. He is looking at the interplay of the NAO, water temperatures by depth, season and capelin (*Mallotus villosus*, the kittiwake's favorite prey) as causative agents. In another project, John demonstrated that a marked decline in a copepod (*Calanus finmarchicus*) in surface waters around Deer Island, NB probably caused the disappearance of Red-necked Phalaropes (*Phalaropus lobatus*) from the area in the mid-1980s. Historically, the phalaropes used the area as a migratory stopover site to feed and fatten up for the migration to western

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South America. The local decline in abundance of the copepod appears to be a reflection of a broader-scale decline that has occurred over the Scotian Shelf and Gulf of Maine, and could be related to a general warming of marine waters in the region.

In August 2005 **Rob Ronconi** (UVIC) began a pilot project with Greater Shearwaters (*Puffinus gravis*) in the Bay of Fundy (NB).

In July and August 2005, **Tony Gaston** and **Kerry Woo** (CWS, Ottawa, Ontario), and **Kyle Elliott** (University of Manitoba, Winnipeg, Manitoba) visited Coats Island, in northern Hudson Bay for the 22nd year of Thick-billed Murre (*Uria lomvia*) and Glaucous Gull (*Larus hyperboreus*) population monitoring. It was a normal year, with good breeding success and healthy nestlings. Elliott deployed several depth-temperature loggers and obtained numerous records of diving behavior, which he will relate to prey that was subsequently delivered to nestlings. Gaston flew surveys in western Hudson Strait to look at distribution of murre in relation to distance from the colony.

Greg Robertson of CWS in St. John's, Newfoundland (NF) reports that most activity related to seabirds in the last year was emergency and incident response. CWS provided on-site observations of seabird numbers during the November 2004 *Terra Nova* FPSO (Floating, Production, Storage and Offloading) oil spill, which released 1000 barrels of crude. Upwards of 10,000 seabirds were estimated to have been impacted by this incident. Later that month, CWS worked with Canadian Coast Guard on an unrelated oil incident that led to the retrieval of 409 oiled seabird carcasses near Cape St. Mary's (NF). In late February 2005, oiled Common Eiders (*Somateria mollissima*) were reported in the vicinity of the Witless Bay Islands Ecological Reserve (NF). Based on helicopter surveys and ground counts, it was estimated that 1400 eiders were oiled in this incident.

Heavy hunting pressure on Common Eiders due to heavy ice conditions was

reported in February, and CWS personnel were deployed to collect data on the age and size of flocks and condition of shot birds.

In summer 2005, seabird surveys were conducted in southeastern Newfoundland, including intensive surveys of tern (*Sterna* spp.) colonies and an increased banding effort for Common Murres (*Uria aalge*).

WASHINGTON AND OREGON

Compiled by **Adrian Gall**

BREEDING COLONIES (EXCEPT MARBLED MURRELETS—SEE BELOW)

The Puget Sound Ambient Monitoring Program (PSAMP) of the Washington Department of Fish and Wildlife (WDFW) monitors selected breeding species in Puget Sound during the summer. Over the last 6 years, **David Nysewander**, **Joe Evenson**, **Bryan Murphie**, and **Tom Cyra** have focused on Black Oystercatcher (*Haematopus bachmani*) nesting in the northern inner marine waters of Washington State. Approximately 75 territories have been monitored each year. In May and June 2005 we documented breeding territories and incubation for most territories in this area, and we successfully implemented new methodologies using calls. Discussions were held to develop monitoring metrics that could be utilized in upcoming seasons by other field staff who are less familiar with Black Oystercatcher behavior. (For PSAMP's winter surveys see "Surveys at sea," below.)

Lee Robinson (USFWS) conducted a 12th season of monitoring on Protection Island National Wildlife Refuge (NWR). Assistants included Robinson's daughter, **Karen** (her 4th season there), and the island's caretaker, **Neil Holcomb**. They studied the productivity of a small colony of Pigeon Guillemots (*Cephus columba*). Protection Island NWR, a satellite refuge of Dungeness NWR, is

located 3.7 km off the mainland in the Strait of Juan de Fuca, Jefferson County, Washington. Fledging success went down for the 4th season in a row, from a high of 87% in 2001 to 39% in 2005. An interesting note is that adult birds caught in a previous year around the same time (and thus in the same part of the breeding cycle) weighed an average of 12 g more this year.

Nathalie Hamel and **Stephani Zador** are both working on their PhDs in the School of Aquatic and Fishery Sciences, University of Washington. Zador's research is on the population dynamics of Common Murres (*Uria aalge*). Hamel is assessing the population-level risk and demographic impact for Common Murres of bycatch in the gillnet fisheries of Washington and British Columbia. She spent the summer collecting data on Tatoosh Island, adding one more year to the long-term monitoring of murre breeding biology led by **Julia Parrish**.

Brian Cooper and **Peter Sanzenbacher** of ABR, Inc. worked with **Roy Lowe**, **Dave Ledig**, and **Dave Pitkin** of the U.S. Fish and Wildlife Service (USFWS) on a pilot study to determine the efficacy of using radar to study Leach's Storm-Petrels (*Oceanodroma leucorhoa*) at nesting colonies on the Oregon coast. Initial results were encouraging, and they hope to continue the pilot study during summer 2007.

Dan Roby, of Oregon State University (OSU) and the USGS-Oregon Cooperative Fish and Wildlife Research Unit, and his cooperators continued research on population status and diet composition of Caspian Terns (*Sterna caspia*) at representative colonies in coastal Washington. In 2005 they studied a recently established colony at Dungeness Spit, in Dungeness NWR on the Washington coast. The tern colony evidently formed for the first time in 2003. It was located on sandy substrate amongst driftwood, approximately one mile southwest of the Dungeness Lighthouse National Historic Site. The researchers estimated that there were

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approximately 680 breeding pairs in 2005, up from 233 to 293 breeding pairs in 2004. This is now the second largest Caspian Tern colony in the Pacific Northwest, after the one on East Sand Island in the Columbia River estuary. Approximately 780 fledglings were produced this year, corresponding to a nesting success of 1.15 young per nesting pair. This compares with 211 to 295 young fledged in 2004, or 0.80 to 1.12 per nesting pair. Nesting success at Dungeness Spit is considered good compared to other well-studied Caspian Tern colonies in the region. In 2005, as in 2004, the diet of terns at Dungeness NWR consisted mostly of surfperch (Embiotocidae; 35%) and salmonids (Salmonidae; 20%). Presumably some of the salmonid smolts consumed by this tern colony were released from the Dungeness Hatchery, located on the Dungeness River approximately 14 km upstream from the mouth. This year's Caspian Tern team included Roby, **Ken Collis** (Real Time Research [RTR]), **Kim Nelson**, **Kirsten Bixler**, **Jessica Adkins**, **Sarah Stieg**, **Lindsay Adrean**, **Yasuko Suzuki**, **Chris Couch**, **Don Lyons**, **Brendan Courtot**, **Anne Mary Myers** (all of OSU), **Allen Evans** (RTR), and a number of seasonal technicians and volunteers. The study was funded by USFWS.

A Final Environmental Impact Statement (FEIS) for Caspian Tern Management to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary was released in January 2005, according to **Nanette Seto** of USFWS in Portland, Oregon. The responsible agencies are USFWS, the U.S. Army Corps of Engineers, and National Oceanographic and Atmospheric Administration (NOAA)—Fisheries. The preferred alternative of the FEIS would redistribute a portion of the Caspian Tern colony that currently nests on East Sand Island in the Columbia River estuary, by managing tern nesting habitat at other sites in Washington, Oregon, and California. A decision on the FEIS is pending; it will be published and released in a Record of Decision.

[*Editor's note:* See also Roby et al.'s report on terns and cormorants in lower Columbia River elsewhere in this issue]

Tom Williamson, **Jeffery Reams**, **Devin Sahl**, and **Todd Martin** of Turnstone Environmental Consultants, Inc. performed landscape-level seabird inventories in conjunction with the potential development of a wind power facility on the Oregon coast. General avian use and breeding bird surveys were conducted on a wide variety of seabird and shorebird species.

MARBLED MURRELETS

The status and trend of Marbled Murrelet (*Brachyramphus marmoratus*) populations and nesting habitat are monitored as part of an interagency program to evaluate the effectiveness of the Northwest Forest Plan (NWFP), according to **Mark Huff** of USFWS. A report on this project is forthcoming: "The Northwest Forest Plan—the first 10 years: status and trends of populations and nesting habitat for the Marbled Murrelet," by Huff, **Martin Raphael**, **Sherri Miller**, **Kim Nelson**, and **Jim Baldwin**; Pacific Northwest Research Station General Technical Report PNW-GTR-650, in press. The five-chapters include a literature review of ecological information on Marbled Murrelets (Nelson et al.), population status and trend results from 2000 to 2003 (Miller et al.), habitat modeling using ground-based vegetation inventories measured at regular intervals (Huff et al.) and interpreted satellite imagery (Raphael et al.). The results were also presented in April 2005 at the conference "Science and the Northwest Plan: Knowledge gained over decade."

Marbled Murrelets have been monitored annually from boats since 2000, covering approximately 3,400 mi² of coastal waters adjacent to the Plan area. Population estimates range from 18,500 to 29,000 birds on any single day, with 95% confidence. These estimates suggests that only a small fraction of the total population (maybe 2 to 3%) is found in the Washington, Oregon, and California portion of the range, the

remainder being northward along the Pacific coast to the Aleutian Islands in Alaska. The largest population was in the Puget Sound and the Strait of Juan de Fuca; the highest densities were along the coast of Oregon and California, north of the Humboldt-Mendocino county line. The smallest population and lowest density were from the Humboldt-Mendocino county line south approximately 200 mi to San Francisco Bay. Population estimates did not change significantly during the first four years of monitoring. Habitat models indicated that Washington had the highest amount of high-quality potential nesting habitat in federally reserved lands, 44% of the total; Oregon and California had 36 and 20%, respectively. Across all lands in the Plan area, approximately 40% of high-quality potential nesting habitat occurred on non-federal lands.

Martin Raphael and **Tom Bloxton**, of the U.S. Forest Service's Pacific Northwest Research Station in Olympia, Washington, continued collaborative studies on Marbled Murrelets in Puget Sound, Strait of Juan de Fuca, and Hood Canal during 2005. Along with researchers elsewhere in Washington, Oregon, and northern California, they completed the 5th year of long-term population monitoring of Marbled Murrelets under the NWFP. We surveyed Recovery Zone 1, including the San Juan Islands to Olympia in Puget Sound and the Strait of Juan de Fuca, for murrelets and other seabirds and marine mammals. We also continued collection of baseline data on within-season and annual changes in distributions, densities, and productivity indices of murrelets in the San Juan Island archipelago.

The second full season of capturing and radio-tagging murrelets at sea in the Strait of Juan de Fuca and Hood Canal yielded 40 tagged adults. We located 8 nests, 4 in Olympic National Park, 2 in Olympic National Forest, and 2 on Vancouver Island. This work was completed with support and cooperation from **Richard Bigley** of the Washington Department of Natural Resources (WDNR). We also trapped 27 murrelets

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along the Oregon Coast in the vicinity of Alsea Bay. We collected blood samples from these birds to contribute to ongoing genetics studies led by **Vicki Friesen** (Queen's University) with cooperation from **Zach Peery**. The objective is to evaluate the genetic similarity of subpopulations of murrelets throughout their range.

We completed work on a map of potential murrelet nesting habitat in Washington, Oregon, and California, as part of the collaborative mapping effort under the NWFP. A habitat suitability map was derived from a region-wide, satellite-based vegetation map developed by the Forest Service and Bureau of Land Management, in support of monitoring efforts throughout the Pacific Northwest.

Tom Williamson, Jeff Reams, Devin Sahl and **Todd Martin** of Turnstone Environmental Consultants, Inc. (TECI) were contracted by WDNR and the Oregon Department of Forestry to perform inland Marbled Murrelet surveys. We conducted intensive surveys in both states in accordance with PSG's Marbled Murrelet Survey Protocol. The work supports WDNR's habitat conservation plan for state forest lands in northwestern Washington State. Biologists **Terry Carten** and **Peter McBride** were WDNR's district representatives. We performed 349 surveys at 62 sites. TECI also delineated Marbled Murrelet habitat for 700 km² in the same region.

In Oregon, TECI surveyed Marbled Murrelets on state forest lands in accordance with the PSG protocol and ODF's Marbled Murrelet Management Plan. Surveys were conducted in suitable habitat on and adjacent to specified sites in 7 ODF districts in Oregon's Coast Range (Astoria, Tillamook, Forest Grove, Western Lane, Coos Bay, Southwest and West Oregon). 1490 surveys were performed at 200 sites. District representatives for ODF were **Diana Ison** and **Jenny Laughman** in Astoria, **Kate Skinner** in Tillamook, **Laurie Brown** in Forest Grove, **Tom Mickel** in Western Lane, **Norma Kline** and **Ryan Greco** in Coos Bay, **Chris**

Rudd in Southwest Oregon, and **Eric Foucht** in West Oregon. **Matt Gostin** was the contract administrator and primary ODF contact.

A long-term radar monitoring study of Marbled Murrelets in the City of Seattle's Cedar River Watershed was initiated in 2005 by **Brian Cooper, Jeff Barna**, and **Peter Sanzenbacher** of ABR, Inc. - Environmental Research and Services.

OFFSHORE STUDIES

David Nysewander, Joe Evenson, Bryan Murphie, and **Tom Cyra** of WDFW are continuing monitoring studies associated with the marine bird and mammal component of PSAMP. Winter continues to be our busiest field period, focusing on two aspects: (1) low-level aerial surveys censusing all species of waterbirds in the marine waters of Puget Sound and the Strait of Juan de Fuca, and (2) tracking of scoters (*Melanitta* spp.) that winter in western Washington, through satellite- and radiotelemetry.

The winter aerial surveys of marine birds and waterfowl that started in 1992 cover some portion of all the inner marine waters of western Washington. The past winter's surveys were conducted in Dec 2004-January 2005; they will be repeated in December 2005-January 2006. Maps of densities for selected species and other data products are now available for the winters of 1992-2004 and the summers of 1992-1999 at <http://wdfw.wa.gov/mapping/psamp/>. These data may also be accessed through the Wildlife Resources Data Section of WDFW in Olympia by contacting **Shelly Snyder** at 360-902-2483.

New funding sources are supporting multi-year studies that began in February 2003. Projects that are ongoing or proposed include radio- and satellite tracking of declining wintering concentrations of scoter, loon (*Gavia* spp.), and grebes (Podicipedidae) in the inner marine waters. In the past three winters we have focused on White-winged Scoters (*Melanitta fusca*) and Surf Scoters (*M. perspicillata*). Satellite

tracking showed that individuals followed from Washington breed in the Northwest Territories and northern Alberta and Saskatchewan, Canada. Males returned to northwestern marine waters for molting within two months, and all females usually returned to Washington waters by the end of September. In the second and third years (2004-2005), we expanded the research to include VHF telemetry and concentrated on four locations in Puget Sound. The study is continuing to reveal many new insights into habits and characteristics of these wintering populations, such as nocturnal concentrations. We also have found intraspecific differences in routes, staging, and nesting area within flyway populations. The project is expected to continue until 2006-2007. Any questions or interest should be directed to **Joe Evenson** (360-902-8137) or **Dave Nysewander** (360-902-8134).

Eric Anderson is continuing his graduate research on Surf (*Melanitta perspicillata*) and White-winged Scoters in the Puget Sound region, assessing the adequacy of winter habitat to allow pre-migration fattening relative to use of herring spawn in the spring. He is working under **Jim Lovvorn** at the University of Wyoming.

Barbara Blackie of the Olympic Coast National Marine Sanctuary (OCNMS) reports that a successful at-sea seabird (and marine mammal) survey was conducted in June. For the first time, OCNMS collaborated with Southwest Fisheries Science Center. The sanctuary project (track lines within the sanctuary) was rolled into the larger Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (CSCAPE), which covers the U.S. West Coast to 300 nm offshore. It was delightful to collaborate with **Lisa Ballance, Karin Forney**, and their crew. The joint effort will add a more in-depth oceanographic component to OCNMS's long-term monitoring data. Two hot bird observers, **Cornelia Odekoven** and **Scott Mills**, joined Blackie for the bird portion of the cruise (many thanks!). Because slightly

different track lines were established, year-to-year comparisons have not yet been analyzed. However, in general we saw fewer large aggregations of shearwaters (*Puffinus* spp.) this year than in 2004, and many more South Polar Skuas (*Catharacta maccormicki*) than previous years.

Rob Suryan (Oregon State University) is continuing his work on satellite telemetry of Short-tailed Albatrosses (*Phoebastria albatrus*) in the North Pacific during the non-breeding season, in cooperation with the Japanese Ministry of Environment (**Noriko Moriwake**), USFWS (**Greg Balogh**), and **Paul Sievert** (University of Massachusetts, U.S. Geological Survey). New projects for Suryan include telemetry of Black-footed (*P. nigripes*) and Laysan (*P. immutabilis*) Albatrosses in Alaska. **Karen Fischer**, who is starting her MS under **Dan Roby**, will investigate the habitat use and spatial and temporal overlap of Black-footed and Laysan Albatrosses with commercial fisheries during the non-breeding season. Their joint project will compare the ecology and fisheries interactions of all three species. They also are collaborating with related studies in California and Hawaii. More details are in the regional report for Alaska.

Conservation efforts this past year included presentations to promote awareness and at-sea conservation of the Short-tailed Albatross and other seabirds. Information and maps from their satellite tracking work have been posted on the Albatross Project website (www.wfu.edu/albatross/), with the cooperation of **Dave Anderson** (Wake Forest University). Rob is also investigating inter-species comparisons of albatross flight morphometrics and the use of wind systems in the central and north Pacific, in collaboration with **Scott Shaffer** and **Yann Tremblay** (Tracking of Pacific Pelagics, University of California at Santa Cruz) and **Dave Anderson**.

Yes, Rob is still synthesizing data collected during the Alaska Predator Ecosystem Experiment. And he is

inching down the home stretch on his dissertation.

NORTHERN CALIFORNIA

Compiled by **Esther Burkett**

COLONY STUDIES

Following up on past foraging ecology studies of Cassin's Auklet in the Channel Islands and surrounding ocean, **Adams, Harvey, and Nevins** initiated a study of the diving behavior, activity budgets, and diet of parent birds during the chick-provisioning period at Prince Island and Scorpion Rock. Adams has enrolled in the University of Otago, Dunedin, New Zealand and is starting work toward a PhD in Zoology under **Henrik Moller**.

A cooperative agreement was signed in August 2005 between the USFWS and Meadowsweet Dairy (a group of environmental artists) to construct nesting habitat for Common Murres on Southeast Farallon Island, Farallon National Wildlife Refuge (NWR). Habitat for an estimated 100-200 breeding pairs will be constructed by piling concrete rubble to resemble nesting ledges. Concrete from old building foundations will be removed from deep soil areas, which also will create additional nesting habitat for burrowing seabirds, including Cassin's Auklet and Rhinoceros Auklet. The nesting ledge will incorporate an observation blind so that PRBO Conservation Science can monitor the success of the recolonization effort. The project was funded by the *Command* Oil Spill restoration funds. Design and preliminary construction phase are planned for fall 2005-winter 2006, and completion of the project is expected in fall 2006. The primary contact is **Joelle Buffa**, Manager, Farallon NWR.

Harry Carter (Carter Biological Consulting, Victoria, British Columbia) assisted in the Common Murre Restoration Project in central California.

He also is working on GIS databases for seabird colonies and roosts in California.

Oregon State University and its cooperators continued research on colony status and diet composition of Caspian Terns (*Sterna caspia*) at representative colonies in coastal habitats of northern California. A total of approximately 1010 breeding pairs nested in the San Francisco Bay area in 2005, down from approximately 1,350 breeding pairs in 2004. The terns nested at 5 known colonies in 2005—Brooks Island, Knight Island, A-7 Pond, Agua Vista Park, and Coyote Hills Salt Ponds. In 2003 and 2004, Caspian Terns in San Francisco Bay nested at Brooks Island, Knight Island, Baumberg Pond, A-7 Pond, and Agua Vista Park. In all three years the largest Caspian Tern colony was on Brooks Island (approximately 87% of the total in 2005).

In 2005 as in 2004, marine forage fishes were the predominant prey types for terns nesting at the Brooks Island colony, in particular surfperch (Embiotocidae), anchovies (Engraulidae), and silversides (Atherinidae). At the Knight Island colony, however, salmon smolts were the most prevalent prey (36.2% of items), consisting mostly or entirely of Central Valley fall-run chinook salmon (*Oncorhynchus tshawytscha*) (which is not listed under the Endangered Species Act). Juvenile salmonids remained a relatively minor proportion of the diet (< 4%) at the other four colonies.

Nesting success at each colony ranged from 0.00 to 1.00 young fledged/breeding pair in 2005. Success was lower on the whole in 2005 (0.32 young fledged/breeding pair), than in 2004 (0.42 young fledged/breeding pair). The level of productivity at colonies in the San Francisco Bay area over the past three years is considered fair to poor, compared to other well-studied Caspian tern colonies in the region. In 2005, numbers nesting at all five colonies appeared to be primarily limited by the availability of suitable nesting habitat above the higher high tide line. Breeding

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success at the colonies was primarily limited by tidal inundation of active nests, human disturbance, and nest predation by gulls. Low food availability apparently contributed to lower success in 2005, both directly (through low intake by chicks) and indirectly (through greater nest predation and sensitivity to disturbance).

Participants in the study included Oregon State University (OSU), Real Time Research (RTR), and U.S. Geological Survey. This year's research team included **Dan Roby** (OSU), **Ken Collis** (RTR), **Kim Nelson**, **Keith Larson**, **Jessica Adkins**, **Anja Schiller**, **Yasuko Suzuki**, **Don Lyons**, **Brendan Courtot**, **Chris Couch**, **Anne Mary Myers**, and **Rob Suryan** (all of OSU), **Allen Evans** (RTR), and a number of volunteers. The study was funded by the U.S. Army Corps of Engineers, with logistic support and technical assistance from the East Bay Regional Parks, U.S. Fish and Wildlife Service, Don Edwards National Wildlife Refuge, California Department of Fish and Game, and San Francisco Bay Bird Observatory.

OFFSHORE STUDIES

Zach Peery received his PhD in Environmental Science, Policy, and Management from the University of California, Berkeley in December 2004. His research focused on the ecology of Marbled Murrelets (*Brachyramphus marmoratus*) in California. He has recently begun joint post-doctoral research positions at Moss Landing Marine Laboratories with **Jim Harvey** and the University of California, Berkeley with **Per Palsbøll**. He will continue to study the population ecology, genetic population structure, and foraging behavior of Marbled Murrelets. One project will involve assessing the effectiveness of the Pacific Lumber Company's Habitat Conservation Plan for the Marbled Murrelet population in northern California. Peery also will be involved in conducting a population viability analysis for the California Least Tern (*Sterna antillarum browni*) in collaboration with **Carolee Caffrey** of the Audubon Society.

Aerial surveys of marine birds and mammals in California continental shelf waters are continuing under **Jeff Davis**, **Laird Henkel**, **Brad Keitt**, **Tonya Haff**, **Glenn Ford**, and **Breck Tyler**, Principal Investigator (University of California, Santa Cruz [UCSC]). The surveys are done under a contract with the California Department of Fish and Game's Office of Spill Prevention and Response (**Paul Kelly**). They are designed to collect baseline distribution and abundance data and to maintain rapid-response capabilities for oil spills. During the past year, the surveys focused primarily on waters in Monterey Bay, off Big Sur, and in the Gulf of the Farallones.

Josh Adams (USGS-Western Ecological Research Center, Moss Landing Marine Laboratories, CA), **Jim Harvey** (MLML) and collaborators **David Hyrenbach** (Duke University, NC), **Cheryl Baduini** (Claremont Colleges, CA), **Hannah Nevins**, and **Scott Shaffer** and **Dan Costa** (Tagging of Pacific Pelagics [TOPP] at UCSC) are tracking the movements and habitat use of Sooty Shearwaters (*Puffinus griseus*) within the California Current System and beyond for a second season. Daily updates of the data are available to the public at: http://www.seaturtle.org/tracking/?project_id=85 and http://las.pfeg.noaa.gov/TOPP_recent/index.html

Adams has also just completed the second year of studies on Ashy Storm-petrel (*Oceanodroma homochroa*) population and foraging ecology off southern California, using mark-recapture methods and radiotelemetry. His collaborators are **John Takekawa** (USGS) and **Paige Martin** (Channel Islands National Park), and with support from the U.S. Navy. Genetic samples are being archived at Claremont Colleges (**Cheryl Baduini**). Preliminary molecular sexing data have been analyzed and presented in a senior thesis by **Amita Patel** (Claremont Colleges).

The TOPP project is working in several parts of the Pacific, reports **Scott A. Shaffer**. Study subjects include albatrosses (*Phoebastria* spp.) at

Guadalupe Island, México (see regional report for southern California) and Tern Island, Hawaii (see regional report for Hawaii and the Pacific). To date, TOPP has tracked over 160 individual albatrosses at these two sites combined, using satellite transmitters. Other studies include tracking of shearwaters at Juan Fernandez Islands, Chile and off New Zealand (see regional report for Hawaii and the Pacific). TOPP has also begun collaborating with **Josh Adams** of USGS and **Jim Harvey** of Moss Landing Marine Labs to track the movements of Sooty Shearwaters in California waters. They hope to continue this work next season.

SOUTHERN CALIFORNIA

Compiled by **Dan Robinette**

COLONY STUDIES

Kathy Keane (Keane Biological Consulting) continues to monitor the breeding biology and foraging ecology of the California Least Tern (*Sterna antillarum browni*) in the Los Angeles and Long Beach Harbors, where nest numbers continue to increase annually (over 1300 nests this year, up from 565 in 2000 and 1071 in 2004). Chick banding and recaptures are used to estimate fledgling success.

Paige Martin (Channel Islands National Park) monitored the breeding effort and success of Xantus's Murrelets (*Synthliboramphus hypoleucus*) and California Brown Pelicans (*Pelecanus occidentalis*) at Santa Barbara Island. This project was part of the long-term monitoring program established in the national park in 1985.

Bill McIver and **Christine Hamilton** (U.S. Fish and Wildlife Service, Ventura, California) and **Harry Carter** (Carter Biological Consulting, Victoria, BC, Canada) monitored breeding effort and success of Ashy Storm-Petrels (*Oceanodroma homochroa*) in sea caves and on offshore rocks at Santa Cruz Island, with

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assistance from **Sarah Fangman** and **Kate Peet** (Channel Islands National Marine Sanctuary, Santa Barbara, California), **Paige Martin**, **Esther Burkett** (California Department of Fish and Game, Sacramento), and several volunteers. Annual monitoring and research on Ashy Storm-Petrels has occurred there since 1994. A long-term monitoring and restoration program is envisioned for the future.

Cheryl Baduini (Claremont Colleges) and her undergraduate students are using molecular techniques for gender identification, population structure, and sex bias of Ashy Storm-Petrels off the Southern California Channel Islands, in collaboration with **Josh Adams** (U.S. Geological Survey).

Dan Robinette, **Julie Lanser**, and **Elizabeth Rogan** (PRBO Conservation Science, Marine Ecology Division) completed their 7th year of an anticipated long-term research program at Vandenberg Air Force Base (VAFB), California. **Nancy Read Francine** (VAFB) has been fundamental in keeping this project funded. Species of interest include Brown Pelicans, Pigeon Guillemots (*Cepphus columba*), Brandt's Cormorants (*Phalacrocorax penicillatus*), Pelagic Cormorants (*P. pelagicus*), California Least Terns, Black Oystercatchers (*Haematopus bachmani*), Western Gulls (*Larus occidentalis*), Ashy Storm-Petrels, Rhinoceros Auklets (*Cerorhinca monocerata*), Sooty Shearwaters (*Puffinus griseus*), and Pacific Loons (*Gavia arctica*). Research includes data collection on population dynamics, breeding biology, foraging habits, diet, roost utilization, and migration. Most data are collected during the breeding season, but data on roost utilization are collected year around.

PRBO also has completed the 6th year of a nearshore foraging study monitoring the use of the Vandenberg Marine Ecological Reserve by seabirds and marine mammals. In 2004, they expanded this study to include monitoring the use of rocky intertidal areas inside and adjacent to the marine reserve by Black Oystercatchers.

PRBO's goal is to further expand this work to include monitoring the use of newly established marine protected areas at the Channel Islands. Other future goals include: (1) investigating the use of Pigeon Guillemots as indicators of sanddab (*Citharichthys* sp.) recruitment to waters on the leeward and windward sides of the Point Arguello Promontory, and (2) initiating a study on the effects of northern anchovy (*Engraulis mordax*) abundance and physical oceanographic variables on the reproductive success of California Least Terns statewide. PRBO has identified a significant positive relationship between the proportion of northern anchovies in the diet of Least Terns and their reproductive success at VAFB. In 2004 and 2005, anchovies were absent in diet samples and the terns experienced reproductive failures.

Harry Carter worked with the California Institute of Environmental Studies to develop a seabird monitoring program for Xantus's Murrelets on the Coronados Islands, Baja California, México, where a construction of a liquid natural gas terminal is planned by the ChevronTexaco Corporation in the next few years. Carter also conducted a preliminary survey of Xantus's Murrelets at Islas Todos Santos, México.

SHOREBIRDS

Pat Baird (Kahiltna Research Group, California State University Long Beach) has finished a collaborative study with **Ron Ydenberg** (Centre for Wildlife Ecology, Simon Fraser University, Canada) and **Xico Vega** (Pro Natura, Mexico) on migration of Western Sandpipers (*Calidris mauri*). They radio-tagged about 90 sandpipers in Panama Bay and Bahia de Santa Maria near Culiacan and followed their migration up the coast to central California. **Kim Mathot** (Simon Fraser University), **Audrey Taylor** (University of Alaska Fairbanks), **Miguel Gueverra** (Pro Natura), and a number of other assistants from Pro Natura, helped in the study. Results of this research will be presented at the Shorebird Science in the Western Hemisphere meeting in Boulder,

Colorado in February 2006. The group will be continuing their work this coming season; they will expand monitoring, compare results with 20 years of historical data, and obtain contaminant samples. They are also establishing a series of teaching units for schools from Panama to Alaska, with the help of Shorebird Sister Schools and **Sue Thomas**, and with **Rosabel Miro**, Panama Audubon, and **Xico Vega**.

OFFSHORE SURVEYS

Phil Capitolo, **Jeff Davis**, **Laird Henkel**, and **Breck Tyler**, Principal Investigator (University of California, Santa Cruz [UCSC]) are conducting aerial photographic surveys of Brandt's and Double-crested (*Phalacrocorax auritus*) Cormorant colonies in southern California. They are under contract with the California Department of Fish and Game's Office of Spill Prevention and Response (CDFG-OSPR; **Paul Kelly**). These surveys are scheduled through 2007. They are continuing the annual surveys of cormorant populations in southern California that Humboldt State University conducted from 1991 to 2003.

Jeff Davis, **Laird Henkel**, **Brad Keitt**, **Tonya Haff**, **Glenn Ford**, and **Breck Tyler**, Principal Investigator (UCSC) conducted surveys off southern California as part of response efforts for the Ventura Harbor Mystery Spill in January 2005. These surveys were also funded by CDFG-OSPR.

Lisa Ballance and **Robert Pitman** are conducting two large-scale ecosystem surveys in the Pacific, each a part of a larger cetacean and ecosystem assessment survey sponsored by the National Oceanographic and Atmospheric Administration (NOAA). The Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem (CSCAPE) is a survey of the California Current from the California-Mexico border to the Washington-Canada border, extending to 300 nm from land. The survey is being conducted aboard two NOAA research vessels during 151 sea days from Jun through Dec 2005. Tracklines are evenly spaced about 40

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nm apart throughout the study area. Further information is at <http://swfsc.nmfs.noaa.gov/PRD/PROJECTS/CSCAPE/default.htm> (For the second survey see the regional report for Hawaii and the Pacific.)

Bill Henry, a Ph.D. student of **Donald A. Croll**, University of California, Santa Cruz (UCSC), will be tracking Laysan Albatrosses (*Phoebastria immutabilis*) at Guadalupe Island, México. This is one aspect of the Tagging of Pacific Pelagics (TOPP) (see also the regional report for Northern California).

Cheryl Baduini, in collaboration with Oikonus Ecosystem Knowledge and **K. David Hyrenbach**, and Baduini's students are assessing Black-footed Albatross (*Diomedea nigripes*) populations and their overlap with longline fisheries, in an effort to reduce bycatch off California and across the North Pacific. As of October 2005 they have deployed satellite transmitters on 18 individuals (9 males and 9 females) and have determined that all birds originated from Hawaiian breeding populations.

HABITAT RESTORATION

Kathy Keane conducts surveys for non-seabird endangered species in southern California wetlands and is working on several wetland restoration projects. In 2003 she supervised biological baseline studies for a restoration site in Upper Newport Bay, and in 2006 she will oversee quarterly bird surveys at Batiquitos Lagoon near San Diego, ten years after its restoration. She is currently involved in the design of a conceptual restoration plan at the Ballona Wetlands in west Los Angeles for the California Coastal Conservancy. Her involvement will ensure that the plan includes habitat enhancement and creation for seabirds and other waterbirds. Kathy is currently living part-time off the grid, south of San Felipe on the western shore of the Sea of Cortez.

OTHER NEWS

George Hunt has moved from the University of California at Irvine to the

University of Washington in Seattle. (See the regional report for Oregon and Washington for his projects.)

Cheryl Baduini (Claremont Colleges) will participate this semester in co-teaching a Tropical Ecology course near Dominical, Costa Rica. This course is part of an undergraduate study abroad program at Pitzer College.

NON-PACIFIC UNITED STATES

Summarized by **Melanie J. Steinkamp**

Patrick Jodice (U.S. Geological Survey, South Carolina Cooperative Fish and Wildlife Research Unit) and **Lisa Ferguson** (Clemson University) continued their study of reproductive ecology of Brown Pelicans (*Pelicanus occidentalis*) along the South Carolina coast. The goal of the study is to measure survival, growth, and condition of pelican chicks in relation to tick infestation. They have collected data on growth rates and survival from two colonies in two years. They are working with **Katie O'Reilly** (University of Portland) to assess baseline and acute levels of corticosterone in pelican chicks in relation to tick infestation. They also are collaborating with South Carolina Department of Natural Resources staff to conduct an analysis of long-term trends in nest counts of pelicans, Royal Terns (*Sterna maxima*), and Sandwich Terns (*S. sandvicensis*) in South Carolina.

Jeff Spendelow of the U.S. Geological Survey, Patuxent Wildlife Research Center (PWRC) continues to coordinate PWRC's long-term cooperative research project on the metapopulation dynamics and ecology of Roseate Terns (*Sterna dougallii*) in the Massachusetts–Connecticut–New York region. Similar to 2004, the majority of fieldwork in 2005 was conducted in Buzzards Bay, Massachusetts (BBMA), in collaboration with Buzzards Bay Tern Project (BBTP) staff under the direction of **Carolyn Mostello** (Massachusetts

Division of Fisheries & Wildlife). Spendelow also spent a few days at his former study site at Falkner Island, Connecticut, helping the staff of the Stewart B. McKinney National Wildlife Refuge band Roseate Tern chicks and identify adults (including some that had moved there from BBMA). In August, with help from staff of the Massachusetts Audubon Society, he scouted out sites on Cape Cod, Massachusetts, for future studies during the post-breeding dispersal of Roseate Terns (from mid July into August).

There was a fair amount of intercolony movement of Roseate Terns in BBMA during the 2005 field season, as in previous years. For example, more than 100 Roseate Tern nests were found in 2005 at Penikese Island, which was colonized by roughly 250 pairs in 2003, but where fewer than 10 pairs nested in 2004. With assistance from BBTP staff, Spendelow trapped and color-banded more than 700 adult Roseate Terns (about 20% of the BBMA breeding population of this endangered species) at this year's 3 BBMA colony sites. He, Mostello, and colleagues will be analyzing capture-recapture data collected throughout BBMA to determine which birds recolonized Penikese Island in 2005. Collaborative work with **Patricia Szczyz** (now at Wayne State College, Nebraska) and **Ian Nisbet** (I.C.T. Nisbet & Co., Falmouth, MA) on the sex ratio and early growth patterns of Roseate Tern chicks during five breeding seasons at Falkner Island will be published in 2005 in *Waterbirds*. Two earlier papers were mentioned in the 2004 regional report.

Paul Sievert (U.S. Geological Survey, Massachusetts Cooperative Fish and Wildlife Research Unit) is continuing his work on satellite telemetry of the Short-tailed Albatross (*Phoebastria albatrus*), and is doing population viability analyses for this species as a member of its recovery team. More information is in the regional report for Alaska. In January, Sievert began working with **Javier Arata** (University of Massachusetts Amherst) on a status assessment of Laysan Albatrosses

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(*Phoebastria immutabilis*) and Black-footed Albatrosses (*Phoebastria nigripes*) for USFWS.

At the University of Wyoming, **Jim Lovvorn** and his students **Jason Kolts** and **Chris North** are continuing studies of the food webs of wintering Spectacled Eiders (*Somateria fischeri*) in the Bering Sea; see the regional report for Alaska. Lovvorn's graduate student **Sam Richman** is continuing measurements of the costs of thermoregulation and diving by White-winged Scoters (*Melitta fusca*), which will be applicable to field projects in San Francisco Bay and Puget Sound by **Susan Wainwright**, **John Takekawa**, **Eric Anderson**, **Tory Poulton**, and Lovvorn. Richman also collected Cassin's Auklet (*Ptychoramphus aleuticus*) chicks from Triangle Island, British Columbia in July, and has raised them in captivity for work on costs of thermoregulation and diving. Lovvorn's student **Eric Anderson** is continuing research on Surf (*Melanitta perspicillata*) and White-winged Scoters in the Puget Sound region, Washington; see the regional report for Oregon and Washington.

Don Dearborn (Bucknell University), **Angela Anders** (Pennsylvania State University), and **Frans Juola** (University of Miami) continued their work with Great Frigatebirds (*Fregata minor*) at French Frigate Shoals, Hawaii, in 2005. Further information is in the regional report for Hawaii.

Robin M. Overstreet and **Stephen Curran** (Gulf Coast Research Laboratory, The University of Southern Mississippi, Ocean Springs [USM]) have recently published on all the known parasites from the American white pelican (*Pelecanus erythrorhynchos*), trematodes from various aquatic birds that produce mortality in aquacultured catfish, and new digenean species from pelicans. Another paper was published along with Andrew Mitchell (U.S. Department of Agriculture, Stuttgart, Arkansas), Andrew Goodwin (University of Arkansas, Pine Bluff), and Thomas Brandt (USFWS, San Marcos, Texas) in

which they discuss a trematode infecting at least the Green Heron (*Butorides virescens*), a larval stage of which kills or harms a variety of fishes, including endangered species. Research is presently underway at USM on trematodes (flukes) and ascaridoid nematodes (roundworms) of the genus *Contracaecum* that infect aquatic birds, as well as on some parasites that infect birds from Lake County, Oregon (Summer Lake Wildlife Area), and from other areas throughout the world.

Lisa Sorenson (Boston University) has been working with the Society for the Conservation and Study of Caribbean Birds to promote seabird awareness and conservation. They have developed a suite of educational and outreach products, including Seabird Identification Cards, A "Seabirds of the Caribbean" Poster, and a Powerpoint slide presentation for distribution on CD. The materials are for distribution to natural resources agencies and environmental educators throughout the Caribbean, and to cruise ship lines and other users of the Caribbean Sea. The purpose is to raise awareness about the loss of Caribbean seabirds. They aim to teach identification and natural history of breeding residents and common migrants, how and why populations have declined, and conservation actions that can be taken.

Also under the auspices of Society of Conservation and Study of Caribbean Birds, **Patricia Bradley** (National Trust for the Cayman Islands) is working on a companion volume to Schreiber and Lee (2000), which will provide island-by-island accounts of seabird distribution in the Caribbean and South American associated islands, using up-to-date information. This effort is supported by land and water-based surveys at breeding sites in the Lesser Antilles, conducted by **Natalia Collier**, **Adam Brown**, **Michelle Hester** (all of EPIC -Environmental Protection in the Caribbean), **Brandon Hay** (Caribbean Coastal Area Management Foundation), **Ann Sutton** (The Nature Conservancy, Jamaica), and others.

A number of regional plans associated with Waterbird Conservation for the Americas have been drafted or completed. **Gary Ivey** and **Caroline Herziger** (independent consultants) have compiled the Intermountain West Waterbird Conservation Plan (IWWCP) to fill information gaps. This plan will aid in conservation efforts for all birds of the Intermountain West Joint Venture, 11 States, and other entities in the IWWCP area. The plan emphasizes that the success of activities outlined in it should be measured by monitoring both habitats and species. A monitoring strategy should exist for focal species and important habitats. For species that have limited data on population size and trends (or no data), monitoring and research to fill these gaps should be identified. An Intermountain West Waterbird Working Group will coordinate closely with the Intermountain West Joint Venture to incorporate waterbird habitat objectives into joint venture projects, and to help develop a monitoring and evaluation system for them.

Stefani Melvin has been hired as the Assistant Non-Game Migratory Bird Coordinator in USFWS's Southeast Region. In that position, she will oversee the completion of the Southeast U.S. Region Waterbird Conservation Plan, with co-authors **Chuck Hunter** (USFWS) and **Walker Golder** (North Carolina Audubon). The plan lays out recommended conservation priorities for waterbirds, with a list of major actions for each category of activities in the Plan. Action items are related to habitat conservation, specific species actions, research and monitoring, and education and outreach.

HAWAI'I AND THE PACIFIC

Laysan and Black-footed Albatrosses (*Phoebastria immutabilis* and *P. nigripes*) will be tracked at Tern Island, Hawaiian Islands during the incubation and brooding periods. This

will be the 4th consecutive field effort by the Tagging of Pacific Pelagics (TOPP) project at the University of California, Santa Cruz (UCSC). **Michelle Antolos**, a Ph.D. student of **Scott A. Shaffer** and **Daniel P. Costa**, will be working at Tern Island. More recoveries and deployments will be conducted using geolocation tags as well. (See Shaffer et al., *Marine Biology* 147, 2005.)

Don Dearborn (Bucknell University), **Angela Anders** (Pennsylvania State University), and **Frans Juola** (University of Miami) continued their work with Great Frigatebirds (*Fregata minor*) at French Frigate Shoals, Hawaii, in 2005. A major focus is on issues relating to mate choice, including links between male parasite loads, male courtship effort, parental care, genetic compatibility of mates, and immunocompetence of offspring. Basic demographic data were also collected and, with **B. A. Schreiber** (Smithsonian Institution), a pilot project was begun using satellite telemetry to assess foraging areas during chick-rearing.

Lisa Ballance and **Robert Pitman** are conducting two ecosystem surveys over a large spatial scale in the Pacific. Each survey is a part of a larger cetacean and ecosystem assessment survey, the (Pacific Islands Cetacean and Ecosystem Assessment Survey (PICEAS), a study of the central tropical Pacific between the main Hawaiian Islands, Palmyra Island, and Johnston Atoll, which is sponsored by the National Oceanographic and Atmospheric Administration (NOAA).

The survey is being conducted aboard one NOAA research vessel during 120 sea days from July to November 2005. Tracklines are evenly spaced throughout the study area approximately 80 nm apart. For both projects, seabird data are collected continuously (daylight hours) using 300 m strip transects. In addition, a comprehensive suite of ecosystem samples is collected, including physical and biological oceanography, mid trophic-level fishes, squids and other invertebrates, and apex predators (cetaceans, pinnipeds, and marine turtles). For more details see <http://swfsc.nmfs.noaa.gov/PRD/ecology/ecology.html> and <http://swfsc.nmfs.noaa.gov/PRD/PROJECTS/PICEAS/default.htm>. (Also see the Southern California report.)

Joanna Smith continues with her PhD at the University of Washington (UW) under **Julia Parrish**. She is interested in the link between foraging behaviour and the use of habitats with respect to the constraints imposed by chick provisioning in breeding birds. She returned to Isla Alejandro Selkirk, Chile in early 2005 to study the visitation patterns and oceanic habitat use of the Juan Fernandez petrels (*Pterodroma externa*) during late chick rearing. A highlight of the season were discussions with the National Park Wardens regarding the detrimental effects of feral cats on endemic seabirds of the island, which are listed by the International Union for the Conservation of Nature (IUCN). Another highlight was seeing Stejneger petrel chicks (*Pterodroma*

longirostris) getting ready to fledge—the reward for enduring endless fall storms.

TOPP is continuing its efforts to track the migrations of Sooty and Pink-footed Shearwaters (*Puffinis griseus* and *P. creatopus*) in the south Pacific. **Peter Hodum** of UW has deployed satellite geolocation tags on Pink-foots at Juan Fernandez Islands, Chile, to track their at-sea movements once they leave their breeding colonies. Collaborators include **Ken Morgan** (Canadian Wildlife Service, Sidney, British Columbia) and **David Hyrenbach** (Duke University Marine Lab). Funding for this project is primarily from the Commission for Environmental Cooperation (part of the North American Free Trade Agreement). **Scott Shaffer** of TOPP has successfully tracked Sooty Shearwaters in New Zealand waters.

NORTH ATLANTIC

Nina Karnovsky (Pomona College) is continuing her research on Dovekies. This past summer she returned to Hornsund fjord, Svalbard, to investigate the foraging and reproductive behavior of Little Auks. In addition, she is examining otoliths from stomach contents and guano of Antarctic seabirds to determine seasonal and inter-annual dietary changes. **Cheryl Baduini** (Claremont Colleges) is collaborating with Karnovsky in a preliminary study to investigate gender-biased growth rates in Dovekie (*Alle alle*) chicks.

INFORMATION FOR CONTRIBUTORS

Pacific Seabirds is the journal of the Pacific Seabird Group. Manuscripts and news items are welcome on any topic relating to research on Pacific seabirds or to their conservation. Short manuscripts are preferred (about 1,000 to 5,000 words for major submissions). Materials should be submitted to the Editor, except as noted below: Dr. V.M. Mendenhall, 4600 Rabbit Creek Road, Anchorage, Alaska 99516; phone (907) 345-7124; Fax (907) 345-0686; e-mail fsgadair@att.net. Deadlines are 15 April for the spring issue and 15 October for the fall issue.

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Contributors are invited to submit the following:

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Use US spelling conventions (e.g., "behavior," not "behaviour" and "criticize," not "criticise"), except when citing non-US journal articles.

Give the scientific name (*italicized*) after the first mention of any genus or species. English names of bird species are capitalized (e.g., Fork-tailed Storm-Petrel). Names of mammals, other taxa, and English names of bird groups are lowercase except for proper names (e.g., blackbirds, shield fern, Steller's sea cow).

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The Pacific Seabird Group holds occasional symposia at its annual meetings. Published symposia are listed below. They are available for purchase (unless out of print). To order, see the membership application/publication order form.

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Asilomar, California, January 1977. Published June 1979 in *Studies in Avian Biology*, Number 2. **OUT OF PRINT.**

TROPICAL SEABIRD BIOLOGY. Ralph W. Schreiber (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Honolulu, Hawaii, December 1982. Published February 1984 in *Studies in Avian Biology*, Number 8. **OUT OF PRINT.**

MARINE BIRDS: THEIR FEEDING ECOLOGY AND COMMERCIAL FISHERIES RELATIONSHIPS. David N. Nettleship, Gerald A. Sanger, and Paul F. Springer (Editors). Proceedings of an International Symposium of the Pacific Seabird Group, Seattle, Washington, January 1982. Published 1984 as Canadian Wildlife Service, Special Publication. **OUT OF PRINT.**

THE USE OF NATURAL VS. MAN-MODIFIED WETLANDS BY SHOREBIRDS AND WATERBIRDS. R. Michael Erwin, Malcolm C. Coulter, and Howard L. Cogswell (Editors). Proceedings of an International Symposium at the first joint meeting of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. *Colonial Waterbirds* 9(2), 1986. **ORDER FROM:** Ornithological Societies of North America, PO Box 1897, Lawrence, Kansas 66044; phone (800) 627-0629; \$12.00.

ECOLOGY AND BEHAVIOR OF GULLS. Judith L. Hand, William E. Southern, and Kees Vermeer (Editors). Proceedings of an International Symposium of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Published June 1987 in *Studies in Avian Biology*, Number 10. **ORDER FROM** Allen Press, Lawrence, Kansas 66044; \$18.50.

AUKS AT SEA. Spencer G. Sealy (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published December 1990 in *Studies in Avian Biology*, Number 14. **ORDER FROM** Allen Press, Lawrence, Kansas 66044; \$16.00.

STATUS AND CONSERVATION OF THE MARBLED MURRELET IN NORTH AMERICA. Harry R. Carter, and Michael L. Morrison (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published October 1992 in *Proceedings of the Western Foundation of Vertebrate Zoology*, Volume 5, Number 1. **ORDER FROM PSG TREASURER;** \$20.00.

THE STATUS, ECOLOGY, AND CONSERVATION OF MARINE BIRDS OF THE NORTH PACIFIC. Kees Vermeer, Kenneth T. Briggs, Ken H. Morgan, and Douglas Siegel-Causey (editors). Proceedings of a Symposium of the Pacific Seabird Group, Canadian Wildlife Service, and the British Columbia Ministry of Environment, Lands and Parks, Victoria, British Columbia, February 1990. Published 1993 as a Canadian Wildlife Service Special Publication, Catalog Number CW66-124-1993E. **ORDER FROM** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A 0H3, Canada. *Free of charge.*

BIOLOGY OF MARBLED MURRELETS—INLAND AND AT SEA. S. Kim Nelson and Spencer G. Sealy (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Seattle, Washington, February 1993. Published 1995 in *Northwestern Naturalist*, Volume 76, Number 1. **ORDER FROM PSG TREASURER;** \$12.00.

BEHAVIOUR AND ECOLOGY OF THE SEA DUCKS. Ian Goudie, Margaret R. Peterseen and Gregory J. Robertson (editors). Proceedings of the Pacific Seabird Group Symposium, Victoria, British Columbia, 8-12 November 1995. A special publication compiled by the Canadian Wildlife Service for the Pacific Seabird Group. Published 1999 as Canadian Wildlife Service Occasional Paper number 100, catalog number CW69-1/100E. **ORDER FROM** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A 0H3, Canada. *Free of charge.*

SEABIRD BYCATCH: TRENDS, ROADBLOCKS AND SOLUTIONS. Edward F. Melvin and Julia K. Parrish (editors). Proceedings of an International Symposium of the Pacific Seabird Group, Blaine, Washington, 26-27 February 1999. Published 2001 by University of Alaska Sea Grant, Fairbanks, Alaska. Publication no. AK-SG-01-01. **ORDER FROM PUBLISHER;** \$40.00.

BIOLOGY, STATUS, AND CONSERVATION OF JAPANESE SEABIRDS. Nariko Oka (editor). Proceedings of an International Symposium of the Japanese Seabird Group and Pacific Seabird Group, Lihue, Hawaii, February 2001. *Journal of the Yamashina Institute of Ornithology* 33(2); Symposium (5 papers), pp 57-147, other papers pp. 148-213. In English with Japanese abstracts. **ORDER FROM PSG TREASURER;** \$75.00.

OIL AND CALIFORNIA'S SEABIRDS. Harry R. Carter (convener) and Anthony J. Gaston (editor). Proceedings of a symposium for the Pacific Seabird Group, Santa Barbara, California, February 2002. Published 2003 in *Marine Ornithology* 31(1). **AVAILABLE ONLINE** at www.marineornithology.org; *free of charge.*

Information on presenting symposia: Pacific Seabird Group Symposia are initiated by any PSG member with interest in a particular topic. The goal is to present a collection of papers that explore and review this topic, usually at an annual meeting of the Pacific Seabird Group. In some cases the papers are then edited and published as a PSG Symposium. Anyone interested in organizing a symposium must first contact both the Coordinator of the Publications Committee and the Scientific Program Chair for an annual meeting. Guidelines will be provided on obtaining approval and on organizing, presenting, and publishing a PSG Symposium, including the responsibilities involved.

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