

# ENDANGERED SPECIES

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

## Protection Sought for Four Vulnerable Plants

Four species of plants were proposed by the Fish and Wildlife Service (FWS) recently for listing as Endangered. All four have experienced declines in their ranges and numbers, primarily as a result of human-related habitat loss. If the proposals become final, these plants and their habitats will receive the protection authorized under the Endangered Species Act.

### *Iliamna corei*

This perennial plant gets its common name, Peter's Mountain mallow, from the only site at which it is found. The single population occurs on private land near the summit of Peter's Mountain in western Virginia (Giles County). When Dr. Earl Core discovered the species in 1927, there were about 50 plants growing vigorously in the soil-filled pockets of an exposed sandstone outcrop. They received full sunlight and produced "an abundant supply of seeds." In July 1984, however, observers counted only 5 plants (consisting of 55 stems) at the site.

The encroachment of competing vegetation and the subsequent reduction in direct sunlight reaching *I. corei* appear to be the main reasons for the population's reduced numbers and its decline in reproductive vigor. Although growth of the for-

est canopy has been a factor, the primary threat is competition from an introduced herbaceous species, the Canadian leafcup (*Polymnia canadensis*), which now dominates the site. How the leafcup became established there is open to speculation, but its spread may have been expedited by habitat disturbances associated with the completion of a nearby power transmission line or the construction of a hiking trail. This trail, now abandoned, was built through the *I. corei* colony and destroyed a number of plants directly. Scientific collecting also has been a problem for *I. corei*, as many botanists have visited the site since its discovery in 1927 to collect herbarium specimens. Some individuals and seeds of this attractive plant also have been taken for planting in home gardens. Any further collecting could be extremely detrimental. For this reason, the FWS did not propose designating Critical Habitat for this species, an action that would pinpoint the site by the required publication of maps and detailed geographical information; nevertheless, if it is listed, the plant will receive habitat protection.

There has been debate among botanists as to the taxonomic distinction be-

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Photo by Steve Croy

*Iliamna corei* (Peter's Mountain mallow) is a perennial growing 20–36 inches (0.5–0.9 meters) tall with large flowers that are rose or light pink in color.

## Giant Kangaroo Rat Proposed for Addition to Endangered Species List



Photo by S.E. Braun

giant kangaroo rat (*Dipodomys ingens*)

Kangaroo rats of the genus *Dipodomys* are small mammals adapted for swift travel by hopping on their elongated hind legs. Several taxa are listed as Endangered, and the Fish and Wildlife Service (FWS) has proposed listing another, *D. ingens*, the giant kangaroo rat (F.R. 8/13/85). Widespread modification of its south-central California habitat has eliminated this species from 94 percent of its former range; the remaining habitat also is vulnerable.

The giant kangaroo rat's preferred habitat consists of native dry grasslands with well-drained, sandy-loam soils suitable for digging burrows. Historically, this rodent was distributed over approximately 2,000 square miles (527,600 hectares) from southern Merced County, through the San

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## Regional Briefs

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

**Region 1**—The Sacramento Endangered Species Office (SESO) staff met in

July with representatives of Lone Star Industries and Larry Seaman Associates to explore the procedures and time frames required to prepare a Habitat Conservation Plan (HCP) in conjunction with an application for an Endangered Species Act

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(ESA) Section 10(a) permit. Recent surveys of sand parkland habitats in Santa Cruz County have documented the presence of remnant colonies of the Endangered Smith's blue butterfly (*Euphilotes enoptes smithii*) at Lone Star Industries' Olympia Quarry and a few adjacent properties. Lone Star's representatives indicated after the July 24 meeting that they plan to proceed with the development of a HCP. The SESO staff is contacting local government officials and all other property owners in the vicinity with known or potential habitat to encourage their participation in the development of such a plan.

Four bald eagle (*Haliaeetus leucocephalus*) nestlings were released on Catalina Island this summer, bringing the total number of birds released over the last 6 years to 24. At least 7 of the 20 birds released prior to 1985 still remain on the island. There have been seven confirmed mortalities; two birds were shot, one was electrocuted, and four died of unknown causes. One pair attempted to nest for the second year in a row, but laid no eggs.

The SESO staff met with consultants representing the Mayhews Landing Association, a development firm that has applied for a U.S. Army Corps of Engineers (COE) permit to construct a residential housing/golf course complex in the City of Newark, California. The 125-acre project site encompasses about 35 acres of wetlands, most or all of which provide habitat for the Endangered salt marsh harvest mouse (*Reithrodontomys raviventris*). Recent trapping at the site yielded an unprecedented 41 harvest mice on a portion of the wetlands. Realizing the major implications of such a project, the developer has asked the COE to place its permit application in abeyance for 4 months to provide an opportunity to resolve endangered species problems.

The SESO staff also assisted FWS law enforcement personnel in stopping a developer from discing and plowing a wetland area supporting salt marsh harvest mice. The developer destroyed about 50 acres within a one-week period after notification by registered mail that the harvest mouse occurred on his property and that "farming" activities may represent a civil or criminal violation of the ESA. A local newspaper article, quoting a representative of the landowners, documented that commercial development of the property is planned in 2 to 3 years, thus discrediting the contention that discing, plowing, and leveling were legitimate agriculture practices in this case. The SESO staff convinced the Environmental Protection Agency (EPA) and the COE to intervene by requiring all disturbances on the property to cease until a permit is ob-

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# Emergency Protection for Loch Lomond Coyote-thistle

On August 1, 1985, the Fish and Wildlife Service (FWS) published a temporary emergency rule to protect the Loch Lomond coyote-thistle (*Eryngium constancei*) as an Endangered species. This plant, which is found only in a 7-acre (2.8-hectare) vernal lake in southern Lake County, California, is vulnerable to extinction due to potential dredging and filling of its seasonal wetland habitat. During the 240-day life of the emergency rule, the FWS will take steps to help ensure the long-term survival of *E. constancei*.

Despite its common name, the species is not a thistle but a perennial herb of the parsley family. The plant annually produces leafless flowering stalks growing up to 12 inches (30 centimeters) high from an overwintering rootstock. A dense "down" of minute hairs, unique to *E. constancei*, covers the stalks and the long, slender basal leaves.

Rain fills the vernal lake bed during winter, and *E. constancei* sprouts, blooms, and sets seed as the water recedes in the spring and summer to reveal a seasonal "meadow." The basin has unusual soil conditions which, together with its hydrological characteristics and surrounding topography, may account for the unique presence of *E. constancei* at the site. Among the other plant species growing in the vernal lake bed are two candidates for Federal listing under the Endangered Species Act, *Navarretia pauciflora* (few-flowered navarretia) and *N. plieantha* (many-flowered navarretia). The latter already is designated by the State of California as endangered, a classification the State also plans to apply to *E. constancei*.

The primary threat facing *E. constancei* is the dredge-and-fill operation proposed by an agent representing the owner of the vernal lake. Approximately 15 percent of the lake bed was dredged and filled in July 1984, which probably resulted in a corresponding reduction in the plant's population. Failure to secure the proper permits and approvals for this action resulted in a county-imposed fine, a halt in the work, and a court order to repair the damage. Nevertheless, the owner's agent has expressed a desire to complete the dredge-and-fill project for the remainder of the vernal lake. If that were to happen, *E. constancei* undoubtedly would become extinct.

The U.S. Army Corps of Engineers (COE) is responsible under Section 404 of the Federal Water Pollution Control Act (Clean Water Act), as amended, to regulate the discharge of dredged or fill material into the waters of the United States. Filling isolated wetlands, like the vernal lake, is authorized by a general nationwide COE permit as long as certain

conditions are met. One such condition is that the "discharge will not jeopardize a threatened or endangered species as identified under the Endangered Species Act." Because of the need to preserve the physical integrity of the lake, the FWS requested on April 3, 1985, that the COE assert individual permit authority over the vernal lake, as allowed under COE regulations. This would require the vernal lake owner's agent to apply for an individual COE permit for any dredge-and-fill work at the site. The COE deferred action on the FWS request until about the time that the emergency listing rule for the Loch

Lomond coyote-thistle was published, when it did assert individual permit authority.

Under Section 7 of the Endangered Species Act, all Federal agencies, including the COE, are required to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the survival of a listed species. Because the Loch Lomond coyote-thistle is now listed as Endangered, COE is required to consult with the FWS on any proposed action, such as permitting a dredge-and-fill operation, that may affect the species.

As required by the court settlement on the illegal 1984 dredge-and-fill work, the vernal lake owner's agent has repaired the physical damage to the lake bed. He also is required to reseed the disturbed land in native plants, including the coyote thistle. The Nature Conservancy is looking into purchasing the vernal lake in order to ensure the long-term protection of its unusual plant resources, and the California Department of Fish and Game also has expressed an interest in the site.



A view of habitat damage at Loch Lomond caused by an illegal dredge-and-fill operation.

## Reference Note

All Fish and Wildlife Service notices and proposed and final rules are published in the *Federal Register* in full detail. The parenthetical references given in the BULLETIN—for example: (F.R. 9/3/85)—identify the month, day, and year on which the relevant notice or rule appeared in the *Federal Register*.

## BULLETIN Available by Subscription

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# Savannas and Bogs of the Southeastern U.S.: Threatened Ecosystems

by Cary Norquist  
Jackson, Mississippi, Endangered  
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Savannas and bogs have long been noted for their unusual and diverse flora. These poorly-drained, fire-maintained communities occur in the Gulf and Atlantic Coastal Plain regions, from North Carolina south to Florida and east to Texas. Both are characterized by the prominence of herbaceous plants and the absence of a distinct shrub or tree layer.

(*Dionaea muscipula*). Other endemic plants include several species of *Xyris* (yellow-eyed grasses), *Eriocaulon* (pipe-worts), *Lachnocaulon* (bog buttons), *Polygala* (milkwort) *Rhynchospora* (beak-rushes), *Habenaria* (fringed orchis), *Calapogon* (grass-pinks), *Lachnanthes caroliniana* (redroot), *Dichromena latifolia* (white-topped sedge), *Lophiola americana* (golden-crest), and *Ctenium aromaticum* (tooth-ache grass).

According to reports by early explorers, savannas and bogs once covered vast

have been converted into farm ponds. The natural cycle of periodic fires has been disrupted by the practice of fire control, while various kinds of habitat alterations often restrict the spread of natural fires that still occur. As a result, many savannas and bogs have been lost through succession.

With the loss of these important ecosystems comes the possible extinction of many of their associated plants, a number of which are now under review by the Fish and Wildlife Service (FWS) to determine if they should be listed for protection under the Endangered Species Act. An example is *Lindera subcoriacea* (bog spice bush), a recently described deciduous shrub, and one of the three *Lindera* species in North America. This particular species occurs in openings of permanently wet, sphagnum, evergreen shrub bogs in the Gulf Coastal Plain of Mississippi and Louisiana and along wet, peaty drainages in the Atlantic Coastal Plain of North Carolina. The Mississippi Natural Heritage Program (MNHP), Mississippi Museum of Natural Science, is currently conducting a status survey of the bog spice bush in the Gulf Coastal Plain for the FWS.

Until recently, *L. subcoriacea* was believed to be endemic to the Gulf Coastal Plain of Mississippi and Louisiana; however, additional populations have been discovered in ecologically similar habitats by the North Carolina Natural Heritage Program (NCNHP) in the Sandhills Region of North Carolina. The MNHP staff has verified seven extant populations (approximately 150 plants) in the Gulf Coastal Plain. Several of these populations are declining and consist of only a few individuals. In North Carolina, popula-



Photo by E. LaVerne Smith

a savanna in the Green Swamp, North Carolina

The term savanna describes a relatively expansive, flat area with scattered trees and shrubs. Bogs are essentially treeless, generally occur further inland, and may occupy bowl-shaped depressions, small stream terraces, and, occasionally, hillsides. Savannas may become dry during seasons of low precipitation, while bogs usually remain water-logged throughout the year.

Without frequently occurring fires, savannas and bogs are invaded by fire-intolerant woody species that shade and eventually overshadow the heliophytic (sun-loving) plants that characterize these open areas. Soil conditions interact with fire to regulate plant succession. Low nutrient, acidic soils, coupled with a seasonally high water table, limit the establishment of woody species. With a complete absence of fire, these communities may succeed to a number of interrelated woody vegetation types, such as an evergreen shrub bog or a swamp forest.

Savannas and bogs are very diverse ecosystems and are habitat for many endemic species. They perhaps are best known for their many species of carnivorous plants, including pitcher plants (*Sarracenia* sp.), sundews (*Drosera* sp.), bladderworts (*Utricularia* sp.), butterworts (*Pinguicula* sp.), and the venus fly-trap

areas of the of the southeastern coastal plains; however, it is estimated that over 97 percent of these ecosystems no longer exist today. Many have been drained and converted to pine plantations or pastures, while others, particularly hillside bogs,



Prescribed burning is a management tool for reducing woody plant encroachment in savannas and bogs.

Photo by E. LaVerne Smith



Photo by K.L. Gordon

bog spice bush (*Lindera subcoriacea*)

tions are all within a 20-mile radius and total fewer than 150 plants. Woody encroachment due to fire suppression continues to dampen the species' vigor. Throughout the year, the MNHP and NCNHP will continue their search for additional populations, and will carry out an assessment of threats to the species.

*Lilium iridollae*, the panhandle lily, is a showy herb that inhabits bogs, savannas, borders of shrub bogs, and banks of

blackwater creeks in northwestern Florida and adjacent Alabama. Historically, it was known from 20 sites, but many have been destroyed through habitat modification, grazing, and overcollecting by wildflower enthusiasts. A 1980 status survey on this species resulted in an estimate that no more than 10 populations exist and that many consisted of only a few individuals. Since *Lilium iridollae* has such a limited number of known populations, the loss of any of its habitat could jeopardize the species' survival.

In central Alabama, there are a number of sandy-gravelly bogs that are habitat for the insectivorous Alabama canebrake pitcher plant (*Sarracenia rubra* ssp. *alabamensis*). This subspecies is endemic to three counties in central Alabama. Many of the original populations have been lost through woody succession, while other sites have been converted to pasture or row crops. Most of the populations adjacent to railroads have been extirpated by herbicide application. Collecting has also greatly contributed to the overall decline of this species and, in several cases, has been responsible for the loss of an entire population. Currently, the Alabama canebrake pitcher plant is known from approximately 12 sites. Only 3 of the populations are of significant size; the others are declining in vigor and are in need of management.

*Pinguicula planifolia* (Chapman's butterwort) and *P. ionantha* (violet-flowered butterwort) are two of the six southeastern species of *Pinguicula*. Both may occur in bogs, depressions in savannas, along margins of peaty ponds, and in shallow standing water. *P. planifolia* is found in this type of habitat throughout the coastal counties of Mississippi, Alabama, and Florida, while *P. ionantha*,

the rarest species in the genus, is restricted to a four-county area in the panhandle of Florida. As with all plants in these ecosystems, they are threatened by any activities that would make the habitat drier or less open.

These are only a few of the plants in the savannas and bogs of the Gulf Coastal Plain that are candidates for listing. Their unique ecosystems, which are of aesthetic as well as scientific value, continue to decline at a rapid rate. The Endangered Species Act recognizes the fact that the only way to conserve species is by conserving their habitat. In this case, however, conservation means more than simply protecting these areas from destruction. To maintain savannas and bogs, they must be frequently burned in accordance with accepted management practices. Further research will be needed to determine how best to apply fire as a tool to benefit each species.



Photo by Andy Robinson

violet-flowered butterwort (*Pinguicula ionantha*)

## Listing Proposal for Endemic Idaho Snail

A species of snail found only on two small hot springs and their immediate outflows in arid Owyhee County, southwestern Idaho, has been proposed by the Fish and Wildlife Service (FWS) for listing as Endangered (F.R. 8/21/85). The main threat to its survival is the drastic and continuing reduction in groundwater that feeds the springs upon which the snail depends.

A formal scientific name and description for the snail has not yet been published; however, biologists have been studying its anatomy and have determined that it represents a previously unknown genus and species in the family Hydrobiidae. Adults of the species reach only about 5 millimeters (0.2 inch) in shell length. A common name for the species has been suggested, the Bruneau hot spring snail, after the general area in which it is found.

An essential part of the species' extremely restricted range is the flow from

springs in a vertical rock face, where the snails feed on surface algae. This rock face provided habitat for most of the snails until ground water mining reduced spring discharge rates. Flows at these springs now are at less than 10 percent of 1954 levels, and at times are even much lower than these reduced levels. Snails are becoming increasingly dependent on the outflow streams, which are vulnerable to periodic scouring by flash floods during heavy rains. The outflows occupied by the species total approximately 305 meters (1,000 feet) in one stream and 122 m (400 ft) in the other. Further lowering of the water table could eliminate these flows altogether and lead to the unique snail's extinction.

If the proposal to list the Bruneau hot spring snail becomes final, this small mollusk will receive the protection authorized under the Endangered Species Act. The major benefit would probably be the habitat conservation measures in Section 7 of

the Act, which requires Federal agencies to ensure that none of their activities are likely to jeopardize listed species. In this case, the Bureau of Land Management (BLM) administers the property containing the springs and their most immediate outflows. (Downstream habitat is privately owned.) Current BLM management is consistent with conservation of the snail, and the agency is not now issuing permits for land entry near the spring site. Future issuance of such permits, however, could be subject to Section 7 consultation with the FWS. This habitat protection will apply to the Bruneau hot spring snail, if it is listed, even though the possibility of vandalism or overcollecting made it imprudent to publicize the species' range with a proposed designation of Critical Habitat.

Comments on the listing proposal are welcome, and should be sent to the Regional Director, Region 1 (address on page 2), by October 21, 1985.

# Final Endangered Species Act Protection for Four Plants and Three Fishes

The following four plants and three fishes were added recently to the List of Endangered and Threatened Wildlife and Plants. They now receive the benefits of all protective measures authorized by the Endangered Species Act.

## ***Buxus vahlii***

*Buxus vahlii* (Vahl's boxwood) is a small tree or shrub that grows only in the semi-evergreen seasonal forests that occur on limestone in northern and northwestern Puerto Rico. With only 40 individuals of the species known to exist, Vahl's boxwood is vulnerable to extinction from potential habitat modification or destruction from limestone mining and urban development. This prompted the Fish and Wildlife Service (FWS) to publish a proposed rule to list *B. vahlii* as Endangered on July 13, 1984 (story in BULLETIN Vol. IX No. 8), and subsequently the final rule (F.R. 8/13/85).

Vahl's boxwood can be found only at two small, isolated locations—one on Commonwealth of Puerto Rico land in Punta Higüero (Rincon) and the other about 70 miles away on privately-owned land in Hato Tejas (Bayamon). The Rincon site is a possible area for the construction of a coal-fueled power plant by the Puerto Rico Electrical Power Authority and the Federal Rural Electrification Administration. Such a power plant would require a large storage area for coal and cinder, which could destroy up to 20 plants and destroy or modify their habitat. Air pollution from the power plant could also affect the species.

The Hato Tejas population of about 24 individuals is located in a group of "haystack" hills (limestone hills with a characteristic haystack shape) that is surrounded by a large shopping center, several commercial and industrial lots, and an old limestone quarry. The possibility exists for further development of the area, which could completely destroy the boxwood's habitat. Past mining activities have already destroyed more than half of this population since the 1950's.

## ***Gardenia brighamii***

In a final rule published in the *Federal Register* on August 21, 1985, the FWS listed an extremely rare plant, *Gardenia brighamii* (Hawaiian gardenia or *na'u*), as an Endangered species. *G. brighamii* is a distinctive tree reaching 20 to 30 feet (6 to 9 meters) in height with a spreading canopy of shiny dark-green leaves. Its white-to cream-colored flowers are very fragrant, and resemble those of the Tahitian gardenia (*G. taitensis*). This species once grew on five of the main Hawaiian Islands

where, at least on the island of Moloka'i, it was a fairly common component of the native dryland forests. Today, it occurs only on the islands of Lana'i (about six plants), Moloka'i (two plants) and O'ahu (one plant), and is believed to be extirpated on Hawai'i and Maui.

Grazing and browsing by domestic and feral animals, and the invasion of exotic shrubs, forbs, and grasses, are severely degrading the Hawaiian gardenia's habitat. Urban development, pineapple and sugar cane fields, and pastures have replaced most of the dryland forests in the Hawaiian Islands, leaving limited habitat available for *G. brighamii*. Potential development on or near the areas where the few remaining plants occur could destroy the rest.

The continuing threats to the few remaining *G. brighamii* individuals led the FWS to propose listing the species as Endangered on October 12, 1984 (see BULLETIN Vol. IX No. 11). A formal designation of Critical Habitat was part of the proposed rule, but, during the public comment period, the FWS received information indicating that the area proposed as Critical Habitat did not accurately reflect the species' habitat needs. After a thorough review of the data, the FWS now believes that a formal designation of Critical Habitat is not prudent; however, the species and its habitat will still receive protection under Section 7 of the Endangered Species Act.

## ***Primula maguirei***

A small perennial herb with conspicuous lavender-colored flowers, *Primula maguirei* (Maguire primrose) is found only in a limited area of Logan Canyon in Cache County, Utah, on land managed by the U.S. Forest Service. *P. maguirei* is typically found growing on northerly exposed damp ledges, crevices, and overhanging rocks along the canyon walls. Currently, there are nine known populations, one of which contains approximately 100 plants; the remainder each contain fewer than 30. Collecting and rock climbing threaten all nine populations, while some (including the largest and most vigorous population) are threatened also by potential highway construction.

Although it is not in immediate danger of extinction, the Maguire primrose is rare, restricted in range, and highly vulnerable to habitat modification. The species was proposed for listing as Threatened on April 13, 1984 (see BULLETIN Vol. IX No. 5). During the public comment period following the proposal, the only opposition to the listing was expressed by the Utah Cattleman's Association, which

stated its concern about the effects that a listed plant species could have on any future improvements of U.S. Highway 89, which passes through *P. maguirei* habitat in Logan Canyon. In the final listing rule (F.R. 8/21/85), the FWS recognized the concerns of this association. Through interagency consultation, ways usually can be found to meet project goals while conserving listed species. In this case, the Utah Department of Transportation has stated that there are no current plans for highway improvements in Logan Canyon other than routine maintenance, and that *P. maguirei* populations would be avoided in any future projects.

## ***Townsendia aprica***

*Townsendia aprica* (Last Chance townsendia), also known from Utah, is a herbaceous perennial less than one inch (2.5 centimeters) tall belonging to the aster family. Currently, there are 12 population sites scattered over an area about 30 miles (48 kilometers) across in eastern Sevier, western Emery, and north-central Wayne Counties. *T. aprica* occurs on silty soils of a formation subject to disturbance by coal mining and oil and gas drilling. Other threats to the species' survival include current and potential off-road vehicle use, cattle grazing and trampling, and highway construction.

Approximately 2,000 individuals are known to exist, most growing on land managed by the Bureau of Land Management. A few are found on private property, and a small population exists within Capitol Reef National Park. The first discovered population, containing about 400 plants, is in Sevier County's Last Chance Creek drainage, hence the species' common name. Most of the habitat under Federal ownership (about 80 percent) is under lease either for coal, oil, or gas. A cattle driveway and Utah Highway 72 traverse the habitat of the Last Chance Creek population.

A proposed rule to list *T. aprica* as Endangered was published in the May 29, 1984, *Federal Register* (see story in BULLETIN Vol. IX No. 6). This proposed classification was based upon the best information available at that time, which indicated that the species was found in only 3 disjunct populations with a total of 215 individual plants. However, during the 1984 field season, more accurate status information became available. After evaluating the threats and the new data, the FWS determined that the species is vulnerable but not in immediate danger of extinction, and that it should be listed as Threatened. The August 21, 1985, final rule reflects this more biologically appropriate classification.

## Available Conservation Measures

Among the conservation measures that are now available to each of these newly listed Endangered or Threatened plants are a requirement for the FWS to develop and implement plans for their recovery; possible Federal funding to States that have approved Endangered Plant Cooperative Agreements with the FWS; and protection from adverse effects of Federal activities. Under Section 7 of the Endangered Species Act, Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of listed species. The Federal agencies involved with these final listing rules (Federal Rural Electrification Administration, Bureau of Land Management, U.S. Forest Service, and National Park Service) are aware of their responsibilities to protect listed species, and must enter into consultation with the FWS if any of the plants might be affected by their activities. Section 7 provisions apply to all four plants even though a formal designation of Critical Habitat was not a part of any of the final rules.

Section 9 of the Act makes it unlawful to remove Endangered plants from lands under Federal jurisdiction, and this protection will also apply to Threatened plants once implementing regulations are completed. In addition, interstate/international trafficking in listed plants without a permit is prohibited, but for those listed as Threatened, properly documented seeds of cultivated specimens are exempt from this prohibition.

## Owens Tui Chub

According to the Desert Fishes Council, the status of the Owens tui chub (*Gila bicolor snyderi*) is the most precarious of any fish in the region of Death Valley, California. This small fish is known to survive in less than one percent of its original range.

Currently, viable populations of the Owens tui chub exist at two locations in the Owens Basin of Mono County: the headwater springs of Hot Creek and approximately 8 miles (13 km) of the Owens River below Long Valley Dam. It has been eliminated from most of its former range by habitat alteration, predation and competition from introduced fishes, and hybridization with a related but non-native subspecies of tui chub. These factors continue to jeopardize the survival of the few remaining taxonomically distinct Owens tui chubs. Accordingly, on March 23, 1984, the FWS proposed to list this fish as endangered and to designate Critical Habitat for the occupied sites (see BULLETIN Vol. IX No. 4). The final rule was published August 5, 1985.

Both current sites are within the Inyo National Forest boundary, but are owned

by the city of Los Angeles, which is the single largest consumer of Owens Basin water. The city's Department of Water and Power supported the listing, but questioned the need for designating Critical Habitat. In response, the FWS noted that the Critical Habitat designation may aid in the development of management plans, and that it is required by law for listed species except under certain circumstances. The final Critical Habitat designation includes a 50-foot (15-meter) riparian conservation zone along both sides of the river and surrounding the Hot Creek headwaters. Maps of these areas are available in the August 5 listing rule.

As part of a general recovery program, the California Department of Fish and Game, the FWS, and the Bureau of Land Management plan to continue earlier efforts to reintroduce Owens tui chubs into Fish Slough (also in Mono County), an area within the subspecies' historical range.

## Conasauga River Fishes

The amber darter (*Percina antesella*) and the Conasauga logperch (*Percina jenkinsi*) are known only from the upper Conasauga River basin in Georgia and Tennessee. Because of their restricted range and numbers, the survival of these fishes could be jeopardized if water development projects now being considered for the basin are implemented without considering the species' ecological requirements. Other factors that could degrade their habitat, such as water pollution from urban or agricultural runoff, pose additional threats. For these reasons, the FWS proposed on July 13, 1984, to list both species as Endangered and to designate their Critical Habitat (see BULLETIN Vol. IX No. 8). The final rule was published August 5, 1985.

Included in the 1984 listing proposal was a recommendation for classifying the trispot darter (*Etheostoma trisella*), which also occurs in the Conasauga River, as Endangered. Subsequently, however, two new populations of this species were discovered. Based on this new information, the trispot apparently still qualifies for a listing (as Threatened rather than Endangered), but the FWS is deferring a decision on listing for 6 months (until January 13, 1986), as authorized in Section 4(b)(6) of the Endangered Species Act. Additional surveys will be conducted in the meantime to clarify the trispot's biological status.

The final listing rule designates 33.5 miles (53 km) of the Conasauga River as Critical Habitat for the amber darter and 11 miles (17 km) for the Conasauga logperch; some of these areas overlap. (See maps in the August 5, 1985, *Federal Register*.) The U.S. Army Corps of Engineers (COE) is the only known Federal agency whose future activities might adversely modify the Critical Habitat. For

several reasons, the COE is evaluating alternatives for meeting the area's water supply needs. The FWS believes that, once these alternatives are fully considered, water development and habitat conservation can be compatible. Both agencies are discussing various approaches.

The protection given listed fish and other animals under the Endangered Species Act is like that extended plants, except for the wider prohibition on the "take" of animals without a permit.

## Hunting of Grizzly Bears is Reduced

The FWS has published an emergency rule modifying the special regulations that allow limited hunting of the Threatened grizzly bear (*Ursus arctos*) in northwestern Montana (F.R. 8/29/85). For 1985, grizzly hunting will cease once the number of human related bear mortalities in the area (outside of Glacier National Park) reaches 15, or once the number of female bears killed reaches 6. This is a reduction from the previous annual quota.

### Background

The grizzly bear historically occurred throughout western North America, from Alaska to central Mexico. Its populations in the conterminous U.S. are now restricted to northeastern Washington, northern and eastern Idaho, western Montana, and northwestern Wyoming. Fewer than 1,000 grizzlies are thought to survive in these areas. Most of these remaining bears occupy the Northern Continental Divide Ecosystem (NCDE) in northwestern Montana.

In the July 28, 1975, *Federal Register*, the FWS published a rule listing grizzly bears in the conterminous 48 States as Threatened. At the same time, special regulations were issued to allow for limited hunting of the grizzly in the Flathead National Forest, the Bob Marshall Wilderness Area, and the Mission Mountains Primitive Area (now the Mission Mountains Wilderness Area) of the NCDE in northwestern Montana. Such hunting was to cease once the number of grizzlies killed throughout northwestern Montana during any one year, from all causes, reached 25.

The Montana Department of Fish, Wildlife and Parks has estimated the 1985 grizzly population in the NCDE to contain 580 bears, of which 387 are found outside of Glacier National Park; however, the grizzly's status varies from place to place within the ecosystem. In some areas, particularly the Mission Mountains, the grizzly is declining. A different situa-

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# Grizzly

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tion exists along the Rocky Mountain front in the eastern part of the NCDE. The 1975 special regulations did not allow grizzly hunting beyond the boundaries of the Flathead National Forest and the Bob Marshall Wilderness Area. More grizzlies are now evident in some places along the front than in 1975, and some are moving down onto private lands, where they prey on livestock and pose a potential threat to human safety. Live-trapping and relocation of bears has met with only limited success. The FWS believes that problems in these areas will escalate and that currently available control measures are inadequate. Confrontations between

people and bears could develop, and would probably result in the destruction of the bears.

Because of the two different critical situations—the decline of the grizzly in the Mission Mountains and the escalation of human/grizzly problems on the eastern front of the Rockies—the FWS decided that an immediate change was needed in the hunting regulations. Hunting of grizzly bears in northwestern Montana will be allowed in parts of the east front. Such hunting could tend to eliminate those bears most likely to have encounters with humans and may cause the remaining grizzlies in these areas to become more fearful of people. Hunting, however, will stop once the number of bears killed during calendar year 1985 (outside of Glacier National Park, where hunting is prohib-

ited) reaches 15. Of this number, no more than six females can be taken, and there will be no hunting of grizzlies that are accompanied by young. Further restrictions and other details are published in the August 29, 1985, *Federal Register*.

The FWS believes that this level of hunting will still allow a general increase in grizzly numbers, even taking into account the estimated illegal kill of about eight bears each year in the NCDE. Before the 1986 hunting season, the FWS expects to have new permanent regulations in place.

Hunting of grizzly bears remains prohibited in the Greater Yellowstone Ecosystem and all other parts of the conterminous 48 States where it is not expressly allowed.

# Four Plants

(continued from page 1)

tween *Iliamna corei* and a closely related species, *Iliamna remota*, which is also a candidate for listing at some time in the future. According to the FWS, however, the most comprehensive information published to date indicates that the two plants are distinct species. Since the threats to *I. remota* do not appear to be as immediately serious as those to some other taxa, action on its listing is being deferred for the present.

The proposal to list *I. corei* as an Endangered species was published September 3, 1985. Comments on the proposal are welcome, and should be sent to the Regional Director, Region 5 (address on page 2) by November 4, 1985.

## Mezoneuron kavaense

Endemic to the Hawaiian Islands, this tree was well known to the early natives, who called it *uhuhi*. It can reach up to 34 feet (10 meters) in height and 12 inches (30 centimeters) in trunk diameter. The dark-colored wood is extremely hard, close-grained, and durable, which made it suitable for use in spears and fishing devices. Cutting of trees for making these tools probably was not a major factor in the decline of this species, although so few remain that further cutting could jeopardize its survival.

At one time, *M. kavaense* was fairly abundant on the islands of Hawai'i, O'ahu, Kaua'i, and Maui. Unfortunately, it has become extirpated on Maui and only three small populations, totalling fewer than 50 trees, survive on the other islands. On Hawai'i, one colony is perched on the slopes of the volcano Hualalai. This land is a mixture of private and State-owned property used for cattle grazing. The populations in Waimea Canyon on Kaua'i and the Wai'anae Mountains of O'ahu are located on State lands

that, although zoned for conservation, contain feral livestock. The zoning does not provide specific protection for the plant.

Grazing by introduced cattle, goats, and sheep is the main reason for the decline of *M. kavaense*, and it continues to threaten the remaining trees. In recent years, the plant's regeneration has been severely inhibited. Not only does livestock feed on shoots, seedlings, and saplings; the black coffee tree borer (*Xylosandrus compactus*), a non-native insect, also attacks the young trees. On the island of Hawai'i, introduced rodents take *M. kavaense* seeds from fruit on the ground and in the trees. Still another threat is competition from exotic plants, particularly fountaingrass (*Pennisetum setaceum*). Consequently, only the O'ahu population of *M. kavaense* still shows any signs of successful reproduction.

*M. kavaense* was proposed for listing as an Endangered species in the August 5, 1985, *Federal Register*. Comments on the proposal are welcome from all interested agencies, organizations, and individuals, and should be addressed to the Regional Director, Region 1 (address on page 2 of the BULLETIN), by October 4, 1985.

## Chrysopsis floridana

Also known as the Florida golden aster, this plant is a perennial herb endemic to small areas in southern Hillsborough and Pinellas Counties, Florida. It grows in open, sunny areas within sand pine-evergreen oak scrub vegetation on well-drained, sandy soil. (In the past, it also grew on beach dunes.) Urban development has eliminated the species from much of its former range, and a variety of threats still face *C. floridana*.

All of the remaining habitat is on privately owned land. The two largest remaining *C. floridana* populations are restricted to vacant lots within growing residential subdivisions. Other, smaller populations are in scrub vegetation

grazed by cattle, on an abandoned railroad embankment, and in a recently burned sand pine scrub area.

Because *C. floridana* requires open areas with bare sand, it can benefit from certain kinds of temporary disturbances, such as limited fire, land clearing, grazing, and even off-road vehicle (ORV) use. It can be destroyed, however, by more intense, frequent, or extensive disturbance, including dumping and heavy ORV use. The plant also does not tolerate mowing.

*C. floridana* was proposed for listing as an Endangered species on August 5, 1985. Comments on the proposal are welcome, and should be sent to the Field Supervisor, Endangered Species Field Station, 2747 Art Museum Drive, Jacksonville, Florida 32207 by October 4, 1985.

## Lindera melissifolia

This small deciduous shrub, the pondberry, is native to a limited number of sites, most of them in the southeastern U.S. It grows to approximately 6 feet (2 meters) tall, and produces pale yellow flowers in early spring before the leaves emerge. The fruit, a bright-red drupe (a fleshy, single-seeded fruit), matures in late autumn. *L. melissifolia* can be distinguished from the two other North American members of its genus by its drooping, membranaceous leaves that have a strong, sassafras-like odor when crushed.

Since it was described in 1788, *L. melissifolia* has been reported from nine States, but it is believed to have become extirpated from Florida, Alabama, and Louisiana. Loss and alteration of its habitat has been, and continues to be, the main threat to the species' survival. The poorly drained depressions and margins of limestone sinks in which the plant grows have been tremendously reduced in number and/or quality by land clearing and drainage activities.

Twelve populations of *L. melissifolia* are known to survive: one in Bladen

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## Four Plants

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County, North Carolina; four on U.S. Forest Service (USFS) land in Berkeley County, South Carolina; one in Wheeler County, Georgia; one on a USFS Research Natural Area in Sharkey County, Mississippi; one on State conservation land in Ripley County, Missouri; and four in Clay County, Arkansas. Almost all of these populations have declined since their discovery, some severely.

The most significant threat to *L. melissifolia* is drainage ditching and subsequent conversion of its habitat to other uses, including tree farming, crop production, and house construction. Even ditching without later changes in land use can alter the hydrology in ways that kill the plant or reduce its vigor. Aggressive weedy plants adapted to disrupted habitat can outcompete the species. Despite the regular production of mature fruits, no *L. melissifolia* seedlings have been observed in recent years at any of the known sites. The cause of this apparent lack of sexual reproduction is unknown, but the potential long-term results could be devastating.

*L. melissifolia* receives some legal protection in North Carolina and Missouri, which both list the species as endangered under their own plant protection programs. On August 13, 1985, the FWS proposed listing *L. melissifolia* as Endangered under the Federal Endangered Species Act. Comments on this proposal are welcome, and should be sent to the Field Supervisor, Endangered Species Field Station, U.S. Fish and Wildlife Service, 100 Otis Street, Room 224, Asheville, North Carolina 28801 by October 15, 1985.

### Available Conservation Measures

If the four plants become listed, they and their habitats will receive the protection authorized under the Endangered Species Act. Among the conservation measures that would apply are the prohibitions on interstate or international trafficking in these species without a permit, the requirement for the FWS to develop and implement recovery plans, and the possibility of Federal aid to States that have approved Endangered Species Cooperative Agreements with the FWS for plants.

Under Section 7 of the Act, Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of listed species. This provision will apply for the four plants if their listing proposals become final, even though the FWS deemed it imprudent to pinpoint the populations with a Critical Habitat designation. At this time, the only potential Federal actions known that could directly effect any of the species are certain USFS management practices on national forest land occupied by *Lindera melissifolia*. Activities such as logging, road building, and drainage ditching, if planned without regard for the species, could jeopardize its survival; however, through interagency consultation, harmful impacts usually can be averted.

Section 9 of the Endangered Species Act makes it illegal to "remove and reduce to possession" Endangered plants from lands under Federal jurisdiction without a permit. This provision would apply to *L. melissifolia* on natural forests if the species is listed; none of the other three proposed plants are known to occur on Federal lands.

## Nontoxic Shot Zones to Apply This Fall

A Federal judge has issued a preliminary injunction enjoining the FWS from allowing waterfowl hunting this fall in 22 counties of 5 States unless those States agree to require hunters to use nontoxic shot. The ruling was in response to a lawsuit filed by the National Wildlife Federation against the FWS and the Department of the Interior, and was issued August 26 by the U.S. District Court in Sacramento, California. It affects portions of California, Oregon, Illinois, Missouri, and Oklahoma.

Under the Migratory Bird Treaty Act, all areas of the U.S. are closed to waterfowl hunting except where opened by the FWS through hunting regulations established each year. The court ruling prohibits the FWS from opening the 1985-86 waterfowl season in the affected areas unless the States first approve regulations requiring the use of nontoxic shot. As a result, the States are now indicating that they will require nontoxic shot in the areas affected by the court ruling.

The judge concluded that the mandatory use of nontoxic shot was required to prevent lead poisoning in bald eagles (*Haliaeetus leucocephalus*). Bald eagles sometimes feed on sick, crippled, or dead waterfowl and can get lead poisoning from shot embedded in the bodies of such birds. Because of this threat to bald eagles, which are protected in the conterminous 48 States under the Endangered Species Act, the FWS proposed on February 13, 1985, to require nontoxic shot for waterfowl hunting in 30 counties within 8 States—Iowa, Kansas, South Dakota,

California, Oregon, Missouri, Illinois, and Oklahoma. (These areas were in addition to portions of 30 States where nontoxic shot zones had already been established to prevent lead poisoning in waterfowl.) In response to the Service's proposal, Iowa, Kansas, and South Dakota agreed to require nontoxic shot; the other five States—those now affected by the injunction—declined to approve the regulations. The FWS is required by law to obtain State approval before nontoxic shot regulations can be implemented or enforced.

On May 7, 1985, the FWS issued final regulations requiring nontoxic shot in portions of Iowa, Kansas, and South Dakota. It also announced its intention not to open waterfowl hunting season next year in 22 counties of the 5 States that had declined to approve the proposed nontoxic shot regulations unless the States agreed to require nontoxic shot next year (see BULLETIN Vol. X No. 6). The FWS felt the States needed time to reconsider their decisions and make necessary arrangements to facilitate the use of nontoxic shot. In June 1985, however, the National Wildlife Federation filed suit to force the FWS to require nontoxic shot in the 22 counties this year or, alternatively, not allow waterfowl hunting there at all. On August 26, the judge ruled in favor of the Federation.

Requests for detailed information on the nontoxic shot zones should be directed to the affected State wildlife agencies.

## Kangaroo Rat

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Joaquin Valley, to southwestern Kern and northern Santa Barbara Counties. Recent surveys, however, indicate that barely 6 percent of this range is still occupied. Substantial populations survive only in a few areas at the southern edge of the original range, and even the status of these populations is precarious.

Conversion of native grasslands for crop production has been the main factor in the giant kangaroo rat's decline and continues to jeopardize the species. It apparently is unable to survive where the processes of cultivation destroy its burrows and food caches. Some habitat also has been lost to urbanization and the development of oil and natural gas fields. Rodent control programs and the indiscriminate use of rodenticides also have reduced or eliminated some populations of the giant kangaroo rat. In some instances, this species was the target of the program; in others, its destruction was inadvertent.

Other unique San Joaquin Valley animals that are in trouble include the Fresno kangaroo rat (*D. nitratoides exilis*), San Joaquin kit fox (*Vulpes macrotis mutica*), and blunt-nosed leopard lizard (*Gambelia silus*), all listed as Endangered. Two others, the Tipton kangaroo rat (*D. n. nitratoides*) and Nelson's antelope squirrel (*Ammospermophilus nelsoni*), are Category 2 candidates for listing. Some of the giant kangaroo rat's main colonies are found within the

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# Kangaroo Rat

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foraging range of the California condor (*Gymnogyps californianus*), one of the world's most critically Endangered birds.

If the proposal to list the giant kangaroo rat as an Endangered species becomes final, this animal and its habitat will receive the full protection authorized under the Endangered Species Act. Among the available conservation measures is the prohibition on taking listed species without a permit, a factor that people planning rodent control programs would need to take into account. Another benefit is the possibility of Federal aid to State conservation programs; California already lists the giant kangaroo rat under its own legislation as endangered and has an Endangered Species Cooperative Agreement with the FWS.

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tained. Application for a permit will trigger ESA Section 7 consultation.

Barbara Massey and Dick Zembal (FWS) have just finished the 1985 light-footed clapper rail (*Rallus longirostris levipes*) census. They did the census on their own time and money, as no Section 6 funds were available for the project this year. The results, compared with those of 1984, are tabulated below. Where known, the sex of the bird was included.

The SESO staff and California Department of Fish and Game personnel searched on July 26 for the delta coyote-thistle (*Eryngium racemosum*), a Category 1 candidate for future listing, at Salt

Habitat conservation would be addressed through Section 7 of the Act, which requires Federal agencies to ensure that none of their activities are likely to jeopardize listed species. The only known Federal actions that may affect the giant kangaroo rat are rodent control operations, the issuance of leases for grazing and other agricultural purposes on Bureau of Land Management (BLM) holdings, and the issuance of permits for oil or natural gas exploration and development on lands administered by the BLM or the Department of Energy. No major conflicts are expected. The FWS already is conferring with both agencies to accommodate both a listing and energy development.

Comments on the listing proposal are welcome, and should be sent to the Regional Director, Region 1 (address on page 2), by October 15, 1985.

Valley Spring Reservoir. The plant was not relocated there, as all collections made at the reservoir were later verified to be *E. castrense*. Earlier collections thought to be *E. racemosum* that were made at Kesterson National Wildlife Refuge (NWR) have been correctly identified as *E. vaseyi*. The delta coyote-thistle may now be extinct.

**Region 2**—Excellent food and water conditions have made 1985 another bumper year for whooping crane (*Grus americana*) production at Canada's Wood Buffalo National Park. There were 28 nests in the park and 16 unusually large chicks were banded. Allowing for some natural losses, more than 95 whoopers are expected to arrive at Aransas NWR this fall.

At Grays Lake NWR in Idaho, 20 chicks were hatched by foster parent sandhill

cranes (*Grus canadensis*). Twelve of these were still surviving in early August, and 10 were captured briefly for leg banding. Water and food conditions are marginal at Grays Lake, due to the drought experienced by the northern Rocky Mountain States. These whooping cranes will begin their migration to Bosque del Apache NWR in New Mexico about mid-September. Approximately 30 adult and subadult whoopers are expected to join this year's chicks in southward migration to New Mexico and Mexico.

On July 24, 1985, the final rule was published determining "experimental population" status for certain reintroduced populations of Colorado squawfish (*Ptychocheilus lucius*) and woudfin (*Plagopterus argentissimus*). Section 10(j) of the Endangered Species Act authorizes experimental populations of endangered species to be treated with more flexibility in the management and recovery of these species. Under this new designation, 296 Colorado squawfish were released into the Verde River near Perkinsville, Arizona, on August 26, and 30,000 squawfish fry were placed into the Salt River on August 28. (See feature story in next month's BULLETIN.) Reintroductions of the squawfish in Arizona will continue under the experimental designation for up to the next 10 years in an effort to reestablish this species into parts of its historical range.

A survey of the black-capped vireo (*Vireo atricapillus*) in Oklahoma reports a decline of this Category 2 listing candidate, with an estimated 100 adults remaining. The black-capped vireo, once a locally common species in Oklahoma, is now found in small areas in southwest Canadian County, the Wichita Mountains NWR, and in north central Blaine County, Oklahoma. Decline of this bird is attributed to almost 100 percent nest parasitism by the brown-headed cowbird (*Molothrus ater*). Surveys of the black-capped vireo in Texas were also conducted, but no results have yet been reported. Cowbird trapping in Texas and Oklahoma was found to be effective in reducing parasitism of black-capped vireo nests by 40 to 100 percent.

The ESA Section 7 biological opinion for Cliff Dam, a proposed dam on the Verde River and a part of the Central Arizona Project, was issued on August 15, 1985. If constructed, Cliff Dam will flood one of the 15 bald eagle nests found along the Salt and Verde Rivers that produced 2 of the 26 eaglets fledged in Arizona this year. The jeopardy opinion under Section 7 listed several "reasonable and prudent alternatives," including: (1) assuring water flows in the Salt and Verde Rivers to provide forage fish for the

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Rail Census Locations	1984	1985
Carpinteria Marsh	26	7 (all males)
Mugu Lagoon	3	7
Anaheim Bay	24	11
Upper Newport Bay	112	87
San Joaquin Reserve Marsh	1	2
San Joaquin Carlson Road	2	0
Santa Margarita	2	1
Guajome Lake Marsh	2	0
Aqua Hedioda Lagoon	6	1
San Elijo Lagoon	10	1 (male)
Kendall-Frost Reserve	24	17
San Diego Flood Control Channel	2	1
Paradise Creek	1	0
Sweetwater Marsh	14	3
E St. Marsh	2	2
F St. Marsh	1	0
Otay River Marsh	5	1
South Bay Marine Reserve	2	1
Tijuana Marsh	38	0
<b>Totals</b>	<b>Locations: 1984 = 19 1985 = 14</b>	<b>277 142</b>

nesting eagles; (2) establishing eagle management areas along both rivers to protect the riparian habitat that these birds need; and (3) providing funds to study movement of these eagles via radiotelemetry.

Construction of Cliff Dam would destroy the Cliff nest, forcing this pair of bald eagles to move. However, the alternatives outlined by the FWS could be expected to provide for continued habitat for all central Arizona eagles. It is hoped that the Cliff bald eagles would select another site along protected streams.

**Region 4**—On June 18, 1985, representatives of the FWS, COE, National Park Service (NPS), Florida Game and Fresh Water Fish Commission, South Florida Water Management District (SFWMD), University of Florida, University of Michigan, Florida Cooperative Fish and Wildlife Research Unit, and the Florida Audubon Society met in Jacksonville, Florida, to discuss recent snail kite (*Rostrhamus sociabilis plumbeus*) studies and management activities. The biologists discussed the COE's plans to initiate a snail kite monitoring program in conjunction with COE's experimental water delivery program in south Florida, which will release water into Everglades National Park in order to restore the natural flow. The restoration program is based on a rainfall runoff design. The water will be supplied from a Water Conservation Area that is in snail kite Critical Habitat and also in one of the species' main nesting areas. The snail kite and its food source, the apple snail (*Pomacea paludosa*), will also be monitored during this study, which will be funded by the COE and the SFWMD.

*Amphianthus pusillus* (little amphianthus), a Category 2 listing candidate, is a diminutive annual plant restricted to vernal pools on granite outcrops. This species primarily occurs in Georgia, with peripheral populations in Alabama and South Carolina. Recent status survey work in Alabama under FWS contract with the Alabama Natural Heritage Program revealed only three populations after an extensive search of suitable habitat in that State. These populations are threatened with habitat destruction by off-road vehicle use, quarrying, and trash dumping. Additional information will be obtained on its status in Georgia and South Carolina, and a status review will be undertaken by the Jackson, Mississippi, Field Office to determine if a proposed listing rule is warranted.

On June 28, 1985, staff members from the Jacksonville, Florida, Endangered Species Field Office met with personnel from the Florida Natural Areas Inventory, Florida Game and Fresh Water Fish Commission, Florida Army National Guard (FLARNG), and a forestry

consultant at the FLARNG Camp Blanding facility in northeast Florida to discuss the status and management of one of the three remaining disjunct populations of Chapman rhododendron (*Rhododendron chapmanii*). At the Camp Blanding meeting, the development of a site management plan was discussed in detail.

The FLARNG and the FWS have a Conservation Agreement for the Endangered Chapman rhododendron. The FWS plans to provide technical assistance to the FLARNG for development of a management plan through the Florida Natural Areas Inventory.

**Region 5**—Approximately 60 bald eagles were hacked into the wild during mid-August in the States of Massachusetts, New Jersey, New York, and Pennsylvania.

Existing nesting habitat of the Endangered Plymouth red-bellied turtle (*Pseudemys rubriventris bangsi*) on Massasoit NWR in Plymouth County, Massachusetts, was expanded and improved through clearing of brush and herbaceous vegetation.

A jeopardy opinion on the use of the herbicide Picoloram was recently forwarded to the EPA. Alternatives to preclude jeopardy require certified applicators to contact the FWS if Picoloram is to be used in certain counties within the Northeast where numerous Endangered plants may be affected.

**Region 7**—Peregrine falcon surveys in interior and northern Alaska reveal continued improvement in the status of the region's two listed subspecies (*Falco peregrinus anatum* and *F. p. tundrius*). Cliff habitat along more than 2,500 miles of rivers were surveyed this summer as part of a cooperative effort by the FWS, Bureau of Land Management, NPS, private consultants, and several volunteers. Populations along most of the major rivers in Alaska have been fairly stable for the past few years, and surveys in 1985 of some of the smaller drainages and tributaries revealed that these areas are being reoccupied as well. One major river in interior Alaska, the Tanana, is the exception. It has remained at 50 percent of its historical level since the late 1970's. High pesticide levels appear to be the reason that this population has not shown the recovery seen in other areas.

A total of 139 pairs and 261 peregrine young were observed this year, and over 200 young were banded. Productivity in interior Alaska may have been affected by a late spring but, in general, was comparable with past years.

*Polystichum aleuticum*, currently a Category 2 listing candidate, is probably the rarest plant in Alaska, and is known origi-

nally from only two islands in the Aleutian Island chain. Recent efforts to rediscover this diminutive fern in the wild have been unsuccessful. *P. aleuticum* was probably never abundant, and introduced caribou and reindeer may have contributed to its current rare status.

**Region 8**—Beginning with this issue, the *Regional Briefs* section will also include activities reported by the *Fish and Wildlife Service's nationwide research program, which is referred to collectively as Region 8.*

Biologists at the Patuxent Wildlife Research Center's (PWRC) California Field Station, the Condor Research Center, recently captured three wild California condors (*Gymnogyps californianus*) for inclusion in the captive breeding program. The first, a subadult male, was captured with a cannon net on June 25, 1985, and taken to the San Diego Wild Animal Park. The second, an adult female, was trapped by biologists using a pit trap on August 7 and transported to the San Diego Zoo as a potential mate for the male. The two birds had been observed courting in the wild earlier this year, and were thought to have formed a pair bond. The third, captured on September 6, was a nonradioed adult female of unknown parentage. This bird was taken to the Los Angeles Zoo to serve as a potential mate for Topa Topa, the adult male condor that has been in captivity for 18 years.

Trapping of three condors for captive breeding was authorized in May 1985 after extensive surveys, combined with the known death of one male condor, indicated that five individuals had been lost to unknown factors since the 1984 census. Twenty-one condors, including the three birds trapped this year and two chicks that hatched in captivity from wild-produced eggs, are maintained currently at the San Diego Wild Animal Park and Los Angeles Zoo.

Biologists from PWRC's Southeast Field Station (Athens, Georgia) located 11 Kirtland's warblers (*Dendroica kirtlandii*) on their wintering grounds in the Caribbean during January–April 1985. They were generally sighted in low coppice growth with concentrations of other warblers in the Bahamas, British West Indies, Dominican Republic, and Turks and Caicos Islands. One Kirtland's warbler that was banded in this study recently was sighted on the breeding grounds in Michigan.

In 1985, a record of 12 Endangered Puerto Rican parrot (*Amazona vittata*) chicks fledged from nests in the Caribbean National Forest, the only site where the species exists in the wild. Seven of the chicks were produced by the five

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## Regional Briefs

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breeding pairs in the wild; five other chicks were produced by captive pairs and fostered into wild nests. Three chicks, including one wild-produced and two captive-produced birds, were fitted with radio transmitters shortly before fledging. Biologists are monitoring their movements and activities to assist in determining causes of mortality.

The captive flocks of Endangered cranes at the main PWRC facility in Laurel, Maryland, produced 13 whooping crane (*Grus americana*) and 28 Mississippi sandhill crane (*Grus canadensis pulla*) eggs during the 1985 breeding season. Seven whooping crane eggs hatched, and six chicks were reared to fledging. Mississippi sandhill crane hatching success was even higher—20 of 23 potentially fertile eggs hatched. Sixteen young survived, and one fertile egg was transferred to the Mississippi Sandhill Crane NWR. In addition to the birds produced by the PWRC flock, one Mississippi sandhill crane chick and one whooping crane chick survived from eggs received from the refuge and Wood Buffalo National Park in Canada, respectively.

The captive flock at PWRC now consists of 38 whooping cranes and 42 Mississippi sandhill cranes. Over 200 sandhill cranes of nonendangered subspecies also are maintained at PWRC for research purposes.

With the recent acquisition and establishment of the Buenos Aires NWR south of Tucson, Arizona, masked bobwhite (*Colinus virginianus ridgwayi*) are being released to reestablish this Endangered bird in the wild. On August 6, 1985, the first shipment of 83 birds arrived from the captive-propagation flock at PWRC and

## 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	25	19	234	4	0	22	304	23
Birds	60	13	144	3	1	0	221	54
Reptiles	8	6	60	8	4	13	99	16
Amphibians	5	0	8	3	0	0	16	6
Fishes	34	4	11	18	3	0	70	38
Snails	3	0	1	5	0	0	9	7
Clams	23	0	2	0	0	0	25	19
Crustaceans	3	0	0	1	0	0	4	1
Insects	8	0	0	5	0	0	13	9
Plants	79	5	1	23	2	2	112	42
TOTAL	248	47	461	70	10	37	873	215**

\*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: 181

Number of species currently proposed for listing: 22 animals  
29 plants

Number of Species with Critical Habitats determined: 87

Number of Cooperative Agreements signed with States: 42 fish & wildlife  
17 plants

September 3, 1985

additional shipments of up to 180 birds per week were scheduled to be sent over the next several weeks. Two hundred masked bobwhites have already been released, and an anticipated total of

1,200–1,500 will be released this year. Since habitat on the refuge is in excellent condition due to high levels of rainfall, biologists are hopeful that from 100 to 200 birds will be breeding there next summer.

## Recovery Plan Update

On August 9, 1985, a recovery plan for the Endangered smoky madtom (*Noturus baileyi*), a rare species of catfish native to eastern Tennessee, was approved. Copies of recovery plans become available for purchase about 6 months from their

date of approval. Requests for copies should be made to the Fish and Wildlife Reference Service, 6011 Executive Boulevard, Rockville, Maryland 20852; telephone 800/582-3421.

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# ENDANGERED SPECIES

## Technical Bulletin

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