

# ENDANGERED SPECIES

## Technical Bulletin

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

### Seven Plants in Southern U.S. Proposed for Listing

Seven plants occurring in the southern United States were proposed by the Service during November for listing as Endangered and Threatened species. These plants all face the possibility of extinction, but may benefit from protection authorized by the Endangered Species Act.

#### *Pityopsis ruthii*

*Pityopsis ruthii*, a plant endemic to Polk County, Tennessee, was first collected in the late 1800s by Albert Ruth, a Knoxville botanist, near the Hiwassee River. Commonly referred to as Ruth's golden aster, this plant is a fibrous-rooted perennial that grows only in the soil-filled cracks of phyllite boulders in and adjacent to the Ocoee and Hiwassee Rivers. Its stems range from one to three decimeters tall and bear long narrow leaves covered with silvery hairs. Yellow flowers appear in a paniculate inflorescence in late August and September, and fruits develop a few weeks after the flowers fade.

*Pityopsis ruthii* is being threatened by water quality degradation, toxic chemical spills, and water flow regime manipulations. The two known populations of this species occur on short reaches of rivers in which water regimes are controlled by upstream dams operated by the Tennessee Valley Authority (TVA). Natural water flows in the Hiwassee River, through the area where the golden aster occurs, have been practically eliminated since construction of the Appalachia Dam in 1943. With the elimination of natural flow cycles, annual scouring of the boulders on which *Pityopsis ruthii* grows cannot occur. The result is that more competitive species now are able to invade the boulders, and encroach and overshadow the riverbanks. *Pityopsis ruthii* has little shade tolerance, and is replaced by other species when sunlight is reduced by 50 percent. If current trends continue, it would appear that this species will eventually be displaced from the Hiwassee River.

The Ocoee River population of fewer than 500 plants appears to be subject to detrimental impacts of artificially high flows during the growing season. Present water management practices on the



*Pityopsis ruthii* (Ruth's golden aster)

river result in frequent high flow conditions that naturally would occur only a few times per year. Although *periodic* high flows appear to be essential for maintaining suitable habitat, *regular* high flows may be exceeding the species' capability to withstand this normally beneficial action. Better water management techniques that fall more in line with the needs of *Pityopsis ruthii* are needed if the species is to survive in this location. The U.S. Forest Service and the TVA have jurisdiction over this plant's habitat or essential habitat components. Federal activities that could have an impact on the species include certain water flow management practices, timber harvesting, and recreational development.

Although there is no legislation in the State of Tennessee that provides protection for *Pityopsis ruthii*, the Committee for Tennessee Rare Plants recognizes the species as an endangered plant, as does the Tennessee Depart-



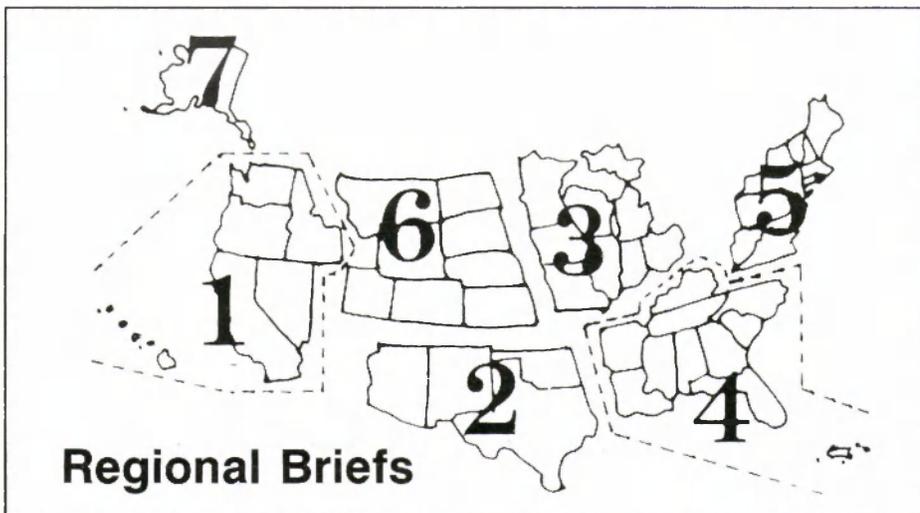
Photo by Andy Robinson

*Pityopsis ruthii* is being threatened by water quality degradation and water flow manipulations.

ment of Conservation. This recognition, however, is only a first step toward ensuring the survival of this species. With only two populations known to exist, Ruth's golden aster would definitely benefit from the protection of the Endangered Species Act if the proposal to list it as Endangered (F.R. 11/20/84) is made final.

Comments on this proposal are invited and should be sent by January 22, 1985, to Mr. Warren T. Parker, Field Supervisor, U.S. Fish and Wildlife Service, 100 Otis Street, Room 224, Asheville, North Carolina 28801.

continued on page 6



**Endangered Species Program regional staffers have reported the following activities for the month of November:**

**Region 1**—The management plan for the Little Kern golden trout (*Salmo*

*aguabonita whitei*) was recently revised and approved by the Fish and Wildlife Service (FWS), the California Department of Fish and Game, the Sequoia National Forest, and the Sequoia National Park. It set forth a program to recover this Threatened fish, and is avail-

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The ENDANGERED SPECIES TECHNICAL BULLETIN is published monthly by the U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

able for public distribution from the Regional Manager, Region 4, California Department of Fish and Game, 1234 E. Shaw Avenue, Fresno, California 93710.

Peregrine falcons (*Falco peregrinus*) have been released in Idaho for the third consecutive year. Of the 13 released at 3 hack sites, 12 fledged successfully and were still at their respective sites after one month.

An experiment was conducted recently to see if a one year-old peregrine would adopt a hack site where other falcons of the year had been released. The Peregrine Fund of Ft. Collins, Colorado, provided a male peregrine to Rich Howard, an FWS biologist. This bird initially had been released in 1983 at an Idaho hack site and retrapped after it was observed with a broken leg. The leg was subsequently repaired and the bird was held at Ft. Collins until February 1984. Howard then worked with the bird until it gained enough strength to fly and hunt for itself. It was released about 2 weeks after four falcons-of-the-year had been released at the hack site. During this hacking effort, another male falcon appeared at the hack site. With six peregrines then at the site, there was some concern that one older male would drive the other male away. At the end of August 1984, however, all six birds remained in the area.

The American Peregrine Falcon Recovery Team for the Pacific Coast recently reported that the number of active eyries observed during the 1984 breeding season was 64 in California and 4 in Washington. No active eyries were observed in Idaho, Nevada, or Oregon in 1984.

A 1984 census conducted by the California Department of Fish and Game revealed 277 pairs of light-footed clapper rails (*Rallus longirostris levipes*) using 19 marshes; 931 to 1,001 breeding pairs (42 percent fewer than 1983 levels) of California least terns (*Sterna antillarum browni*) that produced 510 to 527 fledglings (20 percent fewer than 1983 levels); 848 breeding pairs of California brown pelicans (*Pelecanus occidentalis*) in the Southern Bight that produced 584 fledglings with a productivity rate of 0.69; and 1,535 southern sea otters (*Enhydra lutris nereis*).

**Region 2**—Gerald Burton, an FWS Endangered Species Biologist, represented the Service at the 16th Annual Desert Fishes Council (DFC) meeting held recently in San Luis Potosi, Mexico. Numerous papers were presented on the status of Endangered and

continued on page 10

# Listing Proposed for Four Animals

## Two Flying Squirrels

Two subspecies of the northern flying squirrel (*Glaucomys sabrinus*), which survive on a few mountain tops in the southern Appalachian Mountains, have been proposed by the Service for listing as Endangered (F.R. 11/21/84). Both are evidently very rare, and are jeopardized by habitat loss, human disturbance, and competition with (as well as lethal parasites carried by) the far more common southern flying squirrel (*Glaucomys volans*).

So-called flying squirrels do not actually fly, but are capable of extensive and maneuverable gliding by means of a furred, sheet-like membrane along the sides of the body between the hind and fore limbs. Only two species occur in North America: the southern flying squirrel, found in extreme southern Canada, the eastern United States, Mexico, and Central America; and the northern flying squirrel, found mainly in Canada, Alaska, and the western and northern sections of the conterminous U.S. The northern species was not known to occur south of New York until 1936, when G. S. Miller, Jr., described the subspecies *G. s. fuscus*, based on specimens collected in the Appalachian Mountains of West Virginia. Later, in 1953, C. O. Handley, Jr., described another subspecies, *G. s. coloratus*, from specimens taken in the Appalachians of eastern Tennessee and western North Carolina. Subsequently, *G. s. fuscus* also was found in southwestern Virginia. It is these two subspecies of the northern flying squirrel that the Service has proposed for listing as Endangered.

Shortly after their discovery, it became apparent that the survival of the squirrels may be in jeopardy. A total of 30 specimens are known to have been collected from only eight localities, and recent efforts have failed to find these squirrels at most of the previous collection sites. Over a recent 40-month period, researcher D. W. Linzey placed 490 nest boxes at 35 sites in 5 States. The boxes were checked regularly and the occupants identified; unfortunately, however, only three individual northern flying squirrels were found during the course of study.

According to Peter D. Weigl of Wake Forest University, *G. s. fuscus* and *G. s. coloratus* occur primarily in the ecotone, or vegetation transition zone, between coniferous and northern hardwood forests. Both forest types provide food, and the hardwoods are needed for nesting sites. Since the northern flying squirrel is adapted to cold, boreal conditions, its range has probably been con-



Photo by Nancy Wells-Gosling

Two subspecies of the northern flying squirrel (above) are facing habitat loss and a competing squirrel species.

tracting since the last Ice Age. In the southern States, it now has only relic-tual distribution, and is restricted to isolated areas at high elevations, separated by vast stretches of unsuitable habitat. The northern flying squirrels and their habitat in these last occupied zones face increasing pressure from logging and development of such recreational facilities as ski resorts.

Forest regrowth after clearing, if any does occur, is usually composed of the deciduous trees favored by *G. volans*, the southern flying squirrel. This species, which is expanding into the range of *G. sabrinus*, is more aggressive, more active in territorial defense, and dominant in competition for nesting areas. When the two species meet, *G. volans* would be expected to force *G. sabrinus* into less favorable habitat. In addition to its competitive behavior, *G. volans* unwittingly employs a form of "biological warfare." It carries a parasite, the nematode *Strongyloides*, to which it apparently has developed natural immunity. When the two species come into contact and the parasite is transferred to *G. sabrinus*, which has no immunity, the results can be lethal.

### Available Conservation Measures

If the listing becomes a final rule, *G. s. fuscus* and *G. s. coloratus* will be classified as Endangered and will bene-

fit from the conservation measures authorized under the Endangered Species Act. Taking, possessing, and interstate or international trading in these animals without a permit will be prohibited. The Service also will develop a plan for their recovery to a secure status. Further, Federal grants may become available under Section 6 of the Act to Virginia, West Virginia, North Carolina, and Tennessee for their activities to conserve the squirrels.

The Service believes that a formal designation of Critical Habitat for the two *G. sabrinus* subspecies is not prudent at this time. Flying squirrels in general are popular as pets, and publishing precise Critical Habitat maps could expose the rare subspecies to increased disturbance and collecting. Moreover, the nest boxes placed during the recent status survey are still being used for study, and the squirrels occupying these boxes could easily be taken during their diurnal period of inactivity. Even without the Critical Habitat designation, however, the squirrels and their habitat would receive the full protection authorized under Section 7 of the Act from any adverse effects of Federal actions.

No specific Federal actions are known that may jeopardize the squirrels. Much of the region they inhabit is on national forest land. Therefore, certain activities of the U.S. Forest Service, continued on page 4

# Flying Squirrels

continued from page 3

such as timber sales, spraying of insecticides, or development of recreational facilities, may be subject to interagency consultation.

## Piping Plover

The piping plover (*Charadrius melodus*) has been proposed by the Service for protection under the Endangered Species Act (F.R. 11/8/84). This once very abundant bird is now uncommon over most of its range, due principally to disturbance and habitat loss, and it has disappeared from many historical nesting areas.

Piping plovers occupy their breeding grounds from late March to August. Nest sites are along Great Lakes and Atlantic Ocean beaches, bare areas on dredge and natural alluvial islands in the upper Missouri River system, and salt-encrusted, bare patches of sand, gravel, or pebbly mud on interior alkali lakes of the Dakotas, Montana, and Canadian prairie provinces. The nests themselves are shallow, scraped depressions, sometimes lined with small pebbles, and they usually contain four eggs. After breeding ends, the birds winter along the U.S. coast (from North Carolina to Florida and on to Mexico) and in the Bahamas and Greater Antilles.

Two of the piping plover's three breeding populations are proposed for listing as Threatened. One of them, the northern plains population, is scattered throughout Alberta to Manitoba in Canada and Montana to Nebraska in the U.S. Although some good nesting habitat remains at remote saline wetlands in

Comments on the listing proposal are welcome from all interested agencies, organizations, and individuals, and should be sent to the Director (OES), U.S. Fish and Wildlife Service, Washington, D.C. 20240 by January 22, 1985.

Saskatchewan and North Dakota, the extensive damming and channelization of rivers in the midwestern U.S. has eliminated open sandbar nesting habitat along hundreds of miles of rivers in Nebraska, Iowa, and the Dakotas. Much of the riverine habitat in the midwest was very similar to that used by the interior least tern (*Sterna antillarum athalassos*), which was proposed for listing as Endangered on May 29, 1984.

Within the breeding ranges of the Great Lakes and Atlantic Coast populations, the loss of sandy beach habitat due to recreational and commercial developments has been responsible for part of the decline in piping plover numbers. Some habitat that remains is unusable for breeding plovers because of disturbances by people and their pets. Human presence can disrupt feeding and incubation or can separate chicks from their parents. Foot traffic and dune buggies can directly crush eggs and chicks. Unleashed pets, feral dogs and cats, and certain wild animals (such as raccoons, skunks, and gulls) that tend to expand into developed areas sometimes prey on birds and their eggs, and can cause adults to abandon nesting areas.

There are estimated to be 900 piping plover breeding pairs along the Atlantic Coast of North America, about two-thirds of them in the U.S. This number is down sharply from historical levels, and the bird is absent from many former

nesting beaches. Without protection, the Atlantic Coast breeding population could continue to decline and become extirpated in many other areas; therefore, it has been proposed for listing as Threatened.

The situation facing the Great Lakes breeding population, where fewer than 20 breeding pairs are known to remain, is even more serious, and it was proposed for listing as Endangered. (It should be emphasized that the classifications of "Threatened" and "Endangered" under the Endangered Species Act reflect different degrees of vulnerability to extinction; unless special rules accompany a Threatened listing, the legal protection given Threatened and Endangered species is effectively the same.)

The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an organization of specialists from government agencies and private conservation organizations, cited an "alarming decline" in the piping plover throughout the Great Lakes region and the Maritime Provinces, and assigned to it the status of "threatened." In the U.S., Iowa, Illinois, Michigan, Minnesota, New Jersey, New York, Virginia, and Wisconsin already list the piping plover within their borders as threatened or endangered, and Massachusetts plans to add the plover to its threatened list. At a few nesting sites, human intrusion into nesting grounds is prohibited during the breeding season.

## Available Conservation Measures

The limited protection already giving the piping plover will be supplemented if the Federal listing proposal becomes final. Although the often ephemeral nature of the plover's nesting habitat and its widely scattered distribution preclude a formal designation of Critical Habitat for the species, all conservation measures authorized under Section 7 of the Endangered Species Act will apply. Federal agencies will be required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of the piping plover by directly affecting the birds or by degrading their habitat.

The U.S. Army Corps of Engineers and the Bureau of Reclamation are the two Federal agencies that might expect to be affected to some degree by Section 7 requirements. Routine management of existing water control systems and the development of some beaches is likely to affect plover habitat. Although no single authorized project known to the Service would imperil the species, the listing proposal points out that it is the loss of "one pair of plovers here and one or two there that pose, in



Photo by John Sidle

Piping plovers need undisturbed open habitat, such as this pebbly shore on a North Dakota wetland, for nesting.

the aggregate, the principal threat to the species' continued existence." Through the Section 7 consultation process, the Service will attempt to work with other Federal agencies to find ways of allowing project goals to be met while conserving the plover.

Taking, harassing, and trading in piping plovers are already prohibited under the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), and these protective measures would be reinforced under Section 9 of the Endangered Species Act. Other benefits of a listing include the requirement for the Service to develop a recovery plan for the species and the possibility of Federal aid for cooperating State conservation programs.

Comments on the piping plover listing proposal are invited from all interested agencies, organizations, and individuals, and should be sent to Region 3's Endangered Species Coordinator (address on page 2) by January 7, 1985.

## Desert-Dwelling Bird

A rare songbird, the Inyo brown towhee (*Pipilo fuscus eremophilus*), has been proposed by the Service for listing as Threatened (F.R. 11/23/84). Such protection for the subspecies, which occurs only at a few sites in the western part of the Mojave Desert, may be necessary to conserve its very limited riparian habitat.

The Inyo brown towhee is completely isolated geographically from other brown towhee subspecies, and has become adapted to the rigorous desert environment. Its entire available habitat consists of about 2,700 acres scattered within a circle approximately 11 miles in diameter in the Argus Mountains, Inyo County, California. Inyo brown towhees are restricted to the proximity of dense riparian scrub vegetation, particularly arroyo willow (*Salix lasiolepis*), at springs and along water courses. This habitat provides a source of food (insects and seeds) and cover for nesting, roosting, and escape from predators.

Desert riparian ecosystems are, by their very nature, fragile, and are vulnerable to damage from a number of human-related activities. Diversion of the water supply for livestock grazing, recreation, mining, or any other use could have a severe impact on riparian vegetation. Feral burros (*Equus asinus*) pose an additional threat; in fact, they have already damaged some of the riparian habitat by grazing and trampling. The towhee population is estimated to number fewer than 175 individuals. Because the remaining habitat is so restricted, further degradation could result in serious population losses.

The proposal to list the Inyo brown towhee as Threatened includes a designation of Critical Habitat for the 2,700

acres of available riparian scrub near springs on, or in the vicinity of, the China Lake Naval Weapons Center. All but a tiny portion of this land (about 31 acres) is administered by the U.S. Navy and the Bureau of Land Management (BLM). Both agencies control the use of lands under their jurisdiction. If the listing proposal is made final, these and all other Federal agencies will be required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of the Inyo brown towhee or adversely modify its Critical Habitat. Preliminary contacts with BLM and the Navy have not revealed any current or proposed programs that would adversely affect the habitat. Both agencies are planning a cooperative program to conserve riparian habitat on lands under their jurisdiction.

Other benefits to the Inyo brown towhee of a Threatened listing would include the increased recognition of its vulnerable status, possible Federal aid to cooperative State conservation programs, and restrictions on such activities as taking, harassing, or trading in the birds.

Comments on the listing proposal are welcome from all interested agencies, organizations, and individuals, and should be sent to the Regional Director (SE), Region 1 (address on page 2), by January 22, 1985.

## Two Animals and One Plant Added to List of Threatened and Endangered Species

### Amargosa vole

Twice since its discovery in 1900, the very rare Amargosa vole (*Microtus californicus scirpensis*) was feared to have become extinct. Fortunately, however, a small population found in the 1970s still survives in marshes near Tecopa, California. This small mammal has now been listed as Endangered (F.R. 11/15/84), an action that will give protection to both the vole and its habitat.

The Amargosa vole is a small, mostly gray, mouse-like rodent. It was first collected from a marsh near the town of Shoshone in southeastern Inyo County, California. Marsh vegetation, primarily bulrush (*Scirpus olneyi*), is particularly important to the vole since it provides cover for escape from predators and serves as a food source.

The vole occurs in an extremely arid part of California, and bulrush marsh habitat is restricted to the vicinities of springs or sections of the intermittent Amargosa River that have permanent flow. This limited amount of habitat is extremely vulnerable to modification



Photo by Denise LaBerteaux

Research on the Inyo brown towhee shows its vulnerability to degradation of desert riparian habitat.

and destruction from a variety of land uses. Marshland at the type locality near Shoshone, for example, was burned in the early 1900s and turned into a hog pasture, and the spring feeding it was diverted for construction of a swimming pool. Within the currently occupied range, development of the Tecopa Hot Springs area for mineral baths, together with the spread of mobile-home courts, has greatly modified or even eliminated a significant amount of suitable habitat. Burning and livestock grazing threaten the remaining marshlands.

In recognition of these threats, the Service published in the August 29, 1983, *Federal Register* a proposal to list the Amargosa vole as Endangered and to designate its Critical Habitat (see BULLETIN Vol. VIII No. 9). Most of the five comments received in response to the proposed rule, including those of two California State agencies, supported the proposed actions, and are summarized in the November 15, 1984, final rule.

continued on page 6

# Additions to List

continued from page 5

As an Endangered species, the Amargosa vole will receive the protection authorized under the Endangered Species Act. Taking, possessing, and interstate or international trafficking in this mammal are now prohibited, except under permit. These restrictions reinforce the actions already taken by the State of California under its own endangered species legislation, which prohibits direct taking but does not protect habitat. Since California has an endangered species cooperative agreement with the Service, it is possible that Federal funding through Section 6 of the Act could become available to the State for Amargosa vole research and recovery work. In addition, because it is now listed, the Service is responsible for developing a recovery plan for the vole.

Under Section 7 of the Endangered Species Act, Federal agencies must ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of the Amargosa vole or adversely modify its Critical Habitat. The marshes and associated areas designated as Critical Habitat are scattered within an overall zone of 4,520 acres in southeastern Inyo County (see final rule for map). Approximately 2,060 acres within this zone are administered by the Bureau of Land Management. An analysis of potential economic effects of a Critical Habitat designation revealed that there should be no significant impacts.

## Ozark cavefish

A true troglobitic species, the Ozark cavefish (*Amblyopsis rosae*) is blind and nearly devoid of pigment. After apparently disappearing from more than 40 percent of its historical range, this species has been listed by the Service as Threatened (11/1/84). The small (average total length 50 mm) fish currently is known to survive within 14 caves in 6 counties of the Springfield Plateau of southwest Missouri, northwest Arkansas, and northeast Oklahoma. Habitat alteration, primarily in the form of groundwater pollution, and overcollection appear to be the primary reasons for the decline.

Sinkholes in the soluble limestone bedrock of the Springfield Plateau drain surface waters that are vulnerable to chemical spills, landfill or dump discharges, or human and animal waste disposal. Another threat to the cavefish, that of overcollecting, is complicated by the species' confined habitat and inability to elude captors. There are several documented instances of collectors taking large numbers. As far as commercial exploitation, offers to purchase cavefish have appeared in various publications, and pet stores often feature blind cavefish as curiosities.

The Ozark cavefish was proposed by the Service for listing as a Threatened species on January 31, 1984 (see BULLETIN Vol. IX No. 2). Twenty-six comments on the proposal were received. Among those in support of the listing were the State conservation or wildlife agencies of Missouri, Arkansas, and Oklahoma. These comments are summarized in the November 1 final rule.

As a Threatened species, the Ozark cavefish will receive the same protection under the Endangered Species Act as the Amargosa vole. A formal designation of Critical Habitat for the cavefish was not published because pointing out the localities where it occurs could facilitate illegal collecting; however, its habitat will receive the full protection authorized under Section 7 of the Act. A recovery plan for the species will now be developed. In addition, because Arkansas and Missouri have Section 6 agreements with the Service, Federal aid to protection and recovery programs in these States may become available.

## *Gouania hillebrandii*

Due primarily to the effects of grazing and invasions of exotic plants and insects, *Gouania hillebrandii*, a species of shrub known only from a few sites on the Island of Maui in the Hawaiian Islands, is on the verge of extinction and has been listed as Endangered (F.R. 11/9/84). *Gouania hillebrandii* is one of the few remaining Hawaiian species in its genus.

This plant, which grows up to 6 feet in height, has slender branches covered with a rust or ash-colored fuzz and oval leaves that are dark green on top. The

flowers are small, fragrant, nearly white, and number 3-5 on each inflorescence.

Introduced feral and domestic livestock (cattle and goats) probably have been the greatest threat historically to the habitat of *Gouania hillebrandii*. These animals browse the plant and compact the surrounding soil, which promotes erosion and favors the spread of competing exotic plants. Accidentally introduced insects also are taking a toll. The insect herbivore *Pinnaspis strachani* (hibiscus snow scale) has weakened or killed many of the plants, and unknown chewing insects have caused extensive leaf damage in others.

The Service proposed listing *Gouania hillebrandii* as an Endangered species on September 7, 1983 (see BULLETIN Vol. VIII No. 10), and the proposal was subsequently endorsed by the Hawaii Department of Land and Natural Resources and the Maui County Council. Included in the listing was a designation of Critical Habitat for four small areas totalling about 112 acres in the Lahaina District (see final listing notice for map). Within the area are the dry, exposed ridge crests and north-facing slopes where the surviving populations occur. Only those sites have freedom from unrestricted grazing and the specific wind, soil, and drainage characteristics needed to discourage harmful plants and insects.

Regulations for listed plants differ under the Endangered Species Act from those for listed animals. Section 9(a)(2)(B) of the Act makes it illegal to remove and reduce to possession Endangered plants from areas under Federal jurisdiction; however all known individuals of *Gouania hillebrandii* occur on State lands. Fortunately, taking the plant is prohibited under Hawaii's own endangered species legislation. Interstate and international trade in this plant, though not anticipated, is prohibited under the Federal Act. The species will also receive Section 7 protection against potential harmful impacts of Federal actions. Further, since the State of Hawaii has an endangered species cooperative agreement for plants with the Service, there is now the possibility of Federal funding for State conservation programs.

# Seven Plants

continued from page 1

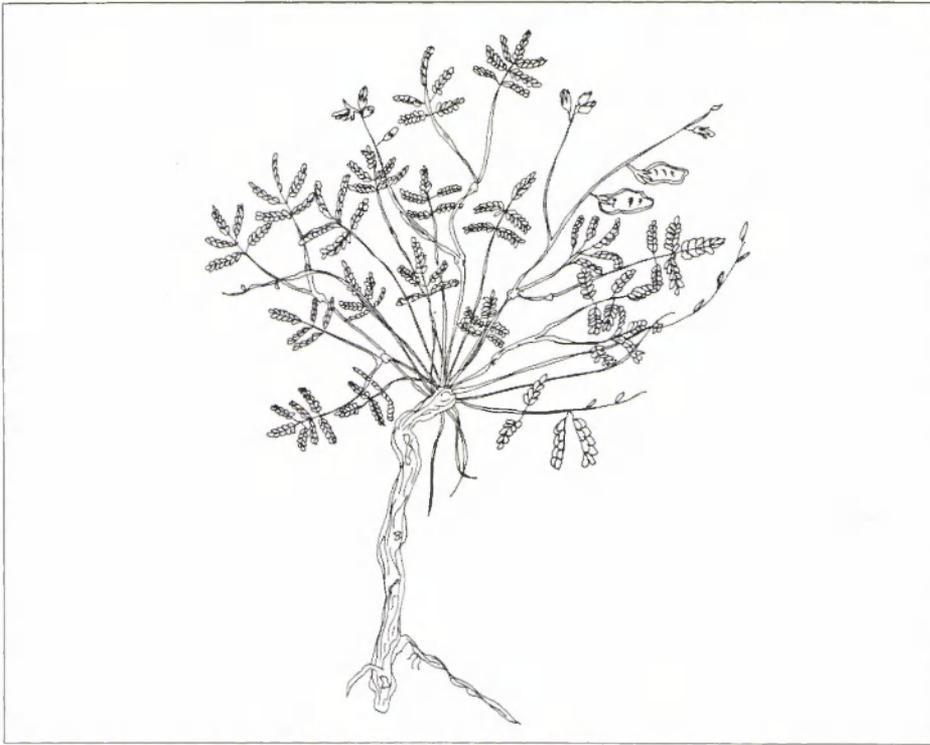
## *Hoffmanseggia tenella*

A perennial member of the bean family, *Hoffmanseggia tenella* has stems that grow from 8 to 15 centimeters tall and terminate into a 3 to 5-flowered inflorescence. The flowers are orange and usually begin blooming from early

March to June, then appear sporadically thereafter depending upon the rainfall. Commonly known as the slender rush-pea, this plant is historically known from three localities in Nueces and Kleberg Counties, Texas, but it now exists as only one population with three individual plants. This population is found in the Blackland Prairie Area of the Gulf Coastal Prairie, where it grows in the hard clay soil of creek banks and associated barren areas. Two of the individ-

ual plants are on private property, and the third is on an adjacent State highway right-of-way.

The most serious threat to *Hoffmanseggia tenella* is habitat alteration. Habitat for this species in the Texas Gulf Coastal Prairie has been severely limited because non-native grasses, such as King Ranch bluestem and bermuda grass, have escaped into uncultivated areas. As a result, native plants are being eliminated by these encroaching



Hoffmanseggia tenella (the slender rush-pea)

species. In addition, private and public landowners have altered the natural habitat to prevent soil erosion, improve rangeland, and control prairie fires. These practices have destroyed the natural characteristics of the Texas Gulf Coast Prairie and, in turn, greatly disturbed the slender rush-pea's habitat. With only one tiny population in existence, this species is extremely vulnerable and subject to extinction if there is further modification of its habitat.

Since there are currently no Federal or State laws protecting *Hoffmanseggia tenella*, the Service has proposed to list it as an Endangered species (F.R. 11/21/84). With only one known population trying to survive in the midst of rapidly diminishing habitat, the protection authorized by the Endangered Species Act may be the only way to rescue the slender rush-pea.

Comments on the proposal to list this species are invited and should be sent by January 22, 1985, to the Regional Director, Region 2 (address on page 2).

### Five Florida Plants

Five Florida pine rockland plants in Dade and Monroe Counties also have been proposed by the Service for listing under the Endangered Species Act (F.R. 11/7/84). Four of these plants, proposed as Endangered, have already been extirpated over most of their historic range and could easily become extinct in the near future. The fifth species, which is proposed as Threatened, has been largely extirpated throughout its former range and is now in danger at one or more of its five remaining sites.

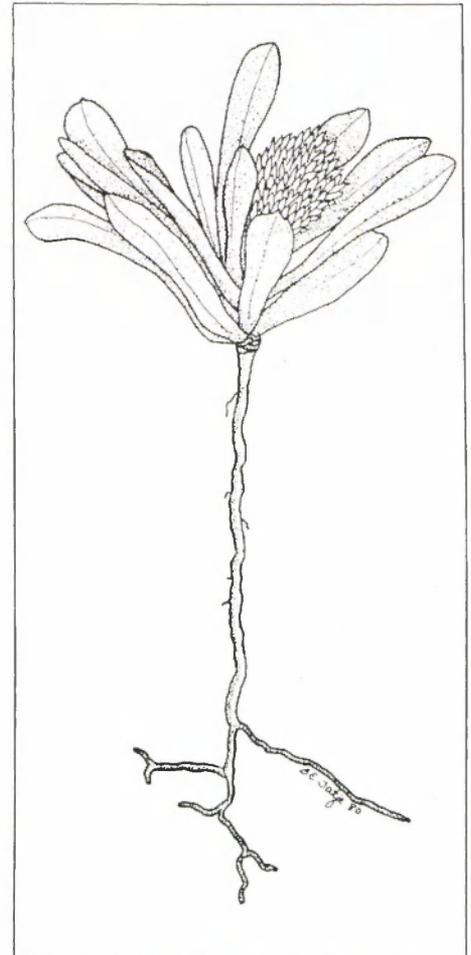
Formerly, pine rockland plants were widely distributed along the south Florida limestone ridge, an area about 65 miles long extending from southeastern Broward County to Long Pine Key in Everglades National Park. The ridge reaches 3 to 5 meters in elevation and provides a markedly different habitat for plants and animals than the marshes and wet prairies that dominate the surrounding areas. The substrate consists of porous limestone, known as Miami oolite, covered by poorly developed soils that are mainly a thin layer of sand. Erosion of the limestone results in frequent holes and jagged surface features, and many plants thriving in these pine rocklands are rooted in crevices in the limestone.

Residential and commercial development of the pinelands began early in the twentieth century and accelerated after 1930. A recent survey estimated that 98 percent of the Dade County pinelands outside of Everglades National Park have been destroyed. This vast reduction in habitat greatly contributed to the decline of the following four species, which now are proposed for listing as Endangered:

- ***Euphorbia deltoidea* ssp. *deltoidea*** (spurge) is a prostrate herbaceous plant with thin wiry stems, deltoid to ovate-shaped leaves, and unisexual flowers. This species formerly occurred throughout the pinelands but is now restricted to eight sites in the vicinity of Cutler Ridge and Perrine and two near Homestead.

- ***Galactia smallii*** (Small's milkpea) is a small vine with compound leaves and pinkish flowers. The former range of this species is poorly known, but it is currently known from only two sites near Homestead.
- ***Polygala smallii*** (tiny polygala) is an erect biennial herb with short branched or unbranched stems that end with clusters of small yellow-green flowers. This species formerly ranged from southeastern Broward County to the Cutler area in Dade County, but is now known to exist at only two sites in the Cutler area.
- ***Amorpha crenulata*** (crenulate lead-plant) formerly occurred throughout the pinelands in the Miami-Coral Gables area. This shrub grows up to 1.5 meters tall, has compound leaves that bear 25-33 leaflets, and bears flowers with a single petal only 6 millimeters long. At present, only two highly restricted sites within the Miami city limits are known to support this species.

***Euphorbia garberi*** (Garber's spurge), which is proposed for listing as a Threatened species, is a prostrate  
continued on page 10



*Polygala smallii* (tiny polygala)

## Special Report:

# Recent Advances in the California Condor Research and Recovery Program



Photo by Fred Sibley

by  
**Robin B. Goodloe**  
Endangered Species  
Research Branch  
Patuxent Wildlife Research  
Center

The California condor (*Gymnogyps californianus*), a New World vulture that weighs approximately nine kilograms and has an average wingspan of three meters, is one of the world's most endangered species. The condor may never have been abundant, although fossil records indicate that the species' historical distribution extended from the Pacific Northwest south to northern Mexico and as far east as Texas and possibly Florida.

California condor numbers and range have declined sharply since the early 1900s, despite more than 40 years of research and management efforts. Currently, the wild population in southern California is thought to number 17 to 19 free-flying birds, with an estimated net loss of about 2 individuals annually. The causes of the species' decline at various periods may include shooting, inadvertent and deliberate poisoning, collisions with powerlines, habitat destruction, and reduced productivity (possibly due to nest disturbance, environmental contaminants, a skewed sex ratio, or loss of genetic diversity). These factors, or factors yet unknown, have resulted in levels of mortality that far exceed the species' natural productivity.

During the past few years, research by U.S. Fish and Wildlife Service (FWS) and National Audubon Society (NAS) personnel, in cooperation with the California Department of Fish and Game (CDFG), U.S. Forest Service, U.S. Bureau of Land Management, the San Diego and Los Angeles Zoos, and other cooperating agencies, has focused on increasing condor productivity in the wild; efforts toward future rees-

establishment of self-sustaining populations through releases of captive-reared birds; identifying mortality factors; and locating essential condor habitat.

Studies at the Condor Research Center (CRC) in Ventura, California, are conducted by Project Leader Dr. J. Michael Scott and Dr. Noel F. R. Snyder, both of the FWS; John C. Ogden and other NAS biologists and technicians; and Steve Kimple of the CDFG; with general supervision by Dr. H. Randolph Perry, Jr., Alexander Sprunt, IV, and Ronald Jurek of, respectively, the FWS's Patuxent Wildlife Research Center (PWRC) in Maryland, the NAS, and the CDFG.

Research efforts by the cooperating agencies have led to major advances in the development of accurate censusing and radio-telemetry techniques, establishment of a captive flock for the breeding program, and identification of important condor nesting, roosting, and foraging areas.

### Condor Population Size

Estimates of population size in the early and mid-1900s were based on comparisons of flock sizes and simultaneous counts of birds from prominent lookouts in known areas of condor concentration. These estimates varied considerably and yielded little information on absolute numbers, population composition, or rates of decline. In 1982, however, Snyder, in cooperation with Dr. Eric Johnson of California Polytechnic State University at San Luis Obispo, refined a censusing technique that identifies individual condors in photographs taken throughout the species' range from mid-summer to early fall. Bird identification is based on unique molt patterns in the primary feathers, which do not normally overlap significantly in flight; known individuals, therefore can be counted, and the total population size and structure can be estimated with reliability.

In 1982, when the photographic censusing technique first was used extensively, 13 adult and 7 immature condors were identified in the wild. The following year, an additional adult condor not identified in the 1982 photographs was located, and estimates of total population size in 1982 were increased to include between 21 and 25 individuals. By late March 1984, however, only 15 adult and 2 ring-necked condors (birds 3 to 4 years of age) were known to exist in the wild. One condor, a dark-headed male that fledged in 1981, was taken into captivity in 1982, and three other condors are known or assumed to have died since the 1982 census.

### Research on Surrogates

Other aspects of the FWS/NAS condor research program, particularly telemetry of radioed birds, captive propagation, and release of captive-bred California condors, require "hands-on" activities with live animals; therefore, preliminary research on closely-related surrogate species was conducted to develop or define safe and effective methods for handling and manipulating large vultures.

Extensive surrogate studies on Andean condors (*Vultur gryphus*), a species from South America that then was not considered endangered, began at PWRC in 1966. These research efforts, currently under the direction of Dr. James W. Carpenter, have refined methods to increase condor egg production and annual breeding by removing eggs and chicks from wild nests at specified times. Other techniques have been devised to cross-foster eggs and chicks between pairs, stimulate breeding in previously inactive pairs, and rear chicks by hand. In addition, the surrogate research has allowed preliminary evaluation of capture, marking, banding, and telemetry techniques for large vultures, and provided information on condor husbandry and biology.

Dr. Stanley Temple and Michael Wallace of the University of Wisconsin conducted additional research on Andean condors in Peru from 1979 to 1982 to develop techniques to capture and handle cathartid vultures, release captive-reared condors (which were provided by PWRC, the Bronx Zoo, and other facilities), and monitor survival and movements of the released birds through radio-telemetry. Temple and Wallace's data were supplemented by studies on trapping and handling of lappet-faced vultures (*Torgos tracheliotus*) in Africa and turkey vultures (*Cathartes aura*) in California. In addition, research on surrogate species by personnel at the San Diego Zoo led to refinement of white blood cell chromosome analyses to sex California condors, which, unlike Andean condors, show no sexual dimorphism.

### Radio-telemetry

Research on surrogate species enabled the FWS and NAS to initiate a telemetry program for the California condor during the past 2 years. In late 1982, four free-flying California condors were captured with cannon nets at baited trap sites in the condor's foraging range. The first, a ring-necked male, was trapped in mid-October, equipped with patagial tags and solar-powered radio transmitters, and released two days after capture. Two adult condors were trapped a month later and identified through feather patterns as the only pair to fledge a chick in 1982. The male was tagged and fitted with one solar-powered radio and a second solar radio

with a lithium battery attachment before release; the female, however, was released without marking. The fourth bird, a dark-headed male that was underweight when trapped in early December, lost weight steadily while being held for sex identification, and ultimately was retained at the Los Angeles Zoo to add genetic diversity to the captive flock. An additional seven birds (including the mate of the radioed adult male, two males, and a female from three other pairs, an unmated adult male, and two immature ring-necked birds) were trapped, radioed, and released in October, November, and December 1984.

The movements of the radioed condors have been monitored since the birds' releases through the combined efforts of mobile ground crews, an aerial tracking team, and, most recently, an automatic tracking tower system. Only one radioed bird, the immature condor trapped in 1982, has died since the telemetry program began; the bird's functional radio greatly assisted in recovery of the carcass for immediate necropsy and determination of death. The seven other radioed birds appear healthy, and their transmitters have caused no noticeable behavioral changes.

The two birds radioed in 1982 have provided extensive data on condor ecology, behavior, habitat use, and limiting factors that, in combination with data collected in the future, will allow for more effective management of the condor population and reduction of major mortality factors. Both radioed birds fed approximately two to three times per week, generally on the carcasses of cattle (calves), deer, and sheep; after-

birth from calving; and deer or wild pig gut piles. The birds were observed soaring, roosting, and feeding with other condors, and their interactions with golden eagles, turkey vultures, and other species at carcasses were documented. Telemetry enabled intermittent observation of the relationships between the radioed adult male, his mate, and their 1982 fledgling. It also made possible observation of the relatively rapid change in the immature radioed male's head coloration from ring-necked in fall 1982 to fully orange-pink color by fall 1983.

Documentation of the seasonal patterns of land use by condors has identified foraging and roosting habitat that should be protected from development or other changes in land use practices, and has located suitable sites for future releases of captive-reared condors. Radioed birds exhibited seasonal use of several foraging areas, feeding extensively, at different times of the year, on the Carrizo Plains in San Luis Obispo County, on the Hudson and Snedden Ranches in southern Kern County, and in the upper Santa Ynez Valley. Roosts used by the radioed birds were located near the foraging grounds or in Santa Barbara County. In addition, the immature male made extended trips into northern Kern County near Glennville and into the foothills of central Tulare County southeast of Lake Kaweah where other immature condors also were observed. These northern areas were not known to support a number of condors during the winter; however, the Kern County area apparently was used as a primary winter foraging area by most of the immature condors in the wild population.

### Mortality Factors

The immature male radioed in 1982 was found dead in the Blue Ridge roosting area of Tulare County in March 1984. Rapid recovery of the carcass shortly after death was possible only because of the bird's functional transmitter and the skill of tracking crew members Larry Riopelle and Jesse Grantham of the NAS. Death was found to be due to chronic lead poisoning. The bird had elevated concentrations of lead in the blood and body tissues, and a misshapen piece of lead that was part of a copper-coated lead bullet was found in the gizzard.

A second fresh condor carcass, identified as the yearling that fledged from the nest in Santa Barbara County in September 1982, was found on the boundary of the Los Padres National Forest in November 1983. The bird, which necropsy revealed was a female, had been independent of its parents

continued on page 10



Photo by Glen Smart

Research on the closely-related Andean Condor has allowed development of techniques used in the California condor and recovery program.

## Condor

continued from page 9

(the radioed adult male and its mate) since late March 1983 and was flying and foraging without apparent difficulty. Tissue samples contained no strychnine or Compound 1080, and only low levels of various metals and organochlorines. However, fluorescent particles similar or identical to the tracerite added to M-44 cyanide capsules used for coyote control were present in the condor's oral cavity, and tissues contained cyanide levels higher than those in the tissues of the condor that died of lead poisoning.

### Nest Observations

FWS/NAS condor research includes observation of the species' reproductive behavior to determine breeding chronology and removal of eggs and chicks from wild nests to increase productivity. Four active condor pairs were known to exist in the wild when intensive nest observations began in 1980. Two additional pairs were located in late 1980 and May 1983, and a seventh pair that previously had been observed only in photographs was found nesting in a tree cavity by Forest Service personnel in March 1984. This represents only the second instance of tree cavity nesting documented for California condors.

Two of the pairs located in 1980 either lost a member or separated between 1982 and 1983. Both pairs experienced difficulties copulating and failed to produce eggs during the observation period. Observations of the nesting activities of the three other condor pairs known to be reproductively active from 1980 to 1982 proved that California condors often produce replacement eggs if earlier clutches are lost, and that they can breed in the year following successful fledging of a chick. In the latter case, however, eggs produced the second year generally are laid late in the breeding season and only in years after early fledging of young. These observations have encouraged condor researchers to selectively remove first-clutch eggs and, when warranted, second clutch eggs and pre-flight nestlings from wild nests to stimulate production.

— end of part one —

**Next month's BULLETIN will conclude this special report on current efforts to conserve the California condor. Advances in increasing condor production and building a captive-breeding flock will be summarized.**

## Seven Plants

continued from page 7

herb with hairy stems, ovate leaves, and inconspicuous flowers. It is found in transitional areas between hammocks and rock pinelands, and on beach ridges in saline coastal areas. This species formerly occurred from the Miami area to the lower Florida Keys. The only known remaining populations occur at four sites in Everglades National Park (Dade County) and one site on Big Pine Key (Monroe County). Habitat destruction or modification threatening *Euphorbia garberi* has been caused by residential and commercial development, increased competition and shading-out by more aggressive plant species, and storms or hurricanes.

Two of these five Florida rockland plants, *Euphorbia deltoidea* ssp. *deltoidea* and *Euphorbia garberi*, could be affected by Federal activities. The former occurs on or near lands under the jurisdiction of the U.S. Army, Navy, and Coast Guard. Any future activities undertaken by these agencies involving modification or removal of pineland habitat in Dade County could have a detrimental effect on this vulnerable plant. *Euphorbia garberi* occurs in Everglades National Park where park management includes prescribed burning of pinelands in areas where the species is located. This habitat management technique is aimed at maintaining pinelands by preventing vegetational succession to hardwoods, and current burning schedules should benefit the species. No monitoring of *E. garberi* is currently being done in the park, but listing this species will focus increased attention on its status.

Comments on this proposal are welcome and should be sent to the Endangered Species Field Station, U.S. Fish and Wildlife Service, 2747 Art Museum Drive, Jacksonville, Florida 32207, by January 7, 1985.

### Critical Habitat

Critical Habitat is not being designated for any of these seven plants at

## Regional Briefs

continued from page 2

Threatened fish species in both the United States and Mexico.

\* \* \*

On October 14, a sick whooping crane (*Grus americana*) was observed by Dr. Rod Drewien on the Bosque del Apache National Wildlife Refuge (NWR). The bird did not feed for 2 weeks and FWS personnel decided to capture it on November 28. After its capture, a veterinarian's examination yielded a preliminary diagnosis of a

this time. A listing alone highlights the rarity of a species and, along with the required publication of detailed location maps that are part of such a designation, the plants would become vulnerable to taking by collectors and to vandalism. The Federal agencies (U.S. Forest Service; TVA; U.S. Army, Navy, and Coast Guard; and the National Park Service) involved in managing the habitat of some of these species have been informed of their locations and are aware of the importance of protecting them.

### Effects of the Listings if Approved

If these proposals are made final, all seven plants will receive the protection authorized by the Endangered Species Act of 1973, as amended. Conservation measures provided to species listed as Endangered and Threatened under the Act include recognition of their precarious status, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Under Section 7 of the Act, Federal agencies would be required to consult with the Fish and Wildlife Service to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the survival of the listed species by directly affecting them or by degrading their habitats.

In addition, interstate and international trafficking in these plants without a permit will be prohibited, with certain exceptions, if they are listed. For the species proposed as Threatened, properly documented seeds of cultivated specimens are exempt from this prohibition. Section 9 of the Act makes it unlawful to remove and reduce to possession Endangered plants from lands under Federal jurisdiction, and this protection will be extended to Threatened plants once implementing regulations are completed. The species that occur on lands under Federal jurisdiction that are part of these proposals are *Pityopsis ruthii*, *Euphorbia deltoidea* ssp. *deltoidea*, and *Euphorbia garberi*.

bacterial infection in the ears and air sacs. The infection has now been diagnosed as a form of fowl cholera. Some acute strains of cholera are responsible for large die-offs of waterfowl, but this more chronic form offers good opportunity for recovery. The crane is now undergoing treatment at the Rio Grande Zoo in Albuquerque, New Mexico, and appears to be responding well. Plans are to release the bird when it recovers.

An injured whooping crane was captured near Linton, North Dakota, in early November by Dr. Drewien and personnel from the FWS regional office in Denver, Colorado, and the North Da-

kota State Game and Fish Department. The bird was transported to the National Zoo in Washington, D.C., for treatment of a compound fracture in the mid-section of its left wing, an injury that may have occurred from a collision with some object. The crane is recovering satisfactorily at the Patuxent Wildlife Research Center in Laurel, Maryland, but veterinarians believe it is unlikely that the injured bones will heal sufficiently to permit a safe release of the bird back into the wild.

As of late November, the whooping crane population at Aransas NWR in Texas totalled 81 birds, including 14 young. In mid-November, a dead whooping crane was recovered on the refuge. The cause of death may have been an avian predator, possibly a great horned owl. An aerial survey on November 28 of the other wild whooping crane population, the Grays Lake NWR/Bosque del Apache NWR flock, located a minimum of 29 whooping cranes in New Mexico, 13 of which were on Bosque del Apache NWR, and several were believed to be still in Colorado.

Jack B. Woody, FWS National Sea Turtle Coordinator, went to Cancun, Mexico, in early November to participate in the 9th Annual MEXUS-Gulf research meeting to discuss current and future plans for management and conservation of international fishery resources in the Gulf of Mexico. The interagency/international Kemp's Ridley sea turtle (*Lepidochelys kempii*) project is a major activity of MEXUS-Gulf.

**Region 3**—A very successful freshwater mussel workshop was recently organized by the Michigan Nature Conservancy and directed by Dr. David Stansbery of Ohio State University. Attendees included biologists from the Michigan Department of Natural Resources and other Michigan and Federal agencies. Special emphasis was placed on mussel identification, survey methods, conservation strategies, and survey needs. Species of both State and Federal concern were discussed, as well as potential additions to the Federal candidate species list. The numerous non-malacologists present were noticeably interested in the discussions, and arrangements were made to provide follow-up field training in survey techniques. It is anticipated that distribution and status data will increase as a result of these sessions.

Preliminary bald eagle (*Haliaeetus leucocephalus*) production counts in the Region 3 States indicate that a greater number of eagles attempted to nest this year, but also that the number of young produced declined slightly. Active nests

in 1983 totalled 546 with 681 young produced. In 1984, there were 599 nests, but the number of young produced was 657. In Minnesota, the number of active nests was the highest recorded since the counts began in 1973.

**Region 4**—A team of biologists with the Service and the Alabama Department of Conservation and Natural Resources recently made an unprecedented effort to save Perdido Key beach mice (*Peromyscus polionotus trissyllepsis*) living on a 4-acre, privately owned beach area of Perdido Key in Baldwin County, Alabama. The property is soon to be bulldozed for condominium development. Between October 15 and October 24, the team set over 600 live traps nightly among the sea oats on primary sand dunes in an effort to safely remove the mice before the bulldozers arrived. Despite the team's efforts, totalling over 4000 "trap-nights," only three beach mice (two young females and one young male) were trapped; 25 cotton rats and two house mice also were taken but released. The beach mice were taken to the University of Mississippi's Rodent Lab where they are being kept pending a decision by the Service on whether the animals should be released into a safe habitat in the wild or kept at the lab for breeding purposes. During its stay at the lab, one of the young females gave birth to two young that unfortunately died several days later.

The Perdido Key beach mouse was proposed for listing as Endangered on June 7, 1984. It is known to occur only on the Alabama end of Perdido Key, where no more than 26 are thought to survive.

The effort to recover the Florida panther (*Felis concolor coryi*) suffered a setback recently. On November 2, a young adult male was struck by a vehicle on the Tamiami Trail, which runs between Naples and Miami. The panther suffered two broken hind legs and one broken hind foot, and was taken to the School of Veterinary Medicine at the University of Florida in Gainesville where it will recuperate for about 8 weeks. Current plans are to release the animal with a radio-collar in the area where it was found. An interesting note is that the highway and habitat conditions on this stretch of the Tamiami Trail are similar to those on State Road 29, just east of Naples, where several other panthers have been hit by automobiles. There are plans to correct some of these problems on State Road 29 to help eliminate similar highway fatalities.

On October 20, the opening day of muzzle-loader hunting season, a female panther was shot and killed in the Corbett Wildlife Management Area of

Palm Beach County by a hunter in a tree stand. The individual was later arrested by the Florida Game and Fresh Water Fish Commission.

Populations of *Dicerandra immaculata* (Lakela's mint) continue to decline due to commercial and residential development. *Dicerandra immaculata* occurs only at a few sites in Indian River and St. Lucie Counties, Florida. A private research organization has expressed an interest in working with The Nature Conservancy, the FWS, and The Florida Native Plant Society to conserve Lakela's mint. Personnel from the Service's Jacksonville, Florida, Endangered Species Field Station will be working with the research organization's land manager. This species was proposed for listing on July 23, 1984.

The single known locality for *Clematis socialis* was recently visited by the FWS botanist in the Jackson, Mississippi, Endangered Species Field Office. This recent addition to the candidate plant list is represented by only a few known colonies located on and adjacent to a roadside right-of-way in northeast Alabama. The population has previously been affected by mechanical/herbicide use in routine roadside maintenance. Additional threats to the species include the encroachment of residential development on contiguous lands, and its extreme vulnerability due to its small population size and restricted range. A status review will be undertaken to determine if a listing proposal is warranted.

**Region 6**—The peregrine falcon recovery program continues to move forward. More peregrine falcons were hatched and raised last spring and summer than ever before. The Peregrine Fund, Inc., hatched 134 peregrines at Fort Collins, Colorado, and successfully raised 131 birds. Of those 131 birds, 120 were released into the Rocky Mountains. Many returning peregrines have been reported, and some released birds produced the first known wild young for many years in Montana and Wyoming.

The Interagency Grizzly Bear Committee (IGBC) met in Denver on October 31 and November 1, 1984, to discuss the following topics: ongoing and proposed research activities; reports from the various committee chairmen; a review of the 1984 bear sighting data, mortalities, and management actions; the need for future revision of the recovery plan; a review of the report on this year's human fatality in Yellowstone National Park; and the grizzly bear habitat symposium being proposed by the For-

continued on page 12

# Regional Briefs

continued from page 11

est Service. An update on the interagency law enforcement effort and a demonstration of a computer modeling program were also presented to the IGBC. The model is intended to determine the cumulative effects associated with changes in habitat and management for free-ranging grizzly bears.

More grizzly sightings were reported in the Yellowstone National Park area during 1984 than in any of the past 10 years (over 1,236 sightings of a population believed to number fewer than 250 bears), but biologists agree that the number of bear-human encounters occurring there this year has not been unusual.

News media interest in the grizzly has greatly intensified in recent years, and has made bear-human encounters much more visible. Biologists also attribute grizzly sightings to the fact that bears have moved into different areas this year due to a scarcity of such natural food sources as white bark pine nuts and berries. More grizzly sightings have also been noted this year in British Columbia, north of Glacier National Park, than in the past 30 years, and more than 30 grizzlies were killed this year in that province.

Increased interagency law enforcement seems to be paying off in the Yellowstone ecosystem. To date, no case of illegal take of a grizzly bear is known for 1983 or 1984 within the ecosystem, although two grizzly deaths remain under investigation. The IGBC hopes soon to see similar intensive patrolling efforts in the northern ecosystem in Montana.

The IGBC also received verbal report updates on several ongoing research

## BOX SCORE OF LISTINGS/RECOVERY PLANS

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	19	19	233	4	0	22	297	21
Birds	59	13	144	3	1	0	220	53
Reptiles	8	6	60	8	4	13	99	16
Amphibians	5	0	8	3	0	0	16	6
Fishes	29	4	11	14	3	0	62	36
Snails	3	0	1	5	0	0	9	7
Clams	22	0	2	0	0	0	24	14
Crustaceans	3	0	0	1	0	0	4	1
Insects	8	0	0	4	0	0	12	9
Plants	66	5	1	9	2	2	85	33
TOTAL	223	47	460	51	10	37	828	196**

\* Separate populations of a species, listed both as Endangered and Threatened, are tallied twice. Species which are thus accounted for are the gray wolf, bald eagle, American alligator, green sea turtle, Olive ridley sea turtle, and leopard.

\*\* 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: 164

Number of species currently proposed for listing: 32 animals  
37 plants

Number of Species with Critical Habitats determined: 66

Number of Cooperative Agreements signed with States: 41 fish & wildlife  
14 plants

November 30, 1984

projects. One such study has indicated that nonmotorized recreation does have a significant effect on the movement of grizzly bears. Results of another study show that temporary baiting of grizzly bears away from problem areas is not a panacea and may actually create more problems. Because of the grizzly's apparently long memory, it is probable that bears will return to the previously baited area the following year in their search for food.

Persons with any questions or a need for additional information on the grizzly bear protection effort are invited to con-

tact Dave Fleming (FTS 776-7531 or commercial 303/236-7531) in the Region 6 office.

**Region 7**—An American peregrine falcon banded as a fledgling last summer on the Porcupine River was recaptured in October at Back Bay NWR in Virginia. Of 1,089 fledglings banded in Alaska since 1979, 60 have been recovered (34 during migration and 26 on the Alaska nesting areas). This is the first recovery of an Alaskan-banded American peregrine falcon east of the Mississippi River.

December 1984

Vol. IX No. 12

# ENDANGERED SPECIES

## Technical Bulletin

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

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