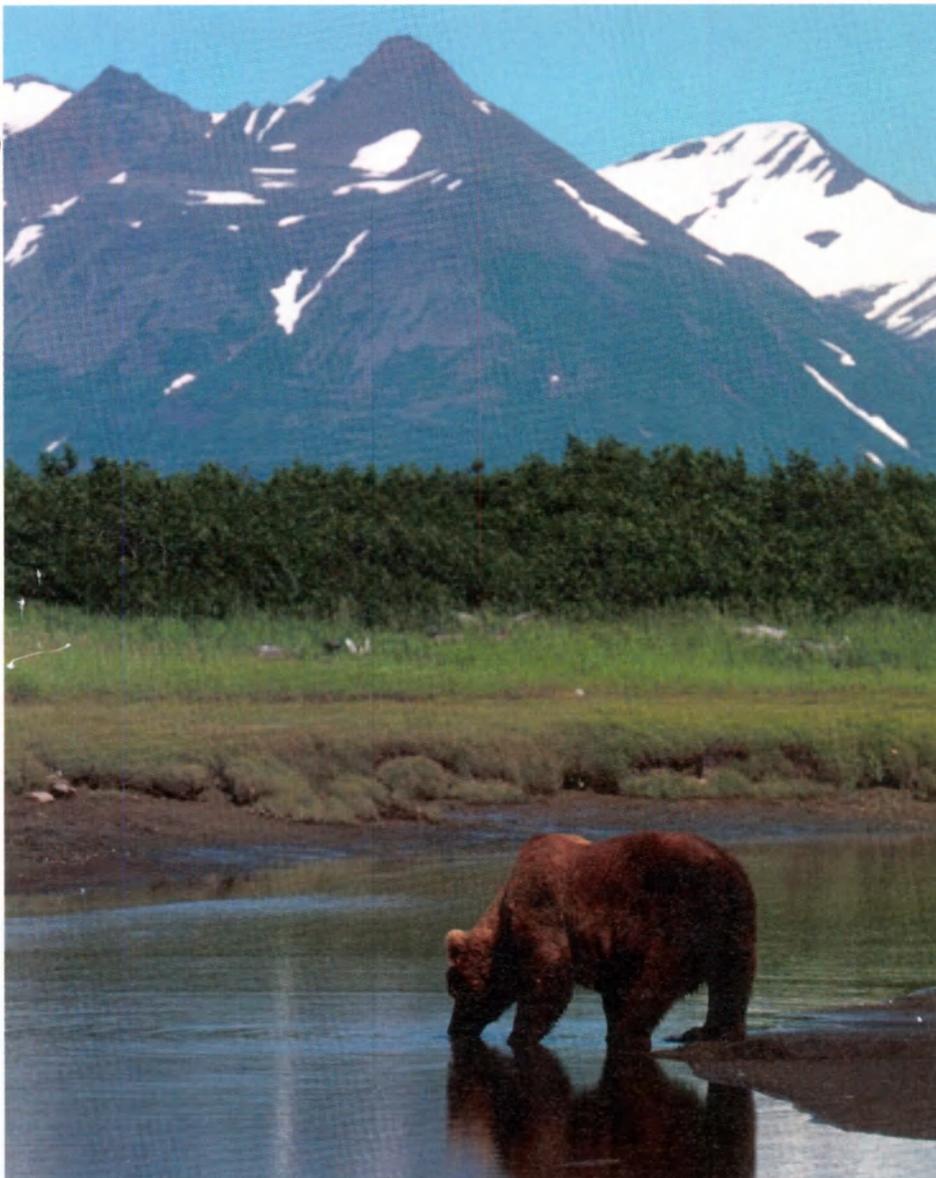


ENDANGERED *Species* BULLETIN

March/April 1999

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During the last great ice age, woolly mammoths, wild horses, musk oxen, caribou, and a host of other creatures migrated from Asia across the Bering Land Bridge to the place we now know as Alaska. Following this rich resource came nomadic hunters, among the first humans to inhabit the New World. The wildlife these people sought provided not only food, shelter, and clothing, but also a spiritual link with nature. Today, modern nomads—tourists—travel from every corner of the globe to enjoy Alaska's wildlife treasures. At the same time, Alaskans continue to depend on fish and wildlife for subsistence, commerce, and quality of life. Balancing the needs of people and wildlife in a fragile environment requires taking an ecosystem approach to resource management.



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U.S. Fish & Wildlife Service

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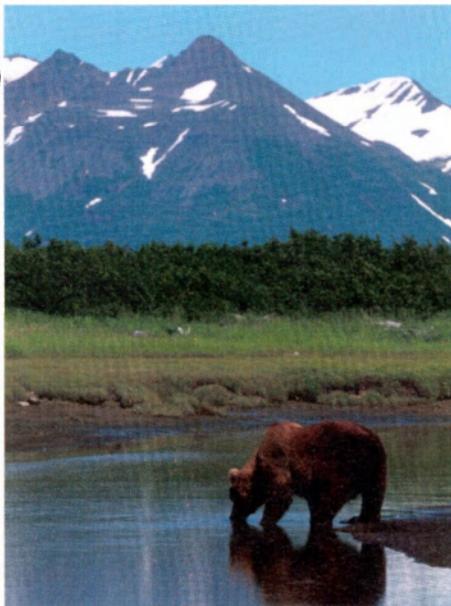
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On the Cover

Although brown bears in Alaska are not listed as endangered, habitat fragmentation has put the Kenai Peninsula population at risk.
 Corel Corp. photo



The Endangered Species Bulletin welcomes manuscripts on a wide range of topics related to endangered species. We are particularly interested in news about recovery, habitat conservation plans, and cooperative ventures. Please contact the Editor before preparing a manuscript. We cannot guarantee publication.

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by David B. Allen

A Land of Superlatives



At 586,000 square miles (1.5 million square kilometers), Alaska is one-fifth the size of the lower 48 States. Superimposed on a U.S. map, Alaska would stretch from Florida to Minnesota to California. Geographically, our State covers four time zones, but for practical reasons only two are used throughout most of the state. The westernmost Aleutian Islands are actually in the Eastern Hemisphere. There are 33,904 miles (54,550 km) of coastline, twice that in the lower 48. Alaska also boasts more than 3 million lakes larger than 20 acres (8 hectares), more than 3,000 rivers, 63 percent of the Nation's wetlands, 39 mountain ranges, 17 of the 20 highest peaks in North America, 1,800 islands; and 100,000 glaciers.

Transportation in Alaska presents unique challenges, since less than three percent of the state is accessible by road. Aircraft are a lifeline to many villages and bush communities throughout the state. But severe winter weather and high costs can make travel within the state complicated; it often costs more to fly from Anchorage to Barrow than it does to fly from Anchorage to Washington, D.C.

Over 85 percent of the National Wildlife Refuge System (nearly 77 million acres, or 32 million ha) is in Alaska, and more than 42,000 river miles (67,600 km) are within refuge system boundaries. Arctic NWR alone is the size of South Carolina. Alaskan climates also can vary widely. Temperatures range from -80 degrees F (-37 degrees C) in winter to 100 degrees F (38 degrees C) in summer.

Contrast Alaska's sheer size with its small human population (621,000) and you get a rough average of one person per square mile. However, more than 75 percent of Alaska's population resides in the larger towns and cities. Numerous Alaska native villages are scattered throughout the State, and physical isolation has produced a cultural diversity here that is probably unmatched. There are 226 Federally-

recognized tribes with 15 different language groups, and 16 percent of the State's population is Alaska Native. Learn more by reading "An Alaska Native's Perspective" in this issue. Alaska has the longest international border of any state, and is located in a unique international "neighborhood"—seven other nations share the circumpolar region encompassing the Arctic Ocean and Beaufort Sea. These nations include Russia, Canada, Norway, Sweden, Finland, Iceland, and Greenland (Denmark). Our International Program is described in this issue.

Only 23 species federally listed as endangered or threatened occur in Alaska. Seventeen of these are managed by the National Marine Fisheries Service, with the other six managed by the Fish and Wildlife Service (FWS). Although Alaska has relatively few listed species, the challenges associated with recovering them are daunting. All but one of the listed species managed by FWS (the Aleutian shield-fern, *Polystichum aleuticum*) are migratory, wintering in very different ecosystems than they breed, and their extensive ranges make international cooperation in management necessary. Much of remote Alaska is still unsurveyed for wildlife and plants, and there is comparatively little knowledge available on arctic and subarctic species. Some species are found in very isolated areas, and it can be hard to track their problems and progress. (Read about these challenges in this issue.) Because some species are so wide-ranging, the average area covered in formal Endangered Species Act (section 7) consultations in Alaska exceeds 100 million acres (40 million ha). Finally, a strong subsistence culture thrives in Alaska. The FWS works side-by-side with Alaskan natives to manage listed species so that both recovery and cultural needs may be met.

Recent successes for endangered and threatened species in Alaska include recovery of the Arctic peregrine falcon (*Falco peregrinus*), proposed delisting

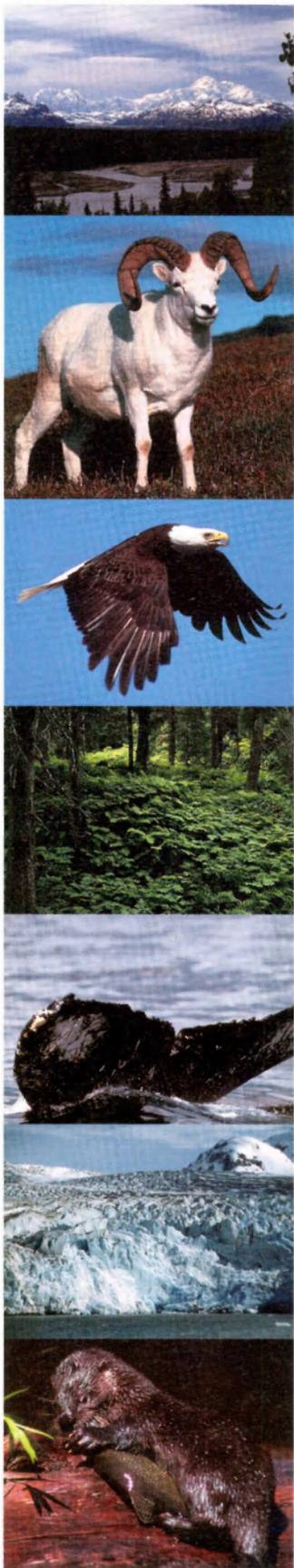
of the Aleutian Canada goose (*Branta canadensis leucopareia*), a partnership with the fishing industry for conservation of the short-tailed albatross (*Phoebastria albatrus*), and a Spectacled Eider Management Plan for the Yukon Delta.

The FWS takes an ecosystem management approach to its stewardship of Alaska's threatened and endangered species, and we recognize two key factors: (1) the various components of an environment are interrelated, and (2) success in fish and wildlife management issues begins by involving State agencies and a broad spectrum of publics. I hope you enjoy this issue, which is devoted to Alaskan ecosystems and issues.

David B. Allen is the FWS Alaska Regional Director.

A Diversity of Ecosystems

by Richard Whiteford



The U.S. Fish and Wildlife Service (FWS) has initiated an ecosystem approach to protecting species and habitats. In Alaska, the ecosystem approach is essential to allow enough room for some species to migrate beyond their presently established ranges to compensate for climate and other environmental changes. Unbroken corridors are needed to prevent disruption of the food supply and provide the elbow-room needed for migration.

For its purposes, the FWS has identified 10 ecosystems in Alaska:

1) The **arctic ecosystem** begins at Point Barrow, the northernmost point of land in the United States, and extends south for around 250 miles (400 kilometers) to the Brooks Range. It reaches from the Arctic Ocean on its western border to Canada's Yukon Territory to the east. The flat lowlands of the North Slope are shrouded in thick permafrost and do not drain well, which causes the formation of many thaw lakes in summer. Foothills separating the flat lowlands from the Brooks Range are covered with tussock sedges and low shrubs. At higher elevations, the vegetation includes such trees as white spruce (*Picea glauca*) and balsam poplar (*Populus balsamifera*), with an understory of willows (*Salix alaxensis*, *S. planifolia*, and *S. lanata*). The arctic ecosystem supports polar bears (*Ursus maritimus*), arctic foxes (*Alopex lagopus*), musk oxen (*Ovibos moschatus*), waterfowl, and small mammals.

2) The **interior ecosystem** roughly spans from the Brooks Range south to the crescent-shaped Alaska Mountain Range and west from the Kaiyuh Mountains to the Canadian border. The interior's rolling forested lowlands and uplands are dominated mostly by white spruce on the south slopes and black spruce (*Picea mariana*) in the low

flood plains and higher uplands. Such mammals as gray wolves (*Canis lupus*), wolverines (*Gulo gulo*), and moose (*Alces alces*) are found here.

One division of the interior ecosystem, the **interior highlands**, has many rugged mountains topped with majestic, snow-capped peaks. Dwarf scrub communities of mountain-avens (herbs in the rose family), such as *Dryas octopetala*, *D. integrifolia*, and *D. drummondii*, dominate this inhospitable environment. Dall sheep (*Ovis dalli*), moose, caribou (*Rangifer tarandus*), and ground squirrels are found in this region.

In the **interior bottomlands**, meandering streams feed numerous oxbow and thaw lakes. Needle leaf, broadleaf, and mixed forests are the norm. It is prime habitat for many mammals, including moose, caribou, beavers (*Castor canadensis*), and muskrats (*Ondatra zibethicus*). It is also a haven for ducks, geese, salmon, and other fish. The bulk of Alaska's human population resides in this region.

3) The **south-central ecosystem** extends southward from Cook Inlet and the Chugach Mountains. This area is covered with rugged mountains, ice fields, and glaciers. Moose, mountain goats (*Oreamnos americanus*), and small mammals live in the mountains, while salmon and freshwater fishes inhabit the streams.

4) The **southeast ecosystem** reaches down the Alaskan panhandle to Queen Charlotte Island. A cluster of about 1,100 islands, the tops of a submerged mountain range, is known as the Alexander Archipelago. This region includes the Tongass National Forest, the largest national forest in the United States. It consists of deep narrow bays, a ragged coastline, high sea cliffs, and a wet, somewhat milder climate. Western

hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*) blanket the shore line and cliffs, providing habitat for moose, mountain goats, and black-tailed deer (*Odocoileus hemionus*), while the coastline and rivers teem with waterfowl and salmon.

5) The **Yukon-Kuskokwim Delta ecosystem**, a flat wetland region pocked with peat mounds and sand dunes, is dominated by the dwarf scrub crowberry (*Empetrum nigrum*). It stretches from the Norton Sound south to the Killbuck Mountains. In the north, the Yukon River flows into the Yukon Delta along the Bering Sea, and in the south, the Kuskokwim River drains the Killbuck Mountains. The Yukon-Kuskokwim Delta ecosystem is important habitat for more than 1.75 million geese and swans, 2 million ducks, and more than 100 million shore and water birds. The land supports moose, caribou, grizzly bears (*Ursus arctos*), black bears (*Ursus americanus*), and gray wolves.

6) The **Northwest ecosystem** consists largely of the Seward Peninsula. A narrow strip of coastal lowlands gives way to the rolling hills of the uplands, which are interspersed with isolated, rugged mountains. Very cold year-round, this area is thinly inhabited by humans. It supports such mammals as caribou, seals, rabbits, squirrels, muskrats, and beavers. Along the coast, ice fishing and seal hunting are means of subsistence for the native people.

7-10) Four marine ecosystems arc around Alaska. To the north is the **Beaufort/Chukchi Sea**, to the southwest are the **Bering Sea/Aleutian Islands** and the **Bristol Bay/Kodiak ecosystems**, and to the south is the **North Pacific/Gulf of Alaska ecosystem**. The Beaufort and Chukchi Seas are a part of the Arctic Ocean and are frozen much of the year. Bristol Bay lies south of the Bering Sea and is flanked on the south by the Aleutian Islands. Many whales on the Endangered Species list inhabit these marine ecosystems, including the northern right

whale (*Balaena glacialis*), bowhead whale (*Balaena mysticetus*), and humpback whale (*Megaptera novaeangliae*), as well as one marine reptile, the leatherback sea turtle (*Dermochelys coriacea*). Walrus (*Odobenus rosmarus*) are also found.

The Bristol Bay-Kodiak ecosystem includes the Alaska Peninsula and the watersheds of the Kvichak and Nushagak Rivers. This 100-mile (161-km) long by 40-mile (65-km) wide island is dominated in the north by spruce forests, while the interior is dense with lush vegetation, and the southwest is covered with grassy hummocks. Summers are cool and wet, and winters here have a moderate maritime climate. Kodiak's native mammals are the Kodiak (or brown) bear, northern river otter (*Lontra canadensis*), short-tailed weasel (*Mustela erminea*), little brown bat (*Myotis lucifugus*), and tundra vole (*Microtus oeconomus*). Millions of seabirds such as cormorants, gulls, murre, and puffins inhabit the bays, inlets, and shores.

The rugged volcanic arc of the Aleutian Islands reaches 1,100 miles (1,800 km) westward from Alaska's mainland, well past the International Date Line. The islands separate the Bering Sea from the Pacific Ocean. Short-tailed albatrosses (*Phoebastria albatrus*) can be found here in the summer, feeding off the rich waters. Steller sea lions (*Eumetopias jubatus*), sea otters (*Enhydra lutris*), and northern fur seals (*Callorhinus ursinus*) live along the coast. Seabirds can be found by the millions.

Cooperative partnerships among the FWS and other public and private concerns are critical to protecting Alaska's rich terrestrial and marine diversity. With so many widely wandering species, the ecosystem approach is the best way to manage Alaska's wildlife.

Richard Whiteford is an environmental journalist and a member of the Society of Conservation Biology.



When it comes to saving natural diversity, many say Alaska is America's last chance to do things right the first time. Only about one percent of Alaska's natural areas have been significantly altered by human activity so far, yet less than 12 percent of its various ecosystems are in highly protected areas. Given the speed and magnitude of ecological changes in the lower 48 States over the past century, Americans cannot afford to be complacent about Alaska.



Opposite page, top to bottom: Denali National Park, Dall sheep, bald eagle, forest, humpback whale, coastal glacier, river otter
Corel Corp. photos

Above, top to bottom: The endangered Aleutian shield-fern (Polystichum aleuticum), an island in the Aleutian chain, polar bear
Photos by Virginia Moran, Karen Boylan/USFWS, and Corel Corp., respectively

Short-tailed Albatross: Back from the Brink

by Janey Fadely



All photos by Hiroshi Hasegawa



Short-tailed albatrosses (*Phoebastria albatrus*) once numbered in the millions. These magnificent, graceful, golden-crowned seabirds soared across the North Pacific Ocean and Bering Sea during the non-breeding season, and gathered on numerous remote western North Pacific islands in large dense colonies during the breeding season. Today, however, fewer than 1,000 short-tailed albatrosses remain, and they face threats that are difficult to quantify, predict, and alleviate.

Short-tailed albatrosses were brought to the brink of extinction in the middle of this century by large-scale exploitation at breeding colonies that began in the late 1800's. Between 1885 and 1903, an estimated 5 million of the birds were taken at Torishima Island, Japan, alone. Large-scale killing of short-tailed albatrosses continued until the early 1930's, except for a few years following the 1903 volcanic eruption on the island. Albatross down was used for quilts and pillows, the wing and tail feathers for writing quills, bodies for fertilizer and fat, and eggs for food. An account from this period stated that short-tailed albatrosses were "...killed by striking them on the head with a club, and it is not difficult for a man to kill between 100 and 200 birds daily." By 1949, there were no short-tailed albatrosses breeding at any of the 15 or more historically known breeding sites, including Torishima, and the species was reported to be extinct.

Thankfully, the report was premature. Albatrosses spend much of their lives at sea where they are harder to detect than at the nesting grounds. Juveniles spend years at sea before returning to their natal colonies to breed for the first time,

and adults may stay at sea and skip one or more breeding seasons, especially if they are displaced from the colony by disturbance or habitat destruction. There is no information on how many short-tailed albatrosses survived the slaughters, but in 1950, several were observed nesting on Torishima. By 1954, the numbers had grown to 25 birds and at least 6 pairs. Japan designated the short-tailed albatross a protected species in 1958 and added protection in 1962 and 1972. Harvest is prohibited and human activities on Torishima are restricted. These protective measures, together with intensive habitat enhancement projects on Torishima, have made it possible for the population to grow to approximately 500 breeding birds and 1,000 total birds today. While this increase is encouraging, the total world population nests in only two colonies. Approximately 30 adults nest on remote Minami-kojima Island, which is difficult and dangerous for biologists to visit because of territorial disputes. The remaining 95 percent of the species' breeding birds nest at the Tsubamesaki ("Swallow Point") colony on Torishima. The albatross's eggs are, more or less, all in one basket.

Short-tailed albatrosses face other natural and human-related threats. The island of Torishima is an active volcano that has erupted several times in the last century. In 1903, an explosive eruption caused 125 human deaths and significant habitat destruction on the island. Albatross breeding habitat is also threatened by monsoon rains that can cause mudslides and erosion. Short-tailed albatrosses return to the same nesting sites each year, and destruction of breeding habitat can delay nesting by

any surviving adults for years. Because Torishima is the only large colony of short-tailed albatrosses in the world, a catastrophic event could have devastating effects on the future survival or recovery of the species.

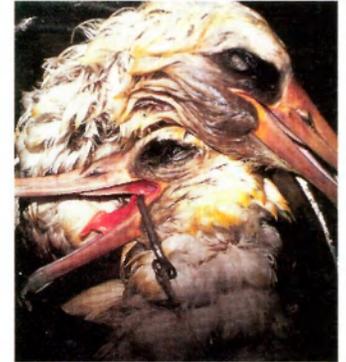
Conservation and monitoring efforts continue on Torishima. Dr. Hiroshi Hasegawa of Toho University in Japan has made several trips per year to Torishima since 1976 to monitor the colony and band chicks. To protect the colony from mudslides and soil erosion, he mounted an enormous project to stabilize slopes and direct mud flows away from the colony with artificial berms and transplanted vegetation. These efforts have paid off with improved nesting success. More recently, he used an experimental program to establish a new colony in stable, well-vegetated habitat on the opposite side of Torishima in an area less likely to be affected by any future volcanic eruptions. Using decoys and broadcasting recorded albatross vocalizations, he successfully lured at least one pair of breeding adults to the new colony site, and the first chick was produced in 1997. Long-term plans call for establishing additional breeding colonies at other sites. Short-tailed albatrosses have also been observed on Midway Atoll in the Northwestern Hawaiian Islands since the early 1930's. Although there are no confirmed breeding records, Midway Atoll (now a national wildlife refuge) could be a potential future colony site.

In addition to natural threats on the breeding grounds, albatrosses face human-caused threats at sea. These include plastics ingestion, oil contamination, and longline fishing. Seabirds actively search out longline vessels in search of bait. During longline setting, baited hooks are available to surface-feeding birds from the time the hooks leave the vessel until they sink out of range. If birds are hooked while attempting to feed on bait, they can be dragged underwater and killed.

Seabird bycatch in southern fisheries has been effectively reduced through the use of: 1) weighted lines, which sink immediately upon entering the water, 2) streamers flown or buoys dragged above the longline as it is being set, and 3) underwater setting of longlines. Recognizing the threat that seabird bycatch could represent, representatives of the longline industry requested that the National Marine Fisheries Service (NMFS) implement regulations requiring the use of seabird deterrent devices in Alaska's hook-and-line groundfish fishery. In response to this request, and as a result of Biological Opinions issued under the Endangered Species Act, NMFS adopted regulations requiring the use of seabird bycatch reduction measures in these fisheries. Since 1995, observers on Alaskan fishing vessels have reported five short-tailed albatross deaths on longlines (two in 1995, one in 1996, and two in 1998). Although population modeling indicates that this rate of mortality in North Pacific fisheries will not jeopardize the future survival and recovery of the species, continued vigilance in improving the effectiveness of seabird bycatch deterrent measures, and in monitoring the other threats to the species, is critical.

The Biological Opinions on Alaska's fisheries also required NMFS to develop and implement a research plan to test the effectiveness of existing seabird deterrent methods in reducing bycatch in North Pacific fisheries. The plan has now been developed and the agencies are searching for funding. Meanwhile, fishermen in the North Pacific and Bering Sea continue to test and improve these methods. Seabird bycatch mitigation measures are also being tested and considered in Hawaiian pelagic longline fisheries. The U.S. Fish and Wildlife Service and NMFS are committed to continuing cooperative approaches to short-tailed albatross conservation with international and domestic partners.

Janey Fadely is a Wildlife Biologist in the Alaska Region.



Because the short-tailed albatross was originally listed as a *foreign* endangered species, it is currently protected by the Endangered Species Act throughout its range *except* in the U.S. The potential threats posed by longline fishing (above), plastics pollution and oil contamination may not individually represent significant threats, but when combined with a catastrophic event on Torishima, could jeopardize the survival and recovery of this species. Thus, the species is still at risk. On November 3, 1998, the FWS published a proposal to extend the range over which the species is listed to include the U.S.

by Greg Balogh and
Brian McCaffery

Management in the Face of Uncertainty



**Author Greg Balogh holds a male
spectacled eider.**

USFWS photo

When the spectacled eider (*Somateria fischeri*) was listed as a threatened species in 1993, scientists knew very little about this enigmatic seaduck. They were uncertain about total population size and even the location of the birds for nine months out of the year. Most critically, they didn't know why eider numbers were declining, only that they were. In just a few decades, a 95 percent decline befell the population on Alaska's Yukon-Kuskokwim Delta (Y-K Delta).

The paucity of data on this species meant that recovery planning would draw more on the team's collective wisdom and common sense than on knowledge of spectacled eider biology. It was a situation in which management had to meet uncertainty head-on.

Wildlife Management Begins With People Management

Due to the spectacled eider's remote habitats, encounters with humans are rare. Consequently, management options for this species are limited. Sport hunting of the species was probably never of much consequence, and ended in 1991, although subsistence hunting continued. This subsistence harvest is one of the few suspected causes of decline that can be managed. Spring waterfowl harvest in rural Alaska is illegal but has been generally tolerated by law enforcement officers out of deference to native culture and tradition. In an effort to reduce the harvest of spectacled eiders, Refuge Information Technicians (RITs) from the Yukon Delta National Wildlife Refuge explained the plight of the spectacled eider to villagers. They asked for the hunters' help in eider conservation, and

the hunters responded. The reported subsistence harvest of spectacled eiders dropped notably after 1992.

As an unintended consequence of decades of spring and fall waterfowl hunting, however, hundreds of tons of lead shot pellets have been deposited along the coastal wetlands of the Y-K Delta. Analyses of blood samples from Y-K Delta spectacled eiders revealed that both adults and young ingest this toxic shot, and that a portion of them die of lead poisoning as a result.

The nationwide ban on lead shot was not enforced on the Y-K Delta prior to 1998 for a number of complicated management reasons. With the observation of lead poisoning in eiders, however, the ban has been phased in and enforced. Steel shot clinics were held in villages all across the Y-K Delta to teach villagers how to shoot the new non-toxic loads, and to dispel the many myths regarding both lead and steel shot that persisted in rural Alaska. Refuge personnel offered steel shot to poor villagers in exchange for the cheaper lead shot they already had.

Filling in The Gaps

After addressing people management, scientists began filling in the 9-month-per-year gap in the species' life history. Radio and satellite transmitters attached to eiders from the three known populations (Y-K Delta, North Slope, and Russia) gave biologists the data that led to the discovery of important and remote molting areas off the northwest coast of Alaska and northeast coast of Russia. Then in 1995, scientists finally unraveled the mystery of where spectacled eiders spend the winter.

A signal from a long-silent satellite transmitter led biologists to a vast expanse of sea ice that contained numerous small cracks and fissures. These breaks in the sea ice contained huge concentrations of spectacled eiders, as many as 50,000 in a single flock. One aspect of this species' biology was finally working in the managers' favor. Apparently, nearly all of the spectacled eiders on the planet congregate in a 40-mile (64-kilometer) diameter area of the Bering Sea during winter. This created a unique opportunity for an inexpensive global census of the species. Recent winter surveys have placed the population at about 400,000.

Still Searching for the Smoking Gun

It turns out that about 90 percent of the world's spectacled eiders are from the Russian breeding population. The unexpected abundance of Russian eiders gave the species as a whole some breathing room this side of extinction. The fact remained, however, that the Y-K Delta population had been devastated. In keeping with the general theme of uncertainty regarding this species, the historic trend of the Alaskan North Slope population was still unknown. If historic population trends were known, scientists might be able to unravel the mystery behind the Alaskan decline. If the species' three populations fluctuated similarly, the force behind the change would likely be lurking in the Bering Sea, where the populations mix on the wintering grounds. If the three populations fluctuate independently, however, we would look to the breeding or molting areas for explanations.

Of course, given the absence of historic trend data, no such clues exist, but that has stopped few from hypothesizing about the cause of the decline. Perhaps spectacled eider populations suffered increased pressure from waterfowl predators when other waterfowl populations declined through the 1980's on the Y-K Delta. The growing human population on the Delta and the resulting abundance of garbage

could also be sustaining artificially high predator populations. A popular claim among indigenous peoples is that the government's research on the spectacled eider breeding grounds leads to nest abandonment and predation.

Any number of changes in the Bering Sea ecosystem could be affecting spectacled eiders. One theory looks to increasing populations of walrus and gray whales as competitors for food used by eiders during the months they are at sea. Unknown ecological changes could also be caused by excessive commercial harvest of Bering Sea fisheries. Recently described declines in bivalve distribution and abundance (perhaps due to global climate change or trawl fisheries) could be affecting the eider's food supplies.

Then there is the ubiquitous problem of environmental contaminants. The Bering Sea is almost certainly the source of the elevated selenium, copper, and cadmium levels detected in some eiders. Whether these elevated heavy metal concentrations are a serious problem to eiders, however, is unknown. The ducks probably acquire the metals from their marine food items, but the source of the metal is (as you may have guessed) unknown.

One of the few certainties in spectacled eider management is that the uncertainty can seem overwhelming at times. On the bright side, our knowledge of the birds' natural history is far more complete than it was just 5 years ago. We may never know for certain what factor or combination of factors caused the Y-K Delta population to plummet, but we have taken a few steps towards recovery of the species.

Greg Balogh and Brian McCaffery are Fish and Wildlife Biologists with the Ecological Services Office in Anchorage and the Yukon Delta National Wildlife Refuge, respectively.



Female (left) and male spectacled eider

Photo by John Warden

by Lori Quakenbush and
Robert Suydam

Does the Steller's Eider Depend on Lemmings?



Male Steller's eider
Photo by Robert Suydam

Iginiquauqtuq is the Inupiat Eskimo name for the little-known seaduck most people call the Steller's eider (*Polysticta stelleri*). The Eskimo name, meaning "the bird that sat in the campfire," comes from the male's distinctive plumage. The male's breast and belly are burnt-orange in color, as the Eskimo name implies. The dark belly contrasts with white sides and a boldly patterned black and white back. As with other ducks, the female is mottled brown, in this case to blend with the arctic tundra while she incubates her eggs in a nest lined with lichen, sedges, and down from her breast.

In 1997, the North American breeding population of Steller's eiders was listed as threatened. The Steller's eider historically nested in the Yukon-Kuskokwim Delta of southwestern Alaska, but it was thought to have been lost as a breeding species there after no nests were found for almost 20 years. Recently, however, several nests have been found, leaving researchers to wonder if small numbers of nests went undetected for two decades or if birds from other breeding areas are beginning to nest on the delta. The largest number of Steller's eiders nesting in Alaska are found near Barrow, the State's northernmost city. Steller's eiders also nest in very low densities across the Arctic Coastal Plain of Alaska as far east as Prudhoe Bay. Most of the world's population of Steller's eiders nest in arctic Russia, where their status is unknown. The Alaska breeding population and many of the Russian breeders appear to molt and winter in large, dense flocks along the Alaska Peninsula, many in the Izembek National Wildlife Refuge.

The reasons for the decline of nesting Steller's eiders in Alaska are not clear. Habitat loss, overharvest, or disturbance do not seem to be the culprits. Evidence mounts that the decline of another eider, the spectacled eider (*Somateria fischeri*), may have been due at least in part to poisoning from lead shot. Lead may have affected Steller's eiders on the Yukon-Kuskokwim Delta, too, but because so few Steller's eiders remain there, the possibility is difficult to address. Large-scale changes in the Bering Sea may be affecting molting and wintering areas of Steller's eiders in ways that we do not yet understand. Other possibilities include increased predation by gulls, foxes, ravens, and other animals.

Some of the known immediate risks to the Steller's eider have been eliminated or greatly reduced. Sport and subsistence hunting of this species are no longer legal. No large development projects are planned within the habitats that Steller's eiders require. Small housing developments to support the growing human population at Barrow pose a threat to some nesting habitat, but consultations under section 7 of the Endangered Species Act are addressing these threats with cooperation from the local government and developers. Other risks that will be evaluated by the Steller's Eider Recovery Team include predation during the breeding season, vulnerability to oil spills, and disturbance in molting and wintering areas.

The breeding biology of Steller's eiders is poorly understood. The U.S. Fish and Wildlife Service (FWS) and the North Slope Borough (a local municipality equivalent to a county government) have been studying Steller's

eiders near Barrow since 1991. Although Steller's eiders were present in all years of the study except one (1992), they nested in only 4 years (1991, 1993, 1995, and 1996). Interestingly, all nesting years corresponded with years of high lemming numbers. Lemmings go through dramatic population fluctuations, as many of us remember from filmed scenes in which hordes of lemmings ran off a cliff. Lemmings are prey for many arctic species, including arctic foxes (*Alopex lagopus*), pomarine jaegers (*Stercorarius pomarinus*), and snowy owls (*Nyctea scandiaca*), especially in years with lemming population highs. Pomarine jaegers and snowy owls depend on lemmings to feed their young, and these two species nest only in years and locations where lemmings are plentiful. Both bird species are aggressive and defend the areas around their nests from predators, especially foxes.

Steller's eiders nest on the ground and, aside from camouflage, have little defense against arctic foxes. In Barrow, Steller's eiders appear to nest near pomarine jaegers, and possibly snowy owls, to take advantage of the vigorous nest defense provided by these birds. Perhaps without the protection provided by jaegers and owls, it is not worthwhile, in an evolutionary sense, for Steller's eiders to attempt nesting. On the other hand, Steller's eiders must also weigh the risks of nesting near jaegers and owls because both bird species can be predators of eider eggs, chicks, and (in some cases) adults. It is possible that abundant lemmings provide an alternate food source for predators, thus greatly reducing the risk of Steller's eiders losing their eggs or chicks to predators. Regardless of why, Steller's eiders appear to nest near Barrow only in years when the area's lemming numbers are high.

The Steller's Eider Recovery Team has begun the process of recovery planning. The challenges include developing recovery criteria without quantitative data on historical numbers,

current population size, and population trends. Recovery will be difficult due to the poor understanding of the causes of the decline, and recovery will be slow due to the fact that Steller's eiders do not nest every year.

As part of the recovery process, the FWS will develop partnerships with local municipalities, Alaska Native organizations, and the State of Alaska. Managers, biologists, Alaska Natives, and other local residents need to work together to further understand the biology of Steller's eiders, the causes of the decline, obstacles to recovery, and ways to recover this "bird that sat in the campfire." Cooperation among people and organizations should pay important dividends for Steller's eiders and perhaps other species in the future. Lots of lemmings could be helpful, too.

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It is possible that abundant lemming populations reduce Arctic fox (above) predation on Steller's eiders.

Carel Corp. photo

Female Steller's eider on nest.

Photo by Kim Fluetsch



The Brown Bears of Kenai: A Population at Risk

by John W. Schoen



Photo by John Schoen/Alaska National Audubon Society

To most people, Alaska symbolizes the very essence of wilderness and the last stronghold for species like wolves (*Canis lupus*) and brown bears (*Ursus arctos*). Unfortunately, like the rest of the world, Alaska's wilderness is showing signs of stress. For example, brown bears on Alaska's Kenai Peninsula have become a "population at risk." A variety of factors have contributed to this growing problem, prompting scientists to raise a warning flag for brown bears within the Kenai ecosystem. Clearly there is cause for concern, but there are also reasonable solutions to this problem if we act swiftly and responsibly.

The brown bear population on the Kenai Peninsula is estimated at 250-300 bears. This small population is geographically isolated from the rest of Alaska. This "island" population is not unlike that in the Yellowstone Ecosystem, where grizzlies have been listed for decades as threatened. Although the Kenai is about 9,000 square miles (23,000 square kilometers) in size, brown bears are regularly distributed over less than half the area. The Kenai Peninsula is connected to the Alaska mainland by a narrow 9-mile (14-km) wide isthmus between Cook Inlet and Prince William Sound. Human activity in this narrow corridor likely restricts movements of bears between the Kenai and mainland Alaska. A research model developed for the Chugach National Forest portion of the Kenai Peninsula estimated that habitat effectiveness for brown bears has already been reduced by approximately 70 percent due to the cumulative effects of human activities.

Brown bears have the lowest reproductive rate of any land mammal in North America. For example, most females don't breed until they are 5 or 6 years old, their average litter is 2 cubs, the interval between litters is 3 to 4 years, and half the cubs may die during their first year. Consequently, brown bear populations cannot sustain high mortality pressures. Expanding human activities across the Kenai will increase bear-human contact, inevitably resulting in the direct mortality of bears through legal hunting, kills in defense of life and property, and illegal killing. Kills in defense of life and property have already doubled on the Kenai over the past decade, and the fall hunting season has been closed for the last 4 years because further losses would not be sustainable.

The Kenai Peninsula is one of Alaska's most developed and fastest growing regions. For example, the human population has more than doubled in the past two decades. Connected by road to Anchorage, the largest city in Alaska, the Kenai is the focal area for many of the State's outdoor recreationists and an important visitor destination for a growing tourism industry. Logging, mining, oil and gas development, land subdivision, and other developments also are increasing throughout the Kenai Peninsula. The spruce bark beetle infestation and the call for extensive salvage logging (and road construction) could exacerbate these developments. All these activities increase opportunities for bear-human encounters, and their cumulative impacts on habitat are of particular concern to wildlife managers in Alaska.

Roads and habitat fragmentation (breaking habitats into smaller, more isolated blocks) are the most significant threats to the conservation of bears because they increase human access and bear mortality. Expanded road construction in the back country, along with all of the other developments and activity on the Kenai, will significantly increase the vulnerability of this small, isolated population. A single, isolated development may not be a significant impact, but it would be an incremental step toward a declining bear population.

Alaska's Kenai Peninsula is clearly showing signs of ecosystem stress, and the brown bear is a key indicator of that stress. Rather than managing in a piecemeal fashion one project at a time, we must take a comprehensive view of this population, beyond agency boundaries, and establish realistic guidelines for resource and recreational development projects. In the mid-1980's, the Alaska Department of Fish and Game, Fish and Wildlife Service, Forest Service, and National Park Service convened an Interagency Brown Bear Study Team (IBBST) to monitor and research brown bears on the Kenai Peninsula. Last year, as a result of concerns over increased salvage logging and road building, the Governor requested the agencies to develop a comprehensive conservation strategy for Kenai brown bears. This plan will include a closer assessment of the Kenai bear population and address the long-term cumulative effects on habitat from continued development.

The time to address the Kenai brown bear problem with a proactive, cost-effective conservation strategy is now. If we wait until later, we may be forced into costly, reactive management to restore a healthy population. To this end, the IBBST and several Alaska conservation groups requested that the Department of Fish and Game designate the Kenai brown bear population an Alaska Species of Special Concern. The Department announced that designation in November 1998, with the objective of

preventative conservation now to forestall a serious crisis in the future.

Securing a future for the Kenai brown bear will become more difficult as development pressures intensify. However, by taking positive actions now, we have reason for optimism. It will not be easy, but with a committed effort, sound science, and collaborative



*An aerial view of the Kenai river.
Photo by John Schoen/Alaska National
Audubon Society*

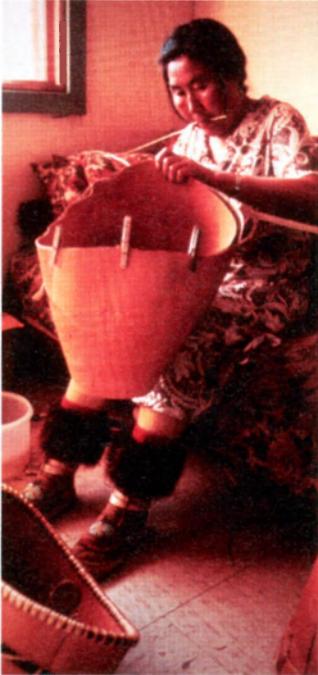
partnerships, we can make conservation work for everyone. Alaska's biological resources represent our greatest sustainable wealth, and conserving brown bears while maintaining the Kenai's ecological integrity is a sound economic and environmental investment. Our ability to bring people together to solve the Kenai brown bear problem will also serve as a positive model for solving other conservation problems elsewhere in Alaska.

Dr. John W. Schoen is the Executive Director of the Alaska Office of the National Audubon Society. Formerly, he worked for 20 years for the Alaska Department of Fish and Game, including 10 years as a brown bear research biologist. He also serves as an Affiliate Professor of Wildlife Biology at the University of Alaska.

Two radio collars from collared brown bears were found tossed into local water bodies. Unreported shootings of Kenai brown bears in addition to reported mortalities increase human impacts, but the biggest threat to Kenai brown bears is piecemeal destruction of their habitat.

An Alaska Native's Perspective

by Fred Armstrong, Jr.



A Native Alaskan makes a traditional basket for gathering wild berries during the brief Alaska growing season.

USFWS photo

*H*ow does the Endangered Species Act (ESA) affect tribes in Alaska? What are the benefits of tribal involvement in the ESA? Will the ESA impact subsistence activities in Alaska? Will it impede the cultural and traditional lifestyle Alaska Natives cherish? These are some of the questions that came to me when I first heard of the ESA. To answer some of these questions, one must first understand the unique laws that affect the livelihoods of Alaska Natives and determine the course that resource managers must take to implement wildlife conservation regulations.

When oil was discovered on the North Slope, the State of Alaska needed to settle a land claims issue with Alaska Natives in order for the trans-Alaska pipeline to be built. It looked to Congress to settle the issue. In hopes of changing the way the Federal Government worked with Native Americans, Congress wanted an alternate solution to creating reservations throughout Alaska. At the same time, Congress wanted Alaska Natives to forge their own destiny and become self-reliant. Hearings were conducted and legislation acceptable to both Alaska Natives and the State of Alaska slowly developed. In 1971, Congress passed the Alaska Native Claims Settlement Act (ANCSA). This law provided for the creation of 13 Native regional, for-profit corporations. The corporation boundaries were created along cultural diversity lines, with the exception of one corporation that represents Alaska Natives living outside of Alaska. (That corporation did not receive a land entitlement but instead received a cash settlement.) Congress authorized the 12 remaining corporations to select land

from 44 million acres (18 million hectares). This land, along with a cash settlement, would be used to pursue economic development ventures to sustain and support their shareholders. Congress also increased the number and size of national parks, preserves, and refuges in Alaska, and the Secretary of the Interior selected a total of 227 million acres (92 million ha) for these purposes. The authority for this was the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA also provided for the protection of subsistence hunting and fishing activities by rural residents of Alaska. Title VIII of ANILCA gives authority for the Federal Government to implement a subsistence hunting and fishing program for rural residents on Federal lands.

One important aspect of ANILCA for tribes in Alaska was the extinguishment of aboriginal hunting and fishing rights. This action paved the way for the State of Alaska to manage fish and wildlife resources throughout Alaska. The passage of ANCSA also revoked the Alaska Native Allotment Act and all reserves for Native purposes, except for one at Annette Island (Metlakatla). Tribes within reservations were given the option of receiving title to their land, but without reservation status. The 44 million acres that the regional corporations selected were based on traditional use and occupancy patterns within each geographic area. These 12 regional corporations represent the diverse cultures within the three ethnic races: Indian, Eskimo, and Aleut.

In 1993, Ada Deer, then Assistant Secretary of the Interior for Indian Affairs, announced the recognition of 226 Alaskan tribes by the Federal

Government. However, an important distinction is that they are tribes without a sovereign land base. This is significantly different from the situation in the lower 48 States, where Native Americans have reservations with sovereign powers to govern their people and land. Within the 226 Alaska tribes are 15 language groups. The Eskimo dialects are Inupiaq, Yupik, Siberian Yupik, Jupik, Cupik, and Central Yupik. The Indian languages consists of Athabascan, Eyak, Haida, Tsimshian, and Tlingit. Finally, the Aleuts consists of Aleut, Alutiiq and a mixture group from the St. Matthew and Middleton Islands.

The existence of many languages within ethnic groups suggests that there are significant differences among the indigenous peoples in Alaska. The lifestyle of Alaska Natives is patterned around subsistence activities within their geographic areas. Cultural and traditional ways differ somewhat; however, the spirituality that is involved in hunting and gathering remains the same. Many people do not understand the connection that Alaska Natives have with the environment in which they live. Alaska Natives have a strong respect for the animals that provide sustenance to them. It shows in the ways that they prepare for hunts and in the ways they prepare and preserve the game. Cultural values are very strong and are passed on through generations.

Resource management by State or Federal agencies is usually based on research and an accumulation of scientific data. The Alaska Native community, however, traditionally relied on word of mouth, visual observation, and information handed down from generation to generation. Observations about animal patterns, density or scarcity, and general health were passed along to other tribal members. This information usually determined whether or not to hunt for certain species. In other words, the Alaska Native community has had its own method of practicing resource management that can be just as effective, if not more so, than

management guided strictly by research and scientific analyses.

In order for truly cooperative management to succeed in Alaska, a blending of the two different styles of resource management is needed. The scientific community must be able to incorporate traditional environmental



knowledge that Alaska Natives provide. Likewise, the Native community must be willing to embrace a management plan that incorporates science as well as their views and ideas.

The ESA is not new to Alaska. The FWS has been implementing this important law effectively in Alaska for a long time. It shows in the way some of the State's endangered species have improved in status toward the ultimate goal of recovery. However, the ways in which activities such as ESA consultation, coordination, and implementation are carried out may change as the involvement of Alaska Natives grows. Outreach efforts need to increase so that Alaska Natives remain informed and become more active partners in endangered species recovery.

Fred Armstrong, Jr., is the FWS Alaska Native Issues Advisor.

The return of spawning salmon is a much-anticipated event. Many Native Alaskan communities depend on salmon as an important food source. Here a temporary "fish camp" has been set up to process the catch.

USFWS photo

The *Exxon Valdez* Spill: 10 Years Later

by Catherine Berg



The body of an oil-soaked sea otter recovered from Prince William Sound after the Exxon Valdez spill.
USFWS photo

Restoration research projects yielding valuable knowledge include:

The Sound Ecosystem Assessment is a \$21.4 million, 7-year project studying the productivity of Pacific herring and pink salmon in Prince William Sound. The research is providing new insights into ocean currents, nutrients, mixing, salinity, and temperatures and how these physical factors influence plant and animal plankton, prey, and predators in the food web.

Alaska Predator Experiment concentrates on the

Shortly after midnight on March 24, 1989, the oil tanker *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound, Alaska, spilling almost 11 million gallons of North Slope crude oil. It was the largest tanker spill in United States history. That spring, the oil moved southward along the Alaskan coast, oiling more than 1,500 miles (2,415 kilometers) of shoreline in Prince William Sound and along the Kenai Peninsula, lower Cook Inlet, Kodiak Archipelago, and Alaska Peninsula. Oiled areas included a national forest, four national wildlife refuges, three national parks, five State parks, four State critical habitat areas, and a State game sanctuary. Oil eventually reached shorelines nearly 600 miles (965 km) southwest of where the spill occurred.

The *Exxon Valdez* ran aground just before the most biologically active season of the year. The resulting oil spill occurred during the seaward migration of salmon fry, major migrations of birds, and the primary breeding season of most species of birds, mammals, fish, and marine invertebrates in the spill's path. Marine birds and sea otters were killed by direct oiling on open water. Birds and mammals that were covered with oil may have ingested toxic quantities as they tried to clean themselves and may have died of cold stress after the oil damaged the insulation provided by their feathers or fur. Shoreline oiling had devastating impacts on the upper intertidal zone and intertidal communities, both from direct oiling and from beach cleaning, particularly high-pressure, hot-water washing. "Injuries" to natural resources did not always occur immediately. Delayed injuries were caused by such

factors as a reduction in critical food sources caused by the spill and persistent oil in the intertidal areas.

Biological resources were considered injured by the *Exxon Valdez* oil spill only if scientific research demonstrated a population-level injury or continuing chronic effects. Such injured biological resources included bald eagles (*Haliaeetus leucocephalus*), black oystercatchers (*Haematopus bachmani*), common loons (*Gavia immer*), clams, common murrelets (*Uria aalge*), cormorants (*Phalacrocorax*, three species), cutthroat trout (*Oncorhynchus clarkii*), Dolly Varden trout (*Salvelinus malma*), harlequin ducks (*Histrionicus histrionicus*), harbor seals (*Phoca vitulina*), Kittlitz's murrelets (*Brachyramphus brevirostris*), marbled murrelets (*Brachyramphus marmoratus marmoratus*), killer whales (*Orcinus orca*), mussels (*Mytilus edulis*), Pacific herring (*Clupea harengus*), river otters (*Lutra canadensis*), pigeon guillemots (*Cepphus columba*), pink salmon (*Oncorhynchus gorbuscha*), rockfish (*Sebastes* sp.), sea otters (*Enhydra lutris*), and sockeye salmon (*Oncorhynchus nerka*).

Wildlife was not the only resource injured by the spill. Some archaeological sites were damaged directly by oil and others were subject to looting and vandalism during and after the clean up. Oil was deposited high above the tide line in designated wilderness areas. The massive intrusion of people and equipment associated with the clean up resulted in an unprecedented disturbance of undeveloped and normally uninhabited areas, and some visible impacts of this disturbance still linger. Sediments were also considered an

injured resource. Oil penetrated deeply into the subsurface of cobble and boulder beaches, especially in sheltered habitats, and oil persists in many tidal locations. Commercial fishing, subsistence uses (hunting, fishing, and gathering), passive use, recreation, and tourism also suffered harm.

To remedy the effects of the spill, a settlement among Exxon, the United States government, and the State of Alaska was approved by the U.S. District Court on October 9, 1991. The settlement resolved criminal charges and civil claims for recovery of natural resource damages resulting from the oil spill. Most of the \$900 million civil settlement, paid out in annual payments over a 10-year period, is dedicated to implementation of a restoration plan that was developed by the Trustee Council agencies: the National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Forest Service, Alaska Department of Fish and Game, Alaska Department of Environmental Contaminants, and Alaska Department of Natural Resources.

Restoration actions under this plan include research and monitoring, general restoration, habitat protection, and a restoration reserve:

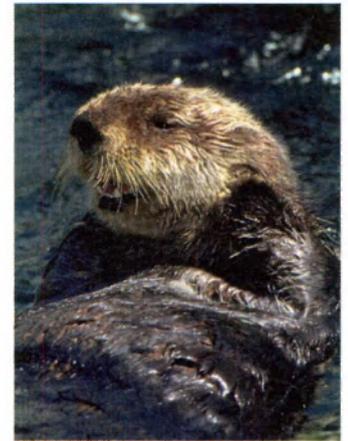
- **Research and Monitoring** Surveys and other monitoring of fish and wildlife in the spill region provides basic information to determine population trends, productivity, and health. Research has focused on identifying the biological needs of individual species and how each species contributes to the Gulf of Alaska ecosystem.
- **General Restoration** This category includes projects to protect archaeological resources, improve subsistence resources, enhance salmon runs, reduce marine pollution, and restore damaged habitat.
- **Habitat Protection** Protection of habitat is recognized as a means to help prevent additional injury to species due to intrusive development or other loss of habitat. Funds have

been used to acquire title or conservation easements on land important for the restoration of injured resources and services. To date, more than 635,000 acres (257,000 hectares) have been acquired (including pending purchases) for a total of approximately \$339.4 million. This includes 1,419 coastal miles (2,283 km) and more than 280 salmon streams. Almost 275,000 acres (442,475 ha) have been added to refuges, much of that within the Kodiak National Wildlife Refuge.

- **Restoration Reserve** The restoration reserve was established in recognition that full recovery from the oil spill would not occur for decades. The reserve fund will support long-term restoration activities after the final payment is received from Exxon in 2001. The reserve is expected to be worth approximately \$140 million, most of which will be dedicated to a long-term science program in the northern Gulf of Alaska.

History will judge the *Exxon Valdez* oil spill as the worst kind of spill in one of the worst places for a spill—an incredibly rich ecosystem. Ten years later, it is clear that many injured species have not fully recovered. Over the past decade of intense studies, funded by the \$900 million civil settlement with Exxon, scientists have made giant leaps in our knowledge of the marine environment on which we all depend. In 1989, we were completely unprepared to gage the environmental damage from the spill because of a lack of information about the populations of most bird and mammal species. Today, we not only have good data on these species but we also understand far better the role each plays in the ecosystem. The legacy of the *Exxon Valdez* spill will be not only the lasting damage to the region's environment but also the efforts of people working together for wildlife restoration.

Catherine Berg is a Wildlife Biologist in the Anchorage Regional Office.



A 5-year Nearshore Vertebrate Predator Project is studying sea otters (above) and three other species (river otters, harlequin ducks, and guillimots) to better understand recovery factors on land and in the nearshore environment.

Corel Corp. photo

recovery of seabirds based on the availability of forage fish as a food source. This 8-year, \$10.2 million project looks at wide-ranging ecological changes to explain why numbers of some species, such as cormorants, pigeon guillemots, and harbor seals, are still diminishing.

In marine mammal research, scientists are using fatty acid analysis to determine what a harbor seal eats by looking at its blubber. This has become an essential tool in understanding why harbor seal populations continue to decline.

by staff of the Alaska
Regional Office

Alaska's International Affairs Program



This team of Russian and American scientists is studying polar bears in the wild.

Photo by Scott Schliebe

Alaska's geographic location between Russia and Canada places it in a center of international ecological importance with its shared borders, seas, and populations of many different species of flora and fauna. It is the primary northern staging area for birds following the great North American flyway—the avian migratory highway linking the Arctic and Latin America. Economically important fish populations and marine mammals move among Russian, Canadian, and U.S. regions. The significance of international conservation is rapidly growing throughout the world as countries recognize the mutual need to conserve shared natural resources, habitats, and indigenous cultures. For Alaska, international conservation requires coordination among the United States, Russia, Canada, Mexico, Japan, and other foreign countries as well as cooperative working relationships with the State of Alaska and the Native community.

Because of the growing need to increase coordination on an international level for the conservation of arctic habitats, the U.S. Fish and Wildlife Service's (FWS) Alaska Regional Office established its own Office of International Affairs (IA) in January 1998. The mission of the IA program is to strengthen cooperation, promote communication, and provide leadership in Alaska for international conservation of fish, wildlife, and plants. The IA Office manages, advocates, and executes priority international issues and programs, and coordinates regional activities. In addition, IA works with State and Federal scientists and managers, universities, non-governmental organizations, and indigenous peoples'

organizations to promote cooperative international conservation efforts.

Current IA efforts focus on several specific functions. A top priority is to coordinate FWS involvement in the work of the international Arctic Council, especially through its Working Group for the Conservation of Arctic Flora and Fauna. International collaboration of this sort serves to strengthen collective scientific understanding of arctic ecosystems. Programs for joint management of shared resources are developing through international treaties and agreements such as the U.S.-Russia Conservation Agreement for Polar Bears of the Chukchi/Bering Sea Region. Another focus of the IA Office is to provide opportunities for technology transfer and technical assistance.

The ability of the FWS to succeed in using an ecosystem approach to resource management rests greatly on our ability to develop effective working relationships with our international and indigenous partners. A short list of Regional Office contributions to international conservation includes:

- serving as the National Representative to the Arctic Council's international working group on the Conservation of Arctic Flora and Fauna,
- Bilateral U.S.—Russia Conservation Agreement for Polar bears of the Chukchi/Bering Sea Region,
- Circumpolar Murre Conservation Strategy,
- Circumpolar Spectacled Eider Conservation Strategy,
- Atlas of Rare Endemic Vascular Plants of the Arctic, and
- participating in wildlife management with Far Eastern Russia.

So... You'd Like to Work in Alaska?

by Karen Boylan

What's that you say? You'd like to work in Alaska? So you can see for yourself why everyone says it's different up here? OK, great. But before sending in your application, please make sure you've examined the following skills and abilities needed for the job:

Must be able to:

1. Carry 50 pounds of gear through shoulder-high wet grass up a 60-degree slope on a remote island to chase and capture 82 flightless Aleutian Canada geese, place them in transport boxes, and haul them back to the ship. Tube-feed said geese with extremely slimy and smelly liquid every 2 hours aboard ship in close quarters amid large, rolling ocean swells until you reach the translocation island. Condition of own stomach has no bearing on tube feeding schedule.

2. Land inflatable boat on beach through heavy, cold surf while wearing mustang suit and seaboots. Avoid dumping self and cargo of Aleutian Canada geese in said surf.

3. Stand all day on ship's flying bridge, counting and identifying every living thing that comes within 150 meters of ship. Identify at a glance and count thousands of "USDAs" (unidentified small dark alcids) in flocks flying, sitting on the water, or diving. Differentiate between crested and whiskered auklets, murrelets and murrelets, Laysan and black-footed albatrosses, horned and tufted puffins, many others. Do this in dense fog.

4. Navigate through dense, wet Katmai forests using bear trails and aerial photographs to find wetlands to delineate. Nimbly dive into trailside bushes to allow oncoming 1,000-pound brown bear the right-of-way. Make

tremendous noise all day to warn bears of your progress through said forest. Develop creative vocal warning techniques beyond "Heyyyyyy, bear!" Photo-document wetlands. Keep camera in focus while backing away from bear.

Must have a willingness to:

1. Separate innards from seabird carcasses that are slightly past their prime for tissue analysis.
2. Perform above task in shipboard lab that is rolling in heavy seas.
3. Listen to Captain say, "Just another day on the Bering Sea" while watching anemometer hit 94 knots.
4. Stay up all "day" (never mind that in summer, "night" never comes and "day" lasts for four months).
5. Spend inordinate amounts of time waiting for airplanes in bad weather.
6. Spend a lot of money for travel that lasts longer than you thought it would. Sometimes, much longer.

Helpful to have immunity to:

1. Seasickness
2. Biting flies
3. F16-sized mosquitoes
4. Sleep

Helpful to have indifference to:

1. Thousand-pound brown bears
2. White-knuckle landings in bush aircraft
3. Wet (very wet) beach landings through ice-cold Aleutian surf

Helpful to pay attention to:

1. 5,000-volt electrical fence around your camp tent
 2. Rustling noises in the bushes
 3. The weather
- Ready?



Corel Corp. photo

But seriously.... Although Alaska is a land of extraordinary scenic beauty, working here requires specialized, often expensive equipment, extensive safety training, and the ability to adapt to an ever-changing environment where conditions can be extreme. It often requires extraordinary measures to accomplish tasks that might elsewhere be considered ordinary. Much of remote Alaska is still unsurveyed for wildlife and plants, and there is comparatively little knowledge available on Arctic and subarctic species. Some species are found in very isolated areas, and it can be hard to track their problems and progress. Safety for our employees is paramount. Extreme weather conditions and frequent work in or near frigid waters requires special training and equipment. Virtually all of Alaska is bear country, and this fact requires all employees working in the field to have bear and firearm safety training for protection.

Karen Boylan is the Congressional Liaison and Deputy ARD for External Affairs for the Alaska Regional Office.

Canada and U.S. Save Shared Species at Risk

by Martha Balis-Larsen,
Chuck Dauphine, and
Susan Jewell



Summering in Canada's Northwest Territories and wintering in southern Texas, the whooping crane has been the subject of binational conservation efforts for thirty years.
USFWS photo

Among the many challenges facing wildlife managers in North America is the fact that political and biogeographical boundaries rarely coincide. For example, the border separating the United States and Canada intersects nine major ecological regions, including Arctic tundra, many forest types, several mountain ranges, two coastal plains, the vast interior plains, and the Great Lakes. These regions feature a great diversity of plants and animals, many of which either migrate or range across the borders between the two countries. Some of these shared species are at risk and need urgent attention in both countries to save them from extinction.

Many North American species that are widely distributed in the continental United States extend only a short distance into Canada or migrate seasonally from Canadian breeding areas to spend the winter farther south. All of the 25 bird species considered threatened or endangered in Canada also occur in the United States. Of the 161 species of animals and plants on Canada's national threatened and endangered lists, about 70 percent are also found in the United States.

According to a review of Federal and State listed species in the U.S., there are more than 800 endangered, threatened, or rare species that occur in both nations. Some species considered at risk in the U.S. are found in sizable numbers in Canada, such as the woodland caribou (*Rangifer tarandus caribou*), wolf (*Canis lupus*), grizzly (*Ursus arctos*), and lynx (*Lynx canadensis*). Other species are considered at risk in Canada but are found more commonly in the U.S., such as the sage grouse

(*Centrocercus urophasianus urophasianus*), northern bobwhite (*Colinus virginianus*), burrowing owl (*Speotyto cunicularia*), eastern Massasauga rattlesnake (*Sistrurus catenatus catenatus*), and spiny softshell turtle (*Apalone spinifera*).

Both nations currently consider such shared species as the right and bowhead whales (*Balaena glacialis* and *B. mysticetus*), whooping crane (*Grus americana*), Eskimo curlew (*Numenius borealis*), Kirtland's warbler (*Dendroica kirtlandii*), leatherback turtle (*Dermochelys coriacea*), and Furbish lousewort (*Pedicularis furbishiae*) as endangered. A number of other species are considered threatened in one country and either threatened or endangered in the other, including the sea otter (*Enhydra lutris nereis*), humpback whale (*Megaptera novaeangliae*), marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), roseate tern (*Sterna dougallii dougallii*), western prairie white fringed orchid (*Plantanthera praeclara*), and golden paintbrush (*Castilleja levisecta*). Several additional species are endangered in one country and extirpated in the other, like the black-footed ferret (*Mustela nigripes*), Atlantic gray whale (*Eschrichtius robustus*), and blackfin cisco (*Coregonus nigripinnis*).

Although the benefit of close cooperation in the management of shared species has long been recognized by both countries, it has traditionally been directed at species of high economic value, such as migratory game and fisheries. The whooping crane and several other endangered species with high public profiles have

been the subject of joint conservation efforts, but they were few and were handled as *ad hoc* projects. Attention is now broadening to consider all species, especially those believed to be headed for extinction. The American and Canadian governments have created a formal agreement to cooperate in identifying and, where feasible, recovering shared wildlife at risk.

In April 1997, Secretary of the U.S. Department of the Interior Bruce Babbitt and former Minister of Canada's Department of the Environment Sergio Marchi signed a document entitled "Framework for Cooperation Between the U.S. Department of the Interior and Environment Canada in the Protection and Recovery of Wild Species at Risk." The framework supports exchanging technical expertise; identifying species that would benefit from bilateral attention; implementing joint recovery plans; recruiting partnerships between State, Provincial, and private agencies and individuals; and creating greater public awareness.

Perhaps the agreement's most important achievement, however, will be to encourage more inclusive and flexible cooperative arrangements. For example, any interested party, whether government or private, may seek the assistance of the two Federal wildlife agencies in establishing cooperative programs with its counterpart in the other country. Moreover, action may be directed at any shared species, regardless of jurisdiction, including species considered at risk in only one of the two countries. The burrowing owl, which has become increasingly endangered in Canada but is not considered at risk in the U.S., is a good example. In late 1998, a symposium was held in Utah to examine the owls' overall status and to seek more information on the poor survival of owls that nest in Canada and winter in the southern U.S. and northern Mexico.

To determine which other species need cooperative efforts, or in some cases additional effort, personnel from

the Canadian and U.S. wildlife services have been assembling three lists of species of mutual concern. One comprises wildlife and plants listed in both Canada and the U.S., and another includes species listed only in one country but whose range historically included both countries. The third list is made up of species of special concern that are experiencing rapid population declines or require more studies to determine their status. By pursuing the needs revealed by these lists, the working group hopes to encourage communication and cooperative recovery efforts. These results will also be shared with the working groups that are coordinating recovery efforts for species shared by the three countries.

Interagency meetings have already led to closer working relationships at the headquarters level, and this is expected to benefit regional and local offices as well. Each country's endangered species management procedures, from listing to consultation to recovery to outreach efforts, will progress from the strengths of the other as we work together to identify and save species at risk that occur on both sides of the world's longest national border.

Martha Balis-Larsen, outreach specialist, and Susan Jewell, biologist, are with the Division of Endangered Species, U.S. Fish and Wildlife Service, Arlington, Virginia. Chuck Dauphine is the Scientific Advisor for the Biodiversity Protection Branch, Canadian Wildlife Service, Ottawa, Canada.

Common Name	Scientific Name	National Status, Canada [COSEWIC]	Federal Status, US [FWS]
<i>Mammal</i>			
Bear, grizzly	<i>Ursus arctos</i>	V	T
Caribou, woodland	<i>Rangifer tarandus caribou</i>	T	E
Ferret, black-footed	<i>Mustela nigripes</i>	EX	E
Otter, southern sea	<i>Enhydra lutris nereis</i>	T	T
Whale, blue	<i>Balaenoptera musculus</i>	V	E
Whale, bowhead (E. & W. Arctic pop.)	<i>Balaena mysticetus</i>	E	E
Whale, finback	<i>Balaenoptera physalus</i>	V	E
Whale, gray (Atlantic pop.)	<i>Eschrichtius robustus</i>	EX	E
Whale, humpback (W. N. Atlantic pop.)	<i>Megaptera novaeangliae</i>	V	E
Whale, humpback (N. Pacific pop.)	<i>Megaptera novaeangliae</i>	T	E
Whale, right	<i>Balaena glacialis (incl. australis)</i>	E	E
<i>Bird</i>			
Crane, whooping	<i>Grus americana</i>	E	E
Curlew, Eskimo	<i>Numenius borealis</i>	E	E
Falcon, American peregrine	<i>Falco peregrinus anatum</i>	T	E
Murrelet, marbled	<i>Brachyramphus marmoratus marmoratus</i>	T	T
Owl, northern spotted	<i>Strix occidentalis caurina</i>	E	T
Plover, piping	<i>Charadrius melodus</i>	E	E, T
Tern, roseate	<i>Sterna dougallii dougallii</i>	E	E, T
Warbler, Kirtland's	<i>Dendroica kirtlandii</i>	E	E
<i>Reptile</i>			
Turtle, leatherback sea	<i>Dermodochelys coriacea</i>	E	E
<i>Clam/Mussel</i>			
Riffleshell, northern	<i>Epioblasma torulosa rangiana</i>	E	E
Weegemussel, dwarf	<i>Alasmidonta heterodon</i>	EX	E
<i>Fish</i>			
Cisco, blackfin	<i>Coregonus nigripinnis</i>	T	EX
Sturgeon, shortnose	<i>Acipenser brevirostrum</i>	V	E
Sturgeon, white (Kootenai River pop.)	<i>Acipenser transmontanus</i>	V	E
<i>Insect</i>			
Butterfly, Karner blue	<i>Lyciaeides melissa samuelis</i>	EX	E
<i>Plant</i>			
Lousewort, Furbish's	<i>Pedicularis furbishiae</i>	E	E
Orchid, eastern prairie white fringed	<i>Platanthera leucophaea</i>	V	T
Orchid, western prairie white fringed	<i>Platanthera praeclara</i>	E	T
Paintbrush, golden	<i>Castilleja levisecta</i>	T	T
Pogonia, small whorled	<i>Isotria medeoloides</i>	E	T
Thistle, Pitcher's or dune	<i>Cirsium pitcheri</i>	E	T

Codes: **EX**= Extinct or Extirpated, **E**= Endangered, **T**=Threatened, **V**=Vulnerable, **C**= Candidate
Sources: U.S. List (50 CFR 17.11 17.12), COSEWIC list (1999), and information from The Nature Conservancy

(Above) Some wildlife and plants listed in both Canada and the U.S. whose ranges historically included both countries.

by Susan Bury and
Hank Fischer

Top 10 Reasons to Support Rancher Compensation

During the past decade, a lot of people have had a lot to say about gray wolves (*Canis lupus*) in the American West. Wolf advocates have petitioned. Scientists have testified. Ranchers have protested, newspapers have editorialized, and legislators have debated.

Through the ebb and flow of 10 years of controversy, there's been one constant: When a rancher has lost livestock to wolves, an independent conservation organization—Defenders of Wildlife—has directly reimbursed the rancher for the market value.

This straightforward economic transaction is widely credited with bringing resolution to the struggle over reintroducing wolves to Yellowstone and central Idaho—one of the longest, most expensive, and hardest fought battles in wildlife conservation history. “In returning the wolf to the Greater Yellowstone Ecosystem, several accommodations were vital so as not to negatively affect Yellowstone’s neighbors,” wrote Yellowstone Superintendent Michael V. Finley. “An absolutely crucial accommodation was Defenders’ wolf-livestock compensation program.”

More than anything else, the compensation program has built public tolerance for the wolves. Probably two out of three ranchers we speak to concerning compensation claims tell us they don’t mind having the wolf around as long as they don’t experience economic loss. As one Red Lodge, Montana, rancher told a reporter, “I’m really in favor of the wolves. I just don’t want to feed them with a \$10,000 mare.”

It’s Time to Double the Promise

From the time of the first compensation payment in 1987 until the 1995

reintroduction of wolves to Yellowstone and central Idaho, Defenders paid a total of about \$16,000 for wolf losses. Then, reintroduction and subsequent reproduction bolstered wolf populations at a much faster rate than most experts expected. Unfortunately, not all wolves restricted their diet to natural prey and livestock predations increased.

The Wolf Compensation Trust is a permanent fund that Defenders promised to maintain at \$100,000 for at least as long as the wolf remains on the endangered species list. For us to honor our future commitments, the fund and the promise need to grow. Our goal is to build the fund to \$200,000 and thereafter promise to maintain it at that level. Here are nine reasons why wildlife professionals should care about Defenders’ compensation program:

1. *Defenders’ compensation program addresses the basic problem.* The late William Penn Mott, Jr., set the stage in 1985. Then the director of the National Park Service, he said, “The single most important action conservation groups could take to advance Yellowstone wolf recovery would be to develop a fund to compensate ranchers for any livestock losses caused by wolves.”

Defenders’ compensation program respects the legitimate financial concerns of those people most directly affected by the presence of predators: the livestock producers. Ed Bangs, U.S. Fish and Wildlife Service gray wolf recovery coordinator, says, “The livestock compensation program certainly made wolves much more tolerable to livestock producers ... and has made wolf recovery more easily attainable.” Jim Peterson, executive vice president of the Montana Stockgrowers

Association, told a reporter that reintroduced wolves are a reality “...so the question becomes how can we live with them and make it as tolerable as possible. The reimbursement is certainly a step in that direction.”

2. *It’s the way of the future.* The compensation concept fits well with the growing trend toward collaboration on environment and conservation projects. A feature on new approaches to conservation in the October 11, 1998, the *Washington Post* identified locally based solutions, economic incentives, and collaboration as important trends.

3. *It reduces illegal killing.* Defenders’ program has almost certainly reduced illegal killing of predators, which is a boon to wildlife advocates and a relief to wildlife law enforcement agents. Curt Mack is Wolf Recovery Coordinator for the Nez Perce Tribe, which has the Federal contract to manage wolf recovery in Idaho. “There was real concern in the rural ranching communities of Idaho that the wolves would eat them out of house and home,” Mack says. “The Defenders’ compensation program has caused these communities to have more understanding and patience, to give the project a chance. In 3 years, Defenders has compensated all confirmed losses, batting a thousand. This makes our job of trying to establish relationships with ranchers that much easier.” He continues, “There’s no doubt that wolves are saved by this compensation. The point I make with ranchers is that every illegal take of a wolf sets back the schedule to recovery, particularly now when every wolf is so important, and that’s not in anybody’s best interest.”



Corel Corp. photo

4. *It's won approval from respected people in the field.* Defenders' program has won the endorsement of leading wildlife professionals. Fish and Wildlife Service Director Jamie Clark has noted that Defenders' compensation program has been "critical to the success of the wolf recovery program.... Despite the rapid increase in the wolf population, livestock are rarely attacked. But when losses do occur, the few ranchers affected are aware of the Service's wolf depredation control effort and Defenders' compensation fund, thus enabling them to accept coexistence with the wolf..." In 1990, the National Environmental Awards Council gave Defenders an Environmental Achievement Award for the fund.

5. *It's won local acceptance.* In Missoula, Montana, the *Missoulian* editorialized, "By stepping forward, checkbook in hand, Defenders has gone a long way toward diffusing the loudest and most emotional critics of restoration of free-ranging wolves." The Bozeman (Montana) *Daily Chronicle* commented, "The program shows that the Defenders aren't being pie-in-the-sky about the wolf recovery efforts.... it

is an important step that shows environmentalists are willing to work with ranchers to make the wolf reintroduction succeed."

6. *It's a great opportunity for people who care.* Visitors to natural areas often ask, "What can I do to help wildlife?" Defenders' compensation program is a wonderful answer for conservation donors who want to support practical programs that achieve direct results. Defenders takes no overhead—every dime is used to buy tolerance for the wolves. As Director Clark comments, "Individuals who supported wolf restoration and contributed to the Defenders compensation program should be proud that they can see and hear the results of their efforts in the form of living, breathing wolves roaming the two most intact ecosystems in the lower 48 States."

7. *It's simple.* In an era when large-scale programs of any kind are regularly strangled by bureaucracy—resented as much by those who must enforce the rules as those who must abide by them—the Defenders' compensation program is refreshingly simple. A rancher who believes a wolf has killed livestock contacts the appropriate State or Federal agency. A biologist visits the site, usually within 48 hours, to confirm or refute that wolves were responsible. When wolf predation is verified, the biologist sends a report to Defenders. We contact the rancher, explain our program, discuss the incident, and determine a compensation payment based on fair market value. The rancher usually receives a check within 2 weeks after Defenders receives verification from the wildlife agency.

8. *A permanent, well-funded program has greater credibility.* Some critics say that \$100,000 is not sufficient as promised compensation. We recognize that decision-makers need to be confident that the fund will continue. While we know we can meet our commitments for the short term, it's important to double the guaranteed size of the fund to prepare for the longer term.

9. *It puts the risk on the people who seek to impose the risk.* From 1987 to 1998, wolves killed about 9 livestock a year in Montana, accounting for one in 20,000 livestock deaths, according to agency livestock statistics. So wolves' impact on the industry is small—but try telling that to the Eureka, Montana, rancher who lost 16 lambs and 12 ewes in one extraordinary depredation in August 1997. Defenders paid him \$3,942 and contributed \$250 for him to hire a backhoe to bury the dead livestock so they would not attract more predators. Through Defenders' compensation program, wolf supporters insure ranchers against the risk of economic loss.

If you want a Letterman-style 10th reason to support compensation, here it is: *the Defenders' compensation program works.*

Integrated into the Landscape

Just as the reintroduced wolves so adeptly integrated themselves into the landscape of Yellowstone, so Defenders' compensation program is now integrated into the landscape of wildlife management. A few years ago, some people argued that it would never work. Now, some folks tell us that we need to make it even stronger to meet the potential demand. With the active support of the wildlife conservation community, the compensation program can continue to serve as a model of success for other important endeavors.

Defenders of Wildlife welcomes contributions of all shapes and sizes for wolf and grizzly bear compensation, and would like your suggestions for individuals, foundations, or corporations that might help us build our compensation fund. Write Hank Fischer, Defenders of Wildlife, Northern Rockies Regional Office, at 1534 Mansfield Avenue, Missoula, Montana 59801 or call at (406) 549-0761.

Hank Fischer is Defenders' Northern Rockies representative. Susan Bury is a consultant to Defenders and a long-time supporter.

During December 1998 and January 1999, the Fish and Wildlife Service (FWS) published the following proposed and final Endangered Species Act (ESA) listing actions in the *Federal Register*:

Listing Proposals

Desert Yellowhead (*Yermo xanthocephalus*) As its name suggests, the desert yellowhead is a plant that grows in an arid environment and produces heads of numerous yellow flowers. It is a member of the aster family (Asteraceae). This species is known from only a 5-acre (2-hectare) site in the Beaver Rim area of southern Fremont County, Wyoming, administered by the Bureau of Land Management. The desert yellowhead was not discovered until 1990, and surveys conducted over past the 8 years have not located any additional populations.



Photo by Chuck Davis/USFWS

The area occupied by the desert yellowhead is potentially vulnerable to surface disturbances from such actions as oil and gas development, compaction by vehicles, and trampling by livestock. To ensure that this plant and its habitat are conserved, the FWS proposed on December 22 to list the desert yellowhead as a threatened species.

Nine Texas Invertebrates On December 30, the FWS proposed to list nine species of small, cave-dwelling invertebrates native to a few sites in Bexar County, Texas, as endangered. All nine species are adapted to an environment without light. Two of the species, *Rhadine*

exilis and *Rhadine infernalis* (no common name), are essentially eyeless ground beetles. Another, the Helotes mold beetle (*Batrissodes ventyri*), is completely eyeless. The Robber Baron Cave harvestman (*Texella cokendolpheri*) is an eyeless form of "daddy-longlegs." The remaining five species—the Robber Baron Cave spider (*Cicurina baronia*), Madla's cave spider (*Cicurina madla*), *Cicurina venii*, vesper cave spider (*Cicurina vespera*), and Government Canyon cave spider (*Neoleptoneta microps*)—are eyeless, or essentially eyeless, spiders.

These creatures are known from karst features (limestone formations containing caves, sinks, and fissures) in north and northwest Bexar County. The health of karst environments depends in large part on the health of the surface environment within their recharge zone. Karst areas are known to have complex groundwater flow paths that are very sensitive to pollution. Contaminants that enter the aquifer can quickly degrade underground ecosystems.

Threats to the habitats of these species include both the direct and indirect effects of urbanization in this rapidly growing region. Caves and karst features are often filled in, and the aquatic cave environment can be degraded by septic effluents, sewer leaks, and pesticide runoff. Predation of the cave invertebrates by the non-native fire ant (*Solenopsis invicta*) is another serious threat. Some caves also have been vandalized or filled with trash.

Twenty-eight caves known to harbor one or more of the native invertebrates are on private lands, 21 are on Department of Defense lands, six are on State-owned land, and one is on a county right-of-way. The Defense Department is taking the conservation of occupied caves on its property into consideration, and some of the private landowners have already expressed a willingness to work with the FWS to develop land management practices that conserve karst habitats.

Santa Ana Sucker (*Catostomus santaanae*)

Historically one of the most common fish in southern California, the Santa Ana sucker has a historic range that coincides with the Los Angeles metropolitan area. The Santa Ana sucker once occurred widely in the Los Angeles, San Gabriel, and Santa Ana River drainages of southern California. It is now restricted to the headwaters of the San Gabriel River system, the lower

part of Big Tujunga Creek in the Los Angeles River basin, and a lowland stretch of the Santa Ana River in Los Angeles, Orange, Riverside, and San Bernardino counties. Because of the danger of continuing habitat loss, the FWS proposed on January 26 to list the Santa Ana sucker as threatened. A non-native population introduced into the Santa Clara River system in Ventura and Los Angeles counties is not included in the listing proposal.

The Santa Ana sucker, typical of the sucker family, has large, thick lips and a small mouth used to "vacuum" algae and invertebrates from stream beds. It is about 6 inches (15 centimeters) long and has a dark, blotchy back and silvery underside. The sucker inhabits small, shallow streams and appears to be most abundant where the water is cool, clean, and clear, although the species can tolerate seasonally turbid water.

The sucker's decline was related to environmental impacts from the region's intense urban development. Water diversions, channelization, and concrete lining of streams, as well as erosion, debris torrents, and pollution, have destroyed or degraded the fish's habitat. Dams also have isolated and fragmented the remaining sucker populations. Impoundments provide habitat for introduced non-native fishes that prey on suckers or compete with them for habitat, which biologists believe also contributed to the species' decline. Approximately 35 percent of the current range of the Santa Ana sucker is on Angeles National Forest lands, including a small portion within the San Gabriel Wilderness.

Critical Habitat The FWS published proposals on December 30 to designate critical habitat in southern Arizona for two listed species, the cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*) and a plant, the Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*).

In southern Arizona, the pygmy owl nests within tree and cactus cavities. It is endangered by the loss or modification of habitat due to dams, water diversions, and urbanization. The proposed critical habitat for this species includes specific river flood plains and Sonoran desert scrub communities in Pima, Cochise, Pinal, and Maricopa counties. The Huachuca water umbel, a semi-aquatic plant, occurs in cienegas (desert marshes), springs, streams, and rivers. Threats to this

species include competition with non-native species, droughts, destructive floods, and habitat degradation caused by livestock overgrazing, water diversions, dredging, groundwater pumping, and certain recreational activities. Proposed critical habitat for the water umbel includes specific stream courses and adjacent riparian areas in Santa Cruz and Cochise counties.

Critical habitat designations do not affect private activities unless there is some Federal involvement. Federal agencies, however, must ensure that any actions they authorize, fund, or carry out do not adversely modify designated critical habitats. The required maps and detailed descriptions of the proposed critical habitats for the pygmy owl and water umbel were published in the December 30 *Federal Register*. When these species were originally given ESA protection, the FWS decided that taking the additional step of designating critical habitats would not be prudent because publishing specific locations could attract plant collectors and lead to harassment of the owl. However, on November 25, 1998, a district court judge ordered the FWS to issue proposed critical habitat designations within 30 days.

Final Listing Rules

Topeka Shiner (*Notropis topeka*) Historically, the Topeka shiner was a common fish in small prairie streams throughout Kansas, Iowa, Minnesota, Missouri, Nebraska, and South Dakota. Currently, however, it occurs in only about 20 percent of its former range due to widespread habitat modification and water quality degradation. Sedimentation, water di-



Photo by Garold Sneeagus

versions, and the loss of riparian buffers damaged the aquatic habitat, and dam construction fragmented some of the remaining populations, restricting genetic interchange. The Topeka shiner is now restricted primarily to a few tributaries within the Mississippi

and Missouri river basins. The vulnerability of this small fish led the FWS to list the Topeka shiner on December 15 as endangered.

St. Andrew Beach Mouse (*Peromyscus polionotus peninsularis*) As their common name indicates, beach mice inhabit not houses and other structures but coastal sand dunes, where they excavate burrows and feed on plant seeds and insects. The St. Andrew beach mouse once lived along nearly 54 miles (87 km) of Florida's panhandle beaches from Gulf County to Crooked Island in Bay County. Over time, its habitat has been reduced by storms, non-storm related shoreline erosion, and coastal development. Other threats include predation by domestic cats and competition from house mice, both of which are associated with beachside development. An estimated 500 St. Andrew beach mice remain. On December 18, the FWS listed this subspecies as endangered.

Withdrawals

Harbor Porpoise (*Phocoena phocoena*) In 1993, the National Marine Fisheries Service (NMFS), which has primary ESA jurisdiction over most marine species, proposed to list the Gulf of Maine/Bay of Fundy population of the harbor porpoise as threatened due to the rate of porpoise bycatch in the area's gillnet fishery. Since that time, however, NMFS has received information regarding the population's status and fishery management actions that reduce bycatch. Because NMFS has determined that ESA protection for the Gulf of Maine/Bay of Fundy population is not warranted, it published a withdrawal of the listing proposal in the January 5, 1999, *Federal Register*.

To learn more about Alaska and efforts to conserve, protect and enhance Arctic fish, wildlife and plants, start with a visit to these web sites:

U.S. Fish and Wildlife Service, Alaska Region
<http://www.r7.fws.gov>

This site is your gateway to Service programs in Alaska. Supporting pages include information about conservation for endangered species, fisheries, marine mammals, migratory birds, and other efforts to protect Alaska's wilderness. You can also learn about, and link to, a wide variety of international programs through which the Service is working with other Arctic nations to strengthen conservation of Arctic species.

U.S. Fish and Wildlife Service, Canada/U.S. Framework for Cooperation between DOI and Canada
<http://www.fws.gov/r9endspp/canada/canada.htm>

From this site, you can view or print the signed April 1997 accord initiating this joint effort. Also available is the "Questions & Answers" related to the signed framework, and two species examples of the benefits of cooperation (the piping plover and the whooping crane). You can also link to the Canadian Wildlife Service's endangered species web page at http://www.cws-scf.ec.gc.ca/es/endan_e.html.

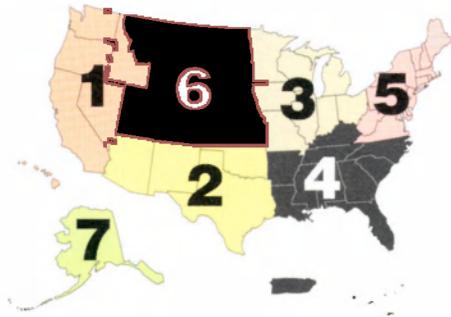
Conservation of Arctic Flora and Fauna (CAFF)
<http://www.grida.no/caff/>

Under the Arctic Council, CAFF focuses on a range of Arctic environmental issues such as biodiversity, habitat protection, and species conservation within an ecosystem approach. CAFF is also working with indigenous peoples to integrate their knowledge into Arctic environmental conservation.

Alaska Public Lands Information Center (APLIC)

<http://www.nps.gov/aplic/center/index.html>

Through this web site, APLIC offers a wealth of information for planning a visit to Alaska's State and Federal public lands. APLIC is a central point of contact for information on lands managed by the National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, Alaska Division of Tourism, Alaska Department of Natural Resources, and Alaska Department of Fish and Game.



Regional endangered species contacts have reported the following news:

Region 1

Aleutian Canada Goose (*Branta canadensis leucopareia*) Avian cholera losses were significant this winter at Merced, San Luis, and San Joaquin River National Wildlife Refuges (NWR) in California. Until temperatures warmed up in late January, biologists at San Luis NWR collected 350 to 400 dead birds per day of various species. At San Joaquin River NWR, the endangered Aleutian Canada goose was the species most commonly killed by cholera, with approximately 800 lost this winter. Merced NWR biologists found moderate numbers of white geese (*Anser albifrons*) and large numbers of coots (*Fulica americana*). Refuge staff worked 7 days per week to keep wetland units as clean as possible in order to reduce the spread of the disease.



USFWS photo

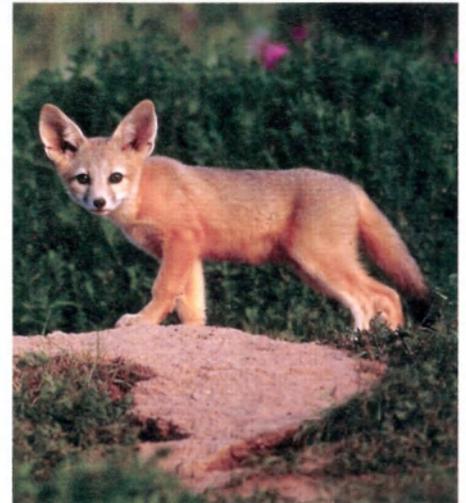
Sacramento NWR Complex California's Sacramento NWR Complex did not escape what appears to have been a statewide outbreak of avian cholera in wintering waterfowl. During the abbreviated work week between Christmas and New Year Day, over 3,000 birds were picked up at Butte Sink NWR. All other refuges in the complex experienced varying degrees of mortality. Disease severity may have been the result of cold temperatures and ice the previous week, which concentrated birds on the remaining open water and restricted refuge staff's ability to complete routine airboat disease patrols.

Salmon In an effort to reduce avian predation on listed salmon smolts, the U.S. Army Corps of Engineers has completed an Environmental Assessment (EA) designed to relocate Caspian terns (*Sterna caspia*) nesting on Rice Island in the Columbia River estuary to a different site, East Sand Island. Caspian terns currently breed on 8 acres (3.2 hectares) of habitat on Rice Island. Limited research indicates that the 10,000 pair colony is consuming between 6 and 25 million salmon smolts per year. Hatchery fish account for approximately 90 percent of the smolts taken. We hope that the relocation of terns to East Sand Island will reduce their predation of salmon smolts due to a larger variety of prey in this area. The EA calls for the creation of approximately 16 acres (6.5 ha) of tern habitat on East Sand Island near the mouth of the Columbia River, deployment of a sound system and decoys on East Sand Island to attract nesting terns, vegetation on Rice and Miller Sands Islands to discourage tern nesting, and potential harassment of terns on Rice and Miller Sands to encourage them to move to East Sand Island. One acre (0.4 ha) of tern nesting habitat will remain on Rice Island. Although small, this site is estimated to support 1,000 pairs.

Sonny Bono Salton Sea NWR Complex A section of the refuge near Bruchard Bay burned recently. The wildfire was extinguished by a U.S. Forest Service fire crew from the Cleveland National Forest. Approximately 7 to 10 acres (2.8 to 4 ha) were burned, with substantial loss of habitat for the endangered Yuma clapper rail (*Rallus longirostris yumanensis*).

Bitter Creek National Wildlife Refuge The decision document for an addition to Bitter Creek NWR was approved on December 28, 1998. CalTrans will donate the 40-acre (16-ha) Wilson tract containing

habitat for the endangered San Joaquin kit fox (*Vulpes macrotis mutica*) to the FWS as mitigation for improvements to State Route 33, which runs through the refuge.



San Joaquin kit fox

Corel Corp photo

Lewis and Clark Commemoration Nearly 200 years ago, explorers Meriwether Lewis and William Clark opened a new frontier for the fledgling United States with their historic journey from St. Louis, Missouri, to the Pacific Ocean and back. In a way, they were western America's first wildlife biologists, and described 178 plants and 122 animals not previously recorded.

A 4-year-long bicentennial commemoration will begin in 2003, with 10 million visitors expected to visit at least one point on the Lewis and Clark National Historic Trail during that time. They will place heavy demands on refuges and hatcheries along the route as they seek information and access to Lewis and Clark sites. At the same time, this event will offer an unprecedented opportunity for the FWS to reach a new audience by reflecting on the past and future of the country's natural resources, including how plants and animals identified by Lewis and Clark are faring today.

The FWS has formed a national Lewis and Clark Bicentennial Team, which met for the first time in January in Portland, Oregon. Potential projects associated with the bicentennial include heritage protection measures such as land acquisition and habitat restoration. For more information, contact Susan Saul, the Region 1 Lewis and Clark Bicentennial Coordinator, at 503/231-2728.

Canada lynx (*Lynx canadensis*) A comprehensive survey by FWS, Forest Service, and Wildlife Conservation Society biologists in the area covered by the Northwest Forest Plan confirmed the presence of Canada lynx in the Oregon Cascades. On July 8, 1998, the FWS proposed to list the U.S. population of this elusive cat as threatened.



Canada lynx
Corel Corp photo

Jobs-in-the-Woods Participants in the "Jobs-in-the-Woods" program, which provides training and employment in environmental restoration to dislocated timber workers in Oregon, completed the final inspection of the FY 1998 West Fork Agency Creek Culvert Replacement Project on lands owned by the Confederated Tribes of Grand Ronde in Yamhill County, Oregon. Failing, undersized, and poorly placed culverts at two locations were replaced by oversized bottomless arch culverts. The new culverts restored fish passage to 7.5 miles (12 kilometers) of suitable habitat for anadromous steelhead (*Oncorhynchus mykiss*) and coho salmon (*Oncorhynchus kisutch*). This project is featured on the Tribes' website, which can be accessed at www.grandronde.org (click on: natural resources, fish and wildlife, culvert project). The FWS contributed one-third of the \$88,374 project cost. This is the second successful fish passage collaboration between Jobs-In-The-Woods and the Tribe, which have reopened 18 miles (29 km) of suitable habitat.

Other Jobs-In-The-Woods personnel completed the final inspection of the FY 1998 Nelson's Checker-mallow Habitat Enhancement Project on lands owned by the Confederated Tribes of Grand Ronde in Polk County, Oregon. The site is one of four areas protected by a conservation easement between the Tribes and FWS for the management of Nelson's checker-mallow (*Sidalcea nelsoniana*), a plant listed as threatened. Approximately 10 acres (4 ha) of upland and wetland habitat dominated by invasive vegetative species were chemically and mechanically cleared, then seeded with native grass species. The Tribes also transplanted 90 checker-mallow plants, salvaged from another location, into an existing population. A new gate and cattle guard were installed to prevent cattle access from an adjoining landowner. At the same time, the Tribes also carried out a wetland mitigation project on an area adjacent to the enhancement/transplant location. This project required close coordination between FWS Oregon State Office contaminants, endangered species, and Jobs-In-The-Woods personnel. Nine partners contributed funds or technical assistance, or participated in the planning process to ensure successful implementation of this project. The FWS contributed \$7,815 of the \$18,382 project cost.

Reported by LaRee Brosseau of the FWS Portland Regional Office.

Region 4

Florida Black Bear (*Ursus americanus floridanus*) The FWS has removed the Florida black bear from the list of candidates for Endangered Species Act (ESA) protection because four healthy populations remain on protected lands in Florida and Georgia. Collectively, these four publicly-owned areas support 1,000 to 2,200 black bears over 3 million acres (1.2 million ha). According to a 1998 status review, which led to the decision, Apalachicola National Forest and adjacent lands support an estimated 400 bears; Okefenokee National Wildlife Refuge, Osceola National Forest, and adjacent lands together contain an estimated 1,200 bears; Ocala National Forest and adjacent lands are estimated to have over 200 bears; and Big Cypress National Preserve and adjacent lands have about 400 bears. In addition, a stable population of 60 to 200 black bears exists on Eglin Air Force Base and its surrounding area in the Florida Panhandle. Isolated populations are also found on private lands or

small tracts of public land. Altogether, the status review concluded that an estimated 1,600-3,000 bears occur in Florida and along the coastal plain of Georgia and southern Alabama. Past land clearing and development have reduced the distribution of the Florida black bear to 25 percent of its historic range.

Reported by Elsie Davis, Southeast Regional Office in Atlanta, Georgia.

Region Five

Swamp Pink (*Helonias bullata*) The FWS New Jersey Field Office contracted a biological consultant to initiate a pilot program that involved contacting 10 private landowners whose property contained populations of the swamp pink, a threatened wildflower. In cooperation with the FWS, the biological consultant also developed a habitat protection agreement that provides an opportunity for private landowners to voluntarily agree to protect and conserve swamp pink and its habitat on private property. Such agreements may significantly contribute to the recovery of swamp pink since many populations of this species occur on private land. As the Swamp Pink Recovery Plan states, "Cooperation from landowners is an extremely important facet of protection for sites located on private lands.... Individual landowners will be contacted regarding the presence of *Helonias* on their property and the significance of this species. Management agreements and deed covenants will be established when

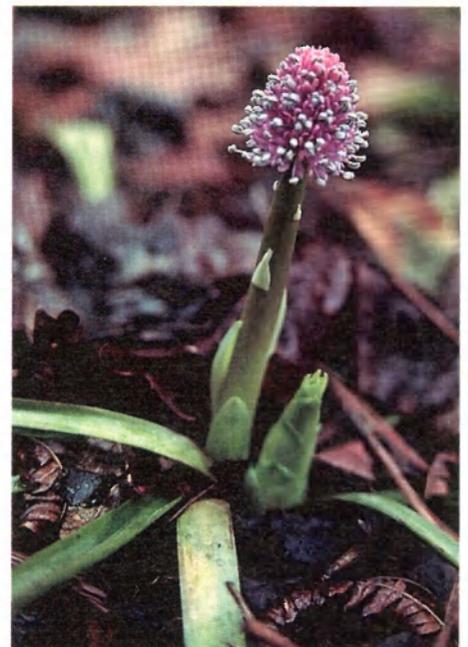


Photo by Judy Jacobs/USFWS

ever possible to protect the natural attributes of the property from disturbance." Many landowners responded positively during the pilot program and are expected to enter into habitat protection agreements following further coordination with FWS biologists.

The first habitat protection agreement was signed in January 1999 by Richard and Mary Blake of Cape May County, New Jersey. They contacted the FWS after reading an article about the swamp pink in their local newspaper. Biologists from the New Jersey Field Office met with Mrs. Blake and discussed swamp pink protection strategies, including entering into a voluntary agreement with the FWS to protect and conserve the swamp pink site and a surrounding buffer area on their property. Additional private landowners have also expressed interest in protecting the swamp pink and are expected to sign habitat protection agreements in the near future. Each landowner will receive a framed certificate in recognition of the agreement.

Indiana Bat (*Myotis sodalis*) Biologists in the FWS New England Field Office in Concord, New Hampshire, are conducting ESA-section 7 consultations with the U.S. Forest Service on 20 active timber sales in the Green Mountain National Forest for potential impacts on the endangered Indiana bat. The FWS is also assisting the Forest Service in developing a biological evaluation of forest activities on a programmatic level. In the White Mountains National Forest, all timber sales that have received FWS review resulted in findings that the sales are "not likely to adversely affect" the Indiana bat.

Indiana bats are considered to be at the northeastern edge of their range in New England. New Hampshire was not considered to be within the species' range until 1992, when a roosting bat was discovered during a summer research project in the White Mountain National Forest. New England has only three known active Indiana bat hibernacula (two in Vermont and one in Connecticut), and they harbor fewer than 10 individuals combined.

Piping Plover (*Charadrius melodus*) The FWS Long Island Field Office has been building partnerships with New York State Department of Environmental Conservation; New York State Office of Parks, Recreation, and Historical Preservation; Citizens Campaign for the Environment; Suffolk County; Nassau

County; The Nature Conservancy; and other groups to restore early successional beach habitat at sites used by the threatened piping plover and New York State-listed least tern (*Sterna antillarum*). Due to years of shoreline management efforts, including beach "nourishment," dune construction, dune grass plantings, and fencing, early successional beach habitat is degraded or in short supply on Long Island. Plans are being developed to ensure post-restoration monitoring surveys.

The Long Island Office also has been working with New York State Department of Environmental Conservation and The Nature Conservancy to educate stewards and land managers about piping plover biology, ecology, behavior, and management. Participants include Federal, State, county, and town representatives, as well as representatives from several not-for-profit organizations such as the National Audubon Society, Krusos Foundation, and Long Island Beach Buggy Association. Although this program was initiated by The Nature Conservancy several years ago, the FWS and the State have since assumed planning and coordination for the training program.



Virginia big-eared bats

Photo by Craig Stihler

Virginia Big-eared Bat (*Corynorhinus townsendii virginianus*) In the fall of 1998, the FWS West Virginia Field Office assisted in the construction of state-of-the-art angle iron gates in the two entrances of the Sinnitt/Thorn Cave system in Pendleton County, West Virginia, to prevent the disturbance of endangered Virginia big-eared bats. With the assistance of the West Virginia Non-Game Wildlife and Natural Heritage Program and the Canaan Valley

National Wildlife Refuge, the FWS prepared for the project by providing construction material (steel, acetylene, oxygen, welding rods, etc.). The project was accomplished through a cave gating workshop put on by the American Cave Conservation Association and sponsored by the FWS Asheville, North Carolina, Field Office, with funding from the FWS Southern Appalachian Ecosystem and the Chesapeake Bay/Susquehanna River Ecosystem offices. Participants in the project included the FWS (West Virginia Field Office, Canaan Valley National Wildlife Refuge, and Asheville Field Office), West Virginia Division of Natural Resources, American Cave Conservation Association, U.S. Forest Service (Jefferson and George Washington National Forests and Mount St. Helens National Monument), National Speleological Society, National Park Service (Mammoth Cave National Park), West Virginia Chapter of The Nature Conservancy, and Bat Conservation International.

The Sinnitt/Thorn Cave system is designated critical habitat for the endangered Virginia big-eared bat and supports both summer and winter colonies. The large summer maternity colony is considered critical to the species' survival. The old-style round bar gate at the Sinnitt entrance enabled the predation of bats leaving the small cave opening by local cats and (probably) raccoons. Bats also had difficulty negotiating the Thorn entrance gate, which requires the bats to enter and exit vertically. These problems should be corrected by the new gates.

With the help of the West Virginia Non-Game Wildlife and Natural Heritage Program, the West Virginia Field Office also delivered construction steel last fall to Schoolhouse Cave in West Virginia's Germany Valley. Schoolhouse Cave provides habitat for a large summer and winter colony of Virginia big-eared bats. The fence that controls human access to the cave had been vandalized several times in the past few years. Construction of a state-of-the-art angle iron gate at the cave entrance should preclude human disturbance of the bats and allow the population to flourish. Construction is scheduled for August 1999.

Reported by Lisa Arroyo of the FWS New Jersey Field Office, Linda Morse of the FWS New England Field Office, and Andy Moser of the Annapolis, Maryland, Field Office.

In the quarter century since passage of the Endangered Species Act (ESA) Alaskan wildlife has undergone both tremendous gains and perplexing losses. On one hand, some animals that were on the endangered species list in 1973 have fared well. On the other hand, declining seabird, marine mammal and some fish species in the Bering Sea ecosystem are an increasingly widespread public concern. The cause and effects of these ecosystem declines are complex and poorly understood. The Service and many partners are working to unravel the mystery, but it is a huge task. For example, Steller's sea lions, which were the primary prey of killer whales, have virtually disappeared from the Aleutians. Is it possible that the decline of one species can cause predator pressure to shift to another species? In observed areas of the Aleutian Islands, sea otters are declining precipitously; evidence and observations point to predation by killer whales. Except for the Aleutians, sea otter populations are stable or growing elsewhere in Alaska.

On the positive side, the arctic peregrine falcon (*Falco peregrinus tundrius*) recovered thanks to the 1972 ban on DDT, protection of its habitat, and prohibitions on taking birds out of the wild for falconry. The Aleutian Canada goose (*Branta canadensis leucopareia*) also falls into the good news category. It was down to about 500 individuals in 1973, due to predation by non-native foxes (*Alopex lagopus*) which were introduced to its nesting islands by fur farmers. After passage of the ESA, the foxes were removed, geese were captive-bred in the Aleutians and reintroduced to fox-free islands, and wintering habitat in Oregon and California was protected. Restoration of the Aleutian Canada

goose has proceeded so well that its status was upgraded in 1990 from endangered to the less critical category of threatened, and it may soon be delisted altogether.

But not all wildlife news from Alaska over the past 25 years has been good. Even as some endangered and threatened species were recovering, others, such as spectacled and Steller's eiders (*Somateria fischeri* and *Polysticta stelleri*, respectively), were added to the threatened and endangered list.

Spectacled eiders were listed as threatened in May, 1993 following a 95% decline of the Yukon-Kuskokwim Delta (Y-K Delta) breeding population in the previous two decades. But then came the spectacular discovery of the spectacled eider wintering grounds within the pack ice of the Bering Sea south of St. Lawrence Island. The global population estimate was revised up from 50,000 to more than 350,000 birds (presumably, mostly Russian breeders). The spectacled eider recovery plan states that a population can be considered for delisting if a single survey yields a minimum population estimate of more than 25,000 breeding pairs. The Arctic Russian population satisfies this delisting criterion, but spectacled eider populations on the Y-K Delta and North Slope remain threatened.

We don't know how many Steller's eiders exist, but there are at least 150,000, with nearly all of the breeding population in Arctic Russia. A few dozen pairs nest some years near Barrow, Alaska, but their status on the North Slope is unclear. We don't have enough information available to adequately document either local or global population trends for Steller's eiders, but they have nearly disappeared as a breeder from the Y-K Delta, and it appears that their breeding

distribution has also contracted on the North Slope.

Ten years after the Exxon Valdez spilled eleven million gallons of crude oil into Prince William Sound, substantive progress is being made toward recovery objectives. The amount of progress and time needed to achieve objectives varies widely, however; recovery for thirteen species is either not happening or data are inconclusive.

On the botanical front, the Aleutian shield fern (*Polystichum aleuticum*) became Alaska's first, and so far only, listed plant in 1988. Although this small plant has probably long been rare, the introduction of grazing animals (reindeer and caribou) onto Adak Island, the only place where it occurs, has taken a toll on fragile alpine habitat near where the fern is found. The Fish and Wildlife Service is working with the Navy, which manages part of the habitat, to fence the remaining ferns. Scientists have tried but so far failed to develop cultivation techniques for use in the propagation of Aleutian shield ferns for eventual reintroduction into native habitat.

Like the state itself, endangered species issues here are unique. While the Service manages relatively few listed species here compared to most other states, the challenges to managing and recovering them are often greater because of unusual factors that occur Alaska. (Discussed in this issue.) Figuring out the complex reasons for ecosystem-scale declines such as the Bering Sea is going to require continued effort by Federal, State, private, corporate, and international partners.

BOX SCORE

Listings and Recovery Plans as of April 30, 1999

GROUP	ENDANGERED		THREATENED		TOTAL LISTINGS	U.S. SPECIES W/ PLANS**
	U.S.	FOREIGN	U.S.	FOREIGN		
 MAMMALS	61	251	8	16	336	49
 BIRDS	75	178	15	6	274	77
 REPTILES	14	65	21	14	114	30
 AMPHIBIANS	9	8	8	1	26	11
 FISHES	69	11	41	0	121	88
 SNAILS	18	1	10	0	29	20
 CLAMS	61	2	8	0	71	45
 CRUSTACEANS	17	0	3	0	20	12
 INSECTS	28	4	9	0	41	27
 ARACHNIDS	5	0	0	0	5	5
ANIMAL SUBTOTAL	357	520	123	37	1,037	364
 FLOWERING PLANTS	540	1	132	0	673	494
 CONIFERS	2	0	1	2	5	2
 FERNS AND OTHERS	26	0	2	0	28	26
PLANT SUBTOTAL	568	1	135	2	706	522
GRAND TOTAL	925	521	258	39	1,743*	886

TOTAL U.S. ENDANGERED: 924 (357 animals, 567 plants)

TOTAL U.S. THREATENED: 256 (121 animals, 135 plants)

TOTAL U.S. LISTED: 1180 (478 animals***, 702 plants)

*Separate populations of a species listed both as Endangered and Threatened are tallied once, for the endangered population only. Those species are the argali, chimpanzee, leopard, Stellar sea lion, gray wolf, piping plover, roseate tern, green sea turtle, saltwater crocodile, and olive ridley sea turtle. For the

purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

**There are 517 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

***Nine animal species have dual status in the U.S.

ENDANGERED Species BULLETIN

*U.S. Department of the Interior
Fish and Wildlife Service
Washington, D.C. 20240*

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