ENDANGERED Species BULLETIN

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Coastal ecosystems are highly dynamic, diverse areas of enormous ecological significance. They contain some of the nation's most productive wildlife habitats, support valuable fisheries, and provide recreation for millions of people. With proper stewardship, these areas should continue to meet many differing human demands without compromising ecological integrity or biological diversity. But some living resources of our coastal areas are showing signs of stress. One indicator of the problems facing coastal ecosystems is the fact that almost half of the nation's endangered and threatened species are found there. As highlighted in this issue, the Fish and Wildlife Service is working to conserve coastal resources for the enjoyment of future generations.

Jennifer Heck/FWS

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On the Cover
California's coast supports a wide variety of dwindling habitats, including kelp beds, rocky intertidal areas, eelgrass beds, salt marshes, beaches, and riparian systems.

photos by B. "Moose" Peterson/WRP

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

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IN THIS ISSUE

Bryan Pridgeon/FWS

B. "Moose" Peterson/WRP

FWS photo

by Steve Glomb

Protecting Coastal Ecosystems

"*Let's go to the beach!*" Such a popular refrain about such a popular destination. In fact, coastal areas have become so popular that many people have decided to live there year-round. The coastal zone is home to over one-third of the U.S. population, and that proportion is expected to grow to 75 percent in the next 15 years. Many of the same characteristics that attract people to coastal areas make these areas prime habitat for fish and wildlife resources. Although they comprise less than 10 percent of the Nation, coastal ecosystems are home to nearly two-thirds of the Nation's fisheries, half of the migratory songbirds, and one-third of our wetlands and wintering waterfowl. The coasts also harbor 45 percent of all threatened and endangered species, including three-fourths of the federally listed birds and mammals.

Can our crowded coastlines provide enough high-quality habitat for people, other animals, and plants? How can we restore threatened and endangered coastal species? How can we keep other coastal species from reaching low population levels? A search for answers to these and other questions led the Fish and Wildlife Service (FWS) to create the Coastal Ecosystems Program (Program). The Program integrates many FWS programs and authorities and focuses them on 11 of the Nation's highest priority coastal watersheds. It encompasses both open coastal areas and inland portions of watersheds, looking broadly at living resource interactions within an ecosystem.

The goal of the Coastal Ecosystems Program is to eliminate or reduce threats to coastal habitats and species. Since no single agency can manage entire coastal ecosystems on its own, the FWS works with Federal, State, and private partners to conserve and protect important coastal habitats. Program funds support a variety of projects: gathering and distributing information for use by local decision-makers; targeted education to catalyze volunteer action; and, most importantly, on-the-ground actions to conserve and restore habitats.

From the Gulf of Mexico to the Gulf of Maine and on to the Pacific Ocean, the Program has funded dozens of

projects in support of threatened and endangered species.

Texas

The sandy, marshy shoreline of Galveston Bay is home to not only several threatened and endangered species, but also over 3 million people, the world's second largest concentration of petrochemical facilities, and one of the nation's busiest ports. Despite all the surrounding industry, the Bay still has significant natural vitality and productivity. Shorebirds, wading birds, endangered brown pelicans (*Pelecanus occidentalis*), and other birds flock to Galveston Bay's shores. At the same time, a tradition of broad public access exists in Texas, including a State law mandating that beaches be open to the public. One challenge undertaken by the Galveston Bay/Texas Coast Ecosystem Program is to channel the access of thousands of people away from the most sensitive habitats, especially at critical times such as nesting.

Working closely with local government officials, the Program built traffic barriers to limit vehicle access to one stretch of beach, and created the 210-acre (85-hectare) Big Reef Nature Park, which includes a wetland/dune/lagoon complex. These traffic barriers reduced the stress the birds feel from close contact with humans and reduced the amount of litter within the park. To compensate for the closure of public beach access, the partners built a pedestrian boardwalk over the dunes and added interpretive signs to educate the public about the importance of the habitat to endangered species and other wildlife. Brown pelicans, Arctic peregrine falcons (*Falco peregrinus tundrius*), and numerous shorebirds can be seen foraging and seeking shelter in the park. Plans are in place to revegetate the dunes, improve shorebird nesting habitat, build observation areas in the Park, and create similar parks in two other spots along Galveston Bay's barrier islands.

Little Pelican Island is the largest and most productive colonial waterbird rookery on the Texas Coast. In past years, hundreds of brown pelicans roosted and attempted to nest on the island, but with little success. Together with the Houston Audubon Society, the Texas Parks and Wildlife Department,

Cape Cod National Seashore is an important recreational resource. With careful planning and management, beaches can serve the demands of people while providing habitat for wildlife. **National Park Service photo**

Endangered brown pelicans and a variety of shorebirds benefit from seasonal protection of important nesting beaches on Little Pelican Island.

Will Roach/FWS

Additional Coastal Projects

Projects of the Fish and Wildlife Service Coastal Ecosystems Program not only benefit listed species, but can help prevent the need to list others:

- **Portions of the Connecticut River, Delaware Bay, and Chesapeake Bay have been designated as "wetland complexes of international importance," largely because of their significance to migratory birds along the Atlantic flyway. Several partnerships are already in place, and others are being formed to protect these areas from urban encroachment and to restore degraded marshes.**

- **On the Eastern Shore of the Chesapeake Bay, 10 northern diamondback terrapins (*Malaclemys terrapin terrapin*), a species of concern, quickly moved into an area that the Program protected from erosion and dredge disposal.**

and others, the Program designed and installed large signs advising boaters, campers, and anglers to stay off the island during nesting season. After this seemingly simple action, pelicans had a very productive year, with 125 nesting pairs. Preliminary estimates for 1995 show an increase to 200 nesting pairs.

Maine

Maine's craggy headlands are a far cry from beaches in the Gulf of Mexico, yet they too provide sites for the Coastal Ecosystems Program to help conserve endangered and threatened species. The rocky islands off the coast of Maine offer breathtaking scenery and exceptional habitat for colonial shorebirds, including endangered roseate terns (*Sterna dougallii*), wading birds, waterfowl, threatened bald eagles (*Haliaeetus leucocephalus*), and other raptors. The rugged beauty and location of these islands has also attracted tourists with plans for development of seasonal homes.

Long-term monitoring of bird habitat, along with outreach programs to educate local people about the ecological importance of these habitats, were conducted by the Coastal Ecosystems Program and the Petit Manan National Wildlife Refuge, setting the stage for action. Sharing this information with groups such as the Maine Audubon Society, the Maine Coast Heritage Trust, the Damariscotta River Association, the Island Institute, and The Nature Conservancy was a critical first step toward protecting these islands. Partnerships with these local land trusts have led to conservation easements and acquisition to protect about 125 acres (51 hectares) of highly significant habitat for threatened and endangered birds. Some islands are now owned by the land trusts, and some have been added to the FWS's National Wildlife Refuge System. The most significant nesting sites are protected, but access is allowed for environmental education and some recreation.

California

Southern California attracts even more people and provides habitat for more listed species than the Texas Coast. The "River of Birds" along the Pacific flyway has lost most of its native, undisturbed habitat for nesting, resting,

and feeding. A partnership with the San Diego County Parks Department, State agencies, and local conservation groups is attempting to reverse the trend by restoring tidal flow to a degraded coastal lagoon. Restoration of the San Elijo Lagoon will likely benefit three endangered species, the California least tern (*Sterna antillarum browni*), light-footed clapper rail (*Rallus longirostris levipes*), and tidewater goby (*Eucyclogobius newberryi*)· two threatened species, the western snowy plover (*Charadrius alexandrinus nivosus*) and coastal California gnatcatcher (*Polioptila californica californica*); and Belding's savannah sparrow (*Passerculus sandwhichensis beldingi*), a species of concern.

Pacific Northwest

While most of the Nation's salmon populations are not currently listed as threatened or endangered, stocks are not as abundant as they once were. Salmon populations in the Northwest have fallen tremendously from the levels of a few decades ago. Projects in four priority embayments within Puget Sound are restoring tidal and intertidal wetlands vital to the survival of juvenile and adult salmon during migration. These efforts will provide direct benefits to salmon populations, helping to keep them from shrinking to the point where the salmon will require protection under the Endangered Species Act. The projects in Puget Sound also serve to demonstrate effective conservation techniques for other coastal managers.

Despite the success of the Coastal Ecosystems Program, it has become clear that to overcome the increasingly rapid pace at which coastal areas are being altered, more innovative, comprehensive, and preventative approaches are necessary. Through its leadership of the Program, the FWS is reaching out to other Federal, State, and local agencies and all interested citizens to come together for the restoration and protection of our Nation's precious coastal resources.

Steve Glomb is a fish and wildlife biologist in the FWS Division of Habitat Conservation in Washington, D.C.

- **Atlantic white cedar forests, a rare plant community, are being restored along the shores of Albemarle-Pamlico Sounds. These forests will provide additional areas for many migratory songbirds whose habitat has been shrinking throughout their migratory pathways.**

- **Wetland restoration in San Francisco Bay, soon to move from the planning to the implementation stage, will provide similar benefits to endangered, threatened, and candidate species on the west coast.**

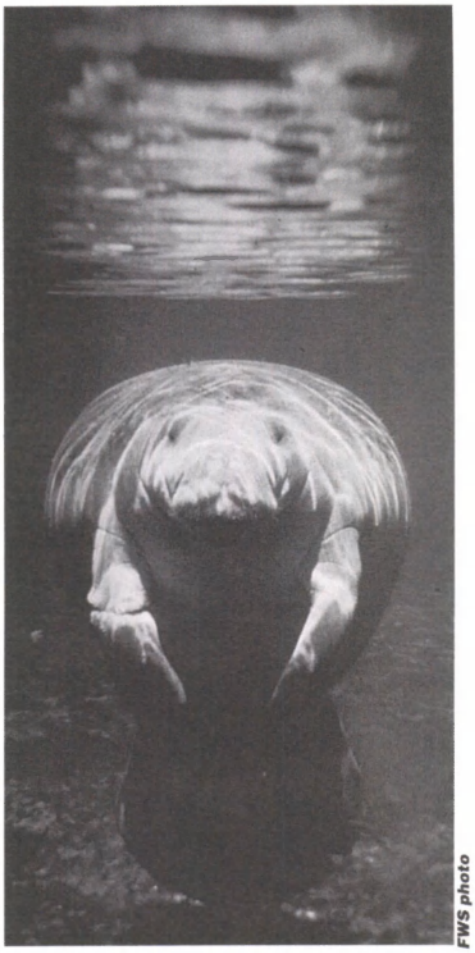
Coastal California gnatcatcher
Arnold Small

Florida Manatee Soft Release

by Jim Kraus

The Florida manatee *(Trichechus manatus latirostris)*, a large, herbivorous aquatic mammal sometimes called a sea cow, is one of the nation's most vulnerable animals. Fewer than 2,000 still swim the waters of the southeastern United States, primarily in coastal areas of Florida. As Florida's human population continues to grow, threats to the manatee and its habitat also increase.

Historically, human activities have accounted for about one-third of the known manatee deaths in Florida each year. Approximately 80 percent of these human-related deaths are related to collisions with boats. In 1994, at least 193 manatees died from all causes, marking one of the worst years on record for the beleaguered population. Of this total, 49 deaths were watercraft-related and 16 involved water control structures. In addition to those killed, many more manatees are injured or orphaned each year. Most adults bear permanent scars from boat propeller strikes. Others need assistance to be freed from fishing and crab pot lines, or require treatment due to cold stress or illness.



FWS photo

As part of the manatee recovery effort, a statewide partnership has evolved to rescue, rehabilitate, and—whenever possible—release manatees back into the wild. Private citizens, non-profit organizations, businesses, and government agencies at all levels contribute to the rehabilitation effort. Manatee rescues in the State are coordinated by the Florida Department of Environmental Protection, in cooperation with the Florida Marine Patrol and 11 other organizations. Authorized participants in the rescue program respond to hundreds of reports of manatees in distress annually, and 20 to 30 animals are rescued for treatment each year. Five Florida facilities currently work with the Fish and Wildlife Service (FWS) in the rehabilitation effort. Sea World of Florida (Orlando), Miami Seaquarium, Lowry Park Zoo (Tampa), Homosassa Springs State Wildlife Park, and Living Seas at EPCOT Center (Lake Buena Vista) are now caring for over 50 manatees.

The captive population has gradually increased due to the growing number of injuries, orphaned manatees, and captive births. Although many manatees have been released successfully, an acute crowding situation has developed at some facilities. In response, participants in the recovery program have developed an ambitious "soft-release" approach to introduce rehabilitated manatees to a semi-natural environment, providing an intermediate phase between the captive facility and truly wild habitat. The results of this approach may show whether long-term captives, orphaned, and possibly captive-born manatees can be integrated into the wild population. When possible, however, injured manatees judged suitable for direct release are still returned to the general vicinity of their rescue as soon as they are fit.

The FWS developed the first soft-release site in 1994 at Merritt Island National Wildlife Refuge near Cape Canaveral. In cooperation with the Kennedy Space Center, and with financial support from the 38,000-member Save the Manatee Club and the Florida Department of Environmental Protection (with money raised from sales of specialty license plates), three fenced enclosures covering 4.5 acres were constructed in a seagrass bed. Manatees with minimal wild experience now can be introduced to a semi-natural habitat and diet in a setting where managers can keep a close eye on their condition and progress.

Soon after construction was completed in August 1994, the soft-release area was occupied by several manatees, known to their caretakers at Sea World of Florida as "Scott," "Moose," and "Monroe." Scott was native to the area and had been in captivity only briefly

Left
At the Merritt Island staging area or soft release site, a team pulls nets to allow the examination of a Florida manatee.
Jim Valade/FWS

for treatment. His role was to introduce the novices in the group to their new surroundings and a natural diet of seagrass. This method shows great promise, and is used whenever suitable individuals are available in the captive population. In other cases, temporary supplemental feeding of familiar food items, and gradual weaning to encourage the transition to the wild seagrass diet, is probably necessary for inexperienced manatees.

On-site observations by teams of volunteers and various program partners are coordinated by the National Biological Service's Sirenia Project. Manatees are observed closely over a period of several weeks and are screened for signs of medical complications. Observations of feeding behavior, interaction with other manatees, and general activity levels are used to assess each manatee's acclimation to its new surroundings and its suitability for eventual release.

Upon arrival at the soft-release site, manatees are fitted with peduncle (tail) belts to which floating radio transmitters are attached. Color-coded tags enable observers to monitor the location and activity of each manatee within the enclosures. Periodic medical examinations give biologists important data on the health of each animal. The decision to release a manatee is based on a combination of factors, including medical histories and the behavior of the animal during its stay in the enclosure. The actual release event can be as simple as opening the gate leading into the Banana River, where manatees can join the resident population. In some cases, however, a short transport by truck to a familiar release site may be needed. To date (August 1995), four manatees have been set free from the soft-release site.

Evaluating the success of the soft release approach will take time and a sustained effort by all parties involved. Many creative techniques will be employed on a case-by-case basis, and every trial will provide new lessons. With the spirit of cooperation and determination shown by partners in the recovery effort, the long-term prospects for released manatees in the "real world" of Florida's busy waterways are looking brighter.

Jim Kraus, the FWS Assistant Manatee Coordinator, is located in the Jacksonville, Florida, Field Office.

by Susan Saul

Songbirds Sing Again in California

The mating call of the male least Bell's vireo *(Vireo bellii pusillus)* was heard in southern California during 1994 in a chorus louder than anyone had heard in years. Preliminary results from this year's surveys indicate that the population continues to show impressive growth.

Once common in streamside thickets from Red Bluff, California, south into Mexico, only about 300 breeding pairs of the gray-olive songbird were found in the United States when it was listed in 1986 as endangered. In 1994, over 1,000 males were heard singing along southern California rivers and streams.

Fish and Wildlife Service biologists Loren Hays and Larry Salata attribute the bird's comeback to both stream preservation and management of a competing species, the brown-headed cowbird *(Molothus ater)*. They also credit the vireo's progress to the local, State, and Federal agencies that have created and managed new vireo habitat to compensate for habitat damage resulting from highway and flood-control projects.

The greatest progress has occurred on Camp Pendleton, a Marine Corps base north of San Diego. It was home to only 26 breeding pairs in 1981. That year, the Marine Corps and the Navy began managing habitat for vireos, and their work became a model for vireo recovery elsewhere in southern California. By 1994, at least 300 breeding pairs nested along the Santa Margarita River and the base's creeks—about as many as were estimated to remain in the entire State in 1986.

Another vireo success story can be found in the Prado Basin of the Santa Ana River near Riverside, where 19 breeding pairs were counted in 1986. Biologists counted about 150 breeding pairs there in 1994, due both to new plantings of willows and mule fat (a low, bushy shrub) and cowbird control. Much of the cost for this work is being paid by Orange County water and flood control agencies to compensate for habitat damage caused by their projects.

Three vireo nesting areas along the San Luis Rey River are being maintained by the California Department of Transportation to compensate for habitat damage caused during the widening of a State highway, and by the Army Corps of Engineers to compensate for damage from a flood control project. In those 3 sites, 22 vireo males established breeding territories. Along the entire San Luis Rey River, from Interstate 15 to the Pacific Ocean, the number of territorial vireo males has grown from about 40 in the mid-1980 s to 142 in 1994.

In 1989, biologists heard only 5 male vireos along the 2 to 3 miles of the Tijuana River inside California. By 1994, 80 male vireos staked out territories; 65 of those found females and mated.

Similar population growth has been documented in vireo habitats elsewhere, and birds from the largest vireo populations are recolonizing historic habitats. Vireos that were color-marked in managed San Diego County areas are appearing and attempting to breed in areas over 80 miles to the north in Riverside and Orange Counties.

Cowbird management has been critical to this recovery because cowbirds practice brood parasitism—laying their eggs in the nests of smaller birds like the vireo. Cowbird eggs hatch first, and their larger chicks eat most of the food vireo parents bring to the nest. Cowbird chicks may also crowd vireo eggs and chicks out of the nest. Many songbirds in the eastern and midwestern United States have evolved defenses against this kind of parasitism. However, cowbirds have been in California for only about 75 years. It is unknown whether the vireos will be able to develop a means of defense.

Hundreds to thousands of cowbirds and their eggs are removed each year. Once the vireo's population becomes large and healthy enough to sustain the cowbird's onslaught, the control efforts can stop.

Biologists are encountering new problems, however, that illustrate the challenges to habitat restoration and vireo recovery. For example, people are dismantling wire-mesh cowbird traps in hopes of selling the parts, according to Barbara Kus, an ecologist at San Diego State University who studies vireos and conducts habitat restoration. Encampments along the San Diego, San Luis Rey, and other rivers in San Diego County are also damaging breeding habitat, disturbing nesting birds, and trampling nests.

The ultimate recovery goal is to have the vireo firmly reestablished in at least one-third of its former range in California before it can be considered for removal from the endangered species list. It appears the vireo is well on the way to reaching that goal.

Susan Saul is a public affairs specialist in the FWS Portland, Oregon, Regional Office.

Left

The least Bell's vireo prefers dense, willow-dominated habitat adjacent to streams. It nests primarily in willows but will use other trees and shrubs.

B. "Moose" Peterson/WRP

Beach Mouse Summit

by L. Karolee Owens, Lorna Patrick, and Jim Moyers

The coastal dunes of Alabama and Florida are home to five threatened or endangered subspecies of the oldfield mouse *(Peromyscus polionotus)*. In April 1995, biologists from Fish and Wildlife Service (FWS) field offices in Jackson, Mississippi, and Panama City, Vero Beach, and Jacksonville, Florida, met in Jacksonville for the first "Beach Mouse Summit" to discuss the status of these mammals and strategies for their recovery.

Beach mice inhabit coastal dunes and feed upon sea oats, other dune plant seeds and fruits, and insects. Dune habitats are threatened by destruction and fragmentation resulting from continued urban and residential growth along the coast. Human presence also increases chances of predation by free-ranging or feral cats and competition for habitat from house mice *(Mus musculus)*. Hurricanes and tropical storms can fragment or destroy dune habitat. Although such storms have always been present, they now pose a greater threat to the beach mice because their habitat is already reduced due to other factors.

Gulf Coast Subspecies

Three of the endangered subspecies occur along the Gulf of Mexico coast: the Alabama beach mouse *(P. p. ammobates)*, Perdido Key beach mouse *(P. p. trissyllepsis)*, and Choctawhatchee beach mouse *(P. p. allophrys)*. Management and recovery actions, which are being conducted in cooperation with the Alabama Cooperative Fish and Wildlife Research Unit at Auburn University, include status assessments, genetic analyses, and supplemental translocation.

Preliminary assessments for the Gulf Coast subspecies include both good news and bad news. The Perdido Key beach mouse appears to be the most imperiled. Currently, two separate sites are occupied—one in Alabama on State lands and the other in Florida on Gulf Islands National Seashore, administered by the National Park Service. The Alabama population is currently stable, but few mice survive at the Florida site, which was supplemented with mice from Alabama in March 1995. Additional augmentation of the Florida population will depend upon the continued stability of the Alabama population. With the onset of the hurricane season, concern for the protection of the Perdido Key beach mouse is paramount. FWS biologists and the Auburn research unit have been working with National Park Service biologists to provide supplemental feeding for beach mice and to fertilize dune vegetation in their habitat.

Results for the Choctawhatchee beach mouse are encouraging. Populations remain at Grayton Beach State Recreation Area, Shell Island (owned by the State of Florida and the Federal government), and Topsail Hill (recently purchased by the State of Florida). The Grayton Beach population, which resulted from a 1987 reintroduction, may need augmentation before it becomes stable.

The range of the Alabama beach mouse has been reduced from 30 miles of coastline to 15 miles. Populations were known to survive at three areas—

Gulf State Park, Fort Morgan State Park, and Bon Secour National Wildlife Refuge—when the subspecies was listed in 1985. Biologists believe that predation by free-roaming house cats is responsible for the apparent loss of the Gulf State Park population. The subspecies is still in relatively good shape at Bon Secour NWR and Fort Morgan Park, although house cats and loss of scrub dune habitat continue to pose threats.

Atlantic Coast Subspecies

One endangered subspecies, the Anastasia Island beach mouse *(P. p. phasma)*, and a threatened subspecies, the southeastern beach mouse *(P. p. niveiventris)*, inhabit the dunes of Florida's Atlantic Coast barrier islands. The Anastasia Island beach mouse is protected on State and National Park Service lands (see *Bulletin* Vol. XX, No. 4). In 1992, beach mice from Anastasia Island were reintroduced to Guana River State Park, on an island to the north within the taxon's historical range. Subsequent surveys indicate the reintroduced population is surviving and has probably expanded beyond the boundaries of the park.

The range of the southeastern beach mouse has become fragmented. Healthy populations survive on public lands at Cape Canaveral National Seashore, Merritt Island National Wildlife Refuge, and Cape Canaveral Air Force Station at the northern end of the subspecies' current known range. To the south, populations remain on State and county lands in northern Indian River County. However, the subspecies has been extirpated from the center of its range, creating a considerable gap between the two extremes. Some areas of suitable habitat between these areas remain on the Archie Carr National Wildlife Refuge. The potential for successful reintroduction is good if predation by feral cats can be controlled.

Biologists attending the beach mouse summit believe the information exchange was valuable and there are plans to make it an annual event. The FWS will continue to work with other Federal and State agencies, local governments, and developers on beach mouse issues.

L. Karolee Owens is a biologist in the FWS Jacksonville Field Office, and Lorna Patrick and Jim Moyers are biologists in the Panama City Office.

An Alabama beach mouse prepares to enter its burrow.
FWS photo

by Anne Hecht

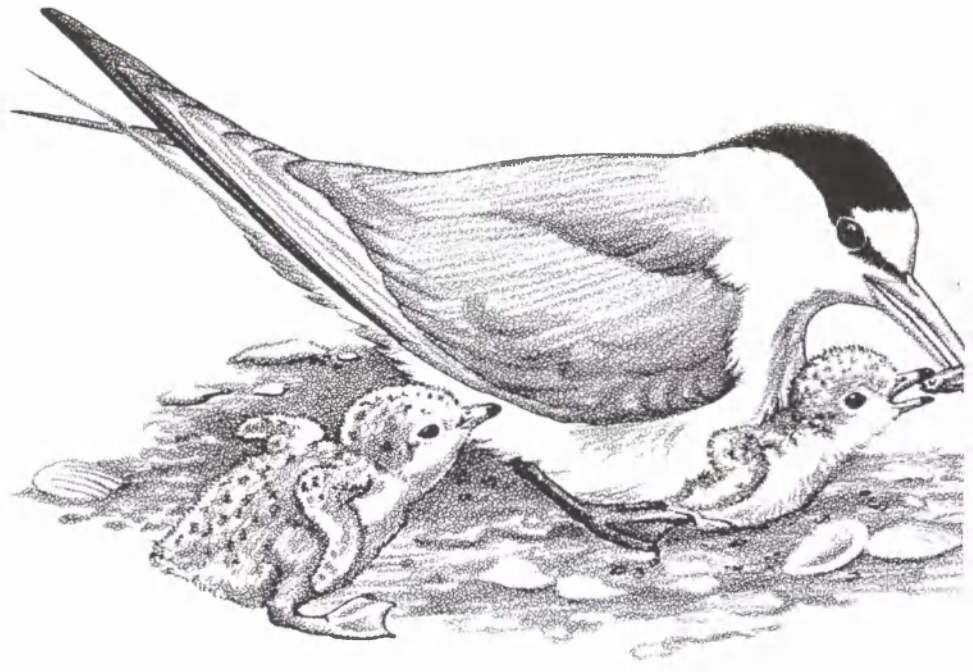
Coastal Plovers on the Rise

Piping plovers were added to the list of threatened and endangered species in January 1986. Three distinct breeding populations are recognized; the birds found along the Great Lakes are designated as endangered, while those nesting on the Atlantic Coast and in the northern Great Plains are considered threatened. The Atlantic Coast population breeds on ocean beaches from Newfoundland to North Carolina (and very occasionally in South Carolina). These small shorebirds winter primarily on the Atlantic Coast from North Carolina to Florida, although some migrate to the Gulf Coast, Bahamas, and West Indies.

Biologists engaged in the effort to restore piping plovers *(Charadrius melodus)* along the Atlantic Coast are now cautiously optimistic that numbers of this threatened population can be increased to the point where Endangered Species Act (ESA) protection is no longer needed. Intensive protection efforts are yielding impressive gains for the species, particularly in the New England portion of its range.

Common along the Atlantic Coast during much of the 19th century, piping plovers nearly disappeared due to excessive hunting for the millinery or hat trade. Following passage of the Migratory Bird Treaty Act in 1918, numbers recovered to a 20th century peak in the 1940's. The subsequent population decline is attributed to increased development and use of beaches since the end of World War II. By 1986, the Atlantic Coast piping plover population was estimated at 800 pairs.

Loss and degradation of habitat due to development and shoreline stabilization have been major reasons for the species' decline. In addition, disturbance by humans and pets often reduces the suitability of habitat, and can cause the direct or



Julie Zickefoose

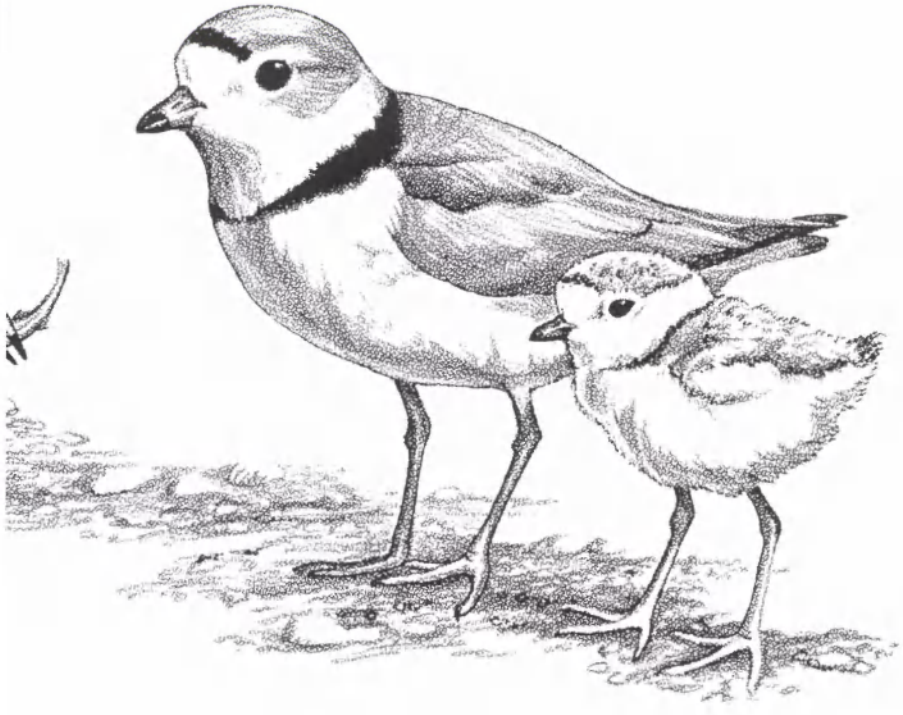
indirect death of eggs and chicks. Predation also is a major limiting factor at many Atlantic Coast sites, where the number and types of predators can be affected by human activities (e.g., littering, which attracts raccoons).

The plight of the plover also is an indicator of an entire ecosystem in trouble. Since the listing of the piping plover, two other beach-dwelling species native to the Atlantic Coast, the northeastern beach tiger beetle *(Cicindela dorsalis dorsalis)* and the seabeach amaranth *(Amaranthus pumilus)*, have been listed under the ESA as threatened species. Two distinct breeding populations of a fourth species, the roseate tern *(Sterna dougallii dougallii)*, were listed in 1987, one as threatened and one as endangered. The loggerhead sea turtle (*Caretta caretta*), another threatened species, nests on plover nesting beaches in North Carolina.

The Atlantic Coast piping plover population count has increased from around 800 pairs in 1986 to approximately 1,150 pairs in 1994. Biologists attribute some of this increase to intensified surveys, but real progress also is being made. In New England, for example, the population grew 118 percent between 1989 and 1994, from 206 to 449 pairs. Less progress has occurred throughout the rest of the range, and sub-populations in Canada and the southern portion of the range have actually decreased over the last six years. While the overall status of the population remains precarious, success in New England demonstrates that recovery is possible.

Recovery accomplishments in the northeast have come through a coordinated effort by many organizations and individuals. Protection measures include the fencing of nesting and foraging habitat, seasonal beach closures to vehicles and/or pedestrians, restrictions on pets, and public education. Measures to reduce predation pressure include placing wire fences around nests and predator removal. Beach stabilization activities also have been modified to prevent or minimize degradation of habitat.

Implementing labor-intensive protection measures for a sparsely distributed species like the plover is only possible because of cooperation by many agencies and organizations. In Massachusetts, for example, 16 Federal, State, county, and



Piping plovers (right) return to their breeding grounds in late March or early April. Following establishment of nesting territories and courtship rituals, the pair forms a depression in the sand. This "nest" is sometimes lined with small stones or shell fragments. Up to four eggs hatch in about four weeks, and the flightless young are soon able to follow their parents in foraging for marine worms, insects, and amphipods. Young are able to fly at around 30 days of age.

The camouflage that helps to protect piping plover eggs and young from predators can make them vulnerable to unintentional destruction by people.
FWS photo

municipal agencies and private organizations marshalled 32,500 hours of paid and volunteer work for the on-site protection of 289 pairs of plovers in 1993. Similar partnerships form the foundation of plover protection throughout the range of the Atlantic population.

Revised Recovery Plan

In February 1995, the Fish and Wildlife Service (FWS) opened a 90-day public comment period on a Draft Revised Recovery Plan for the Atlantic Coast Piping Plover. The draft revision calls for:

- revised delisting criteria based on the results of new data and population viability modelling,
- establishing four recovery units within the plover's Atlantic Coast range, with required population goals for each,
- a summary of existing and needed management activities at 178 current or potential plover breeding sites along the Atlantic Coast, and
- guidelines for protecting piping plover breeding habitat while minimizing conflicts with beach recreation.

The final revised recovery plan should be published soon.

Continuing challenges

The overall outlook for the piping plover has certainly brightened over the last 10 years, but the species is not yet out of danger. While the gains in New England have improved the security of the population as a whole, low numbers and poor productivity in the rest of the population's range leave it vulnerable. Increases in breeding pairs and productivity must be achieved in other portions of the species' range in case some disaster strikes the New England breeding grounds. Another major concern is protection of wintering plovers and their habitat.

Pressure on Atlantic Coast beach habitat from development and recreation will continue. Except on National Wildlife Refuges, where the primary management objective is wildlife protection, it is neither feasible nor desirable to eliminate beach recreation in plover habitat. Biologists are examining ways to reduce restrictions on some types of recreational activities while giving vulnerable wildlife the protection it needs. This poses a formidable challenge, but the rewards for plovers and the beach ecosystem are clear.

Anne Hecht is a special projects coordinator for endangered species in Region 5, and is stationed at Great Meadows National Wildlife Refuge, Massachusetts.

Turtles Dig the Dark

by Sandy MacPherson

Globally, sea turtles have declined because of commercial exploitation, incidental catch during commercial fishing operations, development of coastal nesting habitat, and pollution of the world's oceans. One of the more manageable threats is the presence of "light pollution" on nesting beaches. Artificial lighting can be detrimental to sea turtles in several ways. Studies have shown that light pollution can deter female sea turtles from coming onto the beach to dig their nests; in fact, brightly lit beaches are used less frequently for nesting. Also, females attempting to return to sea after nesting can become disoriented by beach lighting and have difficulty making it back to the ocean. In some cases, nesting females have ended up on coastal highways and been struck by vehicles.

Artificial beach lighting is even more detrimental to sea turtle hatchlings, which emerge from nests at night. Under natural conditions, hatchlings move toward the brightest, most open horizon, which is over the ocean. However, when bright light sources are present on the beach, they become the brightest spot on the horizon and attract hatchlings in the wrong direction, making them more vulnerable to predators, desiccation, exhaustion, and automobiles.

Growing concern about the impact of beach lighting on sea turtles has led many coastal counties and municipalities in the southeastern U.S. to pass lighting ordinances. Some of these local ordinances have been in place since 1987, but compliance has varied widely. As a result, the Fish and Wildlife Service (FWS) continues to receive numerous reports of sea turtle hatchling deaths related to beach lighting.

Education is the key to addressing the impacts of artificial lighting on sea turtles. FWS biologists, working closely with State conservation agencies, have contacted individuals and facilities with lighting problems, explained the effects on sea turtles, and provided information on effective and inexpensive methods to light facilities for human safety while avoiding harm to sea turtles. For example, problem lights often can be turned out during the nesting season or easily shielded. Coastal residents and visitors also are encouraged to turn off exterior lights on beachside balconies and to close all blinds and drapes in oceanfront rooms at night from May 1 to October 31 of each year.

While there is still a long way to go in the effort to darken sea turtle nesting beaches, headway is being made, and the FWS will continue to educate the public on this issue.

Sandy MacPherson, the FWS Southeast Region's Sea Turtle Recovery Coordinator, is located in the Jacksonville, Florida, Field Office.

Four sea turtle species regularly nest on the beaches of the southeastern United States mainland, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. The world's second largest nesting aggregation of loggerhead sea turtles *(Caretta caretta)*, for example, occurs along the southeastern coast. Other species nesting on the mainland and U.S. Caribbean islands include the leatherback *(Dermochelys coriacea)*, green *(Chelonia mydas)*, and hawksbill *(Eretmochelys imbricata)* sea turtles.

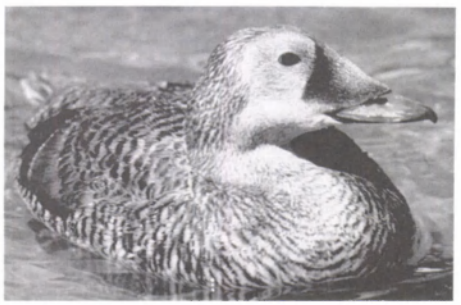
Below

A leatherback sea turtle hatchling emerges from its shell.
FWS photo

Spectacled Eider Mystery is Solved

Spectacled eider drakes sport a distinctive white eye patch circled by a black ring, giving the appearance of spectacles. This colorful species was listed in 1993 as threatened after western Alaska populations declined more than 90 percent in 30 years. No one knows the cause for the decline. In Alaska, spectacled eiders spend summers and breed in tundra areas along the coast. However, more than 90 percent of the species' world population is believed to breed in the Russian arctic.

Above
Spectacled eider drake
Below
Spectacled eider hen
Glen Smart



Where does the spectacled eider, a threatened species of arctic sea duck, go during the winter? It's a question that has stumped biologists for decades. This past spring, biologists of the Fish and Wildlife Service (FWS) and the National Biological Service (NBS) solved the longstanding mystery.

Satellite-tracking technology made the discovery possible. During the spring of 1994, NBS biologist Margaret Petersen headed a study team that fitted tiny transmitters to 22 spectacled eiders captured on the Yukon-Kuskokwim Delta National Wildlife Refuge in Alaska. The transmitters provided information on the birds' locations until December 1994, when the batteries became too weak to send signals strong enough for tracking. At that time, the eiders were dispersed in the Bering Sea south of Saint Lawrence Island, where the ocean had not yet frozen solid.

Unexpectedly, in February 1995, a location signal was received from a transmitter that had been inactive since August 1994. Biologists tracking the eiders found it strange that the signal came not from an area of known open water but from a spot about 200 miles within the arctic icepack.

In March, responding to the signal, FWS biologists Bill Larned and Greg Balogh chartered a plane and flew out over the frozen Bering Sea to search for the answer. To their amazement, they discovered tens of thousands of the elusive ducks jammed into tiny holes in the Bering Sea pack ice, which the birds kept unfrozen by their own body warmth and movement despite the minus 20° F temperature.

Larned and Balogh returned to the remote location in early April to document the presence of 140,000 spectacled eiders, which biologists estimate to be at least half the species' world population.

"The density of the flocks was unprecedented," said Balogh. "It looked like every eider was touching six others. One flock flushed as we passed, and when they flew, a thick cloud of steam rose off the water surface into the icy air."

"The discovery of the wintering area is a major step toward understanding how these birds live, what problems they may be facing, and other important questions we have about the Bering Sea ecosystem," said FWS biologist Russ Oates, leader of the interagency Spectacled Eider Recovery Team. "Now we have a starting point for planning the next phases of the recovery effort."

Envirothon Attracts Students

by Linda Finger

"What is the common name for Casmerodius albus? How many endangered species occur in the United States? Describe the mark-recapture method of estimating a population. Name the most species-rich group of living organisms."

These questions and others were asked recently of local high school students as part of the Envirothon, a natural resource education program in which teams of high school students compete in five study areas—aquatics, soils, wildlife, forestry, and current environmental issues. The Fish and Wildlife Service's (FWS) Jacksonville Field Office took an active role in Florida's "First Coast" (or northeast coast) Envirothon, a regional contest held at the University of North Florida in Jacksonville.

The Jacksonville Field Office developed the wildlife curriculum for the 1995 First Coast Envirothon and staffed the station on test day. This year's competition attracted over 250 students from high schools throughout a three-county area. Student teams were challenged by questions about such wildlife-related topics as identification basics, trapping and marking techniques, biodiversity, and endangered species. Each team had about 30 minutes to answer 25 questions in each subject area. The winning team from the First Coast competition, "The Bio Girls," will travel to Florida's statewide contest courtesy of local Soil and Water Conservation Districts.

Ultimately, a winning team from each State travels to the national competition. The Envirothon program is an excellent opportunity for FWS biologists to interact with other agencies and encourage environmental awareness among high school students. Information about the program is available from local offices of the Natural Resources Conservation Service (formerly known as the Soil Conservation Service).

Linda Finger is a wildlife biologist in the FWS Jacksonville, Florida, Field Office.

The Envirothon is billed as a problem-solving, environmental "quiz bowl." For the students, this one-day competition is the culmination of many months of study. Each team, consisting of five students and a teacher/sponsor, reviews material provided by resource agencies representing the five study areas. The students enjoy selecting the names for their teams, which this year included the Ecocentrics, Wetland Warriors, and Toxic Crusaders.

Below
FWS biologist Linda Finger instructs a team of Envirothon students.
Marc Epstein/FWS

Will *el Lobo* Return?

by Wendy M. Brown

An important milestone was passed recently in efforts to restore the critically endangered Mexican gray wolf *(Canis lupus baileyi)*. The draft environmental impact statement on the Fish and Wildlife Service's (FWS) proposal to reintroduce Mexican wolves to historic range in Arizona and New Mexico was released June 27, 1995. The FWS will host 14 public open house meetings and 3 formal public hearings through October to gather comments on the proposal, and plans to complete the final EIS and record of decision in early 1996.

The Mexican gray wolf, or *el lobo* as it was christened by the Spanish-speakers who shared its range, is the southernmost and most genetically distinct of the five gray wolf subspecies in North America. Only 137 Mexican wolves are known to exist today, and all are being held at 24 zoos and other facilities in the U.S. (19) and Mexico (5). Biologists know little about this species in the wild because viable populations were exterminated before the animals could be studied. Although it is possible that a few wolves may remain in the wild in northern Mexico, no sightings have been confirmed since 1980.

Historically, the Mexican wolf roamed montane woodlands from near Mexico City up through southeastern Arizona, southern New Mexico, and southwestern Texas. Mexican wolves are generally smaller than their northern cousins, weighing 60-90 pounds, and have a richly-colored coat of dark grey, brown, cinnamon, and buff over light-colored underparts. They typically have a well-developed ruff or mane of longer hair around the neck.

Livestock husbandry gradually expanded into the American southwest with Spanish settlement in the seventeenth and eighteenth centuries, and some wolves that took advantage of this new food source were killed. However, the lobo population probably followed the ebb and flow of native prey through the mid 1800's. Completion of the railroads brought settlers and livestock to the southwest in larger numbers, and the war on the wolf began in earnest.

Bounties, private "wolfers," and government agents all did their share. Ironically, the last authenticated reports of Mexican wolves in the U.S. occurred around the time the lobo gained protection under the Endangered Species Act (ESA) in 1976. Meanwhile, wolves in Mexico continued to be persecuted by traps and poisons (particularly compound 1080) as their prey populations were depleted.

In 1977, the FWS contracted biologist/trapper Roy McBride to capture the remaining live wolves in Mexico. The goal was to prevent extinction of the subspecies by establishing a captive population. Between 1977 and 1980, McBride trapped five Mexican wolves from Chihuahua and Durango, including one pregnant female and four males. Two of the captured males, the female,

Mexican wolf pups raised in zoos may be released into former habitat if the reintroduction plan is approved.
Living Desert, Palm Desert, California

and her uncaptured wild mate became the founders of the first certified lineage of Mexican wolves, which now numbers 104 animals. Advanced techniques in molecular genetics analysis recently made it possible to determine that two other captive lineages—the Aragon lineage in Mexico and the Ghost Ranch lineage in the U.S.—are pure *C. l. baileyi*. This important development added 33 individuals from 4 valuable founders to the captive breeding program in July 1995.

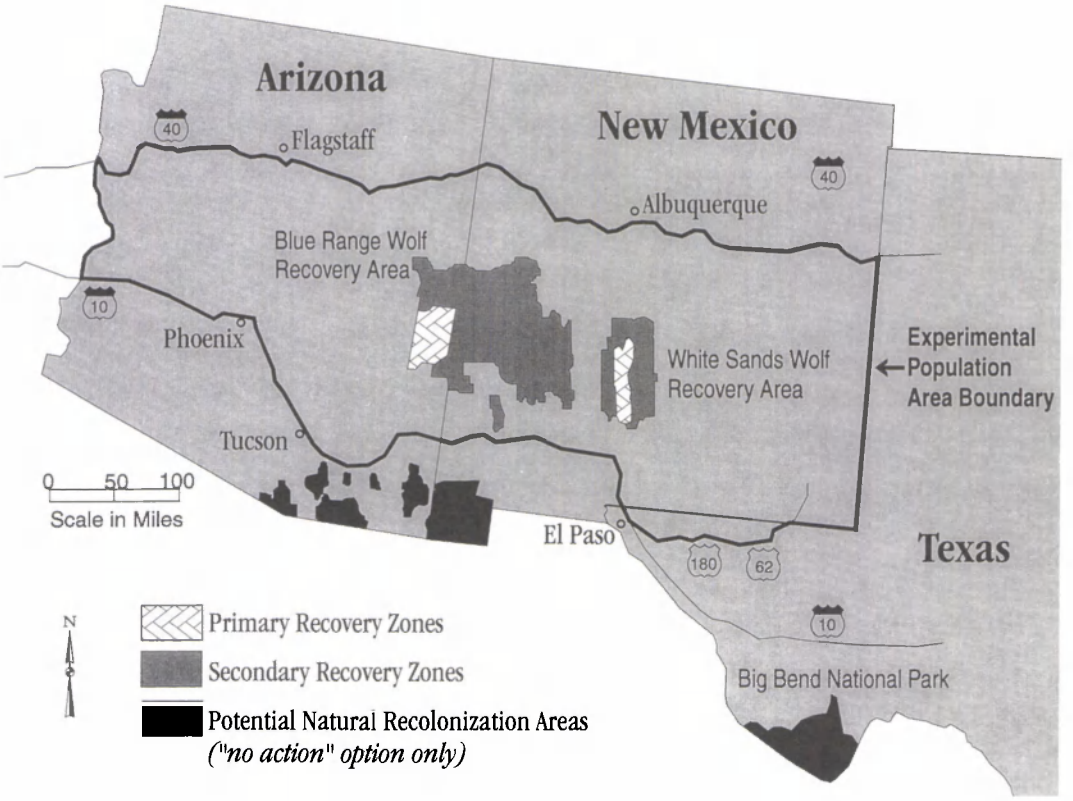
The FWS and cooperating agencies (the USDA Animal Damage Control program, U.S. Forest Service, U.S. Army, Arizona Game and Fish Department, and the New Mexico Department of Game and Fish) have developed a proposal to reintroduce the Mexican wolf to a portion of its historical range. Two geographically distinct areas are proposed, the White Sands Wolf Recovery Area in south-central New Mexico, and the Blue Range Wolf Recovery Area in the Apache and Gila National Forests of Arizona and New Mexico (see map). Each area has advantages and drawbacks. The White Sands area is primarily on a military reserve closed to public use and livestock grazing most of the year, but an analysis of habitat suitability and prey density suggests it could support only about 20 Mexican wolves. The Blue Range area includes about 7,000 square miles of contiguous public lands, most of which is suitable wolf habitat with good prey densities and an estimated capacity to support 100 wolves, but much of the land is grazed by livestock.

If both areas are used, about 120 Mexican wolves could range across approximately 6,000 square miles of public lands. However, the FWS proposal calls for reintroduction into *either* the White Sands area *or* the Blue Range area first, with reintroduction into the second area if necessary and feasible. This would allow an "adaptive management" approach, whereby the project would periodically be evaluated and refined to achieve recovery goals with minimum economic effects.

As with wolf reintroduction efforts in other areas, the greatest public concern in the southwest is livestock depredation. However, under even the worst-case scenario, wolves would be expected to take less than 0.1 percent of available livestock. Further, the private organization Defenders of Wildlife has extended its Rocky Mountain wolf compensation program to pay full market value for any documented livestock losses caused by Mexican wolves.

Recent surveys show that the overwhelming majority of people support Mexican wolf recovery. With the possibility of natural recolonization appearing increasingly remote, reintroduction may provide the last hope for restoring this unique southwestern animal to its native ecosystem.

Wendy Brown is a biologist with the FWS Mexican Wolf Recovery Program in the Albuquerque Regional Office.



Four alternatives are evaluated in the draft EIS, including reintroduction as a "nonessential, experimental" population with limited dispersal allowed; reintroduction with no dispersal allowed; reintroduction under full ESA protection with unlimited dispersal; and "no action/natural recolonization." The FWS has proposed reintroduction of a nonessential, experimental population into primary recovery zones, with dispersal into secondary recovery zones allowed (see map). An experimental population boundary would define the legal status of any wolf found within the area, and wolves would not be allowed to disperse outside secondary recovery zones. The experimental population would be managed under special rules that would minimize any potential conflicts and allow the control of problem wolves.

Grizzlies in Swan Valley

by Kristy J. Pelletier and Christopher Servheen

Swan Valley is situated within the boundaries of the 9,600 square mile Northern Continental Divide Ecosystem grizzly bear *(Ursus arctos horribilis)* recovery zone, where many other large carnivores, such as the gray wolf *(Canis lupus)*, mountain lion *(Felis concolor)*, black bear *(Ursus americanus)*, and lynx *(Lynx lynx)* coexist. Grizzlies enter the valley bottom seasonally in search of food and cross it to reach the large areas of intact habitat on either side. However, grizzlies are finding increasing human development in areas that were once productive and secure habitats. Activities that may affect wildlife include timber harvest, road building, other private and commercial development, and agriculture.

The Swan Valley is a rural area of some 329,000 acres in northwestern Montana, nestled between the towering Mission Mountains and the Swan Range on the western boundary of the Bob Marshall Wilderness. It is a place where people still know each other by name, where there is still some open space between them, and where they continue to coexist on their land with native wildlife. The people of the Swan Valley are interested in maintaining their rural quality of life, but they also want an economic base that includes timber, recreation, and tourism.

Grizzlies living in the Mission Mountains on the west side of the valley and in the Swan Range/Bob Marshall Wilderness on the east side are finding travel across the valley bottom increasingly difficult. The grizzly bear population in the Mission Mountains is thus becoming isolated from the larger and more secure Bob Marshall Wilderness population, and this isolation threatens the future of the grizzly in the Mission Mountains.

As wildlife habitat shrinks, wild areas valuable to humans also disappear. Residents of the Swan Valley live there, in part, because the area retains many of the same wild characteristics that greeted the pioneers nearly a century ago. Swan Valley residents recognized the uniqueness of their situation and decided to take action to protect their valley for themselves, for future generations, and for wildlife.

Early in 1993, a Swan Valley citizen's group invited Chris Servheen, the Fish and Wildlife Service (FWS) Grizzly Recovery Coordinator, to speak at a public meeting about an ongoing habitat analysis project. The FWS had been developing a computer-based geographic information system (GIS) to map areas of development and human influence in the Swan Valley. With this information, the FWS identified the remaining opportunities for wildlife movement between zones of human influence. These linkage zones might allow bears and other wildlife to cross the Swan Valley bottom with less danger of conflict with humans. Linkage zones are areas where animals have opportunities to travel, rest, and feed while moving between larger habitat units. The FWS believes that linkage zones merit some level of protection and careful management so that wildlife movement across the valley bottom would not be completely cut off by human development. Maintaining linkage zones in the Swan Valley could

serve as the last link between the small population of grizzlies in the Mission Mountains and those to the east in the Bob Marshall Wilderness.

The people of the Swan Valley became very interested in linkage zones, realizing that continued development could make the area inhospitable to wildlife and eventually degrade their rural way of life. They formed a diverse working group of residents and landowners, along with invited representatives from State, Federal, and corporate entities, to discuss the threats of habitat fragmentation. Invited agency representatives provided technical input, such as data from GIS mapping, but the final management recommendations were made by Swan Valley residents. Citizens in the working group hoped that recommendations coming from neighbors and peers would be more acceptable than those coming from government agencies.

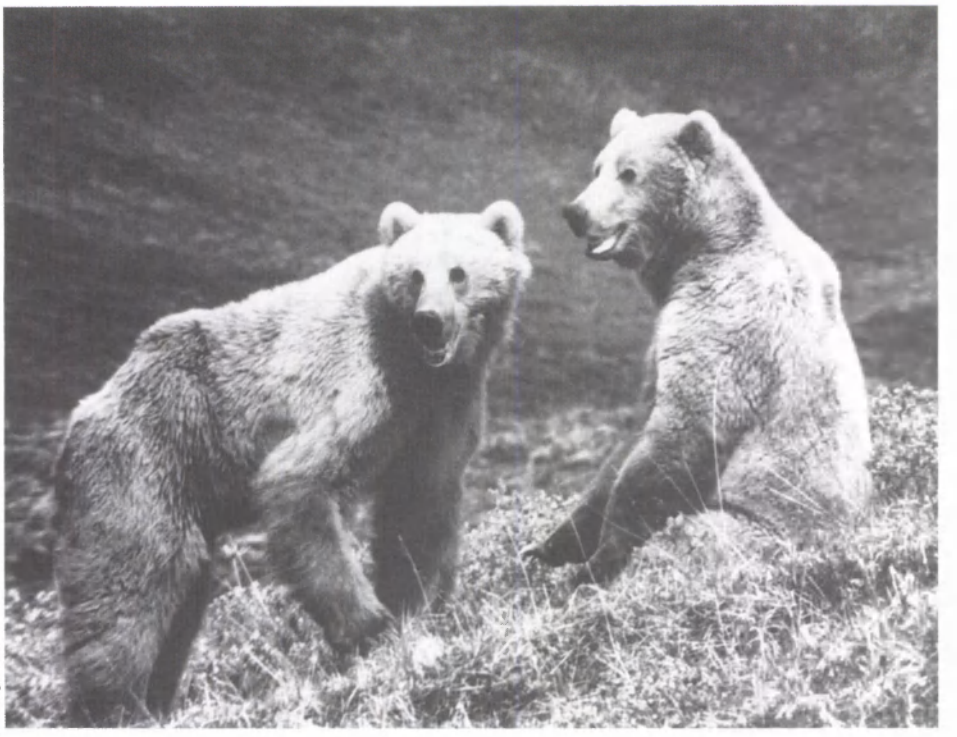
The working group produced a set of land management recommendations for private land owners in the valley on such issues as sanitation, agriculture, subdivisions, road density, full disclosure by area realtors on the needs of native wildlife, and forest management. As a courtesy to the residents, the FWS took the citizen recommendations and compiled them into a comprehensive management document for the 33,000 acres of private land in Swan Valley.

Habitat management in the Swan Valley is complicated by the checkerboard pattern of land ownership. State, Federal, and corporate lands are intermingled with private property. Careful management of the 296,000 acres of public and corporate timber land could have been negated by unplanned development on the non-corporate private land. The Swan Valley Non-corporate Private Lands Management Plan is an effort by local citizens to ensure that vital private lands are included in the overall management process, and will help maintain wildlife linkage zones across the valley.

Local citizens have made all the management recommendations that will affect private lands, their future, and the future of the valley. Cooperative ventures in private land protection are possible when agencies work with local people and these citizens can voice their specific needs and concerns during the process. Using the Swan Valley experience as a model, the FWS plans to offer GIS mapping of wildlife linkage zones and the writing and editing support needed to create locally-generated private land management recommendations to other valleys in the northern Rocky Mountains.

Kristy Pelletier works on special projects in the FWS Grizzly Bear Recovery Office in Missoula, Montana. Christopher Servheen is the FWS Grizzly Bear Recovery Coordinator.

In early 1995, another agreement affecting the Swan Valley was developed between Plum Creek Timber Company, the U.S. Forest Service (Flathead National Forest), the Montana Department of State Lands, and the FWS to resolve complex issues surrounding management of corporate and public forest lands for logging and grizzly bear conservation. This agreement was based on the linkage zones identified by the FWS through the GIS mapping model. All parties agreed to concentrate their timber management practices in certain parts of the valley and to refrain from logging in riparian areas during vital spring feeding periods for bears.



FWS photo

Region 2

Whooping Crane *(Grus americana)* As of early August, the world population of whooping cranes stood at 330. Conditions this year at the species' breeding grounds in Wood Buffalo National Park, Canada, are the worst of the past 5 low-water years. Nevertheless, the latest counts indicate that 47 pairs nested this summer, a great improvement over 1994 when only 28 of a possible 40-46 pairs initiated nesting. The low 1994 numbers may have been the result of poor food conditions on the species' wintering area in Texas.

Twenty-four eggs were transferred from the park this year to captive propagation sites in the United States, and 20 chicks are being reared from these eggs. Forty-two wild chicks were present at Wood Buffalo National Park in June. If the survival rate of wild chicks in 1995 is similar to that of 1994, biologists can expect 20 chicks to arrive at Aransas National Wildlife Refuge in Texas this winter.

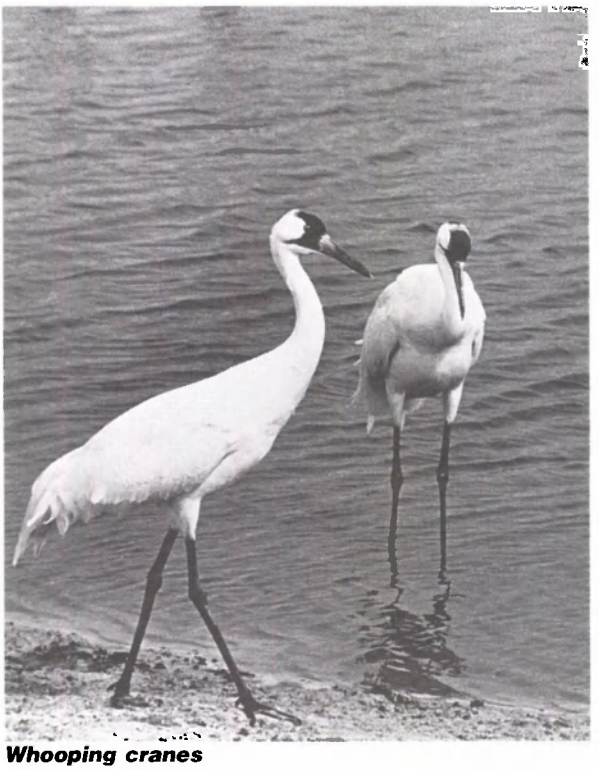
Another 25 chicks produced by captive-propagation flocks are being reared at breeding facilities. Most of the chicks will be taken to the Florida reintroduction site this fall or winter to join the 23 birds surviving from previous releases. Although they are only 3-year-olds, one Florida pair constructed a nest this spring. The first egg production may occur next spring.

Kemp's Ridley Sea Turtle *(Lepidochelys kempii)* Less than 50 years ago, the Kemp's ridley sea turtle was abundant in the Gulf of Mexico. Populations were large enough to generate a synchronized reproductive effort (called an *arribada*) of an estimated 40,000 females nesting in one afternoon. This occurred in 1947 on the species' single known nesting beach, located at Rancho Nuevo on the northeastern coast of Mexico. Since that time, the Kemp's ridley has suffered one of the most dramatic declines in population numbers recorded for any animal. In the years 1978 through 1994, a single *arribada* rarely reached 200 females. Two factors were implicated in the massive decline: 1) extremely heavy egg poaching and 2) intensification of the shrimping fishery in the U.S. and Mexico, with consequent turtle drowning in shrimp trawls.

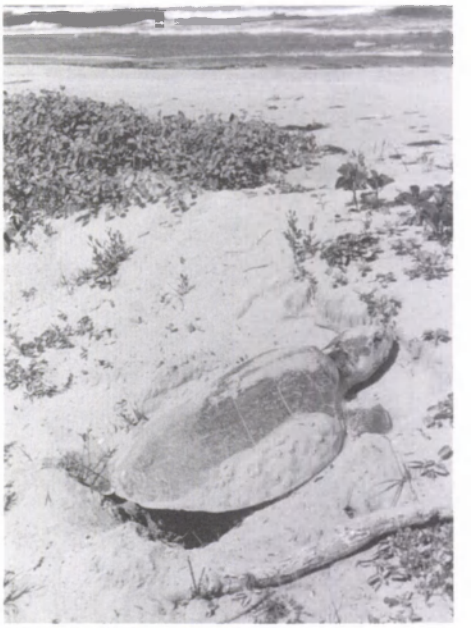
The cooperation between Mexico's Instituto Nacional de Pesca and Region 2 of the FWS over the past 18 years to protect and recover the Kemp's ridley is showing results, and is used as a model for international, multi-agency conservation efforts. From 1978 to the present, under a cooperative beach patrol effort involving both nations, nearly all nests were moved the same day to fenced, guarded corrals to protect them from predation. Adult turtles also are protected on nearly 100 miles of beach when they come ashore to lay eggs. As a result, the number of released hatchlings has been increased to a yearly average of 54,676 individuals.

Over one million hatchlings have been released from the corrals at the nesting beach since protection efforts began, but only recently has recruitment to the adult female portion of the population shown an increase. The numbers of adult females continued to decline (as indexed by numbers of nests) until 1985, but nesting has increased annually since that time. As of late July, 1,804 nests had been saved in 1995. The largest *arribada* this year numbered over 500 turtles and occurred over 2 days.

A definite corner has been turned in recovery of the species, but there is a long way to go before the species is again self-sustaining. Turtle excluder devices are required by U.S. and Mexican regulations for all shrimp trawls used in the Gulf of Mexico. Trawling regulations and enforcement in the U.S. are under the jurisdiction of the National Marine Fisheries Service, an agency of the Department of Commerce.



Whooping cranes
Luther C. Goldman



Kemp's ridley sea turtle
FWS photo

Region 3

Gray Wolf *(Canis lupus)* Cooperative State-Federal monitoring programs in Wisconsin and Michigan's Upper Peninsula have documented continued increases in gray wolf populations. During late winter of 1994-95, there were 85 wolves in Wisconsin and 80 wolves in Michigan, compared with the 1993-1994 estimates of 54 and 57, respectively. These numbers do not include the population on Isle Royale National Park, which supports an estimated 14 to 16 wolves.

Pitcher's Thistle *(Cirsium pitcheri)* This spring, the Fish and Wildlife Service (FWS) Chicago, Illinois, Field Office assisted the Morton Arboretum in planting threatened Pitcher's thistle seeds and seedlings on an Illinois state nature preserve. Over 1,400 seeds and 3 greenhouse- raised seedlings were planted. In 1994, two plants in the preserve flowered for the first time, and seeds collected from those flowers were among those planted this year. Seedlings have emerged from seeds planted in 1994 and six plants are blooming.

Niangua Darter *(Etheostoma nianguae)* The FWS Columbia, Missouri, Field Office and the Missouri Department of Conservation are using the Partners for Wildlife program to assist landowners interested in protecting streams within the critical habitat of a threatened fish, the Niangua darter. One recently proposed restoration project will protect water quality

and a portion of the Niangua River riparian corridor by fencing cattle from the stream.

Bald Eagle *(Haliaeetus leucocephalus)* and **Peregrine Falcon** *(Falco peregrinus anatum)* Some good news about birds of prey in Region 3: five new bald eagle nests have been established in Iowa and one new peregrine falcon nest in Illinois. The eagle nests are in Clinton, Jones, Hamilton, Sac, and Muscatine counties in Iowa, and the falcon nest is on a bridge over the Mississippi River.

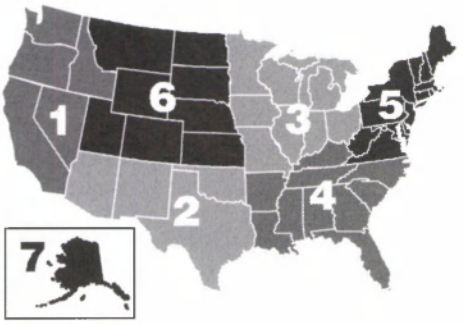
Region 4

Gulf Sturgeon *(Acipenser oxyrinchus desotoi)* When the Gulf sturgeon was listed in 1991 as threatened, the Gulf States Marine Fisheries Commission began work on a management plan. The Commission's Anadromous Fish Subcommittee then offered to expand the effort to include recovery planning. In response, the FWS Panama City, Florida, Field Office formed a partnership with the Subcommittee and coordinated a recovery team that included representatives from the States (Louisiana, Mississippi, Alabama, and Florida), the National Marine Fisheries Service, two conservation organizations, and a commercial fisherman.

The draft recovery/management objectives are to 1) stop additional losses from existing populations, 2) delist the fish once stable populations are reached (by river basins), and 3) open a limited fishery, under State regulation, for recovered stocks. A proposed plan has been approved by the Commission and is under review within the FWS and National Marine Fisheries Service.

Region 5

Karner Blue Butterfly *(Lycaeides melissa samuelis)* The FWS New England Field Office recently took a major step forward in protecting habitat for the endangered Karner blue butterfly in Concord, New Hampshire, by completing a Conservation Management Agreement with the City of Concord, The Nature Conservancy, and the New Hampshire Department of Fish and Game. The agreement call for the cooperative management of more than 300 acres of pine barren habitat at the city airport. It establishes conservation zones where resource agencies will manage habitat to benefit rare species, including the Karner blue, and where no development will occur. In areas where additional airport development is planned, the city has agreed to work with the FWS to minimize impacts on rare species.



Region 2

In July, the Lower Division States/Tribes Endangered Species Steering Committee of the Lower Colorado River Species Program endorsed the development of a habitat conservation plan (HCP) for the Lower Colorado River under section 10 of the ESA. The Steering Committee is composed of representatives from the U.S. Department of the Interior and from agricultural and municipal water, hydroelectric power, and wildlife interests in Arizona, California, and Nevada. As the HCP is developed, Committee members will consider the effects of water and power management on listed species and listing candidates within the mainstem Lower Colorado River and its 100-year floodplain. The goal is to manage wisely the variety of habitats along the Lower Colorado River, develop conservation agreements for listing candidates, and secure a permit for the incidental take of listed species during otherwise lawful activities.

A conservation plan for the Arizona willow *(Salix arizonica)* and its habitat was completed in May 1995. This small, distinctive shrub willow occurs in certain high-elevation riparian ecosystems of the southwest. The commitment of all parties involved—the FWS, Forest Service, National Park Service, White Mountain Apache Tribe, Arizona Game and Fish Department, and Utah Division of Wildlife Resources—resulted in exceptional cooperation. The conservation plan calls for actions to reduce site-specific threats and to improve and protect the species' habitat. The White Mountain Apache Tribe has developed a separate strategy, consistent with the conservation agreement, for management of the Arizona willow on tribal lands.

Spring counts indicate that only three small populations of Attwater's greater prairie chickens *(Tympanuchus cupido attwateri)* survive in the wild, with a total of 68 birds. Historically, an estimated 1 million of the prairie chickens occupied coastal prairie grasslands from southwestern Louisiana to the Nueces River in Texas. The species has been declining in numbers and range since the early 1900's, due primarily to the steady loss of prairie habitat. Literature on greater prairie chickens indicates that when isolated populations fall below 100 males, they will eventually disappear unless habitat is improved.

Efforts to recover Attwater's greater prairie chicken include habitat management (brush removal, modified grazing, prescribed burning), predator control, and captive propagation. FWS grants are funding cooperative management of habitat on private tracts. The Galveston Bay Coastal Prairie Preserve, a 3,000-acre site containing 16 birds, was donated in February to the Texas Nature Conservancy (TNC) by Mobil Exploration and Producing—U.S. The FWS will assist TNC in managing the site. Thirty-five adult birds and 65 young exist at 3 captive propagation sites: the Houston Zoo, Fossil Rim Ranch, and Texas A & M University. The first experimental releases of captive-produced males are expected soon at Attwater's Prairie Chicken National Wildlife Refuge. A fourth facility is expected to join the captive propagation effort later this year.

Attwater's greater prairie chicken
Luther C. Goldman

Items for Recovery Updates and Regional News are provided by regional endangered species contacts.

Listing Proposals June/July 1995

During June and July of 1995, the Fish and Wildlife Service (FWS) proposed listing 24 taxa—21 plants and 3 animals—as endangered. If the listing proposals are approved, Endangered Species Act protection will be extended to the following:

Nineteen Channel Islands Plants On July 25, the FWS proposed listing 19 plants endemic to the Channel Islands off the coast of southern California:

Hoffmann's rock-cress *(Arabis hoffmannii)*, a slender herbaceous perennial belonging to the mustard family (Brassicaceae);

Santa Rosa Island manzanita *(Arctostaphylos confertiflora)*, a perennial shrub in the heath family (Ericaceae);

island barberry *(Berberis pinnata* ssp. *insularis)*, a shrub in the barberry family (Berberidaceae);

soft-leaved paintbrush *(Castilleja mollis)*, a perennial herb in the snapdragon family (Scrophulariaceae);

Santa Rosa Island dudleya *(Dudleya blochmaniae* ssp. *insularis)*, a small perennial succulent in the stonecrop family (Crassulaceae);

munchkin dudleya *(Dudleya* sp. nov. "East Point"), like the above, a small succulent perennial;

Santa Cruz Island dudleya *(Dudleya nesiotica)*, a succulent perennial;

island bedstraw *(Galium buxifolium)*, a woody shrub in the bedstraw family (Rubiaceae);

Hoffmann's slender-flowered gilia *(Gilia tenuiflora* ssp. *hoffmannii)*, a small annual herb in the phlox family (Polemoniaceae);

island rush-rose *(Helianthemum greenei)*, a small shrub in the rock-rose family (Cistaceae);

island alumroot *(Heuchera maxima)*, a perennial herb in the saxifrage family (Saxifragaceae);

Santa Cruz Island bushmallow *(Malacothamnus fasciculatus* ssp. *nesioticus)*, a small shrub in the mallow family (Malvaceae);

Santa Cruz Island malacothrix *(Malacothrix indecora)*, an annual herb in the aster family (Asteraceae);

island malacothrix *(Malacothrix squalida)*, a small annual herb;

island phacelia *(Phacelia insularis* ssp. *insularis)*, a decumbent (reclining) annual in the waterleaf family (Hydrophyllaceae);

Santa Cruz Island fringepod *(Thysanocarpus conchuliferus)*, a delicate annual herb in the mustard family (Brassicaceae);

Catalina Island mountain-mahogany *(Cercocarpus traskiae)*, an evergreen shrub or small tree in the family Rosaceae;

San Clemente Island woodland-star *(Lithophragma maximum)*, a perennial herb in the saxifrage family; and

Santa Cruz Island rockcress *(Sibara filifolia)*, a slender annual herb in the mustard family.

These plants are restricted to one or more of the following coastal islands: Santa Catalina, San Clemente, Anacapa, Santa Cruz, Santa Rosa, and San Miguel. Most of the current populations are found on Federal property or private land that is managed for conservation purposes. Their vulnerable status is primarily the result of widespread habitat degradation caused by non-native animals. Delicate island soils were eroded by sheep, goat, cattle, donkey, horse, and bison grazing; deer and elk browsing; and rooting by pigs. Much of the damage occurred in the past, but in some cases it continues. Habitat disturbance also has promoted the spread of accidentally or intentionally introduced plant species, which often compete with non-native plants.

Four of the primary land managers for these islands—the U.S. Navy, National Park Service, Santa Catalina Island Conservancy, and The Nature Conservancy—are taking steps to improve protection of the unique habitats.

Two Tidal Marsh Plants On June 12, endangered status was proposed for two plant taxa restricted to salt or brackish tidal marshes within the San Francisco Bay region of northern California:

Suisun thistle *(Cirsium hydrophilum* var. *hydrophilum)*, a perennial in the aster family; and

soft bird's-beak *(Cordylanthus mollis* ssp. *mollis)*, an annual herb in the snapdragon family.

The marshlands inhabited by these species are in Suisun and San Pablo Bays, where past human activities have severely reduced, degraded, and fragmented wetland habitats. Large areas were drained for use in agriculture, industrial development, urbanization, waste disposal, and salt production. Diversion of freshwater inflows is increasing salinity levels in the bays to the point that it may be interfering with growth and reproduction in these plants. Water pollution from oil spills and heavy metals is another continuing threat. Competition from introduced noxious weeds is affecting some populations of both species, and the Suisun thistle may be vulnerable to hybridization with a non-native thistle, *Cirsium vulgare*.

Three Texas Invertebrates Three species of aquatic invertebrates known only from springs in Comal and Hays Counties, Texas, were proposed June 5 for listing as endangered:

Peck's cave amphipod *(Stygobromus pecki)*, a small crustacean living below ground at Comal and Hueco Springs;

Comal Springs dryopid beetle *(Stygoparnus comalensis)*, another subterranean species, found in Comal and Fern Bank Springs; and

Comal Springs riffle beetle *(Heterelmis comalensis)*, a tiny beetle that lives primarily in shallow riffles flowing from Comal and San Marcos Springs.

These species require a reliable supply of clean, relatively well-oxygenated water. The primary threat to their survival is a decrease in water quantity and quality as a result of groundwater withdrawal and other activities throughout the San Antonio segment of the Edwards Aquifer. In 1989, the Texas Water Commission classified this part of the aquifer as critical in terms of its potential for groundwater problems related to overdrafting. After applying its model of the Edwards Aquifer to Comal Springs, the Texas Water Development Board estimated that, by the year 2000, the spring could go dry for an extended time if withdrawals continue at historical levels and the region is struck by drought. Pollution is another threat; chemical spills in the highly urbanized San Antonio segment of the Edwards Aquifer recharge zone could contaminate the species aquatic habitat.

Listing Moratorium

In early April, Congress passed a moratorium on adding animals or plants to the list of threatened or endangered species or designating critical habitat. The moratorium, in effect through September 30, 1995, was attached to a Department of Defense supplementary spending bill signed by the President April 10, 1995. The bill also rescinded $1.5 million from the budget allocated to the FWS listing program.

DO YOU HAVE A STORY?

Because of its increasingly diverse audience, the Bulletin is seeking to diversify and expand its coverage of endangered species issues. To be successful, we need your help.

Material on a wide range of topics relating to endangered species is welcome and may be technical or popular in nature. We are particularly interested in success stories and news about recovery (both the development of recovery plans and their implementation). Material also is needed on interagency consultations; Habitat Conservation Plans; other cooperative ventures with Federal and State agencies, conservation organizations, business, and private landowners; changes in a species' status; and new threats.

Before preparing a manuscript, please contact the *Bulletin* Editor (703/358-2390) to determine the length, focus, and timing of proposed articles. We welcome submissions but cannot guarantee their publication in the *Bulletin*. (Authors will be notified if their material is not used.) Manuscripts may be circulated to reviewers for technical content and consistency with Fish and Wildlife Service policies. They may also be edited for length, style, and clarity. The *Bulletin* staff will consult with authors on changes that may affect the content of a manuscript, and authors will have an opportunity to review edited material before publication. Credit will be given for all articles and illustrations.

Style

When preparing a manuscript, follow the *GPO Style Manual* if available. Keep in mind the diversity of the *Bulletin* audience. People from many different backgrounds are added to the mailing list each month, and discussing the context of an issue is an important aid to new readers.

As a general rule, feature articles should be three to five double-spaced pages in length. Shorter items can be sent to the appropriate Regional endangered species specialist for inclusion in the Regional News or Recovery Updates columns. Notices and announcements may be mailed directly to the Editor.

Because *Bulletin* recipients include many scientists and foreign subscribers, please include:

- scientific and common names of all species mentioned (listed and non-listed species).
- Metric equivalents for all measurements.
- Celesius and Fahrenheit equivalents for temperatures.
- Complete names or terms to accompany the first use of all abbrevations and acronyms.

Submissions should always include the author's name, position, duty station, address, and telephone and fax numbers.

Illustrations

Photographs and/or line drawings are very important, and should be submitted with all articles as available. Photographs are particularly welcome, and can be provided as transparencies, prints (black and white preferred), or negatives. Include the photographer's name and material for a caption. Material will be returned upon completion. Please obtain in advance permission for the *Bulletin* to publish the submitted illustrations.

Submission Format

Manuscripts for the *Bulletin* can be submitted several ways. We prefer to receive computer files in Wordperfect 5.1 format. Please transmit them via CC:MAIL (send to R9FWE_DES), or via Internet at R9FWE_DES.BIM@mail.fws.gov. You may also send DOS-formatted diskettes to the *Endangered Species Bulletin*, U.S. Fish and Wildlife Service, 452 ARLSQ, Washington, D.C. 20240. Submissions by FAX can be sent to 703/358-1735 (703/358-2390 to confirm). In all cases, please also mail a double-spaced hard copy.

Printing Schedule

The *Bulletin* is on a bimonthly printing schedule, with six issues per year and an index.

We welcome contributions at any time, but material not received by the "Article Due" date will be held for a future issue.

ISSUE DATE	ARTICLE DUE DATE
January/February 1996	October 30, 1995
March/April 1996	December 22, 1995
May/June 1996	March 26, 1996
July/August 1996	April 22, 1996
September/October 1996	June 24, 1996
November/December 1996	August 30, 1996

BOX SCORE

Listings and Recovery Plans as of August 31, 1995

GROUP	ENDANGERED U.S.	ENDANGERED FOREIGN	THREATENED U.S.	THREATENED FOREIGN	TOTAL LISTINGS	SPECIES W/ PLANS
MAMMALS	55	252	9	19	335	40
BIRDS	75	177	16	6	274	80
REPTILES	14	65	19	14	112	30
AMPHIBIANS	7	8	5	1	21	11
FISHES	68	11	37	0	116	72
SNAILS	15	1	7	0	23	11
CLAMS	51	2	6	0	59	42
CRUSTACEANS	14	0	3	0	17	4
INSECTS	20	4	9	0	33	20
ARACHNIDS	5	0	0	0	5	4
ANIMAL SUBTOTAL	324	520	111	40	995	315
FLOWERING PLANTS	407	1	90	0	497	193
CONIFERS	2	0	0	2	4	1
FERNS AND OTHERS	26	0	2	0	28	12
PLANT SUBTOTAL	435	1	92	2	530	206
GRAND TOTAL	759	521	203	42	1,525*	521**

TOTAL U.S. ENDANGERED: 759 (324 animals, 435 plants)
TOTAL U.S. THREATENED: 203 (111 animals, 92 plants)
TOTAL U.S. LISTED: 962 (435 animals, 527 plants)***

*Separate populations of a species listed both as Endangered and Threatened, are tallied twice. Those species are the leopard, gray wolf, piping plover, roseate tern, chimpanzee, green sea turtle, and olive ridley 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 411 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.

***Six animals have dual status.

ENDANGERED Species BULLETIN

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