

# ENDANGERED SPECIES

## Technical Bulletin

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

### Listing Proposals — October/November 1989

Sixteen species—11 plants and 5 animals—were proposed by the Fish and Wildlife Service during October and November 1989 for listing as Endangered or Threatened. All are native to the United States. If the proposed listings are approved, Endangered Species Act protection will be extended to the following:

#### *Remya* spp.

*Remya* is a genus of small perennial shrubs in the aster family (Asteraceae, also known as Compositae). It comprises three species, all of which are endemic to the Hawaiian Islands. These plants grow to about 3 feet (1 meter) tall, with many slender, sprawling branches. The narrow leaves are up to 6 inches (15 centimeters) in length and coarsely serrated. Small, dark yellow flowers are clustered at the ends of the stems.

The quality of the natural Hawaiian environment has been degraded steadily since the introduction of many non-native animals and plants. Grazing and browsing by feral and domesticated animals, the erosion and other habitat degradation they cause, and competing naturalized plants are the greatest threats. Many of Hawaii's endemic plants and animals, which evolved in isolation, have declined in range and survive only in pockets of relatively undisturbed habitat.

All three species in the genus *Remya* were proposed on October 2 for listing as Endangered:

- ***R. mauiensis*** — This species is known from two small populations in the western part of the island of Maui, where they occur on adjacent ridges. There appear to be 20 to 25 plants at one site and 1 or 2 at the other. The State of Hawaii has fenced the larger population to protect it from cattle.
- ***R. montgomeryi*** — Apparently restricted to the island of Kaua'i, *R. montgomeryi* is known from only one site on the sheer, virtually inaccessible cliffs below the upper rim of Kalalau Valley. The population's size is unknown, but is believed to number fewer than 50 plants.
- ***R. kauaiensis*** — Another Kaua'i endemic, this species is known from



*Remya montgomeryi*

five small populations in the Koke'e State Park area. The sites contain a total of about two dozen individuals.

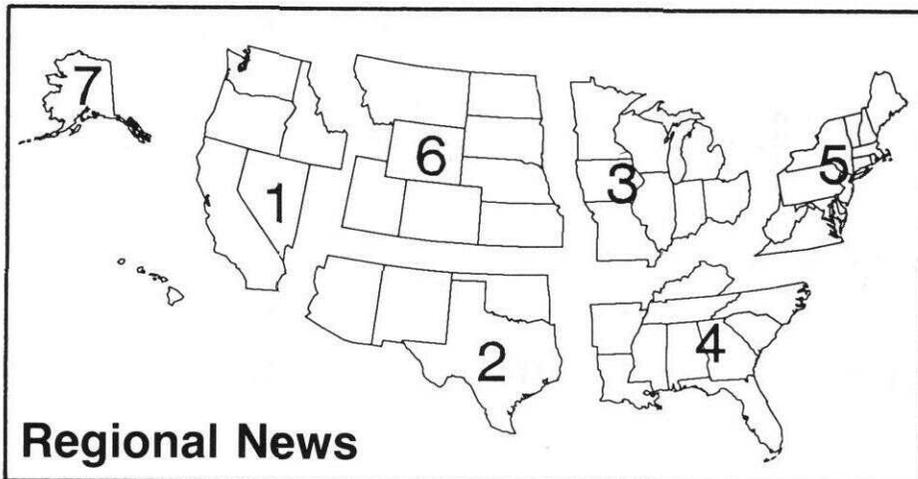
#### **Dwarf Iliau (*Wilkesia hobydi*)**

The dwarf iliau, a Hawaiian plant in the aster family (Asteraceae), is related to the spectacular and more widely known sil-

versword. It apparently occurs only on two steep ridges in the Na Pali coast area of western Kaua'i. Both populations are on State-owned land within the Pu'u ka Pele Forest Reserve, and they total approximately 350 individuals.

*Wilkesia hobydi* has been proposed for listing as Endangered (F.R. 10/2/89). The

(continued on page 4)



## Regional News

### Regional endangered species staffers have reported the following news:

**Region 1**—Between July and August, 28 sea otters (*Enhydra lutris*) were captured along the central California main-

land and released at San Nicolas Island off southern California. At least 14 of the otters were still at the island by the end of August. An aerial survey also found three in the "no otter" management zone and

one back in the mainland range. (See BULLETIN Vol. XIII, No. 4, for more details on the San Nicolas Island translocation effort.)

As recommended by the Sea Otter Recovery Team, the Fish and Wildlife Service is proceeding with two modifications to enhance the translocation program. The Service has applied for a modified permit to use radios that can be implanted in the otters. Such equipment will significantly enhance the ability of biologists to locate and track sea otters. The Service also is planning to propose a rule change to allow the translocation and reintroduction of adult females with dependent pups.

Biologists are continuing to track 29 woodland caribou (*Rangifer tarandus caribou*) with active radio collars in northern Idaho's Selkirk Mountains ecosystem. This has not been a good year for the herd. Preliminary information indicates that caribou reproduction was poor in 1989. Only 2 or 3 calves have been observed with the 19 radio-collared cows. In addition, five adults and one yearling died in August, the highest observed mortality in one month since the caribou were introduced from Canada. One caribou was killed by a mountain lion (*Felis concolor*), three are suspected to have been killed by bear, and two died of unknown causes.

Sixteen grizzly bears (*Ursus arctos*) in the Selkirk Mountains ecosystem are wearing active radio collars, including four grizzlies that were captured in British Columbia, Canada, last June. (Some bears frequently move back and forth across the international border.) This year, the first bear captured in the Selkirks—a female caught in 1983—was tracked to a spring range southwest of Priest Lake. The Service is proposing to add this habitat to the Selkirk grizzly bear recovery zone in an upcoming recovery plan revision.

In the North Cascades grizzly bear evaluation area, personnel from the Service's Olympia Field Station are participating in the grizzly bear monitoring effort being conducted by the Washington Department of Wildlife. Biologists have been searching here for evidence of the bears for the past year. In late fall, two separate grizzly bear tracks were confirmed by biologists in the North Cascades—the first time grizzlies have been positively identified in this ecosystem in over 20 years.

Forty-five dead desert tortoises (*Gopherus agassizi*) were recently found on 274 acres (111 hectares) north of Las Vegas, Nevada, that were recently transferred from the Bureau of Land Management (BLM) to the Kerr-McGee Chemical Corporation. About half of the tortoises appeared to have died in the past year.

(continued on page 9)

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# Red Wolf Recovery Continues to Gather Steam

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Since our last story on the red wolf (*Canis rufus*) recovery effort (see BULLETIN Vol. XIV, Nos. 1-2), much has happened. With an unexpected natural disaster, additional wolf releases, and planning for new island propagation sites and a new mainland release site, this year has been a busy and exciting time.

Thirteen red wolves now roam Alligator River National Wildlife Refuge in eastern North Carolina. Three of them are juveniles that have been in the wild since they were pups. Two of these juvenile wolves were born and raised in the wild at Alligator River; the other was born on Bulls Island, part of the Cape Romain National Wildlife Refuge on the South Carolina coast, and released at Alligator River in January 1989. These wolves are doing well. Another Bulls Island wolf pup that was released at Alligator River in January 1989 was struck and killed by a car on November 21.

The Fish and Wildlife Service released 12 wolves at Alligator River last summer. Two of these, an adult pair consisting of a 7-year-old male and a 3-year-old female, were released July 3. On July 24, the Service for the first time released an entire family unit together. The family unit consisted of two adults (the only two remaining wolves of the original eight released at the refuge in 1987), three female pups, and one male pup. All four of these pups were born in captivity at the refuge last winter. In mid-August, a pair of 2-year-old wolves that had not bred also were released, followed by another 2-year-old pair a few weeks later.

Two of the wolves released at Alligator River in 1989 subsequently died. An adult male released on January 3 was killed by a car on July 31. In early September, the adult male from the family unit released July 24 was found dead. Dr. Nancy Thomas from the Service's National Wildlife Health Laboratory in Madison, Wisconsin, determined that it had been killed by another wolf. (A juvenile wolf has since paired with the adult female.)

In spite of these losses, Service biologists are satisfied with the progress being made at Alligator River. The mix of 13 experienced adults, yearlings, and pups should put the refuge's wild wolf population in good shape for the next breeding season. To help ensure that the refuge's wild wolf population increases, the Service is planning to capture at least one of the adult female wolves in late February 1990 and artificially inseminate her. This will mark the first time the Service has attempted to artificially inseminate red wolves.



Fish and Wildlife Service photo

Service biologist Mike Phillips moving a red wolf at Alligator River National Wildlife Refuge

Although the Alligator River Refuge is becoming well known as the only place where there are red wolves in the wild, the refuge is also the world's second largest red wolf captive breeding facility. With the release of 12 wolves last summer, space in the wolf pens has been freed. Red wolves will be brought in from other captive breeding facilities to acclimate them to the area. Some of them will be adult pairs that can be released if the free-ranging pairs fail to reproduce. The Service has learned through experience that it is necessary to have a large number of wolves on hand to meet various management contingencies.

One unexpected event that occurred this year was Hurricane Hugo, which played havoc with the Bulls Island propagation site (see BULLETIN Vol. XIV, Nos. 9-10). All five wolves on the island survived the storm, but one died a short time later. Although the condition of the four remaining wolves had not been ascertained as of early December, there is still prey on the island for the wolves to feed on and the wolves are moving around the island. After assessing the situation, Warren Parker, the Service's red wolf coordinator, decided that the project would continue on schedule. The original pen destroyed by the storm will be rebuilt, and sometime in mid-winter the wolf pups will be recaptured and moved off the island.

There are now seven pups and an adult male wolf ranging the Horn Island propagation site off the coast of Mississippi, part of the Gulf Islands National Seashore (administered by the National Park Service). The male's mate was found dead in

an emaciated condition in mid-September. Dr. Nancy Thomas examined this wolf and found that it had died of pancreatic cancer—a very rare event. (Only about a hundred or so cases are known in the literature of canids with this type of cancer.) The other wolves are doing well.

If all goes according to plan, an adult breeding pair with pups will be released this winter on a new propagation site on Durant Island, off the coast of Alligator River Refuge. The Service has developed a cooperative agreement with the private owners for this release.

The Service is planning to establish another propagation site in January on St. Vincent National Wildlife Refuge, a barrier island off the Florida panhandle. An adult pair will be placed on the 12,000-acre (4,680-hectare) island to breed and provide wild pups for the mainland release sites. Two of the pups from Horn Island or Bulls Island also may be placed on this island.

Planning for a second mainland release site is also proceeding. The Service is considering several possible locations within the red wolf's historical range in the Southeast. If everything works out, a second mainland release site will be established in 1990.

It is worth pointing out that the red wolves the Service has reintroduced back into the wild have not been responsible for any known livestock depredations, injuries to people, or drops in game populations. The Service is carefully monitoring all the reintroduced red wolves to ensure that human-wolf problems are minimized.



photo by Derral Herbst

*The dwarf iliau (Wilkesia hobbeyi) branches from its base and grows to about 2 feet (60 cm) in height. Whorled tufts of narrow leaves grow at the top of each branch. Cream-colored flowers about 0.75 inch (2 cm) across are borne in clusters up to 18 inches (45 cm) long.*

## Listing Proposals

(continued from page 1)

greatest threat to its survival is browsing by feral goats. Large herds roam the cliffs upon which the plants grow and are responsible for a great deal of damage. They not only eat the plants but accelerate erosion of the fragile ridge soil. The goat herds are increasing rapidly due to game management practices aimed at maintaining high numbers for hunting.

### **Aupaka (*Isodendron hosakae*)**

The fifth Hawaiian plant proposed during October (F.R. 10/10/89) for listing as Endangered, *I. hosakae* is found on the island of Hawai'i (the "Big Island"). This woody shrub, a member of the violet family (Violaceae), grows up to 30 inches (76 cm) in height. It has narrow, lance-shaped leaves and small flowers that are yellowish-green to white in color. This species is one of four in the genus *Isodendron*, which is endemic to the Hawaiian Islands.

About 275 individuals grow on three volcanic cinder cones in the Waikoloa area of the South Kohala District. All three sites are on privately owned land. The greatest immediate threat to *I. hosakae* is browsing and habitat disturbance by domestic cattle. Feral pigs also have been observed in the area and their rooting

may pose additional problems for this species, as it does for many other Hawaiian plants. On several occasions in the past, the entire area has been leased on a temporary basis to the U.S. Army for ground troop training exercises. Such military activities could pose an additional threat, as could range fires during the dry season.

### ***Aristida portoricensis***

This plant, a grass in the family Poaceae, is another species endemic to an island ecosystem, occurring only in southwestern Puerto Rico. Currently, it is found at two sites on privately owned land. Both populations are threatened by habitat loss, and the Service has proposed listing *A. portoricensis* as an Endangered species (F.R. 10/10/89).

Known locally as pelos del diablo (devil's hair), *A. portoricensis* grows as bunches of tufted stalks that can reach up to 20 inches (50 cm) in height. The species apparently was once more widespread in southwestern Puerto Rico, but the clearing of land and introduction of competing grass species for cattle pastures may have eliminated *A. portoricensis* from parts of its range. Collection sites from 1903 and 1927 appear to have been lost to residential and commercial development.

Habitat loss continues to threaten the species. Both remaining *A. portoricensis*

sites are subject to residential development, and the larger population is in an area proposed for copper and gold mining.

### ***Harrisia portoricensis***

Three small islands off Puerto Rico contain the only remaining range of another rare plant, *Harrisia portoricensis*. Known locally as the higo chumbo, this plant is a columnar cactus that grows with other cacti in semi-open dry forests. Its slender, usually unbranched stem grows to about 6 feet (2 meters) in height. Large, greenish-white, funnel-shaped flowers open at night. The fruits of this cactus are a preferred food of the yellow-shouldered blackbird (*Agelaius xanthomus*), another Endangered species. *Harrisia portoricensis* was proposed October 18 for listing as Threatened.

This cactus once occurred in the southwestern section of Puerto Rico, but it disappeared from the island as its habitat was converted to urban, industrial, and agricultural uses. It is now found only on the islands of Mona, Monito, and Desecheo. Mona and Monito are being managed as wildlife reserves by the Puerto Rico Department of Natural Resources; however, Mona, which has most of the species' habitat, has been proposed several times in the past as a site for a prison and a superport/oil storage facility.

Once again, the effects of feral livestock are the main threats. Pigs on Mona damage the cacti when digging for edible roots, and goats on both Mona and Desecheo are believed to be altering the vegetational composition of these islands. Desecheo is managed by the Service as part of the National Wildlife Refuge System. Goat control on this island would likely be part of a recovery effort for the cactus.

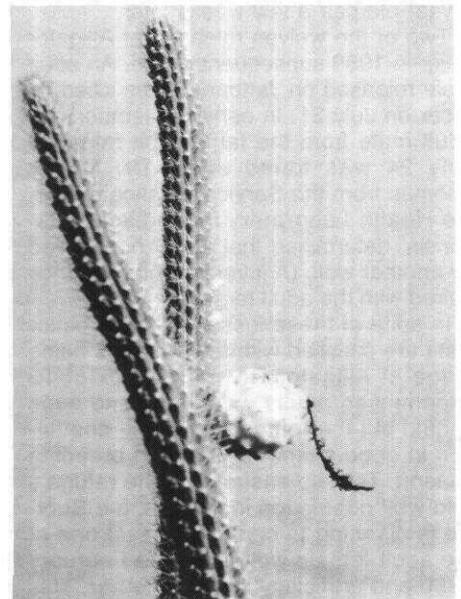


photo by Sue Rice

***Harrisia portoricensis***

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## Listing Proposals

(continued from previous page)

### Michigan Monkey-flower (*Mimulus glabratus* var. *michiganensis*)

A semi-aquatic perennial herb in the snapdragon family (Scrophulariaceae), this plant occurs primarily along lakeshores and streams in the Mackinac Straits and Grand Traverse regions of northern Michigan. It grows as clumps of up to several hundred clonal stems, each about 14 inches (36 cm) in length and lined with coarsely-toothed leaves. The solitary yellow flowers are tubular and two-lipped, with the tube and lower lip irregularly spotted.

Currently, the Michigan monkey-flower is known from only 12 sites, 8 of which contain fewer than 10 individual plants. Due in part to the species' association with water, its habitat is rapidly being developed for recreational and residential purposes. Three historical populations already have been lost, and two others have been severely damaged. Some incidental commercial use has occurred as well. One population was discovered after a botanist was served a sprig of the plant as a garnish on his restaurant dinner plate.

Populations of the Michigan monkey-flower occur in Sleeping Bear Dunes National Lakeshore (managed by the National Park Service), a University of Michigan biological station, and two local parks. Almost two-thirds, however, are on privately owned land. Several of the landowners have advised the Service of their plans to protect the plant. Nevertheless, because the species as a whole is believed vulnerable to extinction, the Service has proposed to list *Mimulus glabratus* var. *michiganensis* as Endangered (F.R. 10/2/89).

### Sentry Milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*)

The Latin name *cremnophylax*, meaning "watchman of the gorge," aptly describes the location of this plant. It is found at one site on the very edge of the South Rim of the Grand Canyon. Unfortunately, because the site is also a popular scenic viewpoint, the sole population of this plant is being trampled by park visitors. Accordingly, the Service has proposed to list it as Endangered (F.R. 10/18/89).

The Sentry milk-vetch, a low-growing plant, forms mats less than 1 inch (2.5 cm) high with short, creeping stems, compound leaves, and whitish or pale purple flowers. It is part of the dwarf plant community that grows in the shallow soils of Kaibab limestone "pavement."

A thorough census in 1989 indicated that the population contained fewer than 500 plants. A 1989 inventory of monitoring plots established the previous year revealed a 14 percent decline in plant numbers. The cause is believed to be trampling and drought. A paved walkway leads through the species' habitat, but many visitors take a short-cut from the parking lot to the canyon rim and walk directly over the plants. In response, the National Park Service has proposed to erect a fence around the population.

### Barneby Ridge-cress (*Lepidium barnebyanum*)

Named after Rupert Barneby, who discovered it in 1947, this small plant is a perennial herb in the mustard family (Brassicaceae). The species is known only from Duchesne County, Utah. It apparently is restricted to a narrow soil type, and the plants grow only on a series of shale barrens topping three ridgelines near Indian Creek. Approximately 5,000 individuals occupy fewer than 500 acres (200 hectares) of habitat. The entire range is within the Uintah and Ouray Res-

ervation of the Ute Indian Tribe. Because the species' range is limited and is subject to habitat degradation, the Service has proposed to list *L. barnebyanum* as Endangered (F.R. 11/27/89).

The habitat is being damaged by off-road vehicle recreation, which in this area is concentrated on the sparsely vegetated ridgelines. In addition to soil compaction and erosion, the plants themselves are being trampled. The Bureau of Indian Affairs, which is responsible for assisting the Ute Tribe in resource management on the Reservation, is attempting to protect the habitat but lacks statutory authority for effective control.

The area is also immediately adjacent to active oil and gas fields. Further development of these fields could threaten the Barneby ridge-cress unless specific actions are taken to protect the occupied sites. The Bureau of Land Management is responsible for oil and gas leasing on lands that are under Federal jurisdiction, including Indian Reservations.

If *L. barnebyanum* is listed, both agencies will have legal authority and responsibility under the Endangered Species Act to protect the habitat.



The Barneby ridge-cress (*Lepidium barnebyanum*) grows to about 6 inches (15 cm) high from a deep tap root and forms clumps about 8 inches (20 cm) across. It bears small, white to cream-colored flowers from May to July.

drawing by K. H. Thorne

(continued on page 6)

## Listing Proposals

(continued from page 5)

### Kral's Water-plantain (*Sagittaria secundifolia*)

An aquatic plant, Kral's water-plantain is restricted to the Little River system in northeastern Alabama and northwestern Georgia. Only one of two historically known populations survives, and it faces impacts from water quality degradation and a potential hydroelectric impoundment. On October 18, the Service proposed to list this species as Threatened.

Clearing of adjacent river banks for silviculture, residential/recreational development, surface mining, and agriculture pose a significant threat to the aquatic habitat. Erosion resulting from these activities increases stream turbidity and siltation. Such impacts probably led to the extirpation of the other *S. secundifolia* population and reduced the amount of suitable habitat for the species as a whole. Additional impacts on the species may result from garbage dumping and leaking sewage systems, which lead to increases in the amount of filamentous algae in the water. Extreme turbidity and dense growths of algae reduce the amount of light available to the plants for growth and flowering.

Impoundments have been created over large areas of habitat presumed suitable for *S. secundifolia*, and undocumented populations may have been destroyed. Approximately 33 percent of the habitat occupied by the one remaining population would be destroyed if a proposed hydroelectric impoundment is constructed on the Little River. However, the power company promoting the facility views the Little River site as the least desirable of several alternatives it is evaluating.

### Inflated Heelsplitter (*Potamilus inflatus*)

This freshwater mussel receives its common name from its inflated shell and the sharp, wing-like ridge formed where the two shells join. The inflated heelsplitter once inhabited parts of seven rivers in Alabama, Louisiana, and Mississippi, but extensive habitat alteration has eliminated this mollusk from most of its historical range. The Service has proposed to list *P. inflatus* as Threatened (F.R. 10/27/89).

Currently, the inflated heelsplitter can still be found in parts of the Amite River in Louisiana and the Tombigbee and Black Warrior Rivers of Alabama, although its range has declined significantly in all three rivers. The species has been extirpated from the Tangipahoa River, Louisiana; the Pearl River, Mississippi; and the Alabama and Coosa Rivers, Alabama. These rivers have been extensively altered for a variety of purposes. Some *P. inflatus* populations disappeared when the

free-flowing habitat was impounded for navigation, flood control, and hydropower. Others were lost as rivers were channeled for navigation and dredged for gravel mining. Sedimentation from surface mining, along with water pollution from urban and industrial effluents, have contributed to the decline. Most of these factors threaten the remaining *P. inflatus* populations.

### Fanshell Mussel (*Cyprogenia stegaria* (= *C. irrorata*))

Another freshwater mollusk, this species historically occurred throughout the Ohio River and its large tributaries in Virginia, West Virginia, Pennsylvania, Ohio, Indiana, Illinois, Kentucky, Tennessee, and Alabama. Currently, however, only three reproducing populations are known to remain. The collection of a few old specimens over the past decade indicates that some small, apparently nonreproducing populations may persist in other areas. Because of continuing threats to the habitat, the Service has proposed listing the fanshell mussel as an Endangered species (F.R. 10/2/89).

The factors that reduced the range and reproductive capacity of the fanshell mussel apparently are similar to those that affected the inflated heelsplitter. Much of the riverine habitat in the Ohio River system has been converted to reservoirs and navigation channels, dredged for channel maintenance and gravel/sand mining, and/or degraded by pollution. The fanshell's only known breeding populations are in sections of the Clinch River, Tennessee and Virginia; Green River, Kentucky; and Licking River, Kentucky.

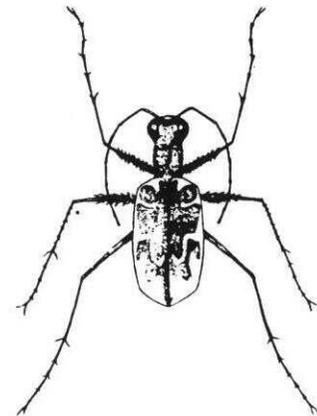
### Two Tiger Beetles

Endangered Species Act protection was recommended for two species of tiger beetles known primarily from river and ocean beaches in the northeastern United States (F.R. 10/2/89). The **Puritan tiger beetle (*Cicindela puritana*)** was proposed by the Service for listing as Threatened, and the **northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*)** was proposed as Endangered.

There are many species of tiger beetles. These day-active insects capture small arthropods in a "tiger-like" manner, grasping prey with their mandibles (mouthparts). As larvae, they live in burrows. They are voracious predators even during this stage, fastening themselves near the tops of their burrows by means of abdominal hooks and reaching out to seize passing invertebrates. Because of their interesting behavior and variety of forms and habitats, tiger beetles have received much study. A journal devoted exclusively to these beetles, "Cicindela," has been published since 1969. Tiger beetles also are believed to be more

highly sought-after by amateur collectors than insects of any other single genus.

- The Puritan tiger beetle historically occurred in scattered locations along the Connecticut River in New Hampshire, Massachusetts, and Connecticut, and along the Chesapeake Bay in Calvert and Kent Counties, Maryland. The reasons for this disjunct distribution are unclear. However, the habitat in both areas is similar, characterized by narrow, sandy beaches with adjacent bluffs or cliffs of sand and clay. Puritan tiger beetles have a one-year life cycle, and during their larval stage they burrow into moist areas of the cliffs or back beaches. They emerge as adults in early summer to feed and mate in beach areas.



drawing by Josephine Thoms

**Puritan tiger beetles (*Cicindela puritana*) are brownish-bronze above with a metallic blue underside. They usually measure under 0.5 inch (11 millimeters) in length.**

The 17 dams built along the Connecticut River above Hartford probably inundated some Puritan tiger beetle populations and decreased the water flow necessary for habitat maintenance at other areas. Pollution of the Connecticut River may have extirpated other populations, although the largely successful clean-up effort taking place on this river may permit reestablishment in some areas. Cliff stabilization activities also have modified the beetle's habitat, eliminating the newly exposed areas needed for egg-laying and burrow construction.

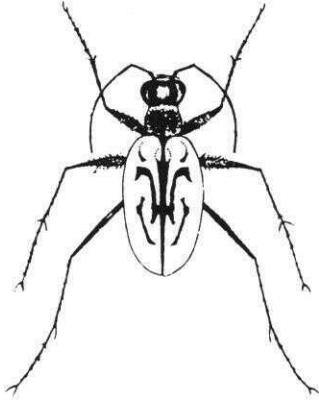
- The northeastern beach tiger beetle historically occurred in abundance on sandy beaches from Cape Cod, Massachusetts, to central New Jersey, and along the Chesapeake Bay in Maryland and Virginia. Unlike the larvae of the Puritan tiger beetle, northeastern beach tiger beetle larvae

(continued on next page)

## Listing Proposals

(continued from previous page)

occupy burrows directly on the beach, in and above the high-tide zone. Another difference is that northeastern beach tiger beetles have a 2-year life cycle, over-wintering twice as larvae.



drawing by Josephine Thoms

**Northeastern tiger beetles (*Cicindela dorsalis dorsalis*) have white to light-tan elytra (anterior wings) with a bronze-green head and thorax. They reach up to 0.6 inch (15 mm) in length.**

The dependence on beach habitat and the length of its larval stage make the northeastern beach tiger beetle particularly vulnerable. Because the larvae occur only in the intertidal zone, they are unavoidably in the path of beach users and their vehicles, which crush the animals and their burrows. Studies conducted in Maryland and Virginia point out that as beach use increases, tiger beetle numbers decrease. Oceanfront development is a growing threat as well. Due to these factors, the northeastern beach tiger beetle is believed to be extirpated from all of its range north of Maryland, except for a small population on the island of Martha's Vineyard.

## Desert Tortoise (*Gopherus agassizi*)

The Mojave population of the desert tortoise, consisting of those tortoises to the north and west of the Colorado River, was proposed October 13 for listing as Endangered. (See feature in BULLETIN Vol. XIV, Nos. 9-10.) Habitat degradation, predation, and disease are believed to threaten the population with imminent extinction. Currently, the Mojave population is protected under a temporary, emergency listing rule. The Service plans to make a final decision on long-term protection for the Mojave population by April 1, when the emergency listing expires.

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## Conservation Measures

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 and Commonwealth conservation departments that have Endangered Species Cooperative Agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages further conservation efforts by State and local agencies, independent organizations, and concerned 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 fund, authorize, or carry out are not likely to jeopard-

ize 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 not legally binding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, it is unlawful to collect or maliciously damage any listed species on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal trespass law also is illegal under the Act. In addition, some States have their own more restrictive laws specifically against the take of State or federally listed plants and animals.

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## Final Listing Rules Approved for Two Desert Fishes

Final listing rules were published recently for two small desert fishes in the minnow family, the Clover Valley speckled dace (*Rhinichthys osculus oligoporus*) and Independence Valley speckled dace (*Rhinichthys osculus lethoporus*).

Before the region became drier at the end of the Pleistocene, these fishes may have occupied all of the streams and wetlands maintained by small springs in Clover and Independence Valleys in northeastern Nevada. Today, they are restricted to a few spring systems. The Clover Valley speckled dace occurs in three springs and outflows, and the Independence Valley speckled dace is known to occur in only one spring system. All of these habitats are on private land used for ranching. The size of the current populations is unknown.

These desert fishes have been adversely affected by habitat alterations to facilitate irrigation and by the introduction of non-native fishes. Some of the springs and wetlands that once supported both subspecies have been ditched and impounded to support ranching operations. Because of their extremely limited distribution, the effects of introduced fish species, and continuing threats to their habitats, the Service proposed the Clover Valley and Independence Valley speckled daces for listing as Endangered in the September 18, 1987, *Federal Register* (see BULLETIN Vol. XII, No. 10); the final rule was published October 10, 1989. (The two subspecies were incorrectly given the same scientific name in the table in the October 10 *Federal Register*. This error was corrected in the November 17 *Federal Register*.)

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## Utah Cactus Delisted

The Fish and Wildlife Service has published a final rule to remove the purple-spined hedgehog cactus (*Echinocereus engelmannii* var. *purpureus*) from the Endangered Species List (F.R. 11/27/89). A 1988 study determined that *E. e. purpureus* is merely a sporadically occurring color and spine phase of *E. e. chryso-centrus*, a common species in the Mojave Desert in southwestern Utah. Because

*E. e. purpureus* exhibits no population integrity independent of *E. e. chryso-centrus*, and cannot be defended as a distinct species, subspecies, or taxonomic variety, it is not eligible for Endangered Species Act protection. The subspecies was proposed by the Service for delisting on January 19, 1989 (see BULLETIN Vol. XIV, Nos.1-2).

# Aleutian Canada Goose Proposed for Reclassification

Michael D. Rees

In 1967, the Aleutian Canada goose (*Branta canadensis leucopareia*), a small Canada goose subspecies faced with extinction, was listed as Endangered. At the time, biologists were aware of only one breeding area in Alaska, and the migration routes and wintering grounds were unknown. Twenty-two years later, after an intensive recovery effort, Aleutian Canada goose numbers have increased enough for the subspecies to be proposed for reclassification from Endangered to the less critical status of Threatened.

Aleutian Canada geese probably once occurred on islands from the western Gulf of Alaska and Alaska Peninsula region to the Commander and Kuril Islands of the Soviet Union. The subspecies, distinguished from most other Canada geese by its small size, abrupt forehead, and ring of white feathers at the base of the neck, used to nest and rear young on most of the larger Aleutian Islands. We now know that most Aleutian Canada geese leave their Alaska breeding grounds in September and winter in the upper San Joaquin Valley of California. Two small subpopulations spend the winter further north in the Sacramento Valley and near Pacific City, Oregon. The geese leave their wintering areas in April and return to Alaska.

## Decline of the Species

Through the late 1800's, Aleutian Canada geese were numerous throughout the Aleutian Island chain, which stretches southwest from the Alaska Peninsula for over 1,000 miles in the Bering Sea. The decline in the numbers and range of this subspecies is largely attributed to the introduction of arctic foxes (*Alopex lagopus*) onto the islands. Commercial fox farmers released these non-native foxes on most of the Aleutian Islands from 1836 to about 1930. The foxes multiplied rapidly and were easily trapped on the islands. Unfortunately, the Aleutian Canada geese on these islands became easy prey for the foxes. By the late 1930's, surveys of the Aleutian Islands indicated that the geese were rare or extirpated on islands where foxes had been introduced.

By the time the Aleutian Canada goose was listed, it was speculated that only 200-300 geese remained. Nesting was believed restricted to a single island, Buldir, near the western end of the Aleutian chain. Foxes had not been introduced on Buldir because of its small size (4,914 acres; 1,990 hectares) and rugged topography. Two other remnant goose populations were subsequently discovered. In 1979, a breeding population of geese was

found on Kilihtagik Island (230 acres; 93 ha), south of the Alaska Peninsula. Another remnant breeding population was discovered in 1982 on the 2,082-acre (842-ha) Chagulak Island.

Hunting and the loss of wintering habitat also may have contributed to the decline of the Aleutian Canada goose. The Aleuts, the local native people, historically hunted the goose on its nesting areas. In the recent past, Aleutian Canada geese were hunted recreationally and for food within the Pacific Flyway, particularly in California. Hunting in the migration and wintering areas was likely responsible for preventing the recovery of the remnant breeding populations.

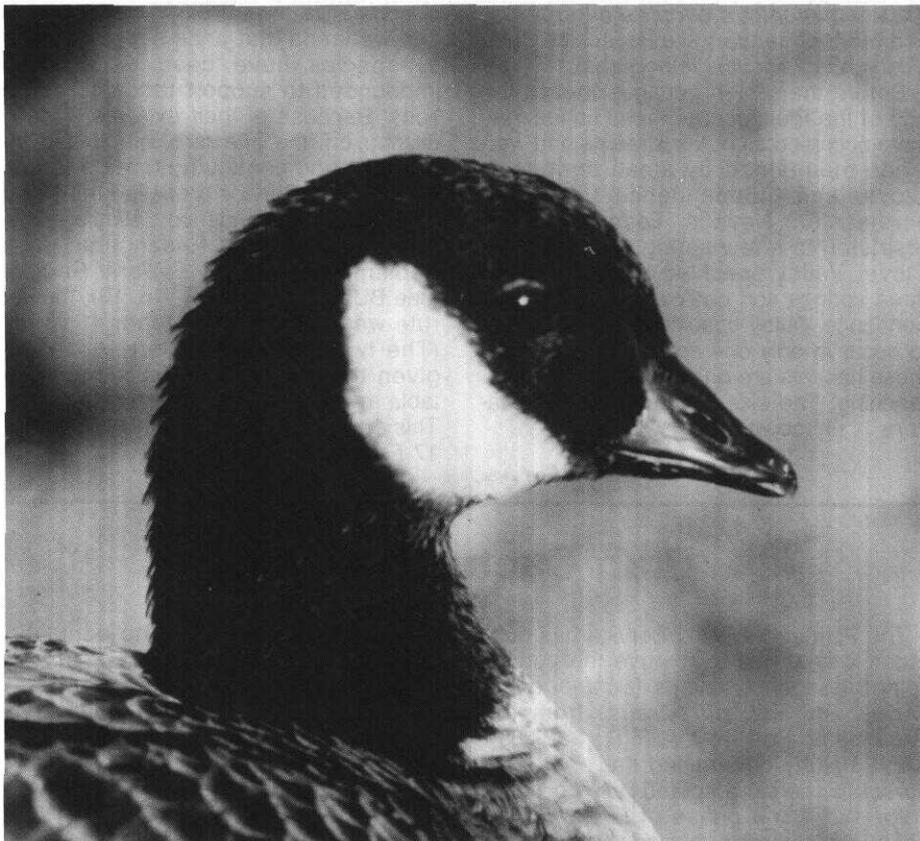
## The Recovery Effort

After the Aleutian Canada goose was listed as Endangered, an intensive effort was launched in Alaska, California, and Oregon to recover the species. In Alaska, the area west of Unimak Pass was closed to Canada goose hunting in 1973. The recovery effort in the breeding grounds focused on eliminating arctic foxes from former nesting islands, reestablishing breeding populations on fox-free islands, and conducting surveys to discover and monitor new nesting populations.

Even before the Aleutian Canada goose was listed in 1967, efforts were being undertaken to eliminate fox populations on islands that had once been occupied by nesting geese. By 1965, the Service had eradicated all foxes from Amchitka Island; by the late 1970's, Alaid, Nizki and Agattu Islands also were free of fox. More recently, Amukta and Rat Islands were cleared. Apparently all foxes also have been eliminated from Kiska Island, although additional surveys are needed to verify this. Altogether, more than 244,000 acres (98,800 ha) are now free of foxes in the Aleutians, including several small islands that either escaped fox introductions or where fox populations have died out.

The Service began an effort to reestablish breeding populations of the goose on islands where foxes were eliminated. In 1963, the Service removed 18 goslings from Buldir to begin a captive breeding population. Captive-raised geese were then released on selected islands. These early releases, however, proved largely unsuccessful. In 1979, an effort was begun to transplant wild family groups from Buldir to fox-free islands. This approach proved more successful. In 1984, the Service confirmed that a small population of nesting geese had been reestablished on Agattu Island—the first nesting of wild Aleutian Canada geese on

(continued on next page)



Fish and Wildlife Service photo

Aleutian Canada goose

## Aleutian Canada Goose

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that island since the 1930's. Small breeding populations subsequently were confirmed on Nizki and Alaid Islands in 1988, and a single pair of nesting geese was discovered on Amukta Island in 1989. Although more than 450 geese have been released on Amchitka and 116 geese were released recently on Little Kiska, nesting on these islands has not yet been confirmed.

In the Aleutian Canada goose's wintering grounds, a major effort was undertaken to protect the wintering flock from hunting and to preserve roosting and feeding habitat. Federal, State, county, and municipal governments worked together with hunting and waterfowl groups. The States of California and Oregon assisted in the recovery effort by identifying key migration and wintering areas, initiating hunter education programs, and modifying hunting regulations. Hunting closures in selected areas began in California in 1975 and in Oregon in 1982. Several key staging and wintering habitats in Oregon and California have been protected through easements and inclusion within the National Wildlife Refuge System. Other important areas have been acquired by the California State Wildlife Area and Park systems.

As a result of the recovery effort in both the breeding and wintering grounds, the Aleutian Canada goose population has increased in the wild from fewer than 800 birds in 1975 to approximately 5,800

today. On the California wintering grounds, the number of geese has increased an average of 16 percent annually from 1975 to 1988. In its breeding range, the bird now nests on seven islands. Based on the best current estimates available, the Service believes that the primary breeding population on Buldir numbers 1,100-1,500 pairs; 20-22 pairs on Kiliktagik Island; 35-40 pairs each on Agattu, Nizki and Alaid Islands; and 50 pairs on Chagulak Island. More than 140 geese are also being held by zoos and waterfowl propagators in the United States and Canada.

## The Reclassification Proposal

The Aleutian Canada goose population now exceeds the minimum criteria in the Aleutian Canada Goose Recovery Plan (approved in 1977 and revised in 1982) for reclassification from Endangered to Threatened. After reviewing the substantial improvement in the status of the Aleutian Canada goose and other relevant information, the Service believes that a change in classification under the Endangered Species Act is warranted. The proposal to reclassify the status of the species was published in the September 29, 1989, *Federal Register*. A final decision on the proposal should be published within a year.

Although significant progress has been made in recovering the Aleutian Canada goose, the Service believes the subspecies still requires Endangered Species Act protection. The small, isolated breeding populations are vulnerable to extirpa-

tion from random environmental events, such as storms and earthquakes. Less than 15 percent of the habitat once used by nesting geese has been cleared of foxes. In California, the wintering flock is often concentrated on roosting and feeding sites. In these areas, the threat of disease, such as avian cholera, will increase as the population grows in number. The greatest remaining threat to the survival of the species, however, is the loss of unprotected wintering habitat. Important wintering areas are threatened by changing agricultural practices and conversion to housing, highway, and commercial development.

The proposed change in classification from Endangered to Threatened would not significantly alter the protection of this species under the Endangered Species Act (although it would allow greater management flexibility). Anyone taking, attempting to take, or otherwise illegally possessing an Aleutian Canada goose would be subject to the same penalties now in force. Section 7 of the Act also would continue to protect this species from Federal actions that would jeopardize its survival.

The recovery program will continue until the Aleutian Canada goose has reached a secure, self-sustaining status. Meanwhile, the Service will continue to remove arctic foxes from historical nesting islands and reintroduce wild geese on fox-free islands. Aleutian Canada goose hunting closures will be maintained in key migration and wintering areas. The Service will also monitor population trends and mortality from hunting, disease, and other factors.

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## Regional News

(continued from page 2)

The cause of their deaths was determined to be upper respiratory disease syndrome. The Nevada die-off is comparable to the number of tortoises that died per acre in the Desert Tortoise Natural Area in California, according to the BLM's District Office in Riverside, California. (See BULLETIN Vol. XIV, Nos. 9-10, for more details on this disease.)

\* \* \*

This summer, staff from the Service's Patuxent Wildlife Research Center and numerous local volunteers set up a second remote release site for Andean condors (*Vultur gryphus*) in the Sespe Condor Sanctuary, California. On September 4, three young pre-flight Andean condors were brought to the new site. All of the condors showed few signs of stress during the trip and began feeding at the site.

Four Andean condors (Y-1, R-4, R-5 and R-7) are now flying in the sanctuary, using known flight paths of California condors (*Gymnogyps californianus*). (See BULLETIN Vol. XIV, Nos. 1-2.) The condors are feeding regularly at the remote feeding platforms. After another condor, R-6, showed increasing interest in human activities, she was taken into captivity to undergo behavioral modification at the Los Angeles Zoo. Different techniques will be tried on R-6 to determine if she can be conditioned to avoid humans.

**Region 2**—The carcass of a yearling male whooping crane (*Grus americana*) was discovered October 30 in a pasture in Hitchcock County, Nebraska. Evidence at the scene and necropsy results indicated that the bird struck a two-wire electric distribution line as it flew to or from a temporary wetland in the pasture. The whooping crane was last seen alive accompanying two other whoopers in Saskatchewan, Canada, on October 24. Eighteen other whooping cranes are known to have collided with electric wires in the past, resulting in 13 deaths.

\* \* \*

Twenty-two whooping cranes have been moved from the Service's Patuxent Wildlife Research Center in Laurel, Maryland, to the International Crane Foundation in Baraboo, Wisconsin, to establish a second captive flock (see BULLETIN, Vol. XIV, Nos. 9-10). Eight cranes were flown up to Baraboo on November 8 on a U.S. Marine Corps C-130 aircraft, which was participating in a training flight. Six cranes were flown up on November 16 by Northwest Airlines, which donated space for the birds as a contribution to the recovery of this Endangered species. The other eight birds were transferred on December 7. All of the birds were shipped without injury, and they underwent a 30-day quarantine to ensure they were free of disease organisms and parasites.

On November 21, a subadult female whooping crane died at the Foundation during an examination. The bird appeared normal before and during the 10-minute check but collapsed shortly after release. Although the Foundation's veterinarian immediately attempted to resuscitate the

(continued on page 10)

## Regional News

(continued from page 9)

bird by injecting fluids and applying CPR, the effort was unsuccessful. A post-mortem examination at the Service's National Wildlife Health Research Center in Madison, Wisconsin, suggested that the whooping crane died from shock, complicated by internal hemorrhage from a small puncture in the bird's jugular vein where a blood sample had just been withdrawn. The blood may have failed to clot due to high blood pressure associated with stress.

An aerial survey by Fish and Wildlife Service biologist Tom Stehn on November 24 located 144 whooping cranes, including 20 fledged young, on Aransas National Wildlife Refuge, Texas. Canadian biologist Ernie Kuyt had been predicting 12 to 18 fledged young, but late summer surveys were difficult because birds were widely scattered due to drought (see BULLETIN Vol. XIV, Nos. 9-10). One adult pair and several subadults have not been seen since last spring, but may show up later at the refuge. If all the missing birds are alive, the total number of whooping cranes in the wild will be 151.

**Region 4**—The Nature Conservancy's Alabama Chapter recently purchased land in Cherokee County to protect the Endangered green pitcher plant (*Sarracenia oreophila*). This site supports one of the largest remaining populations, consisting of several hundred individuals. The Service is managing most of the other green pitcher plant populations in Alabama, and is working with The Nature Conservancy in managing its site. The Alabama Forestry Commission also is assisting in the green pitcher plant recovery effort, conducting an annual burning program on sites that support the plant. Such burning controls the growth of brushy vegetation that could displace the pitcher plant.

*Grammitis nimbata*, a primarily tropical fern thought to have been extirpated a decade ago from its only known North American locality, was recently rediscovered in North Carolina. The species, a Category 2 candidate for listing, is believed to survive only in gametophytic form (i.e., the fern's sexually reproductive stage) at that site. The plant's status in Cuba, the main part of its range, is unknown.

In October 1989, the North Carolina Wildlife Resources Commission, with the assistance of the National Park Service and University of Tennessee, transplanted 48 Threatened spotfin chubs (*Hybopsis monacha*) from the Little Tennessee River, North Carolina, into

Abrams Creek in Great Smoky Mountains National Park, Tennessee. This is the second consecutive year that spotfin chubs have been transferred to and from these locations.

Abrams Creek also was stocked with yellowfin madtoms (*Noturus flavipinnis*) and smoky madtoms (*Noturus baileyi*) this year. This project, which involves the Service, U.S. Forest Service, National Park Service, Tennessee Wildlife Resources Agency, and Aquatic Specialists of Knoxville, Tennessee, is in its fourth year. The status of these fish populations, as well as the spotfin chub, in Abrams Creek is unknown, but studies of their survival and reproductive success are expected to be conducted in 1990.

The Endangered fat pocketbook mussel (*Potamilus capax*) is known to occur in the St. Francis River system in six Arkansas counties. A recent survey found this species in a tributary of the system, the Little Bay Ditch, approximately 3 miles (5 kilometers) beyond its known range. The mussel also is known to occur in the St. Francis River system in Missouri, the Wabash River in Indiana, and the Cumberland River in Kentucky. The Missouri Department of Conservation recently relocated approximately 2,000 fat pocketbook mussels from 10 miles (16 km) of the St. Francis River system that were being dredged to two sites on the Mississippi River.

Biologists from the Mississippi Department of Wildlife, Fisheries and Parks have completed this year's survey of the Endangered penitent mussel (*Epioblasma penita*) and Judge Tait's mussel (*Pleurobema taitianum*) in the Buttahatchie River, Mississippi. Efforts to sample the river were hampered by unusually high water most of the summer. Despite the difficulty of sampling, it was apparent that the two listed species were not as abundant as observed during a preliminary survey in 1987. The cause of this apparent decline has not been determined.

High levels of mercury have been found in a dead Florida panther (*Felis concolor coryi*) in the Shark River Slough area adjacent to Everglades National Park. A necropsy of the 4-year-old female panther was conducted by the Florida Game and Fresh Water Fish Commission. When the cause of death could not be identified, the Commission sent the animal to the Service's Patuxent Wildlife Research Center in Laurel, Maryland, to test for pesticides and heavy metal contaminants. The results of an initial survey indicated that the panther had 98 parts per million wet weight of mercury in the liver—an extremely high level. A second analysis showed an even higher mercury level.

Biologists from the Service and the Florida Game and Fresh Water Fish Commission are currently analyzing 33 tissue samples from 15 other dead panthers that have been archived. The initial results of the analyses indicated that all the panthers had mercury above background levels, although none were as high as those found in the dead female panther. The level of mercury contamination varied among the panthers, indicating that this problem is not confined to the east Everglades area. It is suspected that the east Everglades female panther and other panthers that are feeding on raccoons (which usually eat fish and other aquatic animals) are bioaccumulating mercury.

Additional blood and hair samples will be taken from living cats across the Everglades this winter. These samples will confirm how widespread mercury contamination is among Florida panthers.

**Region 5**—The Fish and Wildlife Service's Northeast Regional Office endangered species staff has developed a computerized database for tracking the recovery of listed species in the Region. One use of the database is to help prepare a biennial report to Congress on progress being made to develop and carry out species recovery plans.

Maryland's sole Canby's dropwort (*Oxypolis canbyi*) population declined to only three plants this year. Two of the plants were removed and brought into cultivation at the North Carolina Botanic Garden in order to preserve the gene pool of this northernmost population and eventually reestablish the species at the site. There are 24 other extant populations of this plant in Delaware, Georgia, and North and South Carolina.

Atlantic Coast piping plover (*Charadrius melodus*) production was up this year, thanks to increased habitat protection and public education. Over 700 pairs (about 60 more than last year) nested on coastal beaches. Productivity rates varied widely around the Region, from 0.9 in Maryland to 2.38 in Maine.

Although the productivity of bald eagles (*Haliaeetus leucocephalus*) in Region 5 was slightly lower than in previous years, the birds continued to do well. In 1989, 324 bald eagle pairs produced 293 young, which met one of the Service's recovery targets for the species in the Region.

The peregrine falcon (*Falco peregrinus*) also continued on the road to recovery. In 1989, 83 pairs were on territories in the Region and 105 young were fledged, versus 67 pairs and 85 young in 1988.

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## Regional News

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The U.S. Forest Service is working with the U.S. Fish and Wildlife Service to conserve habitat of the Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*) in the Monongahela National Forest, West Virginia. Areas scheduled for logging are being surveyed for the presence of this Endangered subspecies, and any colonies found are avoided. Information gathered thus far indicates that there are 8 populations consisting of about 36 squirrels in the Monongahela. In addition, the Forest Service has purchased approximately 40,000 acres for addition to the national forest, including some Virginia northern flying squirrel habitat.

The Cheat Mountain salamander (*Plethodon nettingi*) also occurs in the Monongahela National Forest, in habitat related to that of the squirrel. With funding from the Fish and Wildlife Service under Section 6 of the Endangered Species Act, the West Virginia Department of Natural Resources is conducting a population study of this Threatened amphibian. Once again, the Forest Service is cooperating by considering the salamander's habitat during its timber management planning.

A new running buffalo clover (*Trifolium stoloniferum*) population has been found near Elkins, West Virginia, along a historical buffalo (bison)/elk trail. It is believed to be the largest known population in the State. Many botanists speculate that a major reason for the decline of this Endangered plant from its once abundant, widely distributed status is the absence of bison and elk, which once provided the soil enrichment, periodic habitat disturbance, and seed dispersal this species apparently needs to thrive.

With Section 6 funding from the Service, the West Virginia Department of Natural Resources has found six new populations of the flat-spined three-toothed snail (*Triodopsis platysayoides*) in the Cooper's Rock area of the Cheat River Gorge.

**Region 6**—The first effort to relocate gray wolves (*Canis lupus*) in Montana as part of the northern Rocky Mountain wolf recovery program met with disappointment. Last spring, an adult male wolf was killed by a rancher near Marion, west of Kalispell, far outside the designated wolf recovery area. This area is primarily owned by private cattle ranchers and timber corporations. The Service subsequently discovered a den in the area where the male wolf was killed. This den was being used by a pack that included another adult male, an adult female, and three pups. Service biologists from the Helena Fish and Wildlife Enhancement Office, together with the local landowners,

monitored the situation through the summer. At the end of August, a decision was made by the Service, in consultation with the local landowners, to relocate the pack to reduce the potential of livestock depletions. It was hoped that the pack would stay together in its new home in Glacier National Park, Montana, and that the adults would continue to care for the pups. In Minnesota, the only area in North America where wolf pup relocation has been successfully attempted, most radio-collared and ear-tagged pups relocated at this age survived.

All members of the pack were trapped by September 9 (except for one pup), fitted with radio collars, and released in Glacier National Park. (The pup that was not trapped was last reported to be on U.S. Forest Service land south of Marion, but its fate is unknown.) The adult female almost immediately began to travel in the direction of the den site. At last report, she had settled down on national forest land in the Swan Valley, southeast of Kalispell. The adult male also left the park, moving into an area near a livestock ranch. When efforts to haze this wolf out of the area failed, a biologist discovered that the animal's front paw, injured and treated when he was first trapped, had become badly infected. As a result of this injury and the animal's emaciated condition, a decision was made to euthanize the wolf. Unfortunately, the two wolf pups, which had remained in the park, also died. Their cause of death was found to be starvation. As a result of this experience, the Service is reevaluating its management plans for future wolf relocations.

After trying for 4 years, a pair of bald eagles has finally fledged two young at Barr Lake State Park, about 15 miles (24 kilometers) northeast of Denver. This represents the first time bald eagles have been known to successfully fledge young along the Front Range of Colorado since 1985. The pair nested in a live cottonwood tree next to a large double-crested cormorant (*Phalacrocorax auritus*) rookery. The two young eagles, a male and a female, hatched in late March and fledged by mid-April. Later in the summer, the banded eaglets were flying up to 10 miles (16 km) from the nest site. Early this fall, the birds were found roosting in cottonwoods along the South Platte River, north of Barr Lake. It is hoped that the eaglets will return to the Front Range of Colorado to nest when they reach sexual maturity.

**Region 8**—The Service's National Wildlife Health Research Center at Madison, Wisconsin, is continuing its investigation of whooping crane tuberculosis. Center scientists used DNA hybridization assays to identify two *Mycobacterium* isolates from hunter-killed sandhill cranes (*Grus canadensis*) and snow geese (*Chen hyperborea*).

The Service's National Ecology Research Center (NERC) in Fort Collins,

Colorado, hosted a meeting on November 6 and 7 to present available information on the biology, ecology, habitat requirements, and population status of the desert tortoise. The research needs for recovering the species were also discussed. The meeting was attended by biologists from the Service's Region 1, 2, and 6 offices, Colorado State University, Bureau of Land Management, and State wildlife agencies.

**Region 9**—According to the U.S. Department of Agriculture, over 4.2 million acres (1.7 million hectares) were bid by landowners for entry into the Conservation Reserve Program during the June/July sign-up. States with large wetland acreages had larger sign-ups. North and South Dakota accounted for over 1.2 million acres (486,000 ha) of the total sign-up. The Agricultural Stabilization and Conservation Service estimates that about 800,000 acres (324,000 ha) of wetlands and adjacent buffer areas throughout the nation were included in the sign-up. (See BULLETIN XIV, No. 5, for a description of the Conservation Reserve Program.)

The Fish and Wildlife Service has always recognized the importance of wetlands for maintaining fish and wildlife. Among their many values, wetlands provide essential habitat for approximately 40 percent of the Nation's endangered and threatened species. The Service is now completing work on a unified approach to wetlands conservation. The Wetlands Action Plan describes the role of the Service in helping to meet the President's goal of "no net loss of this Nation's wetlands." It will highlight the Service's existing activities (e.g., endangered species activities, Farm Bill programs, the North American Waterfowl Management Plan) and new initiatives (e.g., a national coastal and estuary program, an urban wetlands conservation plan, an effort to encourage private lands stewardship).

The Endangered Species Act Amendments of 1988 require all Federal agencies, and encourage States that receive Section 6 matching grants, to report "reasonably identifiable" expenditures to conserve listed species. The International Association of Fish and Wildlife Agencies recently provided the Service with a species-by-species breakdown of the States' reasonably identifiable expenditures. For fiscal year 1989, the States reporting expended approximately \$4.1 million to conserve listed species.

The Service recently published a new brochure entitled "Pesticide Use and Endangered Species." The brochure describes how determinations are made of the possible effects of pesticides on listed species and their habitats, and what precautions users can take. Copies are available by writing the Regional Directors (see BULLETIN page 2).

# Experimental Population of the Guam Rail is Approved

The Fish and Wildlife Service has published a final rule authorizing a nonessential experimental population of the Endangered Guam Rail (*Rallus owstoni*) under Section 10(j) of the Endangered Species Act (F.R. 10/30/89). Currently, the species survives only in captive breeding facilities. The wild population will be established on the island of Rota in the Commonwealth of the Northern Mariana Islands, which is outside the probable historical range of the species. This exception to normal reintroduction policy is necessary because the species' primary habitat on Guam has been "indefinitely altered" by the accidental introduction of the predatory brown tree snake (*Boiga irregularis*), which has virtually wiped out the island's native birds.

It is hoped that wild rails from the Rota experimental population eventually can be reestablished on Guam after a way is found to control the snakes. Designating the Rota population as nonessential provides considerable flexibility in managing the population. The Service proposed the experimental population designation on June 19, 1989. (See BULLETIN Vol. XIV, No. 7, for background on this story.)

## BOX SCORE LISTINGS AND RECOVERY PLANS

Category	ENDANGERED			THREATENED			SPECIES TOTAL	SPECIES WITH PLANS
	U.S. Only	U.S. & Foreign	Foreign Only	U.S. Only	U.S. & Foreign	Foreign Only		
Mammals	32	19	241	6	2	23	323	25
Birds	61	15	145	7	3	0	231	58
Reptiles	9	7	59	14	4	14	107	22
Amphibians	6	0	8	4	1	0	19	5
Fishes	49	2	11	25	6	0	93	48
Snails	3	0	1	6	0	0	10	7
Clams	34	0	2	0	0	0	36	22
Crustaceans	8	0	0	1	0	0	9	4
Insects	10	1	1	7	0	0	19	12
Arachnids	3	0	0	0	0	0	3	0
Plants	163	6	1	42	7	2	221	89
<b>TOTAL</b>	<b>378</b>	<b>50</b>	<b>469</b>	<b>112</b>	<b>23</b>	<b>39</b>	<b>1071*</b>	<b>292**</b>

Total U.S. Endangered **428**

Total U.S. Threatened **135**

Total U.S. Listed **563**

Recovery Plans approved: 252

\*Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

\*\*More than one species are covered by some recovery plans, 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.

Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife  
36 plants

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Vol. XIV, Nos. 11-12

# ENDANGERED SPECIES

## Technical Bulletin

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

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