

# ENDANGERED SPECIES

## Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20204

### Endangered Species Staff in Washington is Reorganized

As part of a general reorganization within the U.S. Fish and Wildlife Service from use of a program management system to a line-staff system, the former Washington Office of Endangered Species now has a new name—the Division of Endangered Species and Habitat Conservation—and a wider range of responsibilities. This reorganization parallels one that has already taken place in the Service's Regional and field offices. The following summary should help to acquaint people outside the Service with the new organizational structure:

#### Fish and Wildlife Enhancement

The Assistant Director for Fish and Wildlife Enhancement (Enhancement), Ronald E. Lambertson (telephone 202/343-4646), provides staff support to the Director and the Regions on Service responsibilities in these areas: 1) Endangered and Threatened species listing, consultation, and recovery; 2) wetland and upland habitat protection, restoration, and conservation; 3) environmental contaminants; 4) wetlands mapping; 5) grants to the States; and 6) international activities involving protected species. Staff support responsibilities are primarily in the areas of coordinating with the Service's Regional offices, policy and budget preparation, and special issues. Under the Assistant Director for Enhancement are four divisions:

##### 1. Division of Endangered Species and Habitat Conservation

The former Office of Endangered Species and Division of Ecological Services have been combined to form the new Division of Endangered Species and Habitat Conservation. Robert Smith is acting Chief, and Ken Stansell is acting Deputy Chief (telephone 703/235-2771). This division provides staff support to the Assistant Director on 1) Endangered and Threatened species listing, consultation, and recovery policy; 2) wetland and upland habitat protection, restoration, and conservation; and 3) wetlands mapping. The new division consists of the following branches:

**A) Listing and Recovery** (Janet Hohn, acting Branch Chief; 703/235-1975) — As its name implies, this branch is responsible for most of the duties of the former Office of Endangered Species. Among its responsibilities are: developing policy and guidelines for listing actions, recovery plans, and economic analyses of Critical Habitat; tracking of listing actions, petitions, and recovery plans during their review in Washington; compiling Regional selections of listing candidates; coordinating the development of briefing material; and serving as a liaison to other agencies and organizations. The development of proposed and final listing rules, identification of listing candidates, evaluation of listing petitions, and preparation and implementation of recovery plans are responsibilities of the appropriate Regional Offices. Listings of foreign species, however, will be developed in the Service's Office of Scientific Authority

**B) Federal Activities** (Frank DeLuise, Branch Chief; 703/235-2418) — This branch develops regulations and policy to implement the Endangered Species Act (particularly Section 7 inter-agency consultations), Fish and Wildlife Coordination Act, National Environmental Policy Act, and other laws that give the Service specific authority. It works with such Federal agencies as the Army Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, Federal Energy Regulatory Commission, and the Minerals Management Service to help them avoid and mitigate losses of wildlife habitat resulting from their activities. At the request of the Director, the branch also alerts other agencies, development interests, and conservation organizations about habitat enhance-

ment opportunities. Section 7 consultations and Biological Opinions, permit evaluations, and environmental impact statement reviews are delegated to the Regions. The Service's Office of Scientific Authority will issue Biological Opinions on foreign import permits.

**C) Special Projects** (Robert Misso, Branch Chief; 703/235-2760) — Passage of laws popularly known as the Farm Bill, Omnibus Bill, and Emergency Wetlands Act presents new areas of opportunity for conserving wildlife habitat. The Special Projects branch develops approaches for making the most of these opportunities. Among the branch's other important responsibilities are conducting the National Wetlands Inventory and developing the Endangered Species Information System.

**D) Technical Information and Support Services** (Jim Beers, Branch Chief; 703/235-2407) — This branch provides administrative and automatic data processing support for all Enhancement divisions, and develops budget material for all divisions but Federal Aid. Processing controlled correspondence and producing the *Endangered Species Technical Bulletin* are two of the branch's other primary responsibilities.

##### 2. Division of Environmental Contaminants

This division provides staff support to the Assistant Director and technical support to the Regional Offices on activities relating to a variety of environmental contaminants. Among its areas of involvement are: hazardous materials disposal sites; spills of oil and other toxic substances; herbicide and pesticide registration and application; contaminant considerations in Federal water resource development; management of contaminants on Service and

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## Regional News

**Endangered species regional staff members reported the following news for the months of October and November:**

**Region 1** - The Fish and Wildlife Service's Sacramento, California, Endangered

Species Office presented testimony to the State Water Resources Control Board on two fishes of the Sacramento - San Joaquin Delta estuary, the Delta smelt (*Hypomesus transpacificus*) and Sacramento splittail (*Pogonichthys macrolepidotus*).

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**Region 8** (FWS Research and Development), Washington, D.C. 20240; Richard N. Smith, *Regional Director*; *Endangered Species Staff*; Clarence Johnson, *fish and crustaceans* (202-653-8772); Bettina Sparrowe, *other animals and plants* (202-653-8762).

### U.S. Fish and Wildlife Service Regions

**Region 1:** California, Hawaii, Idaho, Nevada, Oregon, Washington, and Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the Virgin Islands. **Region 5:** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide.

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Both species have been recommended as candidates for future listing proposals because of declines in their distribution and abundance.

A recent alternative from the California Department of Transportation for redesigning State Route 1 through Carmel will reduce impacts to the Hatton Canyon population of Hickman's onion (*Allium hickmanii*) by approximately two-thirds. Nearly 55 percent of the species' range occurs on the bluffs above Hatton Canyon. The Hickman's onion is a Category 1 listing candidate.

In response to recent findings, African clawed frogs (*Xenopus laevis*) will be trapped and removed from habitat of the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), an Endangered fish in Soledad Canyon (Los Angeles County). These non-native frogs are highly predacious and can have significant impacts on fish populations. The trapping effort is a short-term effort while biologists at California State University - Northridge seek to determine how severe an impact these frogs are likely to have on the stickleback population if they are not controlled.

A second population of the Endangered San Mateo thornmint (*Acanthomintha obovata duttonii*) has been discovered. This small population of 11 plants was observed on San Francisco Water Department property adjoining the Edgewood County Park on the west side of Interstate 280. The area is managed as natural open space; therefore, the population is considered relatively secure from development threats.

Efforts to save and recover the Owens pupfish (*Cyprinodon radiosus*) were set back by the contamination of its last refugium by largemouth bass (*Micropterus salmoides*). These introduced predators were recently discovered above the uppermost fish barrier at the Bureau of Land Management's spring refugium in Mono County, California. The California Department of Fish and Game suspects that the mode of access was an unauthorized fish transplant. Within the past year, largemouth bass have gained access to all four of the isolated spring habitats that were established in Fish Slough as pupfish refugia.

It was an excellent year for nesting bald eagles (*Haliaeetus leucocephalus*) in Idaho. Nine new nest territories were identified. There were 11 more occupied territories in 1987 than in 1986 and 15 more than in 1985. Successful nesting pairs have more than doubled since 1985 and increased 78 percent over 1986. The number of young produced in 1987 (60) doubled the 1986 figure of 30, and the

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## Regional News

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number of young fledged in 1987 (57) was more than twice the 26 fledged in 1986.

Representatives of the Service's Sacramento Office, the City of Sacramento, the Central Valley Regional Water Control Board, and the American River Flood Control District again examined the contaminated zone at the northern margins of the city's main landfill. It borders the southern edge of the American River approximately one mile above the confluence with the Sacramento River. Contaminants of some sort appear to be leaking out of the landfill toward the American River, killing all vegetation in their path, including some 100 elderberry plants. The elderberry plants, host for the Endangered valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), were being grown as part of a mitigation plan for work done by the Flood

Control District at another location. More study is needed to determine the exact nature of the contaminants before remedies can be determined. Evidence of the valley elderberry longhorn beetle was found on a proposed riprap site on the Stanislaus River at the boundary of San Joaquin and Stanislaus Counties. This finding increases the eastern extent of the beetle's known range.

**Region 2** - Six Mexican wolves (*Canis lupus baileyi*) have returned home to Mexico, approximately 10 years after one female and 3 males were imported from Mexico to start a captive breeding program in the U.S. The Mexican Government requested the three pairs of wolves in order to start its own captive breeding program. In the U.S., captive Mexican wolf numbers had increased to 30, with breeding being limited by a lack of holding facilities. The 30 wolves were held at 4 facilities: Rio Grande Zoological Park, Albuquerque, New Mexico; Alameda Park Zoo, Alamogordo, New Mexico; Arizona-Sonora

Desert Museum, Tucson, Arizona; and the Wild Canid Survival and Research Center, Eureka, Missouri. The shipment of these six animals will allow space for additional breeding in U.S. zoos and establish three additional holding facilities to increase the number of Mexican wolves in captivity. In Mexico, the wolves are being housed at Colonia Cuauhtemoc, a park near Mexico City; San Juan de Aragon Zoological Park in Mexico City; and the Ecological Center of Sonora in Hermosillo. Three Mexican veterinarians spent several days in New Mexico prior to the wolf shipment, learning handling and breeding techniques from Kent Newton (Rio Grande Zoo and Mexican Wolf Propagation Committee leader) and Norma Ames (Mexican Wolf Recovery Team leader). Veterinarians Gerardo Lopez Islas, Carlos Contreras Loza, and Rene Hernandez then accompanied the wolves on the historic return trip to the land of their grandparents' birth.

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## Progress on Gila Trout Recovery Leads to Reclassification Proposal

The Gila trout (*Salmo gilae*), native to relatively undisturbed mountain streams in the southwestern United States, once was a common game fish. Historically, it inhabited the Verde and Agua Fria River drainages in Arizona and the headwaters of the Gila River in New Mexico. Over the past century, however, deteriorating water quality and impacts from introduced fishes eliminated the Gila trout from most of its former range. By 1967, this fish survived only in sections of five small New Mexico streams, and the Fish and Wildlife Service listed it as Endangered. Fortunately, the habitat of these five populations is secure, and biologists have restored seven other populations on protected land. In recognition of the species' improved status, the Gila trout has been proposed for reclassification from Endangered to the less critical category of Threatened (F.R. 10.6.87).

Habitat conservation has played a vital role in recovery of the Gila trout. Ten of the eleven streams that contain populations of this species are in designated wilderness areas within Gila National Forest (New Mexico) and Prescott National Forest (Arizona). U.S. Forest Service regulations on wilderness protection will minimize or prevent water quality problems from logging, mining, and other watershed disturbances.

The Gila trout also is benefiting from efforts to control non-native trouts. When the Gila trout originally began to decline, non-native brown trout (*Salmo trutta*), rainbow trout (*Salmo gairdneri*), and cutthroat trout (*Salmo clarki*) were introduced to support sport fishing. These more adapt-

able trout overwhelmed the dwindling number of Gila trout and caused severe problems through hybridization, predation, and competition. Recovery actions initiated after the Gila trout was listed included chemical treatment of streams within its range to remove introduced fishes and construction of physical barriers to prevent reinvasion by the non-native trout.

As the habitats were secured, biologists with the U.S. Fish and Wildlife Service, U.S. Forest Service, New Mexico Department of Game and Fish, and New Mexico State University moved adult Gila trout from each of the last five successfully reproducing indigenous populations and released them into the closest suitable renovated stream. Securing and replicating the five ancestral populations to establish seven more fulfills the criteria es-

tablished in the Gila Trout Recovery Plan (approved in 1984) for reclassifying the species to Threatened.

Currently, all stream reaches that contain Gila trout are closed to sport fishing. The reclassification proposal contains a special rule that, if approved, would allow the State of New Mexico to establish a regulated sport fishery for the Gila trout. Such an action would not interfere with the species' recovery; in fact, it was recommended in the recovery plan. Many of the reintroduced populations are now at or near the carrying capacity of their habitat. A sport fishing program, combined with angler education, would show that the Gila trout can provide the same recreational quality as the non-native trouts. Future recovery efforts will include renovation of larger streams and establishment of additional Gila trout populations.



Gila trout

photo by John N. Rinne

# Red Wolves Return to the Wild

**Warren Parker**  
**Red Wolf Coordinator**  
**Asheville, North Carolina, Field Office**

After nearly a decade of effort, the red wolf (*Canis rufus*) has been placed back into the wild. A pair of red wolves was released onto Alligator River National Wildlife Refuge in northeastern North Carolina on September 12, 1987. Three other pairs were released on September 30. This marks the first time in North American history that a species considered to be extinct in the wild was released into the wild. In the early to mid-1970's, the species was saved by a carefully planned captive breeding project. The objective of this captive breeding effort has always been to place red wolves back into selected portions of their historical range.

The four pairs of wolves were brought to the refuge in November 1986 and were acclimated for 10 months in 2,500-square-foot holding pens on various portions of the refuge. Prior to their release, they were fed native prey species. The "soft" release consisted simply of feeding the animals and then securing the pen doors in an open position. They typically stayed in their pens for several days before venturing out on their own. Intensive monitoring of the wolves by radio telemetry permits field technicians to follow daily movements.

Public response to the release has been extremely rewarding, with refuge deer hunters and visitors reporting sightings of the animals on access roads. One male, following a canal, ventured into the outskirts of Mann's Harbor, a community of 700 people. He was tracked by his transmitter collar and quickly captured by refuge personnel. The incident actually en-



photo by Steve Maslowski

red wolf

hanced local public interest and support for the project when the animal was returned to the refuge in an efficient manner.

Unfortunately, two of the released female wolves died in December 1987. One fell victim to kidney failure apparently caused by an infection; tissues have been sent to the Service's National Wildlife Health Research Center in Madison, Wisconsin, for analysis. The second suffered injuries thought to have resulted from a fight with another wolf. On the brighter side, all of the other wolves are doing well. They have become so adept at catching their own natural food that they now weigh more than at any time in captivity.

On January 22, eight more wolves were brought from captive breeding facilities to acclimation pens at Alligator River. Two of them are unpaired adult females that have been placed in pens with the recently "widowed" males. The other six wolves include an adult pair and four young-of-the-year wolves that biologists will observe to see if natural pairing occurs. All will be released in the spring of 1988.

In the meantime, several "island projects" have been initiated by the Service. These entail the acclimation of a select pair of captive red wolves on an island, their release, and the eventual capture of their wild offspring for release at permanent reintroduction sites. Wild animals are greatly needed to enhance the opportunities for a successful recovery of this uniquely North American species.

The first island project is taking place at Bulls Island in Cape Romain National Wildlife Refuge, South Carolina. On November 19, an adult pair was placed in acclimation pens on Bulls Island for release in the spring of 1988.

## California Sea Otter Translocation

**Robert L. Brownell, Jr.**  
**National Ecology Research Center**  
**San Simeon, California**

Between August 24 and October 30, 1987, U.S. Fish and Wildlife Service and California Department of Fish and Game biologists captured 108 southern sea otters (*Enhydra lutris nereis*) along the central California coast and released more than half of them into another part of the population's historical range. Sixty (13 males and 47 females) of these sea otters were released at San Nicolas Island off the coast of southern California after a short stay at the Monterey Bay Aquarium. The others, mostly excess males, were flipper-tagged and released at the capture sites. The Service expects that the translocated animals will establish themselves



photo by Richard Bucich, courtesy of Friends of the Sea Otter

California sea otter

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# Listing Protection is Proposed for Seven Species

Four plants and three animals whose survival is in question due to habitat loss and other factors were proposed by the Fish and Wildlife Service recently for listing as Threatened or Endangered species. If the listing proposals are made final, the protection and recovery benefits offered by the Act will be available to these species:

## Mohr's Barbara's-buttons (*Marshallia mohrii*)

A perennial herb in the sunflower family (Asteraceae), *M. mohrii* grows up to 2.3 feet (70 centimeters) high and bears heads of showy white to lavender flowers. This species is endemic to moist, prairie-like open areas in the southern Appalachian Mountains. It currently is restricted to 14 known sites; seven historical populations apparently have been extirpated. Because the remaining colonies are vulnerable to loss from habitat modification, the Service has proposed to list *M. mohrii* as Threatened (FR. 11/19/87).

Thirteen of the surviving populations are in northern Alabama and one is in northwestern Georgia. Many of the plants grow along roadside rights-of-way. Road widening or certain roadside maintenance activities (e.g., herbicide applications, mowing during the flowering season) could jeopardize the *M. mohrii* colonies unless precautions are taken. The Alabama Highway Department, which has jurisdiction over some *M. mohrii* habitat, has agreed to work with the Service to protect the sites. Other populations of the species occur on privately-owned lands that could be drained and converted from native habitat to improved pastures or cropland. Efforts are under way to encourage conservation of *M. mohrii* sites by these landowners.

## Mead's Milkweed (*Asclepias meadii*)

This perennial plant grows as a solitary stalk up to 16 inches (40 cm) tall lined with broadly ovate leaves and topped by a cluster of greenish to cream colored flowers. Historically, Mead's milkweed occurred throughout much of the virgin "tall grass" prairie of the midwest. Most of the original prairie upon which this species depends has been replaced by urbanization and agriculture, and only isolated pockets of tall grass habitat remain. Today, *A. meadii* is believed to be extirpated from Indiana and Wisconsin, but it survives in Kansas, Missouri, Illinois, and Iowa.

Although about 28 percent of the known *A. meadii* populations are on State and Federal lands, most occur on private property and lack legal protection. The Service has proposed to list Mead's milkweed



*Mohr's Barbara's-buttons*

photo by Cary Norquist

at the Federal level as a Threatened species (FR. 10/21/87). (It is listed already by the States of Illinois, Iowa, and Missouri.) Federal law does not prohibit the removal or destruction of listed plants on private lands, but the Service will seek to develop conservation agreements with the landowners.

## Sandplain Gerardia (*Agalinis acuta*)

Another plant restricted to open, prairie-like habitat is the sandplain gerardia, an annual herb in the snapdragon family (Scrophulariaceae). This species currently is known to occur in sandy areas of coastal plain grassland in the northeast (Cape Cod, Massachusetts, and Long Island, New York—six sites each) and on



*Mead's milkweed*

photo by John Schwegman, Illinois Department of Conservation

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*sandplain gerardia*

Photo by D. Daniel Boone

## Proposed Listings

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a serpentine barren in Baltimore County, Maryland (one site). Although *A. acuta* also was known historically from sites in Connecticut and Rhode Island, these colonies can no longer be found. Threats to the nine surviving populations have led the Service to propose listing the sandplain gerardia as an Endangered species (FR. 11/19/87).

Construction of year-round residential developments, summer cottages, and marinas has eliminated a number of former *A. acuta* sites. Secondary impacts of this urbanization also have had serious impacts on the gerardia's habitat. The species appears to require periodic disturbance of its habitat to keep the sites open and free from the encroachment of dense woody vegetation. In the past, livestock grazing and extensive fires (often set intentionally) suppressed invading scrub oak and pitch pine forests; however, the shift from agriculture to urbanization has led to a decrease in grazing and an increase in fire suppression. As a result, competing vegetation has claimed many historical gerardia sites.

The *A. acuta* site in Maryland is at Soldier's Delight, an area of unusual vegetation protected as a State Natural Environmental Area. Most of the species' other known populations are on private lands. In addition to seeking management agreements with the landowners, the Service will investigate the possibility of reestablishing *A. acuta* colonies on protected sites within the species' historical range. Cooperation with The Nature Conservancy, which has done most of the recent survey work on the gerardia, and the State resource agencies, which have management authority for the species, will continue.

### **Erubia (*Solanum drymophilum*)**

*S. drymophilum*, a tall evergreen shrub in the nightshade family (Solanaceae), is endemic to the island of Puerto Rico. One of this plant's distinguishing characteristics is the growth of whitish, star-shaped hairs that cover the leaves, young stems, and white flowers. Another is the presence of numerous stiff spines nearly one-half inch (1.25 cm) in length that armor the leaves and inflorescences. Of the four populations documented by collections, only one survives, and the Service has proposed to list *S. drymophilum* as an Endangered species (FR. 11/19/87).

The extensive clearing of Puerto Rico's montane forests undoubtedly contributed to the erubia's decline. Deliberate eradication efforts aimed at this species are another likely factor. *S. drymophilum* apparently is able to recolonize disturbed sites, such as pastures, but its spines are

widely perceived to be a threat to livestock. Consequently, the species has been routinely cut when discovered on pastureland. The last known population, consisting of approximately 200 plants, occurs on 5 acres of privately owned land that is subject to commercial development.

### **Boulder Darter (*Etheostoma* sp.)**

An undescribed species in the subgenus *Nothonotus* (a manuscript describing the species is in preparation), the boulder darter is a small fish known from the Elk River system of Tennessee and Alabama. It is restricted to stretches of fast-moving, deep water flowing over a boulder substrate—a specific type of habitat that already was limited in this region before reductions caused by reservoir construction. Further habitat loss or degradation could lead to the boulder darter's extinction, and the Service has proposed to list this fish as Endangered (FR. 11/17/87).

Boulder darters survive in disjunct segments of habitat within about 25 miles (46 kilometers) of the Elk River and two tributaries in Giles County, Tennessee, and Limestone County, Alabama. No new impoundments are planned for this area; however, siltation from major land disturbances in the watershed, run-off of improperly used pesticides, chemical spills, or other factors that could degrade water quality are potential threats to the boulder darter in its reduced range. Water pollution is believed to be at least partially responsible for the loss of a population in Shoal Creek. Listing the boulder darter as an Endangered species could encourage efforts to preserve water quality.

The Service is working with the State of Tennessee to investigate a possible reintroduction site. Habitat improvement through the placement of boulder substrate at selected sites along the Elk River also will be evaluated as a recovery method if the darter is listed.

### **Stephens' Kangaroo Rat (*Dipodomys stephensi*)**

Like other kangaroo rats, this rodent has a large head, external cheek pouches, and elongated rear legs used for jumping. Its habitat is usually described as coastal sage scrub or annual grassland. *D. stephensi* probably once occurred throughout much of the coastal sage scrub of the Perris and San Jacinto Valleys and up adjoining sandy washes in southern California. However, agriculture and urbanization have led to a severe reduction in native habitat. Much of what does remain consists of small, isolated pockets that probably will not support Stephens' kangaroo rat populations over the long term.

Within the overall remaining range of *D. stephensi*, only about 6 percent of the land is zoned for uses that are compatible with the species' survival, and not all of the habitat in that 6 percent is suitable for this kangaroo rat. Further complicating the picture is the fact that the species does not occupy all apparently suitable habitat, perhaps because of disturbance by off-road vehicle use (common in southern California) and application of rodent control chemicals. The Service has proposed listing the Stephens' kangaroo rat as an Endangered species (FR. 11/19/87).

Most of the remaining habitat is privately owned, but the Service is not aware of any existing agricultural activities that would be restricted by a listing. Although Federal lands comprise only a small part of the kangaroo rat's current range, one significant population does occur on the Fallbrook Naval Weapons Annex, which adjoins Camp Pendleton. No conflicts between *D. stephensi* conservation and Federal activities at this or other sites are anticipated. Recovery activities for the Stephens' kangaroo rat, if it is listed, will concentrate on habitat protection and management. Measures to avoid poisoning this species during rodent control operations also will be addressed.

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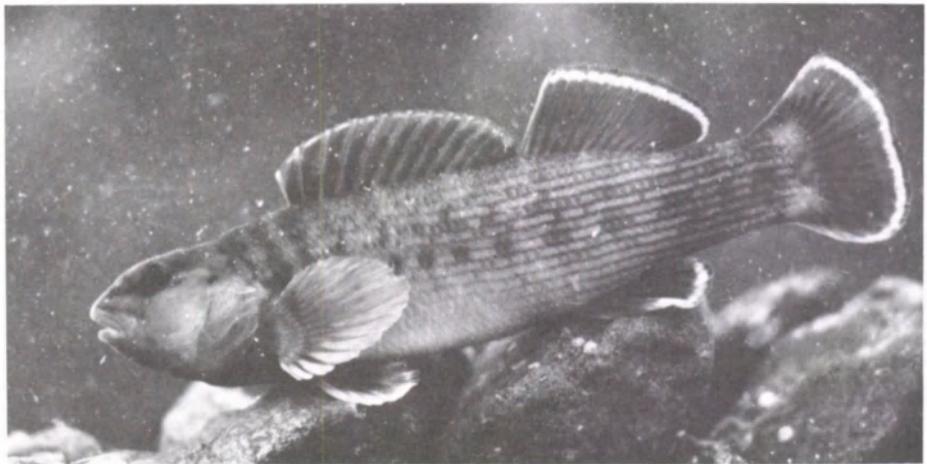


photo by Richard Biggins

boulder darter

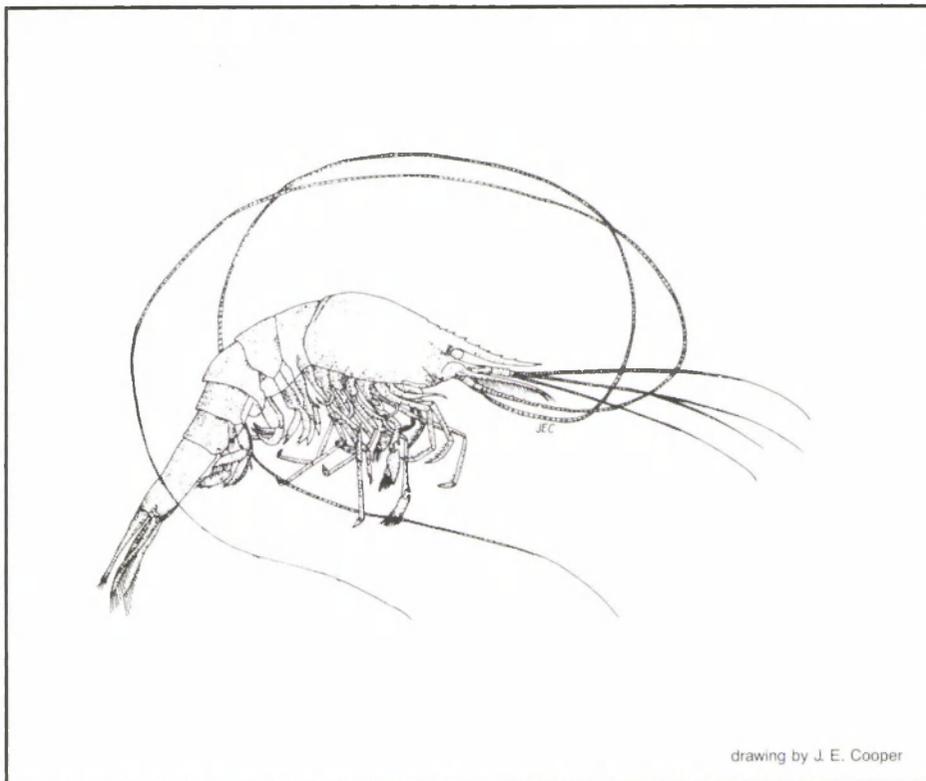
## Proposed Listings

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### Alabama Cave Shrimp (*Palaemonias alabamae*)

Groundwater pollution threatens the Alabama cave shrimp (*P. alabamae*), a nearly transparent freshwater crustacean that can reach up to 0.8 inch (20 millimeters) in total length. This species has been found at only two sites: Shelta Cave, which lies inside the city limits of Huntsville, and Bobcat Cave, located on the Redstone Arsenal. A search of over 200 caves in northern Alabama failed to turn up the species anywhere else. Both caves occupied by the shrimp are within a drainage contaminated by past manufacturing of the pesticide DDT. Because sinkholes can drain surface pollutants directly into the aquifer, groundwater contamination represents a continuing threat to cave-dwelling aquatic species.

The National Speleological Society, which funded initial status surveys on the Alabama cave shrimp, owns both entrances to Shelta Cave and has gated them to control human access. Biologists who have surveyed this cave regularly have not seen any shrimp there since 1985. A small population is believed to survive in Bobcat Cave, where only two or three shrimp have ever been observed at a single time. Access to this cave is restricted by the U.S. Army, which has jurisdiction over the Redstone Arsenal.



drawing by J. E. Cooper

**Alabama cave shrimp**

Examples of recovery actions that may be pursued if the Alabama cave shrimp is listed are management agreements with Redstone Arsenal and the National Speleological Society to help ensure con-

tinued protection of the caves, studies to better understand groundwater recharge patterns, and attempts to control pollution of the aquifer

## Rediscovery of The Wyoming Toad

The Wyoming toad (*Bufo hemiophrys baxteri*), a small amphibian that occurs only in the Laramie Basin of Wyoming, was listed in 1984 as Endangered after serious declines were observed over a 10-year period. Last summer, a fisherman found a population of Wyoming toads at a private lake about 11 miles west of Laramie. These were the first Wyoming toads seen since 1983. This population was surveyed by biologists from the National Ecology Research Center in Fort Collins, Colorado, the Region 6 Endangered Species Office, the Wyoming Game and Fish Department, and the University of Wyoming on August 21 and September 1. An apparently healthy population of up to several hundred toads was present. Juvenile toads, including recently metamorphosed individuals, were present, indicating that this population had reproduced successfully in 1987 and the past several years. Two adult toads that were found dead from unknown causes on September 1 were collected for examination.

Research and management priorities were identified at a meeting held in Laramie on September 10 among representatives of the Fish and Wildlife Service, Wyoming Game and Fish Department,

and the University of Wyoming. Better knowledge of Wyoming toad breeding biology and habitat requirements is needed, and the cooperation of two private landowners will be essential. Provided that reproduction is adequate in 1988, it was recommended that an at-

tempt be made to establish a new population by transplanting eggs. The probable site would be the Hutton Lake National Wildlife Refuge, which is known to have had a population of Wyoming toads in the past.



photo P. Stephen Corn

**Until last summer, the Wyoming toad had not been seen since 1984.**

# Final Listing Rules Approved for 10 Species

During October and November of 1987, final rules were approved to add 10 taxa—five animals and five plants—to the Federal lists of Endangered and Threatened wildlife and plants. The following now receive protection under the Endangered Species Act:

**Black-capped Vireo (*Vireo atricapillus*)** — This songbird, which is distinguished by its black or slate-gray crown, faces threats from habitat modification and nest parasitism by the brown headed cowbird (*Molothrus ater*). The vireo's once extensive breeding range has been reduced to sites within three small areas in central Oklahoma, the Edwards Plateau to Big Bend area of Texas, and northern Mexico. It is now listed as Endangered (FR. 10/6/87).

**Roseate Tern (*Sterna dougallii dougallii*)** — This white, dove-sized sea bird is similar in appearance to most other tern species. Unlike many other species of terns, however, it nests only along marine coasts in small, localized colonies. The number of suitable breeding sites for this ground-nesting bird has greatly diminished due to oceanside development and human disturbance, competition from expanding numbers of large gulls, and predation. Accordingly the Service has listed the roseate tern population of northeastern United States and adjacent Canada as Endangered and the Caribbean population (including Florida and the Bahama Islands), which is in a somewhat less critical condition, as Threatened (FR. 11/2/87).

**Hualapai Vole (*Microtus mexicanus hualpaiensis*)** — A very rare, mouse-sized animal, the Hualapai vole is known to occur only in the Hualapai Mountains of northwestern Arizona. It has among the most restricted habitats of any North American mammal. Because the small patches of suitable habitat are threatened by livestock graz-

ing, human recreation, and other factors, the Service has listed the Hualapai vole as Endangered (FR. 10/1/87).

**Sand Skink (*Neoseps reynoldsi*) and Blue-tailed Mole Skink (*Eumeces egregius lividus*)** — Both of these small lizards are endemic to central Florida and depend on scrub habitat with sandy substrates. Urbanization and conversion of land from sandhill and scrub vegetation to citrus groves have eliminated much of the former habitat. Rapid development in this region clouds the future of the two skinks, and the Service has listed them as Threatened (FR. 11/6/87).

**Florida Bonamia (*Bonamia grandiflora*)** — A perennial morning-glory vine, this plant produces sturdy prostrate stems about 3 feet long and vivid blue flowers. The bonamia, like many other plants and animals endemic to central Florida, is jeopardized by the loss of scrub habitat. A rule listing this species as Threatened was published in the November 2, 1987, *Federal Register*.

**Welsh's Milkweed (*Asclepias welshii*)** — An herbaceous perennial, Welsh's milkweed grows up to 40 inches tall and produces cream-colored flowers with rose-tinged centers. This plant is endemic to the Coral Pink Sand Dunes and nearby Sand Hills of southern Utah. The population in the Coral Pink Dunes is being disturbed by off-road vehicle recreation, and portions of the areas in which both populations occur are leased for gas and oil production. Included in the October 28, 1987, final listing rule was a designation of Critical Habitat (see the *Federal Register* for maps and details).

**Heliotrope Milk-vetch (*Astragalus montii*)** — The second of three recently listed Utah plants is the Heliotrope milk-vetch, an herbaceous perennial in the

pea family *A. montii*, which grows only 2 inches high, produces pink-purple, white-tipped flowers and inflated pods. It occurs only on limestone barrens along the timberline of the Wasatch Plateau, a region of active oil and gas exploration associated with the Overthrust Belt. The Service decided that listing Welsh's milkweed as a Threatened species would ensure that adequate care is taken to conserve *A. montii* habitat during energy development. A map of the designated Critical Habitat is included in the November 6, 1987, *Federal Register*.

**Toad-flax Cress (*Glaucocarpum suffrutescens*)** — The third recently listed Utah plant is the toad-flax cress, a perennial herb that sends out slender, simple stems and yellow flowers from its deep, woody root. It is endemic to small outcrops or "islands" of a single calcareous shale stratum in the Uinta Basin. Much of this limited habitat was degraded during collection of surface rock for building stones; oil and gas production; and (historically) livestock grazing. Energy development remains a threat, and the toad-flax cress has been listed as Endangered (FR. 10/6/87).

**Heller's Blazing Star (*Liatris helleri*)** — Heller's blazing star, a compact perennial herb that produces showy spikes of lavender flowers, is endemic to a few peaks in the Blue Ridge Mountains of North Carolina. Most of the open summit areas on which the plant occurs have been, or are being, developed for commercial recreation purposes. Increasing use of other *L. helleri* sites by hikers and sightseers poses additional threats to the habitat from erosion, soil compaction, and trampling. In recognition of its vulnerable status, the Service has listed Heller's blazing star as Threatened (FR. 11/19/87).

## Conservation Measures Authorized by the Endangered Species Act

Among the conservation benefits provided to a species if its listing under the Endangered Species Act is approved are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and implement recovery plans; the authorization to seek land purchases or exchanges for important habitat; and the possibility of Federal aid to State or Commonwealth conservation departments that have signed Endangered Species Cooperative Agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encour-

ages further conservation efforts by State and local agencies, independent organizations, and individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the survival of a listed species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service on ways to avoid jeopardy. For species that are proposed

for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are non-binding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or traffic in listed animals except by permit for certain conservation purposes. For plants, the rule is different; the prohibition against collecting applies only to listed plants found on lands under Federal jurisdiction. Some States, however, have their own more restrictive laws against take of listed plants.

# Developers Convicted in Bird Killings

Two Florida land developers have pleaded guilty and have been sentenced by the United States District Court for the Middle District of Florida for killing red-cockaded woodpeckers (*Picoides borealis*), a species listed as Endangered because of the disappearance of its habitat for development and agricultural uses.

Pursuant to a plea agreement, one of the defendants agreed to contribute \$300,000 to the National Fish and Wildlife Foundation for red-cockaded woodpecker recovery projects. Jail terms were suspended but the developers were sentenced to 2 years of probation and their corporation received a 3-year term of probation and a \$1,000 fine.

The indictment charged that the defendants were engaged in discussions of steps necessary to obtain a Florida Development of Regional Impact Order, required by Florida law to commence development of Oak Run, a residential housing development near Ocala, when they were informed that the land they sought to develop contained cavity trees characteristic of red-cockaded woodpeckers. The defendants then instructed their employees to remove the cavity trees used by the woodpeckers and hunted the woodpeckers with shotguns at the Oak Run Development site. Nearby developments that were found to have nesting red-cockaded woodpeckers had previously been



Photo by Jerome A. Jackson

## red-cockaded woodpecker

required to set aside tracts of land to preserve habitat for this Endangered species.

The case was jointly investigated by the Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service. U.S. Attorney Robert Merkle said that willful violations of Federal wildlife

laws would be fully investigated and vigorously prosecuted, and in appropriate cases every available sanction under the law, including incarceration, would be sought.

Reprinted from *Fish and Wildlife News*

## Regional News

(continued from page 3)

Efforts to reintroduce the Mexican wolf at White Sands Missile Range in southern New Mexico have been stopped. In a September 29, 1987, letter, Commanding General Joe Owens stated that it was not in the best interest of the Range to support the reintroduction program. As earlier agreed, the Service needed the support of State and land managing agencies in order to implement this controversial reintroduction effort.

The Service has funded ocelot (*Felis pardalis*) research in south Texas for the past 6 years, and information gained during this study is going to be used to begin developing recovery techniques. The collared ocelots are on or around the Laguna Atascosa National Wildlife Refuge, but five of them are trying to disperse from the refuge. Suitable habitat and travel corridors in the vicinity are limited, and 5 cats have been killed in the last 6 years on roads while attempting to disperse. The Region 2 Refuge Division is now funding work to develop translocation techniques for these cats. Part of the refuge is relatively isolated, mainly by water, but appears to be good ocelot habitat. An attempt will soon be made to capture a young male and

female as they disperse and move them to the unoccupied refuge areas. The two cats being considered for translocation are both radio-collared and have been moving back and forth across a road. After the cats are moved, they will be monitored to determine how they react.

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The Kemp's Ridley Sea Turtle Working Group met in the Albuquerque Regional Office October 28 and 29, 1987. The group is made up of representatives of the National Marine Fisheries Service, National Park Service, Mexico's Instituto Nacional de Pesca's Proyecto de Tortugas Marinas, Texas Parks and Wildlife Department, and U.S. Fish and Wildlife Service. Fifteen sea turtle experts and managers attended the meeting. Past efforts were reviewed and current recovery actions arranged in priority. Future recovery activities were discussed in light of the fact that Mexico has protected the only Kemp's ridley (*Lepidochelys kempii*) nesting beach since 1966 and both nations have worked since 1978 to recover the species while the population of nesting females continues to decline at a rate of 3-4 percent per year. Full protection of nesting females (500) and enhancing hatching success were given top priority.

The group hopes that implementation of Turtle Excluder Device (TED) regulations

(second highest priority) will turn around the trend seen at the nesting beach with an increase in recruitment to the adult population. The single largest identified source of mortality to juvenile and adult ridleys is the shrimping industry, and implementation of TED regulations should reduce deaths considerably.

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An aerial survey on November 29 located 126 whooping cranes (*Grus americana*) on Aransas National Wildlife Refuge, Texas. This figure includes 103 adults and subadults and 23 young. Another family group was present in Nebraska on November 30 and a single young whooper has been south of Amarillo, Texas, since November 1. Twenty-five chicks fledged last August in Canada and, with all currently accounted for, we have again had good survival of the young during migration.

A juvenile whooping crane in the Grays Lake (Idaho) flock hit a powerline in the San Luis Valley of Colorado and died. A necropsy at the National Wildlife Health Research Center in Madison, Wisconsin, revealed that the bird had a severe case of avian tuberculosis. Because the infection had been in progress for an estimated 2 months, the bird would have become infected while at Grays Lake National

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## Regional News

(continued from page 9)

Wildlife Refuge. Avian tuberculosis is caused by a bacterium that can persist in the soil for several years. Infected birds pass the bacteria with their droppings and thereby infect the soil or potential foods. Healthy birds then become infected when they ingest the bacteria while feeding.

The 93 percent survival rate for the 1985 reintroduction of Knowlton pin-cushion cacti (*Pediocactus knowltonii*) in northwestern New Mexico is very encouraging. Approximately half of the plants in the reintroduced population are flowering and fruiting, which suggests the presence of pollen vector(s) at the site. No new plants have been observed at the site but many plants have begun to form multiple stems and we hope to see new plants soon.

In addition to the 1985 population established from cuttings, an area adjacent to the reintroduction site was seeded in September 1987. The New Mexico Division of Forestry planted about 170 seeds at varying depths in the soil. This plot will provide valuable data on seed germination as well as comparative data on the two different reintroduction techniques. Overall, the prospects for recovering the species appear to be good.

In early October, the U.S. Forest Service coordinated a count of Mount Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*) middens or pine cone storage areas. About 60 people (including U.S. Fish and Wildlife Service and Arizona Game and Fish Department employees) helped with the count. Groups of 6 to 10 people spread out in a line and moved through the habitat in the Graham Mountains in an attempt to count all of the red squirrel middens. Because one squirrel uses one midden, the count can be used for estimating the population. The first such count was conducted in the spring of 1986. Based on this year's survey results, including middens found this year that were missed last year, the 1986 estimate was revised to 323 squirrels (up from 242). The fall 1987 estimate is 242 squirrels, down 25 percent. This decrease may be due to what appears to be a poor Engelmann spruce (*Picea engelmannii*) cone crop this year. Engelmann spruce seeds are one of the squirrels' main foods.

**Region 4** - Hatchling surveys and nest counts conducted by the Florida Game and Fresh Water Fish Commission show that American crocodile (*Crocodylus acutus*) numbers have increased significantly since last year. Seventy-three hatchlings were tagged this season compared to only 60 last year. A total of 29 nests have been located so far, and more are expected. Eight nests have been discovered in 1987 on Key Largo. In 1986, six nests were found on Key Largo, but

only three were producing young. Serious droughts in the Florida keys curtailed crocodile production in recent years, but ample rain has provided suitable nesting conditions this year. Road kills are a common problem since adequate underground culverts are not provided along the heavily traveled U.S. Highway 1 to the Keys. On the average, three crocodiles a year are killed on U.S. Highway 1.

The Service's Cooperative Fish and Wildlife Research Unit at Gainesville, Florida, has been conducting status surveys of the Wakulla seaside sparrow (*Ammodramus maritimus junicola*) and the Smyrna seaside sparrow (*A. m. pelonota*), both of which are Category 2 listing candidates. Interim results indicate that the Wakulla seaside sparrow still occurs in large numbers on its salt marsh habitat on Florida's panhandle coast. However, the Smyrna seaside sparrow, formerly found in coastal salt marshes in northeastern Florida, appears to be extinct. Breeding seaside sparrows along Florida's east coast are now represented only by a small colony of the wide-ranging Macgillivray's seaside sparrow (*A. m. macgillivrayi*) in Duval County. (This subspecies nests northward to Cape Hatteras, North Carolina.) The last known dusky seaside sparrow (*A. m. nigrescens*) died in June 1987 (see BULLETIN Vol. XII No. 5-6).

A biologist from the Jacksonville, Florida, Field Office testified at a Florida Department of Environmental Regulation hearing involving a project in DeBarry Bayou, Volusia County Florida. The project involved the construction of a 98-wet-slip marina for a multifamily development. A "no jeopardy" Biological Opinion had been written by the Jacksonville Office based on the project's expected impact on the manatee (*Trichechus manatus*) and other fish and wildlife. In the Opinion, the Service recommended that the project be reduced to 26 wet-slips, which is equal to one powerboat wet-slip per 100 linear feet of shoreline. The recommendation was rejected by the U.S. Army Corps of Engineers and the applicant.

Standard guidelines were established recently for surveying red-cockaded woodpeckers (*Picoides borealis*) in the southeast. The new policy stipulates that suitable habitat (pine and pine-hardwood over 60 years of age) within one-half mile of project impacts needs to be surveyed for colonies if any pine over 30 years of age will be affected. The reason is that colonies will forage up to one-half mile from the colony site.

An injured Arctic peregrine falcon (*Falco peregrinus tundrius*) is recovering at the Florida Raptor Rehabilitation Center in Maitland. Following its recovery the bird may be released in Indian River County. The bird was found by workers on September 30 in a grove west of Vero Beach.

The testing of the "Morrison version" of a soft turtle excluder device (TED) has been completed by the University of Georgia's Marine Extension Service. The device consists of a deflector panel constructed from 8-inch stretched mesh webbing and it is installed on the inside of the shrimp trawl. Turtles and some bycatch are guided along the barrier to an escape hole in the trawl. A total of 42 turtles were caught in the control (non-TED) net, but none were retained in the Morrison version of the soft excluder device. If approved by the National Marine Fisheries Service, this 2- or 3- pound, inexpensive device (about \$45 installed) will provide an acceptable option for the shrimp industry.

The Anastasia Island beach mouse (*Peromyscus polionotus phasma*) is a Category 2 listing candidate. Currently, the only known viable populations of this mouse are located on the north end of Anastasia Island on the Anastasia Island State Recreation Area (St. Johns County, Florida) and at the southern tip of the island on Fort Matanzas National Monument. A new bridge scheduled for construction across the Matanzas Inlet sometime in the early 1990's may adversely impact the mouse population at Fort Matanzas. Although beach mice are plentiful at Fort Matanzas, their available habitat is less than 25 acres. If the Anastasia Island beach mouse is listed as Endangered, the bridge problem will need to be resolved through the Endangered Species Act's Section 7 inter-agency consultation procedures before construction begins. The beach mouse population on Anastasia Island State Recreation Area remains low due to heavy human use of the area, competition from feral house mice, and predation by domestic cats.

A new population of the Endangered northern flying squirrel (*Glaucomys sabrinus fuscus*) has been found in North Carolina approximately 50 miles south of the nearest known population. The site is located on land administered by the National Park Service, which is working with the Fish and Wildlife Service to protect the animals and their habitat.

The Service's Asheville, North Carolina, Field Office assisted the American Cave Conservation Association in the construction of a gate at a Kentucky cave. The cave will be used in educational programs for teachers and students in the central Kentucky area. Education is an integral part of the efforts to protect caves inhabited by Endangered species like the Kentucky cave shrimp (*Palaemonias ganteri*), Ozark cave shrimp (*Amblyopsis rosae*), Alabama cave fish (*Speoplatyrhinus poulsoni*), Virginia big-eared bat (*Plecotus townsendii virginianus*), Ozark big-eared bat (*P. t. ingens*), Indiana bat (*Myotis sodalis*), gray bat (*M.*

(continued on next page)

*grisescense*), and Madison cave isopod (*Astrolana lira*).

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**Region 7** - Although it is currently listed by the Service as a foreign species, the Endangered short-tailed albatross (*Diomedea albatrus*) was once so abundant in Alaska waters that it was an important food of resident Aleut Indians along the Aleutian Island Chain and Alaska Peninsula. With fewer than 400 short-tails remaining in the world, this species is now only rarely seen away from its breeding islands off Japan. Recently an immature short-tailed albatross was killed when it was accidentally hooked by commercial fisherman setting halibut gear in the Gulf of Alaska. The bird was marked with both Japanese metal and plastic color leg bands. Dr. Hiroshi Hasegawa responded to an inquiry to the Bird Migration Research Center in Chiba, Japan, and informed us that the albatross was one of 53 fledgling short-tails he had banded on Torishima in April 1987.

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Over 30 people participated in peregrine surveys and banding activities in Alaska in 1987. Biologists from the Fish and Wildlife Service, Bureau of Land Management, National Park Service, Alaska Department of Fish and Game, and numerous volunteers observed 190 nesting pairs, 23 unmated adults, and 345 young. These numbers reflect the continuing improving status of peregrines in Alaska. Current population figures and productivity levels are above those once considered to be historic baseline data, suggesting that peregrines in Alaska probably were already decreasing when biologists first conducted surveys in the 1950's and 1960's. When populations stabilize, we will have a better idea of true historic (pre-DDT) levels, assuming that no other factors have significantly influenced the population.

Over the years, more than 2,000 peregrines have been banded in Alaska, and recoveries have been reported from Alaska to Argentina. Through these banding studies, the Service has learned that Alaska peregrines migrate southward throughout the lower 48 States but principally west of the Mississippi River, and winter for the most part in Argentina and Brazil.

Of the 200 hatching-year peregrines banded in Alaska last summer, Don Morizot and Tim Maechtle of the University of Texas report that four, plus one 2-year-old bird banded in 1986, were captured at Padre Island, Texas, this fall. A total of 27 peregrines banded in Alaska have been trapped at Padre Island since 1979.

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**Region 8** - Kirtland's warblers (*Dendroica kirtlandii*) on their breeding range in Michigan nest at a small number

of sites within a much larger region of apparently suitable habitat. In 1987, all actual and most potential breeding sites were photographed from the air at a scale (1 inch - 500 feet) that showed major habitat features in sharp detail. False infrared color prints of these areas have been received and will be used to provide an overview of the bird's entire breeding range. Habitat analyses of occupied and unoccupied areas will provide for a detailed understanding of habitat features critical to nesting.

Eleven Kirtland's warblers were caught during the week of September 14, indicating that good numbers remain in Michigan far longer in the season than previously believed. In addition, two territorial birds captured were undergoing wing molt; therefore, these birds probably remained in Michigan for at least another week. These data have important management implications in that activities potentially detrimental to Kirtland's warblers currently are allowed in their breeding colonies after August 15. Some examples of detrimental activities include rabbit hunting with dogs and shotguns, logging operations, and seismic surveys for petroleum.

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Biologists with the Patuxent Wildlife Research Center's Mauna Loa, Hawaii, Research Station located and monitored 15 active palila (*Loxioides bailleui*) nests from February through August 1987 in a study area on Mauna Kea. Preliminary results indicated that palila nesting success for this period was only 20 percent. The cause of the low nesting success is uncertain; however, observations were made of nest desertion, possible predation, unexplained nestling death, exposure to inclement weather, and unexplained disappearance of eggs and nestlings. Techniques are being developed to better document and explain the factors responsible for nest failures in the study area.

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Researchers at Patuxent's California Research Station have been actively evaluating potential sites for a proposed experimental, temporary release of Andean condors (*Vultur gryphus*) in California. The objectives of the research are to: (1) refine condor release techniques developed with black (*Coragyps atratus*) and turkey (*Cathartes aura*) vultures in Florida and Andean condors in Peru, (2) test the criteria currently being used to select California condor (*Gymnogyps californianus*) release sites, and (3) develop written protocols for the release of California condors. Researchers have also been trapping golden eagles (*Aquila chrysaetos*); blood samples of the eagles will be analyzed for contaminants as part of a study on the contaminant load of scavenger species within the traditional range of the California condor

## Reorganization

(continued from page 1)

Departmental lands and facilities; and point and non-point source pollution control. (Chief, John Rogers; 703/235-1904)

### 3. Division of Federal Aid

Federal grants for State fish and wildlife conservation programs are authorized under the Federal Aid in Fish Restoration Act (Pittman-Robertson Act), Federal Aid in Wildlife Restoration Act (Dingell-Johnson Act), Anadromous Fish Conservation Act, and Endangered Species Act. The Federal Aid division provides staff support to the Assistant Director for implementing these grant programs. (Chief, Conley Moffett; 703/235-1526)

### 4. Office of Management Authority

Formerly called the Federal Wildlife Permit Office, this office acts as U.S. Management Authority for implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (popularly known as CITES). In consultation with the Office of Scientific Authority, it carries out procedural aspects of listing and delisting animal and plant species on the CITES appendices. The Office of Management Authority also directs and controls Service permits for import, export, transshipment, and interstate commerce involving Federally-protected species, although issuance of permits to "take" listed species is now a responsibility of the Regional Offices. (Acting Chief, Marshall Jones; 202/343-4968)

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## Sea Otter

(continued from page 4)

at the island and become the founding members of a new breeding colony. Blood and tissue samples were collected from each animal while at the aquarium so that genetic lineages can be followed as the population grows. The Service also has collected 8 years of baseline data on the macroinvertebrate and macroalgal populations (including commercially harvested species) in the nearshore community at San Nicolas Island and plans to monitor the effects of the introduced otters on this ecosystem. As the population grows, Service biologists will monitor the sea otters' activity.

The plan to reintroduce sea otters at San Nicolas Island is the result of many years of expert analysis and public review. (See feature article in BULLETIN Vol. XI No. 8-9 and No. 10-11.) Further news on the reintroduction program will appear in future editions of the BULLETIN.

## New Publications

*Inventory and Monitoring of Wildlife Habitat*, compiled and edited by Allen Y. Cooperrider, Raymond J. Boyd, and Hanson R. Stuart, is an 858-page guidebook for professional wildlife biologists who plan or conduct inventories and monitoring studies of a variety of wildlife habitats. Specialists from government, academia, and the private sector have contributed chapters on the following topics: Planning (Problem Definition and Issue Identification, Study Design, and Review of Literature); Major Habitats (Critical Habitat Features, Classification Systems, and Inventory and Monitoring Systems); Species Groups (Correlation with Habitat Features, Population Measurement Techniques); Habitat Measurements (Field Measurement Techniques, Precision and Accuracy); Special Studies (Weather and Climate, Food Habits, and Movement, Migration, and Habitat Use); and Analysis and Presentation (Data Management, Economic Analysis, Data Analysis and Evaluation, and Presentation of Results). Copies of this book, which was produced by the Bureau of Land Management, are available for \$38.00 from the Government Printing Office (stock number 024-011-00170-1). Address orders to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Candidate Threatened and Endangered Plants of Alaska*, published by the University of Alaska Museum (Fairbanks), is a new illustrated publication summarizing rare plant information for Alaska. The 73-page booklet was cooperatively funded by the U.S. Fish and Wildlife Service,

Category	ENDANGERED			THREATENED			SPECIES* TOTAL	SPECIES HAVING PLANS
	U.S. Only	U.S. & Foreign	Foreign Only	U.S. Only	U.S. & Foreign	Foreign Only		
Mammals	28	20	242	5	0	22	317	23
Birds	60	18	141	7	3	0	229	55
Reptiles	8	6	60	13	4	13	104	21
Amphibians	5	0	8	4	0	0	17	6
Fishes	40	4	11	25	6	0	86	45
Snails	3	0	1	5	0	0	9	7
Clams	28	0	2	0	0	0	30	21
Crustaceans	5	0	0	1	0	0	6	1
Insects	8	0	0	7	0	0	15	12
Plants	131	6	1	32	3	2	175	56
TOTAL	316	54	466	99	16	37	988	263**

\* Separate populations of a species that are listed as Endangered and Threatened are tallied twice. Species thus accounted for are the gray wolf, bald eagle, green sea turtle, olive ridley sea turtle, leopard, piping plover, and roseate tern.

\*\* More than one species may be covered by some plans, and a few species have more than one plan covering different parts of their ranges.

Number of Recovery Plans approved: 223  
 Number of species currently proposed for listing: 17 animals  
 31 plants

Number of Species with Critical Habitats determined: 102  
 Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife  
 36 plants

November 30, 1987

Bureau of Land Management, National Park Service, and U.S. Forest Service. Single copies are available free of charge from Michael Amaral, Endangered Spe-

cies Specialist, U.S. Fish and Wildlife Service, Sunshine Plaza, Suite 2-B, 411 West 4th Avenue, Anchorage, Alaska 99501.

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# ENDANGERED SPECIES

## Technical Bulletin

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

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