

ENDANGERED SPECIES

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

Four Plants Given Endangered Species Act Protection

During April 1985, the following four plants were listed by the Fish and Wildlife Service for protection under the Endangered Species Act:

Goetzea elegans

Goetzea elegans (the beautiful goetzea), a very rare evergreen shrub or small tree that is found only in northern Puerto Rico, has been listed by the Service as Endangered (F.R. 4/19/85). Road construction, periodic trimming of roadside vegetation, certain livestock grazing practices, and potential limestone mining threaten this species' survival.

Fewer than 50 beautiful goetzea plants currently are known to exist. Two of the three known sites where the species occurs are separated by about one-quarter mile (0.4 kilometers) and are found along the edge of a semi-evergreen seasonal forest on limestone in the Guajataca Gorge area of Isabella, Puerto Rico. One of these two sites is privately owned and harbors only six plants; the other is owned by the Commonwealth of Puerto Rico's Department of Transportation and Public Works, and supports only one or two adult plants and three root suckers. The third site, a privately-owned remnant of undisturbed forest, is located about 3.5 miles (5.6 km) east of the other two sites on a ravine in the Municipality of Quebradillas. Approximately 30 individuals of the beautiful goetzea can be found here, including the only plant known to have produced flowers and fruit since 1936.

On June 18, 1984, the Service proposed to list *G. elegans* as an Endangered species (see BULLETIN Vol. IX No. 7). Only two comments were received; see the final rule in the April 19, 1985, *Federal Register* for details.

Critical Habitat was not designated for *G. elegans* as part of the final rule, due mostly to the possible threats to its existence from collecting, taking, or vandalism. The required publication of maps that are part of a Critical Habitat designation would increase the beautiful goetzea's vulnerability and be detrimental to its survival. However, even without this formal designation, the species and its habitat will still receive all the protection author-

ized by Section 7 of the Endangered Species Act.

The only potential Federal involvement known at this time that may have an effect on the beautiful goetzea is that of the Federal Highway Administration (FHWA). In the event that highways adjacent to the species' sites are widened or resurfaced as they have been in the past, FHWA may be required under Section 7 to consult with the Fish and Wildlife Service to avoid jeopardizing the species' survival. A strong commitment will be needed to protect *G. Elegans'* habitat from substantial modification and, ultimately, the extinction of the species.

Amsinckia grandiflora

As a result of habitat modification for agricultural use, intensive livestock grazing, urban development, and other land use activities that have extensively altered the natural plant communities within its historic range, *Amsinckia grandiflora* (large-flowered fiddleneck) populations have drastically declined over the years.

Currently, fewer than 50 individuals are known to exist. These low numbers, along with an extremely restricted range and low reproductive potential, contribute to the species' vulnerability. To reduce the possibility of its becoming extinct, the Service has published a final rule listing *Amsinckia grandiflora* as Endangered and designating its Critical Habitat (F.R. 5/8/85).

The large-flowered fiddleneck has bright green foliage covered with coarse, stiff hairs and red-orange flowers arranged in a fiddleneck-shaped inflorescence, as the species' common name describes. Today, this annual plant is known to survive only at a half-acre (.2 hectare) site on Department of Energy (DOE) land near Livermore, California, in southwestern San Joaquin County. The site is a grassy, steep, west- and south-facing slope of a small ravine having light-textured clay soil. Invasion of its habitats by other, more aggressive *Amsinckia* species and weedy exotic plants are threatening the large-flowered fiddleneck. In addition, testing of explosives by DOE, although not conducted in the immediate vicinity of the population, has the potential

to start grass fires that could enter the species' habitat and affect its chances for survival. After these threats were recognized, the Service proposed listing the species as Endangered (see story in BULLETIN Vol. IX No. 6).

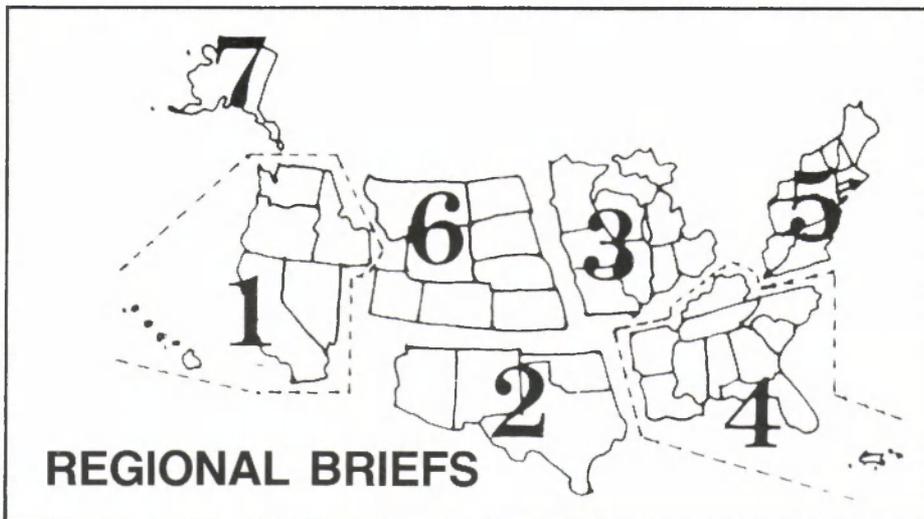
Critical Habitat has been designated for *Amsinckia grandiflora* to include one area of approximately 160 acres (65 hectares) in San Joaquin County. This area exceeds the current range of the fiddleneck, but it is believed to contain places suitable for expansion or relocation of the species that are needed for the plant's recovery. With a steep west- and south-facing slope and light-textured soil, the Critical Habitat area satisfies the most immediate physiological needs of *A. grandiflora*. Conserving this area would meet most of its requirements on a long-term basis.

The University of California's Lawrence Livermore Laboratory has been given funding and authorization by DOE to conduct various activities in the vicinity of the large-flowered fiddleneck population and its Critical Habitat. These activities, which include testing of chemical high explosives, controlled burning, and construction, could adversely impact the fiddleneck and its habitat unless they are undertaken carefully. Consultation between the Service and DOE will be necessary to ensure that such activities have no adverse effects.

Carex specuicola

A perennial member of the sedge family, *Carex specuicola* has a triangular stem 25-40 centimeters (10-16 inches) high and thin, pale green leaves clustered near the base. This species is found only around three seep-springs near Inscription House Ruin on the Navajo Indian Reservation, Coconino County, Arizona. Each population occurs on an area of less than 200 square meters (2,150 square feet) along the outflow from its respective seep-spring. It is estimated that all three populations total fewer than 700 plants. The species was proposed for listing as Threatened with Critical Habitat on April 11, 1984 (see story and drawing in BULLETIN Vol. IX No. 5).

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REGIONAL BRIEFS

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

Region 1—The cui-ui (*Chasmistes cujus*) migration season is at hand. The Marble Bluff Fish Facility is operational and the Great Basin Complex field crew is

monitoring the build-up of the offshore, prespawning aggregate. Cui-ui spawners should begin entering the Truckee River by early May. Over 150 adult cui-ui have already been captured in the river delta with a merlin trap. These fish were marked and released for estimating the

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size of the aggregate. In addition to these adults, over 100 precocious cui-ui from the 1980 year class were caught and released along with 200 adult Lahontan cutthroat trout (*Salmo clarki henshawi*), all fish ranging in size from 5-13 pounds.

Region 2—The revised Whooping Crane Reovery Plan is currently being prepared for agency review, and a contingency plan is being reviewed by Fish and Wildlife Service (FWS) and State personnel. The contingency plan describes response actions for use whenever a sick or injured whooping crane (*Grus americana*) is sighted or when healthy whoopers are sighted in a hazardous situation (e.g., disease outbreak, high-risk hunting situation, environmental contaminants).

The Bosque del Apache National Wildlife Refuge (NWR) flock is on its summer grounds in Idaho and Wyoming. All but one of the Aransas NWR whoopers had departed for Wood Buffalo National Park in Canada by April 24. No mortalities have been reported during migration this spring.

The annual Kemp's ridley sea turtle (*Lepidochelys kempii*) project at Rancho Nuevo, Mexico, is currently under way. On April 11, the American contingent joined its Mexican counterpart at the beach to set up camp. Fifteen turtles arrived on the beach to nest on April 15, followed by 25 more on April 20. These numbers are typical of the slow nesting start for this species. The Secretaria de Pesca (Mexico's Secretary of Fisheries) generously donated to the U.S. 3,000 Kemp's ridley eggs, as compared to previous donations of 2,000 eggs. These eggs will be used to augment the imprinting program conducted by the National Park Service at Padre Island National Seashore and the headstart program at Galveston National Laboratory (National Marine Fisheries Service) in Texas. The increase in donated eggs reflects a major increase in commitment to the project by agencies in Mexico and the United States.

A recent helicopter survey located a new bald eagle (*Haliaeetus leucocephalus*) nest in a cottonwood tree in west-central Arizona along the Bill Williams River drainage on Bureau of Land Management (BLM) land. At the time of discovery, the grove of trees in which the nest was found was on fire. Survey personnel and BLM firefighters were able to save the tree and the nest, which contained two chicks that were about 8 or 9 weeks old. The adult female bald eagle was found carrying a radio backpack, indicating that she was fledged from the Southwest bald eagle population along the Salt and Verde Rivers (Arizona) in the late 1970s. Currently, there are 15

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Two Plants Proposed for Listing as Endangered

Two rare species of plants were proposed by the Fish and Wildlife Service recently for listing as Endangered. One is a wildflower endemic to Minnesota, and the other is a shrub native to one of the Hawaiian Islands. If, after further consideration, these listing proposals are made final, both plants will receive protection under the Endangered Species Act.

Minnesota Trout Lily

The only known species of plant that is found only in the State of Minnesota, the Minnesota trout lily (*Erythronium propullans*), appears to be in danger of extinction. Only 14 sites are known, all 1–3 acres (.4 to 1.2 hectares) in size with a total of a few hundred plants in Rice and Goodhue Counties. These colonies are vulnerable to habitat loss resulting from construction of housing projects and other forms of urban development.

The lily-like plant is about 15 centimeters (6 inches) tall, with one pair of mottled green, pointed leaves arising from near the base. A single small, nodding, bell-shaped flower is borne at the end of a slender, leafless stalk. Its recurved petals are pink or roseate. A spring ephemeral, it blooms in April or May, and then the aerial parts of the plant disintegrate after the canopy of its deciduous forest habitat fills out in early June.

E. propullans grows on the north-facing slopes of wooded valleys along the Cannon and Zumbro Rivers. All occur on privately owned land. Several large historical colonies located 1.5 miles (2.4 kilometers) from the city of Faribault have been eliminated by conversion of pastureland to cropland. Road construction near Faribault also has eliminated several colonies, and another within the city limits has been destroyed by motorcycle use. Most of the remaining urban sites face these same threats. Fortunately, two Minnesota trout lily sites are owned by the Minnesota Chapter of The Nature Conservancy and are being managed for the species' benefit.

The proposal to list *E. propullans* as Endangered was published in the *Federal Register* on May 3, 1985. A designation of Critical Habitat was not included since publicizing the sites with maps and detailed habitat descriptions would increase the vulnerability of this rare wildflower to overcollection. One of the sites was severely damaged in the early 1970s when a large number of plants were removed for replanting in a landscape arboretum.

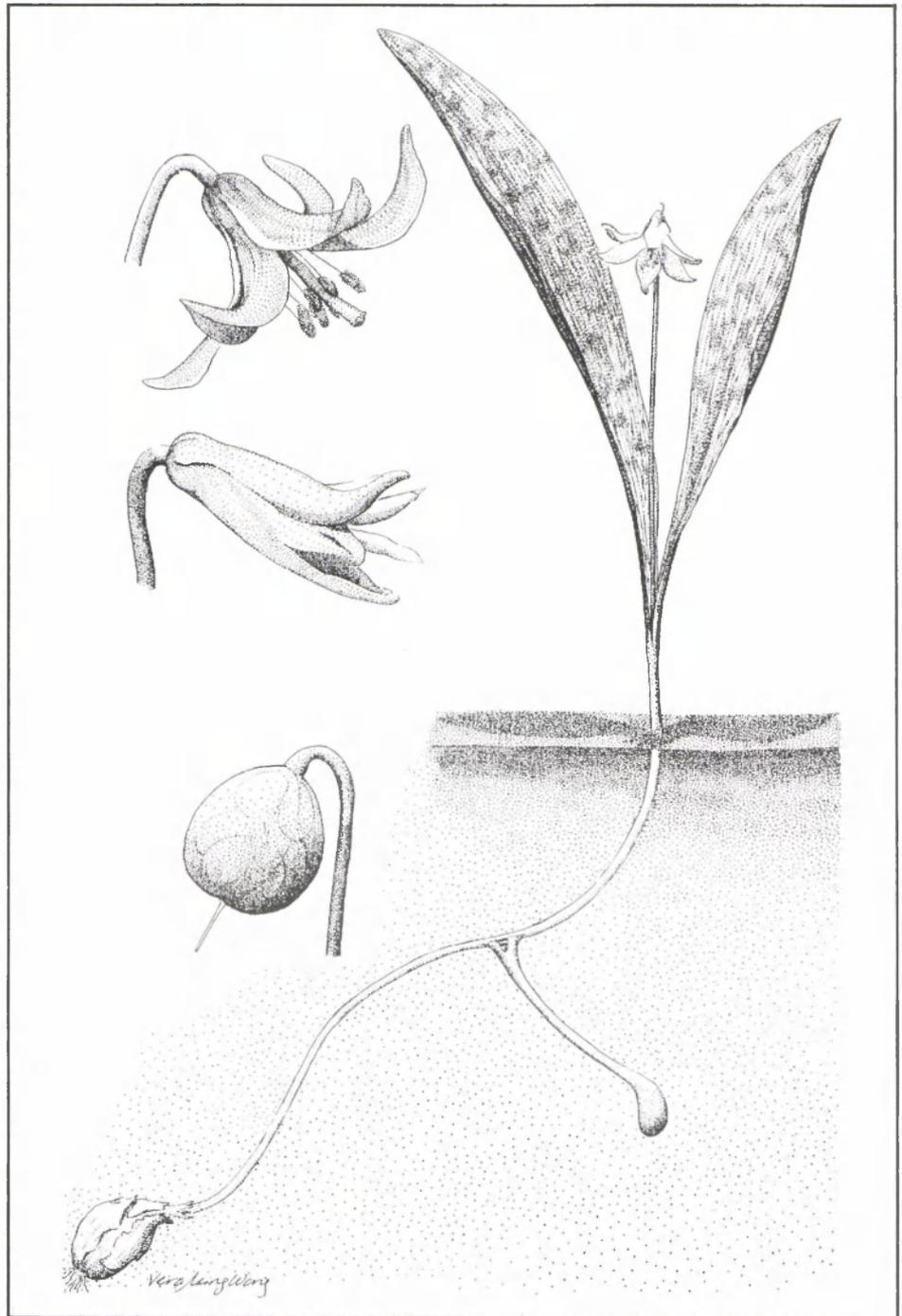
Comments on the listing proposal are welcome from all interested agencies, organizations, and individuals, and are due to the Endangered Species Division, Region 3 (see page 2 of the BULLETIN for address) by July 2, 1985.

Achyranthes rotundata

As has happened to so many of the plant species endemic to the Hawaiian Islands, *Achyranthes rotundata* has declined drastically from habitat loss and competition from exotic plants. This low shrub reaches up to 6.5 feet (2 meters) in height and is covered with short, silvery hairs. Although the flowers themselves are small and inconspicuous, the inflorescences and leaves are valued in making traditional leis.

Historically, *A. rotundata* may have been abundant all along the arid and semi-arid lowlands of the Wai'anae Coast on the island of O'ahu. After an apparent 88-percent reduction in range, *A. rotundata* can be found today only at opposite ends of the coast. One population, which occurs on a military reserve at Ka'ena Point, consists of only two individuals. Approximately 2,000 plants are known from the Barbers Point population, at the opposite end of the species' historical range.

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Minnesota trout lily, with flowers and capsule

Drawing by Vera Wong

Two Plants

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A. rotundata appears to be in danger over the remaining 12 percent of its historical habitat, a remnant that itself has already been altered to an extent. The two plants at Ka'ena Point could be overwhelmed by thickets of exotic plants. At Barbers Point, the population consists of three distinct sub-populations. One of them contains 80 percent of the species' known total numbers and occurs on privately owned lands that are proposed for development as an industrial site. The remaining two small colonies are on Federal lands managed by the U.S. Army and Coast Guard. A variety of introduced plants at Barbers Point threaten to crowd out *A. rotundata* and alter the open, sunny habitat it needs. Because of the decline and continuing threats to its survival, *Achyranthes rotundata* was proposed for listing as an Endangered species (F.R. 4/22/85).

Research now in progress indicates that two additional species of *Achyranthes*, now believed to be extinct, may in fact be synonymous with *A. rotundata*. Should this prove true, the

species would have originally been found on Lana'i and Moloka'i, as well as on O'ahu, emphasizing the historical decline in range.

A designation of Critical Habitat was not included in the proposed listing rule because publicizing the population sites could subject them to greater taking pressure. As already mentioned, the plant has been used for making leis. Due to its rare status, *A. rotundata* also could be sought after by collectors of rare plants or by vandals.

Comments on this proposal are invited and are due to the Regional Director, Region 1 (address on page 2), by June 21, 1985.

Available Conservation Measures

If the proposals to list *Erythronium propullans* and *Achyranthes rotundata* as Endangered are made final, both plants will receive protection under the Endangered Species Act. One of the conservation measures authorized by the Act is a prohibition against interstate or international trafficking in Endangered plant species without a permit. Another, which makes it illegal to remove and reduce to possession Endangered plants from lands

under Federal jurisdiction, would apply to the *A. rotundata* plants on Federal land. (Further, under Hawaii's own endangered species legislation, a Federal listing would automatically put the species on the State's list, and take would be prohibited under State law.) There is the possibility, through Section 6 of the Act, of Federal funding to States that have Endangered Species Cooperative Agreements with the Fish and Wildlife Service. (Currently, Hawaii is among the States with such an agreement for plants.)

Under Section 7, Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of Endangered species, even when Critical Habitat has not been designated. Of the two plants proposed for listing in April, this provision would probably apply mainly to *A. rotundata*, since it occurs on Federal lands at the Ka'ena Military Reserve, Camp Malakole, and the Barbers Point Lighthouse grounds. Plans are being considered to declare these lands, in whole or in part, as excess and thus eligible for disposal. Cooperation among the Fish and Wildlife Service and the appropriate Federal agencies will be needed to conserve the species' remaining habitat.

Recovery Plan for Smith's Blue Butterfly

On November 9, 1984, the Fish and Wildlife Service approved a recovery plan to assist in the recovery of the Endangered Smith's blue butterfly. This plan, when funded and carried out, may help restore this species to a more secure status.

The Smith's blue butterfly (*Euphilotes enoptes smithi*) is a relatively small but-

terfly with a wingspan of slightly less than one inch. Males are bright lustrous blue on the upper wing surfaces, and females are brown with a band of red-orange markings across the hind wings. The undersides of both males and females are whitish-gray and speckled with black dots. Both sexes also have prominently checkered fringes on both fore wings and hind wings, but males have wide black borders

and a very hairy appearance of the body. The Smith's blue butterfly is separated from other subspecies of *E. enoptes* by its light undersurface ground color with prominent overlying black markings.

This butterfly is endemic to a number of inland and coastal sand dunes, serpentine grasslands, and cliffside chaparral communities along the central California coast in Monterey, Santa Cruz, and San Mateo Counties. When the species was listed as Endangered on June 1, 1976, it was known primarily from remnant, partially stabilized sand dunes around Monterey Bay. Since its listing, additional colonies of the butterfly have been discovered in other locations and habitat types, including the ancient beach sands at Zayante Sand Hills and a serpentine grassland in San Mateo County.

The Smith's blue and other members of the genus *Euphilotes* are intimately dependent on their host plants, seacliff buckwheat and coastal buckwheat. The buckweats are used as larval and adult food plants—the larvae eat the flowerheads and the adults obtain nectar from the flowers. Adult butterflies of both sexes use the same plants not only as their primary nectar source, but also as sites for resting, sunning, mate location, and copulation. The primary factor that limits the populations of the Smith's blue is the occurrence of its host plants; however, presence of these host plants does not always indicate that the butterfly will

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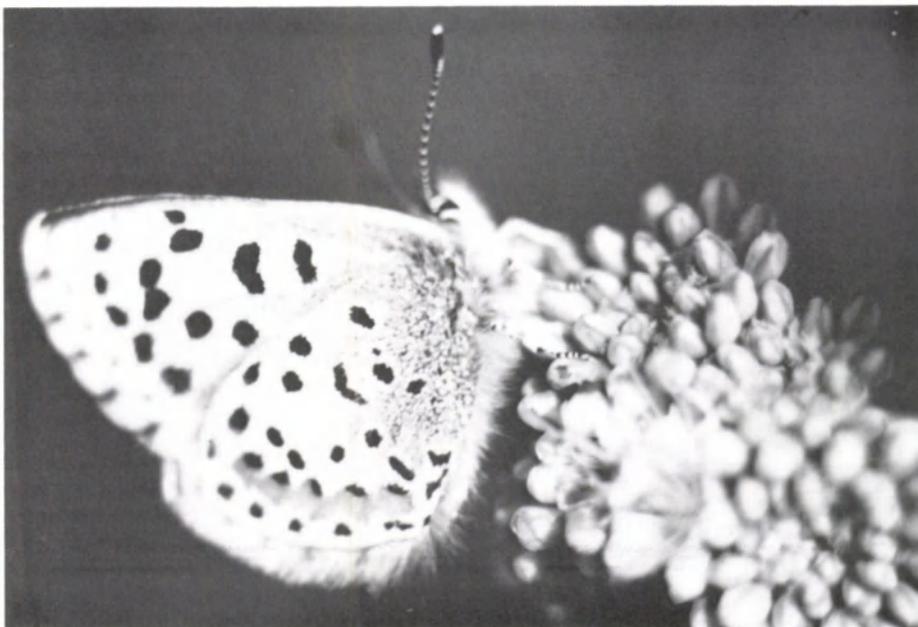


Photo by Larry Orsak

The Endangered Smith's blue butterfly faces threats primarily from recreational activities.

Butterfly

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be present in an area since the plants are much more widely distributed than the butterfly.

Adult butterflies are univoltine (a single generation per year) and emerge from their pupal cases in a single extended flight season from mid-June to early September, a period synchronized with the peak flowering period of the buckwheats. Individual adults live for only about one week; however, individual emergences are staggered over the long summer flight period. This long flight period is partially the result of microclimatic differences among the habitats and differences in the flowering time of the host plants, which themselves can be significantly affected by annual climatic variation.

The Seaside-Marina dune complex contains patches of suitable habitat for the Smith's blue. Even though this dune system has been drastically altered in recent times, it is still one of the largest and best preserved dune systems in central California. This dune complex has been severely affected by housing developments, highway construction, off-road vehicle (ORV) use, foot traffic, urbanization, sand mining, military activities, and the introduction of exotic plants. More than 50 percent of the dunes have been destroyed or significantly altered.

The long-term survival of the Smith's blue butterfly colonies in coastal dune habitats depends on continuous recruitment of the native plants produced by dynamic sand dune succession. This natural successional sequence has been altered in many of the dunes in the Seaside-Marina system by the introduction of Holland dune grass (*Ammophila arenaria*) and iceplant (*Carpobrotus* ssp.) for sand dune stabilization. These two plants disrupt the natural successional process and tend to out-compete many of the native plants in this system.

Recreational activities are also often destructive to sand dune vegetation. The use of dunes by hikers and hang-gliders is destructive to sand dune vegetation, disturbing both plants and seeds. The construction of parking lots for dune users also destroys habitat by covering the dunes with pavement and by increasing the foot traffic in nearby areas. Another major threat to the butterfly colonies in coastal dune habitats is ORV traffic. The destructive effects of this activity are well-documented at Marina State Beach and on dune systems throughout the west coast. Urbanization has also played a major role in reducing habitat quality in coastal sand dunes.

Other causes of the decline of Smith's blue habitat include the military activities at Fort Ord in Monterey County, although Fort Ord does maintain a preserve for the butterfly. Sand mining also is a significant

contributor to the direct destruction of this species' habitat. In 1983, Smith's blue butterflies were discovered at two locations in Santa Cruz County. One of these inland dune habitats is an active quarry. The amount of natural dune habitat remaining at this site has been reduced by sand mining operations, and the size and extent of distribution of the butterfly colony there is not known. The other known inland dune habitat has experienced some surface disturbance, but a much greater proportion of the native vegetation is still intact.

Smith's blue butterfly colonies are also found in sites not associated with sand dunes. They are found on steep coastal cliffs in the Big Sur region, in woodlands somewhat inland at Vasquez Knob, and in road cuts along Cove Peak Road. Many of these sites appear relatively secure because they are inaccessible and unsuitable for human development. However, in unseasonably wet years such as 1982, some of these sites experienced slope failure and slumping. Road maintenance and rebuilding threatens the integrity of some of these habitats.

These butterflies have also been collected from near Crystal Springs Reservoir in San Mateo County. The habitat type there is referred to as serpentine grassland and is located on water company lands within the San Francisco Bay watershed. There are no known threats to the butterflies at Crystal Springs Reservoir; however, most of the other serpentine grasslands in the San Francisco Bay area have been developed or are vulnerable to development. If any other butterfly colonies are discovered in these other serpentine grasslands, they will more than likely be vulnerable, too.

Recovery Actions

The primary objective of the recovery plan for the Smith's blue butterfly is to prevent extinction of the species and to accomplish its recovery by conserving the ecosystems upon which it depends for survival. This objective will be achieved when either of the following conditions have been met: (1) when colonies at all the 18 known sites have viable, self-sustaining populations that have been maintained for a period of 10 consecutive years with no foreseeable threats to the future survival of the colonies, or (2) when an equivalent number of butterfly colonies have been made secure at comparable alternative sites that will ensure the species survival. If, after 10 consecutive years, a total of 18 sites appear to be permanently protected, then the Smith's blue butterfly would qualify for delisting.

To accomplish the plan's primary objective, it is important that appropriate Federal and State agencies vigorously enforce all laws and regulations that may affect the survival of the species. These laws include, the Endangered Species

Act, the California Coastal Zone Protection Act, the Federal Coastal Zone Management Act, the National Environmental Policy Act, and the California Environmental Quality Act. Effective law enforcement is needed to reduce unauthorized ORV traffic on coastal sand dunes and inland dune parklands, and is also needed for activities that result in the taking of this butterfly. Such activities include sand mining, grading, and various development projects in the coastal and inland sand dunes.

The populations at Marina State Beach are extremely vulnerable, so a management plan for this area must be developed and implemented. As previously stated, recreation in the form of unrestricted foot traffic, hang-gliding, and occasional ORV traffic on the dunes threaten the survival of the colonies here by destroying dune vegetation and causing substrate compaction. A management plan is needed to give direction to the State Park staff for managing these habitats. Reserves should also be set up to protect the two large colonies at the beach. The reserves should include the areas where the colonies now occur and include reasonable buffer strips.

The active blow-out at Marina State Beach threatens to move across Highway 1. If this occurs, sand would be removed to maintain the road and that sand would be lost to the dune system. Stabilizing this blow-out is a high priority recovery task. Native plants should be used to stabilize the sand and increase host plant availability. Iceplant and Holland dune grass, widely used in California to stabilize sand dunes and highway rights-of-way, tend to exclude native flora. Replacing them with native dune species would provide additional habitat for the Smith's blue and help to secure the colonies at Marina State Beach.

The Salinas River National Wildlife Refuge is cooperatively managed by the Service and the California Department of Fish and Game. Some colonies of Smith's blue butterflies occur in remnant sand dunes on the refuge. However, exotic plants have invaded the dunes and ORV use has degraded the area. The same control measures need to be taken for the butterfly here as at Marina State Beach.

The U.S. Army has designated one of the sand dune areas at Fort Ord as a preserve for the Smith's blue butterfly. Patrols are needed at both the north and south dune areas to control ORV use. Iceplant is also a problem here despite recent attempts by the Youth Conservation Corps to remove this exotic plant. The effort should be continued and a management plan should be prepared for the butterfly preserve to give direction and continuity to military activities in adjacent areas.

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Butterfly

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For the Smith's blue colony in the Zayante Sand Hills, a land protection plan should be developed to identify an effective means for protecting this colony which inhabits areas held in reserve for future sand mining activities. Unless

these areas that support the butterfly are protected, the species will lose its valuable habitat here. Habitat management plans also are needed for the colonies that occur in the several cliffside chaparral communities and serpentine grasslands (Crystal Spring Reservoir, Big Creek Preserve, Burns Creek, Vasquez Knob, and Cove Peak Road).

All additional sites where Smith's blue colonies are found may be more difficult to manage and secure because many of them are privately owned and some have already been proposed for development. Nevertheless, the Service will explore possible ways to maintain and protect these habitats.

Progress in the Robbins' Cinquefoil (*Potentilla robbinsiana*) Recovery Program

by Dr. Kenneth D. Kimball
Director, Research Department
Appalachian Mountain Club

The Robbins' or dwarf cinquefoil (*Potentilla robbinsiana* Oakes) is a small perennial flower endemic to the alpine zone of the White Mountain National Forest, New Hampshire. It was listed as Endangered under the Endangered Species Act on September 17, 1980 (see story in BULLETIN Vol. V No. 10). *P. robbinsiana*, a member of the rose family, is a very low, almost stemless plant. Mature plants are no larger than a half-dollar, with a dense tuft of leaves above ground and deep tap root underneath. During mid-June, *P. robbinsiana* supports one to thirty slender flowering stems, each bearing a single, complete yellow flower. The species is associated with an open, exposed alpine habitat, where competition from other plants is low.

Historically, the plant was known to occur in three or four sites, but, after the 1960s, it was known to survive at only a single location, the Monroe Flats on Mt. Washington, at about 1,550 meters (5,086 feet) in elevation. This population is comprised of approximately 1,600 mature plants occupying an area less than one hectare (2.5 acres) in size. The Monroe Flats population is adjacent to the heavily hiked Crawford Path, part of the Appalachian Trail, and is within 300 meters (328 yards) of the Appalachian Mountain Club's (AMC) Lakes of the Clouds (LOC) Hut, which can host 90 overnight guests. In 1984, another adult and one deceased plant, surrounded by several juvenile plants, were found in the White Mountains at the site of a population once thought to be extirpated.

Because *P. robbinsiana*'s survivability is contingent on the conservation of the Monroe Flats population, protection and recovery efforts for the species are closely coordinated among the AMC's Research Department, the Fish and Wildlife Service's Region 5 Endangered Species Office, and the U.S. Forest Service. The primary objectives of the Robbins' Cinquefoil Recovery Plan (approved July 22, 1983) are to protect this population in its entirety, encourage its natural

expansion, and establish four new self-sustaining populations within the species' presumed historical range.

Due to its reduced numbers, *P. robbinsiana* is threatened by potential drought from two natural environmental stresses, wind desiccation and frost-heaving. Trampling by hikers, however, may be the most serious threat. In 1979, efforts to protect *P. robbinsiana*'s habitat from hikers began with the construction of a screen wall to clearly define the route of the hiking path and discourage off-trail excursions by hikers into the species' essential habitat. Since 1981, the AMC Research Department has been monitoring causes of trespass into the habitat. In addition, the AMC has been conducting programs at the LOC hut to educate hikers and botanists on their roles in the species' conservation. The Crawford Path was diverted out of the plant's habitat, and the essential habitat was legally closed to public use in 1983. Several *P. robbinsiana* have been transplanted into a viewing garden adjacent to the LOC hut for observation and education. These ongoing efforts have greatly reduced the potential stress to the population from trampling.

In 1973, and again in 1983, the population was counted by Dr. Raymond Graber of the U.S. Forest Service. A slight decline was observed, which may represent natural annual variations in population size. Funded through the Fish and Wildlife Service, the AMC Research Department (under my direction) began research on the species' demography, habitat requirements, and reproductive biology in 1984. Drs. Tom Lee (of the University of New Hampshire) and Charlie Cogbill (of the Center for Northern Studies) have been working with the AMC study. The objective of the continuing project is to assess the potential genetic variability within the parent population prior to the selection of seed stock to be used in establishing new populations. Though the flower has both male and female reproductive organs, ongoing studies suggest that *P. robbinsiana* produces seed through apomixis, i.e. reproduction without fertilization. Pollination does appear to be necessary, however, as a catalyst for embryo formation.

In his review of the historical data on the *P. robbinsiana* population and the stability of its current habitat, Dr. Cogbill

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Photo by Rose Paul

Potentilla robbinsiana occupies protected niches between small stones in the exposed alpine habitat of the Monroe Flats on Mt. Washington, New Hampshire.

Status Review on Ivory-billed Woodpecker

The Service has initiated a status review on the ivory-billed woodpecker (*Campephilus principalis*) to determine if this species is extinct and should be removed from the U.S. List of Endangered and Threatened Wildlife (F.R. 4/10/85).

The ivory-billed woodpecker is the largest North American woodpecker, averaging 20 inches (51 centimeters) in length. Its plumage is shiny black, with a white stripe down the neck from the cheek to the back. The outer halves of the secondaries (inner major flight feathers) are white and form a large triangular patch across the lower back when the bird is perched. Females have a black crest; males have a red crest. Its large bill is the distinctive color of pale ivory.

The ivory-bill is often confused with the smaller pileated woodpecker (*Dryocopus pileatus*), which is about 17 inches (43 cm) long. Pileated woodpeckers, however, show no white across their backs when resting. In flight, pileated woodpeckers show white on the forward rather than the rear portion of the wing (as in the ivory-bill). Both male and female pileated woodpeckers have a red crest (the male's is more extensive) and a black bill.

Two subspecies of the ivory-bill are recognized by the American Ornithologists' Union: the American ivory-billed woodpecker (*Campephilus principalis principalis*) and the Cuban ivory-billed woodpecker (*Campephilus principalis bairdii*). Both subspecies may be extinct and are being considered under this notice of status review. Differences between the two subspecies are minute and can only be seen in the hand. The Cuban subspecies was last reported from the pine forests of the eastern mountains of Cuba, but was known to occur historically over most of Cuba, including the Isle of Pines.

The American ivory-billed woodpecker formerly occupied bottomland and swamp forests from northeastern Texas, southeastern Oklahoma, northeastern Arkansas, southeastern Illinois, southern Indiana, and southeastern North Carolina; southward to southern Florida; and west through the Gulf States to the Brazos River, Texas. Early accounts gave no accurate or definite statements of abundance, but indicated that the ivory-bill was never common. Its numbers and distribution began to decrease in the latter half of the nineteenth century.

The primary reason for the decrease in ivory-bill numbers appears to be a reduction in suitable habitat from logging of old-growth cypress swamps and bottomland forests. Young trees apparently provide much fewer of the food insects (wood-boring larvae) that the ivory-bill needs

than do the mature trees of a very old or virgin forest. Large stands of such trees are necessary; the home range of a pair of ivory-bills is estimated at 6 to 17 square miles (15 to 44 square kilometers).

There has been little solid evidence over the last 30 years that the ivory-billed woodpecker still exists. From time to time, the Service has received reports of sightings, but most are clearly of the common pileated woodpecker. Others seemed to indicate some possibility that one or more ivory-bills were wandering around the southeastern U.S. during the 1950s and, perhaps, later decades. To the Service's knowledge, however, there has been no unanimously accepted report of live ivory-bills since the early 1950s.

In the past, data on possible ivory-billed woodpecker sightings have been withheld by some individuals on the assumption that the birds would be better protected if no one learned of their presence. While

understandable, this approach also results in a lack of knowledge for those agencies that could manage the habitat to benefit the species.

Any person, organization, or agency with biological information on the current status of this bird, if it still exists, is encouraged to write to the Regional Director, Region 2 (address on page 2) by August 8, 1985. Photographs and other confirming materials are especially solicited; however, all reports are welcome. Visual observations without supporting descriptions of the bird(s), its behavior, the habitat, and general locale would be of little value to the Service.

The Service will consider all data that it now has, as well as any new information obtained as a result of this review. Depending upon what is indicated by the data, further surveys could be initiated, a workshop held to discuss the findings, or a rulemaking prepared to delist one or both subspecies because of extinction.



The ivory-billed woodpecker: extinct?

Service Announces Petition Findings

The Service has announced findings on four petitions, three that recommended adding certain species to the U.S. List of Endangered and Threatened Wildlife and Plants and one that advocated a delisting.

1. A petition from the American Malacological Union, received by the Service on August 22, 1984, requested an Endangered or Threatened classification for the spiny river snail (*Io fluviatilis*) of Tennessee and Virginia. The Service found that this petition presents substantial information that the requested action may be warranted.

2. A joint petition from Defenders of Wildlife, the National Resources Defense Council, and the Environmental Defense Fund, received September 11, 1984, requests that the Service list the desert tortoise (*Gopherus agassizii*) as Endangered throughout its entire U.S. range (California, Arizona, and Nevada, except for Utah where it already is listed as Threatened). The Service finds that this petition also contains substantial information that the requested action may be warranted.

3. The South Carolina Wildlife and Marine Resources Department, in a petition received August 15, 1984, requested that the American alligator (*Alligator mississippiensis*) be reclassified within that State to "Threatened due to similarity of appearance," a classification that now applies to the species in Louisiana and Texas. Currently, alligators in South Carolina are

listed as Endangered or Threatened in different parts of the State. Again, the Service found that the petition contained substantial information that the petitioned action may be warranted.

4. A petition from the National Audubon Society to list the McKay's bunting (*Plectrophenax hyperboreus*) and St. Matthew vole (*Microtus abbreviatus fisheri*) as Endangered was judged by the Service as not containing substantial data that such a listing is warranted. Both animals are found on St. Matthew Island, Alaska, where a development project has been proposed. Information available to the Service indicates that, at most, 5 percent of the island would be affected.

Section 4(b)(3)(B) of the Endangered Species Act requires that, within 12 months of receipt of a petition found to present substantial information, a finding be made as to whether the petitioned action is: not warranted; warranted and a listing proposal should be published; or warranted but publication of a listing proposal is precluded by other listing activity. All comments and information received in response to the status reviews of the spiny river snail, American alligator, and desert tortoise will be considered in making such findings.

Information can be submitted to the Associate Director—Federal Assistance (OES), U.S. Fish and Wildlife Service, Washington, D.C. 20240, until further notice.

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other active bald eagle nests in Arizona this year with 24 chicks. If these fledge, this year will be another record year for bald eagle production in Arizona.

Six bald eagle chicks from Florida eggs are currently being hacked in eastern Oklahoma in the Sequoyah NWR. Radio transmitters have been attached to these birds to monitor their movements. It is hoped that these eagles will return to the refuge to nest in 4–5 years.

Plans are under way to begin masked bobwhite (*Colinus virginianus ridgwayi*) chick reintroductions on the newly acquired Buenos Aires NWR in southern Arizona. The FWS will take possession of the refuge on August 1, 1985, and stocking should begin that same month, using birds produced at Patuxent Wildlife Research Center in Laurel, Maryland. The Patuxent masked bobwhites will be "foster-parented" by wild caught, sterilized Texas bobwhites (*C. v. texanus*). Biologists are optimistic that a new population will quickly become established from these releases.

A minimum of five adult pairs of peregrine falcons (*Falco peregrinus*) are reported nesting in west Texas this year. Three additional pairs are nesting on the Mexico side of the Rio Grande and hatching has been confirmed at one eyrie there. Pesticide analysis of potential peregrine prey found in the area (doves, swallows, phoebes, etc.) is in progress. Following the nesting season, prey remains and eggshell fragments will be retrieved from all nests to determine prey utilization and the degree of eggshell thinning. This project is being conducted through the cooperative efforts of the Texas Parks and Wildlife Department, FWS, National Park Service, and The Peregrine Fund.

Region 3—In April, regional office personnel participated in two FWS Habitat Preservation field station evaluations in regard to Section 7 consultation. The evaluations were held at field stations in Green Bay, Wisconsin, and East Lansing, Michigan, and were conducted to ensure the efficiency and adequacy of the Endangered Species Program. Field station personnel were found to be doing an excellent job.

Research during the past winter months has found 11 Endangered Kirtland's warblers (*Dendroica kirtlandii*) in the Bahamas and islands to the south. This species is also believed to be existing as far south as Haiti and possibly in Cuba.

The cowbird control program for the Kirtland's warbler began on April 15, 1985. The program will set out to remove the cowbirds (*Molothrus ater ater*) from warbler nesting areas in order to increase fledgling success for this Endangered bird. In the 1970s, cowbirds caused close to a 100 percent loss of warbler production. It has been proven that with an effective cowbird control program, fledgling success can once again be great.

Research has been undertaken to determine the extent of parvo virus in wolves (*Canis lupus*) in Minnesota. As a first step, researchers are trying to determine the extensiveness of this intestinal disease and its ramifications. Parvo virus is fatal in domestic dogs (*Canis familiaris*), but not necessarily fatal in coyotes (*Canis latrans*), and thought to have some degree of fatality in wolves.

Dr. Steven Kellert has completed his comprehensive study on Minnesota residents and wolves. This study, funded by the FWS, the U.S. Forest Service, several conservation organizations, and a grant from the Mardag Foundation, was conducted to determine the various opinions and degrees of knowledge among people about the wolf. Data obtained from the study will be used to develop education programs to better inform people about the facts and myths concerning this often misunderstood animal.

Region 4—The FWS Jacksonville, Florida, Endangered Species Field Station recently concluded a formal Section 7 consultation with the Federal Highway Administration (FHWA) on the upgrading of Alligator Alley, a road that extends from Naples to Fort Lauderdale, to Interstate 75. The FWS determined that precautions provided in the biological assessment prepared by the FHWA were not sufficient, and the project as planned would likely jeopardize the survival of the Florida panther (*Felis concolor coryi*).

The major issue in this consultation was providing enough wildlife crossings under Interstate 75 at known or suspected panther crossing points to allow this species the opportunity to move northward and southward without being killed on the highway. Highway fatalities have claimed 10 panthers over the last several years, three of them occurring within the last 6 months on a one-mile stretch of Alligator Alley.

Three alternatives were determined to be feasible, with the stipulation that the

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selection of one would eliminate the jeopardy situation. The first was to elevate the roadway over four of the major wetland areas that are critical to the panther; the second was to build 25 wildlife crossings and modify 13 bridges to allow wildlife to move under the interstate; and the third was for the FHWA to initially accept a reduced number of wildlife crossings with the intent of funding an accelerated research program to better define other panther crossing points.

Knowing that this consultation was going to be controversial and that a great deal more work was going to be required, field station personnel video-taped that segment of Alligator Alley within essential panther habitat. The video film showed where the wildlife crossings were to be located and proved invaluable during briefings in Washington, D.C.

On March 7, 1985, the Jacksonville Field Station hosted a meeting to discuss preliminary recovery plans for the Endangered wood stork (*Mycteria americana*). Representatives from Federal and State agencies, water management districts, and conservation organizations, along with other concerned biologists, met to discuss wood stork recovery goals and the procedures that must be implemented to achieve those goals. Discussions focused on securing habitat for the entire life cycle of the wood stork, developing models for population dynamics and movement of wood storks, and developing public awareness of the species and wetland problems. A technical draft of a wood stork recovery plan will be developed by the Jacksonville office by the end of this fiscal year.

The U.S. breeding population of the species was listed as Endangered under the Endangered Species Act on February 28, 1984. This rule provides protection for wood storks occurring in Florida, Georgia, Alabama, and South Carolina. The decline in the U.S. breeding population is due to inadequate reproduction attributed to the reduction in the food base (mostly small fish) necessary to support breeding colonies. The reduction in the food base is attributed to loss of wetland habitat as well as changes in hydroperiods of remaining wetlands.

The Jacksonville Endangered Species Field Station is currently analyzing data contained in a recently received contract report on the Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) in preparation for a proposed rulemaking to add this bird to the Federal list of endangered wildlife. The Florida grasshopper sparrow is non-migratory and occurs only in the prairie region of south-central Florida. It prefers low brush

habitat of saw palmettos, woody shrubs, and sparse brush grass. It is a small bird, about 5 inches (13 cm) in length, colored mostly black and gray, and lightly streaked with brown on the nape and upper back. The song of this sparrow is one of the weakest of any North American song bird, having more the quality of an insect's buzz. During the breeding season, the Florida grasshopper sparrow feeds on insects, spiders, and seeds. No information is available on its winter diet.

According to the contract report, the principal reason for the decline of this sparrow and the greatest threat to its survival is habitat loss due to pasture development and/or improvement for livestock. Data contained in the report, which were obtained over a 4-year period, indicate not only that the range of the species has decreased, but that the total number of birds may now be less than 250. Most remaining populations are on privately owned lands, but one population is known to occur on Federal land at the U.S. Air Force's Avon Park Bombing Range in Polk and Highlands Counties.

The Arkansas Game and Fish Commission has proposed to protect 36 caves that provide habitat for gray bats (*Myotis grisescens*) against human disturbance by placing warning signs at entrances and by use of management structures to prevent human entry at an additional 11 caves. This is a timely proposal as a recent study by Dr. Michael J. Harvey, under contract to the Commission, indicates that there has been a 9-percent decline in the summer gray bat population in Arkansas between the period 1979-1981 (mean population size 120,700) and 1982-1984 (mean population size 109,300).

In October 1984, the FWS began an effort to live-trap Perdido Key beach mice (*Peromyscus polionotus trissyllepsis*), a subspecies proposed for listing, from a small coastal area of private land in Baldwin County, Alabama, that was scheduled for development. Over 4,000 trap nights resulted in the capture of three beach mice, which were transported to a research facility for housing in a small-mammal laboratory.

After months of planning and field work, a decision was reached to release the three captive beach mice back into natural habitat. The location chosen was Gulf State Park in Baldwin County, Alabama, an area approximately one mile (1.609 km) west of where the mice were originally captured. The release was a combined effort between the National Park Service and the FWS.

In order to enhance the chances for a successful release, an enclosure was placed one foot (.3048 m) deep on a primary sand dune. The beach mice were placed into the enclosure at dusk on Feb-

ruary 13, 1985. Within five minutes, all mice had settled down and found refuge under vegetation.

Beach mice are normally most active at night and by early the next morning, five burrows had been excavated in the primary dune. No mice were on the surface and they were presumed to be in the new burrows. From the amount of excavated material outside the burrows, it was believed that three of the burrows were not dug very deep and possibly were escape burrows, while two burrows were dug much deeper and probably were nesting chambers. The enclosure was then removed.

Use of the enclosure was felt to be an asset in this successful release because the mice were restricted to one small area that probably conserved energy and reduced stress, they were forced to dig burrows in close proximity (thereby enhancing the chances of forming a family group), and protection was provided from predation during the initial burrowing activity.

Region 5—Recovery continues for the peregrine falcon (*Falco peregrinus*) in the Northeast as evidenced by the 34 pairs of peregrines found nesting or attempting to nest this spring. Several pairs were even found at some northern mountain sites. These numbers indicate a substantial increase over last year's approximate 16 pairs of nesting peregrines.

One of the last two bald eagle (*Haliaeetus leucocephalus*) nests located at Hemlock Lake in New York State has produced at least one eaglet. This eaglet is the first one hatched since 1970. State biologists feel that this successful production is due to the help of a new female eagle that replaced the old one which was badly contaminated with DDT.

Region 6—The whooping crane spring migration began in April from Aransas NWR on the Texas Gulf Coast and will terminate 2,600 miles north at Wood Buffalo National Park in Canada. There are currently 84 birds in this main flock, 69 adults and 15 young. In addition, there are 35 birds held in captivity and 30 birds in the foster-parent flock that migrates between New Mexico and Idaho. This Endangered bird continues its slow but steady comeback from near extinction with a total of 149 birds from only 18 wild birds in 1983.

A grizzly bear (*Ursus arctos horribilis*) habitat symposium, sponsored by the Interagency Grizzly Bear Committee and the University of Montana, was held at the University of Montana in Missoula during the week of April 29. The purpose was to help participants gain a common understanding of current grizzly bear habitat

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management activities; present recent developments and describe current conditions in grizzly bear habitat management; describe grizzly bear mapping techniques and levels of technology; and describe the cumulative effects analysis process. Proceedings from the symposium will be published as a U.S. Forest Service Intermountain Research Station General Report later in 1985.

Region 7—The trapping of a female American peregrine falcon (*Falco peregrinus anatum*) along the Tanana River on April 19 marked the earliest capture date for peregrines in Alaska. The trapping, in conjunction with an extensive banding program, provides information on movements, longevity, and health of the peregrines. This particular female was banded as a nestling in 1981, approximately 125 miles from the trap site.

The peregrine banding program has yielded numerous band returns ranging

from Washington State to Central and South America. The most recent return was that of a bird banded as a nestling on the Colville River in 1983 and recovered in southeastern Brazil in November 1984. The Bureau of Land Management and the National Park Service will cooperate with the FWS in 1985 to survey and band peregrine falcons along approximately 2,000 miles of Alaska's rivers.

Four Plants

(continued from page 1)

Because of its low numbers and restricted distribution, *C. specuicola* is susceptible to threats from water development and livestock grazing or trampling. Livestock already are being watered at two of the water sources near the plants. Accordingly, the species was listed as Threatened in a final rule published in the May 8, 1985, *Federal Register*.

The Fish and Wildlife Service does not anticipate that use of the seep-spring for livestock watering will affect, or be affected by, the Critical Habitat designation since the actual watering sites are located far enough away from the site where *C. specuicola* is found. The Bureau of Indian Affairs has informed the Service that it plans to monitor the habitat as part of a plan to develop an informal monitoring system for the resources under its jurisdiction.

Erigeron rhizomatus

A perennial herb in the aster family, *Erigeron rhizomatus* (rhizome fleabane) grows in clumps from underground stems, or rhizomes. Each clump can reach 25-45 cm (10-18 inches) high and up to 30 cm (12 inches) across. Its leaves are narrow, only up to one cm (.4 inch) long, and dark green. The plants usually reproduce clonally rather than by seed.

E. rhizomatus is restricted to 20 small populations scattered over the Datil and Sawtooth Mountains in northern New Mexico. Some occur in McKinley and Catron Counties on the Cibola Natural Forest, and some on Bureau of Land Management (BLM) property in Catron County. Given its limited distribution and low numbers (about 200 known individuals), *E. rhizomatus* is particularly vulnerable to habitat disturbance.

Most of the populations are located close to inactive uranium claims. The plants could be jeopardized if these claims are reactivated and developed without planning for the species' conservation. Road construction and the resulting erosion could also have an adverse impact on some *E. rhizomatus*

colonies unless the roads are properly planned and constructed. The population on BLM-administered land occurs on an allotment under moderate cattle grazing use. Some of the plants could be trampled and their habitat eroded if grazing levels are increased. Wildfires and certain recreational uses of the area have been mentioned as other possible dangers to the plant. Because of these threats, *E. rhizomatus* was proposed for listing as a Threatened species on April 24, 1984 (see story in BULLETIN Vol. IX No. 5). The final listing rule was published in the April 26, 1985, *Federal Register*.

A Critical Habitat designation for *E. rhizomatus* was not included in the final rule. The species occurs only on U.S. Forest Service and BLM lands, and these agencies are aware of their conservation responsibilities; therefore, no additional protection would be extended in this case by making a formal Critical Habitat designation. Section 7 of the Act requires both agencies to refrain from any action that is likely to jeopardize the species' survival. Plans to reactivate the uranium operations or increase grazing, for example, would not necessarily be prohibited, but the appropriate agency would be required to consult with the Fish and Wildlife Service.

As stated above, all four of the newly listed plants will receive protection 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 or adversely modify their Critical Habitats.

Under Section 9, it is illegal to "remove and reduce to possession" Endangered plants, such as *Amsinckia grandiflora*, from lands under Federal jurisdiction. Regulations are being developed to extend similar protection for plants classified as Threatened. When they are completed, Section 9 will apply as well to all known *Carex specuicola* and *Erigeron rhizomatus* populations.

Interstate and international trafficking in listed plants is prohibited, except under permit. Seeds of Threatened plants are

exempt from these prohibitions if a statement of "cultivated origin" appears on their containers. However, the Service anticipates that few if any trade permits will be sought or granted since none of the four newly listed plants is common in the wild or in cultivation.

Other benefits to the plants of a listing include the requirement for the Service to develop plans for their recovery and the possibility of Section 6 funding to States and U.S. Territories with Endangered Species Cooperative Agreements. Currently, California and Puerto Rico have such agreements for plants.

Ferret Survey Training Program

The Wyoming Cooperative Fishery and Wildlife Research Unit at the University of Wyoming recently conducted two programs to train persons working for public and private agencies to properly survey areas for presence of the Endangered black-footed ferret (*Mustela nigripes*). Workshops lasted one day and consisted of classroom and field exercises. Participants were instructed in methods to survey ferrets in the daytime as well as at night, and discussions of surveys in different seasons took place. Instructors also presented information on State and Federal laws that must be complied with when conducting searches.

Participants were certified so that they can conduct these surveys in areas where it is assumed that black-footed ferrets are likely to occur. Instructors were from the Wyoming Game and Fish Department, U.S. Fish and Wildlife Service, the University of Wyoming, and private agencies.

If there is interest in this course being offered again, notify Angela Brummond at the Wyoming Cooperative Research Unit, Box 3166, University Station, Laramie, Wyoming 82071; telephone 307/766-5415.

Listing Proposals for Two Western Plants are Withdrawn

The Fish and Wildlife Service (FWS) has withdrawn proposals to list two western plants, *Hedeoma diffusum* (Flagstaff pennyroyal) and *Phlox pilosa* var. *longipilosa* (long-haired phlox), as Threatened (F.R. 3/26/85). New data indicate that both plants are more abundant and that the threats they face are not as serious as previously thought. For these reasons, the FWS determined that neither plant needs, nor is eligible for, protection under the terms of the Endangered Species Act.

Hedeoma diffusum, a perennial herb in the mint family, was proposed for listing as a Threatened species on June 29, 1983 (see story in BULLETIN Vol. VIII No. 7). At that time, the plant was believed to be restricted to 10 locations in the Flagstaff, Arizona, area and threatened by habitat loss from urban development. A subsequent survey, contracted by the U.S. Forest Service (USFS) to Dr. B.G.

Phillips of the Museum of Northern Arizona, revealed the presence of a second population center 7 miles southwest of the one previously known population center. The survey brought the total number of known *Hedeoma diffusum* sites to over 100, with more than 50 sites having at least 100 plants each and 5 sites having over 1,000 plants. Most of them are on USFS-administered lands (Coconino National Forest), and several are within the Red Rock-Secret Mountain Wilderness Area. The USFS already protects *Hedeoma diffusum* and other species on its "Sensitive Plant List," and has developed a management plan for its conservation.

Phlox pilosa var. *longipilosa* also had been proposed for listing as Threatened (F.R. 8/29/83). This plant is endemic to the Quartz Mountain area of the Wichita Mountains in southwestern Oklahoma. At the time of its proposed listing (see story

in BULLETIN Vol. VIII No. 9), it was thought to be jeopardized by quarrying, grazing, and recreational development at Quartz Mountain State Park. Later, in May 1984, a team of Federal, State, and academic volunteers conducted an intensive survey of known habitat on U.S. Bureau of Reclamation land (which is leased to Oklahoma for use as the State park). Data gained during this survey, together with the findings of a 1984 status survey by I.H. Butler, indicate that *Phlox pilosa* var. *longipilosa* is thriving. An estimated 14,000 to 20,000 plants occur on Federal lands, and the suspected threats do not appear to be as great as once thought. For these reasons, *Phlox pilosa* var. *longipilosa* does not seem to be in any danger of extinction. Should its status deteriorate in the future, however, it may be proposed again for listing.

Cinquefoil

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found that both have been relatively stable over the past 48 years. The collection pressure for herbariums that occurred during the late 1800s to early 1900s is no longer a serious threat. Ongoing research on microhabitat requirements of the plant, paralleling the reproductive biology study, will be used in the selection of sites for establishment of new reproducing colonies in potential historical habitats. The presence of newly established or

reestablished populations will reduce the chances of the species' extinction should the Monroe Flats population be lost—due, for example, to such a random event as the unauthorized landing of a military helicopter in the habitat during 1983. To date, this project has enjoyed strong support from the AMC, Fish and Wildlife Service, and U.S. Forest Service, and it has the advantage of a recovery plan that is practical and straight-forward.

Because of these cooperative efforts, there is increasing optimism for the future of the Robbins' cinquefoil.

Recovery Plan Update

Two recovery plans were approved in April: the *McKittrick Pennyroyal Recovery Plan* (4/12/85) and the *Woodland Caribou Recovery Plan* (4/12/85). Copies of recovery plans become available for purchase about 6 months from their date of approval. Requests should be made to the Fish and Wildlife Reference Service, 6011 Executive Boulevard, Rockville, Maryland 20852; telephone 800/582-3421.

NOTE: In Bulletin Vol. X No. 4, we indicated that the *Bald Eagle—Pacific States Recovery Plan* was approved. This plan has not yet been approved and we apologize for the error.

Attention Readers

If you are receiving a duplicate copy of the BULLETIN, or if your office continues to receive copies addressed to individuals no longer employed by your agency, please let us know so that we can eliminate these entries from our mailing list. Please refer to the zip code as well as to the addressee when you call or write regarding changes in the mailing list. Thank you.

—The Editor



Photo by Everett Marshall

Rose Paul, Research Assistant with the Appalachian Mountain Club Research Department, surveying the habitat preferences and demograph of *P. robbinsiana* on Mt. Washington. In the background is the Crawford Path, part of the Appalachian Trail.

New Publications

Species of Special Concern in Pennsylvania, edited by H.H. Genoways and F.J. Brenner, is a "blueprint for action in saving the most endangered and threatened portions of the flora and fauna of the Commonwealth." This 430-page book, intended as a reference for use by anyone interested in conserving Pennsylvania's biological resources, contains many distribution maps, black and white photographs, and six full-page color plates. To order a copy, send \$30.00, plus \$3.00 for shipping/handling, to the Publications Secretary, Carnegie Museum of Natural History, 4400 Forbes Avenue, Pittsburgh, Pennsylvania 15213. (Pennsylvania residents should add 6% States sales tax.)

Threatened and Endangered Plants and Animals of Maryland, the proceedings of a symposium held at Towson State University in September 1981, is now available for purchase. The 476-page volume includes 22 papers presented at the symposium, along with 8 others invited subsequently. All were fully revised and updated as of 1984. The price per copy is \$13.00 (tax and postage included). Send a check or money order to the Maryland Department of Natural Resources, Fiscal and Supportive Services Office, Tawes State Office Building, Annapolis, Maryland 21401-9974.

Part 3 of the *Atlas of the Rare Vascular Plants of Ontario* is now available. This installment, edited by G.W. Argus and C.J. Keddy, covers more than 160 species in 25 families, including the Brassicaceae, Ericaceae, Fabaceae, Poaceae, and Rosaceae. The first and second parts of the *Atlas* were published in 1982 and 1983, and are still available. Part 4, the final installment, should be available in 1986, and will automatically be sent to those receiving the earlier sections. Order the

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	20	19	234	4	0	22	299	23
Birds	59	13	144	3	1	0	220	54
Reptiles	8	8	60	8	4	13	99	16
Amphibians	5	0	8	3	0	0	16	6
Fishes	30	4	11	17	3	0	65	37
Snails	3	0	1	5	0	0	9	7
Clams	22	0	2	0	0	0	24	18
Crustaceans	3	0	0	1	0	0	4	1
Insects	8	0	0	4	0	0	12	9
Plants	69	5	1	13	2	2	92	41
TOTAL	227	47	461	58	10	37	840	212**

* 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: 178

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

Number of Species with Critical Habitats determined: 71

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

16 plants

May 3, 1985

Atlas free-of-charge from the Rare and Endangered Plants Project, Botany Division, National Museum of Natural Sciences, Ottawa, Ontario, Canada K1A 0M8.

New England's Rare, Threatened, and Endangered Plants, written by Garrett E. Crow, focuses attention on and provides a comprehensive assessment of 101 of the rarest plants in New England. A limited number of copies of this invaluable report are available free upon request from the FWS Region 5 office (see address on page 2).

The Black-footed Ferret Workshop Proceedings are now available. This publication contains 32 papers presented at a

2-day ferret workshop last fall at the University of Wyoming in Laramie. Federal, State, university, and private interests were represented. Among the topics addressed were: ferret detection and management techniques; habitat evaluation procedures; landowner relations; captive propagation and reintroduction possibilities; genetics; the various State and Federal laws protecting the species; and a variety of other material valuable to persons interested in the recovery of the black-footed ferret. Copies of the proceedings can be purchased for \$10.00 (post-paid) from the Wyoming Game and Fish Department, Special Publications-BFF, Cheyenne, Wyoming 82002.

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