April 1985 Vol. X No. 4

ENDANGERED SPECIES

Technical Bulletin

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

Eight Plants Proposed for Listing as Threatened or Endangered

During March, eight plant taxa were proposed by the Service for addition to the List of Endangered and Threatened Wildlife and Plants. All eight are native to small sites in different parts of the United States, where they face habitat damage and other threats. If the proposed lists are made final, these plants will receive protection under the Endangered Species Act:

Photo by Gerald D. Carr

The Mauna Kea silversword produces a globular rosette that can reach 2 feet (61 centimeters) or more in diameter, consisting of lance-shaped leaves covered with long silvery hairs. Its flowering stalk, which can grow up to 8 feet (2.4 meters) in height, supports numerous branches bearing small flowering heads. After flowering, plants with a single rosette die.

Mauna Kea silversword

One of the Hawaiian Islands' most impressive and well-known plants is the silversword, or *'ahinahina*. The most famous variety is *Argyroxiphium sandwicense* var. *macrocephalum*, which grows high on the volcano Haleakala, Island of Maui. Another variety, found on the upper slopes of the Island of Hawai'i's highest volcano, Mauna Kea, is extremely rare and in danger of extinction. Only about 35 individuals of the Mauna Kea silversword *(A. s.* var. *sandwicense)* survive, out of a population that presumably once numbered in the thousands, and it has been proposed for listing as Endangered (F.R. 3/6/85).

Historically, the Hawai'i variety occupied the alpine slopes of the Mauna Kea volcanic dome within the 8,500–12,000 foot level, mostly above the tree line and in barren desert areas above other vegetation. (There are unconfirmed reports that it once may have occurred on one of the island's other volcanic mountains, Hualalai.) The taxon was first scientifically collected in 1825 by Scottish botanist James Macrae, who wrote that it was "truly superb, and almost worth the journey of coming here to see it on purpose." As recently as about 50 years ago, the Mauna Kea silversword was so abundant that one man who climbed the mountain told others that "his eyes glared in the morning sun" from the sunlight reflecting off the plants in the upper Wailuku River basin. It is this same area of the mountain that maintains the last few surviving Mauna Kea silverswords.

The introduction of various livestock animals to the Hawaiian Islands in the late 1700s had severe consequences for the native flora. Feral goats, sheep, pigs, cattle, and horses multiplied and dispersed widely throughout the islands. These animals have virtually eliminated the Mauna Kea silversword, and have vastly altered

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Recovery Plan Approved for Two California Butterflies

A plan developed to assist in the recovery of two Endangered butterflies, the San Bruno elfin and the mission blue, has been approved by the Service (10/10/84). With the aid of this recovery plan, these two species may once again become secure and self-sustaining.

* * *

At one time, the San Bruno elfin *(Callophrys mossii bayensis)* and mission blue *(Icaricia icarioides missionensis)* butterflies probably occurred on hill tops and ridges throughout much of northern San Mateo County to the San Francisco Peninsula and northward to southern Marin County in California. Urbanization of this region has significantly reduced the range of both species to relicts of their former abundance, except at San Bruno Mountain in northern San Mateo County, where suitable habitat exists for at least seven colonies of the San Bruno elfin butterfly and almost all extant mission blue butterfly colonies. In addition to San Bruno Mountain, other colonies of the San Bruno elfin occur on Milagra Ridge, Montara Mountain, Peak Mountain, and Whiting Ridge, also in San Mateo County.

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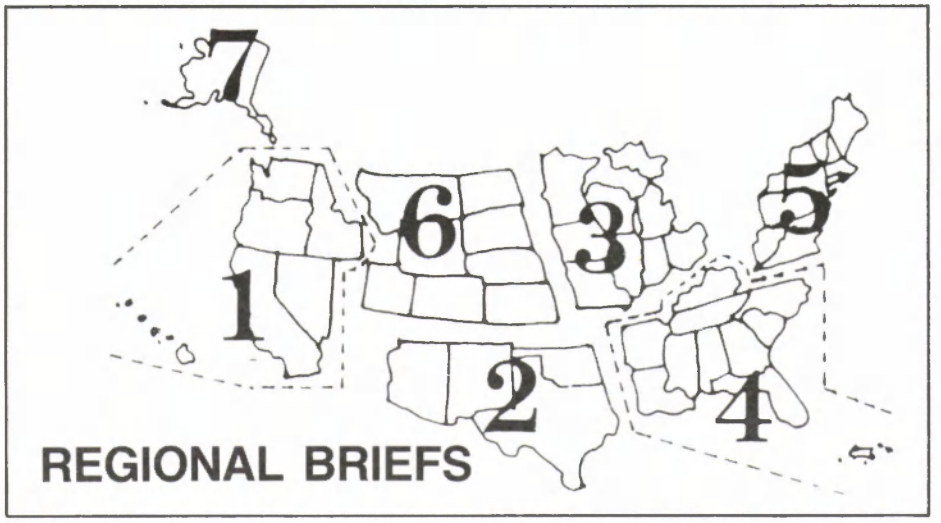
Photo by Larry Orsak

Only four colonies of the San Bruno elfin are known to exist, all of them in the coastal mountains of San Mateo County, California.



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

Region 1—The Fish and Wildlife Service (FWS) held several meetings with Bureau of Land Management (BLM) biologists to discuss a habitat protection plan for the Bruneau Hot Springs snail (genus and species undescribed), a Category 1 candidate species in Idaho for which a listing proposal is under review. Dr. Fritchman, an invertebrate zoologist with the biology department of Boise State University, has been to the site, collected specimens, and is culturing them in the lab. Possible sites for relocating the snails into secure habitats are being investigated. A meeting with U.S. Geological Survey and Idaho State hydrologists revealed that the aquifer feeding the hot spring is being drawn down by ground water pumping for agricultural use and that the spring would become dry at some future date. Survival of the snail does not look good unless other secure habitats can be found or existing agricultural practices modified.

* * *

Region 2—The 1985 Crane Workshop was held March 26–28 at Grand Island, Nebraska. Dr. James Lewis, Whooping Crane Coordinator for the FWS, and John VanderWalker of the Platte River Trust co-chaired the meeting. Fifty-three professionals from Canada and the United States presented research papers on the topics of populations, habitat, management, disease and mortality, captive propagation, behavior, hunting, reproduction, and aspects of migration. Twenty-three papers dealt with whooping crane *(Grus americana)* subjects, four were about the Endangered Mississippi sandhill crane *Grus canadensis pulla)*, and the remaining papers dealt with the nonendangered sandhill cranes used as surrogates for research. The participants toured crane habitat along the Platte River and the Rainwater Basin of Nebraska, viewing thousands of cranes, geese, and ducks. The Whooping Crane Recovery Team met after the workshop to complete revisions on the 1980 recovery plan.

* * *

A female Sonoran pronghorn *(Antilocapra americana sonoriensis)*, one of 10 that were captured and radiocollared by the Arizona Game and Fish Department in 1983, was found dead on the Cabeza Prieta National Wildlife Refuge in early March. Analysis of the carcass by personnel at the University of Arizona's animal pathology laboratory indicates that the pronghorn may have been killed by a coyote *(Canis latrans)*. The carcass will eventually be sent to the Natural History Museum in Washington, D.C., for preservation and possible display. This is the second of the collared pronghorns to die over the 2-year period that the monitoring effort for this Endangered mammal has been in effect.

* * *

An Endangered bonytail chub *(Gila elegans)* was captured from Lake Mohave by contractors with Arizona State University. The fish was rushed to Page Springs State Hatchery in Arizona, and it will eventually join the Endangered fish breeding program at Dexter National Fish Hatchery (NFH) in New Mexico. This is only the 19th bonytail chub to be captured

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REGIONAL BRIEFS

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in the lower basin of the Colorado River over the past 10 years. The others all came from Lake Mohave, too, and were placed in Dexter NFH, where successful spawning procedures have been developed. Eventually, the FWS plans to reintroduce this species into portions of its former range under the experimental population regulations finalized on August 27, 1984.

The Lake Mohave bonytail chub population apparently has survived in that reservoir of the Colorado River since Davis Dam was built in the early 1950s. The youngest chub discovered so far was 37 years old, and most are more than 40 years old. Although the reservoir habitat allows survival of adult fish, requirements for spawning are lacking, resulting in a rapidly disappearing senescence population. Expansion of introduced striped bass *(Morone saxatilis)* in Lake Mohave may eliminate the few remaining chubs even before old age.

* * *

Region 4—Section 7 formal consultation between the FWS and the U.S. Forest Service (USFS) has recently been completed with the issuance of a "no jeopardy" biological opinion. The USFS agreed to incorporate into their activities various management guidelines for the Endangered red-cockaded woodpecker *(Picoides borealis)* that should ensure the continued welfare of this species on USFS lands in the Southeast. The guidelines are very similar to those outlined in the revised draft of the Red-Cockaded Woodpecker Recovery Plan.

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Correction

In BULLETIN Vol. X No. 3, the photo caption on page 1 should have described all three pelicans shown as immatures. Our apologies to the photographer, who is not responsible for the caption.

Protection Given to Three Desert Fishes

Three subspecies of desert fishes were listed by the Service during March as Threatened. All three are endemic to small springs systems, and are vulnerable to any activities that might deplete or degrade their aquatic habitat. Under their Threatened classification, these fishes and their habitat will now receive the protection and recovery programs authorized by the Endangered Species Act:

The **Hutton tui chub *(Gila bicolor* ssp.)** is found only in Hutton Spring and a nearby unnamed spring, both located in arid Lake County, south-central Oregon. This fish was proposed for listing as Threatened on April 17, 1984 (see BULLETIN Vol. IX No. 5), due primarily to threats thought to be posed by the side effects of heavy cattle grazing and by chemical contamination of the water table. It now appears that current grazing practices are not degrading the aquatic habitat; however, if the property is later sold to people who might be less interested in conservation than the current owners, water quality could suffer. Other future threats could include excessive ground water pumping or springflow diversion.

A long-term, but potentially more serious, threat to the Hutton tui chub is chemical contamination of the ground water that feeds the springs. A toxic waste dump is located less than 2 miles from Hutton Spring in the now-dry Alkali Lake. During 1976, about 25,000 55-gallon drums of 2,4-dichlorophenoxyacetic acid (or 2,4-D) and methylchlorophenoxyacetic acid (MCPA) manufacturing residues were buried along the southwest margin of the lake. The barrels were severely damaged when initially buried, and have since polluted the ground water, surface water, and air in the Alkali Lake area. Dispersal of these herbicides and their by-products may result in the extinction of the Hutton tui chub unless measures are undertaken to prevent contamination of its habitat.

The **Foskett speckled dace *(Rhinichthys osculus* ssp.)** also occurs in Lake County, Oregon, within Foskett Spring and its outflow. It may also be found in a small springpool to the south where a transplant was attempted in 1982. Like the Hutton tui chub, this variety of the speckled dace could be threatened by future increases in grazing and water use. The vulnerability of the Foskett Spring habitat is accentuated by its small size and very restricted flow (less than 0.5 cubic feet per second). It was proposed with the Hutton tui chub (F.R. 4/17/84) for listing as Threatened (see BULLETIN Vol. IX No. 5).

The **Big Spring spinedace *(Lepidomeda mollispinis pratensis)*** is a small fish restricted to the intermittent Meadow Valley Wash in southern Nevada. It was first collected in the 1930s from a marshy area adjacent to Big Spring, which is near the town of Panaca. In 1959, however, ichthyologists discovered that diversion of water for agriculture and the introduced mosquitofish *(Gambusia affinis)* had apparently eliminated the Big Spring spinedace from its type locality, and the subspecies was thought to be extinct.

Fortunately, Nevada Department of Wildlife (NDW) biologists rediscovered the spinedace at a site in Condor Canyon, a 4-mile (6.4-kilometer) section of Meadow Valley Wash just northeast of Panaca that has perennially flowing water. A reintroduction of the spinedace above a barrier falls was later conducted by NDW, and now the fish occurs in most of the available Condor Canyon habitat. Since the stream is shallow and only 3 feet (0.9 meters) wide in most places, it is particularly vulnerable to reduced or even lost flows from groundwater pumping or channelization and diversion. Overgrazing of the riparian vegetation along its banks could result in siltation, increases in water temperatures, and changes in dissolved oxygen levels. Aside from these threats to its habitat, the spinedace itself would be imperiled if exotic fishes become established in Condor Canyon. For these reasons, the Big Spring spinedace was produced for listing as Threatened on November 30, 1983 (see BULLETIN Vol. VIII No. 12). A Critical Habitat designation for the 4 stream miles in Condor Canyon and a 50-foot (15.24 meter) riparian zone along each side was proposed at the same time.

The Nature Conservancy owns some of the habitat at the head of Condor Canyon, but about 3.25 miles (6 km) of the canyon are administered by the Bureau of Land Management (BLM). About one-half of the Critical Habitat is within BLM grazing allotments, which currently are in a non-use status. Any federally authorized reactivation of the allotments would probably require consultation with the Fish and Wildlife Service in order to prevent adverse modification of the Critical Habitat.

* * *

Under their Threatened classification, the Hutton tui chub, Foskett speckled dace, and Big Spring spinedace are now protected by the Endangered Species Act. Among the conservation measures conferred by the Act are protection against any adverse effects of Federal actions, a requirement for the Service to develop a recovery plan, possible Federal aid to State conservation activities for these fishes, and controls on taking.

Included in the final listings were special rules authorizing the take of all three fishes for certain conservation purposes, in accordance with State laws. These special rules should allow for more efficient conservation and recovery activities. Habitat degradation, rather than intentional taking of the fishes, is the primary threat to their survival. Both Oregon and Nevada already prohibit the take of these fishes without a State-authorized scientific collecting permit.

Blue Ridge Goldenrod Listed as Threatened

A perennial herb endemic to the high mountain peaks in North Carolina and Tennessee, the Blue Ridge goldenrod *(Solidago spithamaea)*, has been listed by the Service as a Threatened species (F.R. 3/28/85). Habitat disturbance as a result of recreational development and use has reduced *Solidago spithamaea* to just three populations, but now with the protection authorized by the Endangered Species Act to aid in its conservation, the species will have a better chance for survival.

Two of the remaining populations of *Solidago spithamaea* occur on private lands in Avery County, North Carolina, and the third grows in a national forest located on the border between Mitchell County, North Carolina, and Carter County, Tennessee. Heavy recreational use by hikers, rock climbers, and sightseers continues to threaten the remaining populations of the Blue Ridge goldenrod, and construction of new trails and other related improvements at any of the three sites where the species occurs could further jeopardize its existence.

On July 23, 1984, the Service proposed to list *Solidago spithamaea* as Threatened (see BULLETIN Vol. IX No. 8) and solicited comments on its status, distribution, and threats to its existence. Comments were received from seven parties comprised of Federal and State government agencies and private conservation organizations. All comments supported the Service's decision to list the species, and most agreed that the decision not to designate Critical Habitat was the proper one, considering that such a designation could prove detrimental to the species.

As a Threatened species, the Blue Ridge goldenrod will now be entitled to all the conservation measures provided to species listed under the Endangered Species Act. These include recognition of its precarious status, development of plans for its recovery, and prohibitions against certain practices. Under Section 7 of the Act, Federal agencies are required to consult with the Fish and Wildlife Service to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the survival of any listed species. Even though a formal designation of Critical Habitat is not part of this final rule, *Solidago spithamaea* will nevertheless receive this full Section 7 protection. In addition, interstate and international trafficking in this plant without a permit is now prohibited, with certain exceptions. However, properly documented seeds of cultivated specimens are exempt from this prohibition.

Condor Setback

Recent observations of the critically Endangered California condor *(Gymnogyps californianus)* indicate a drop in the number of breeding pairs remaining in the wild.

Nesting activity should have begun several months ago, and biologists at the Condor Research Center in Ventura, California, have observed only single adult condors in the territories of three pairs that nested in 1984. At a fourth territory, one member of the breeding pair is missing, but its mate has apparently formed a new pair bond with another bird. These birds were observed copulating early in the breeding season, but in recent weeks only the male has been seen. At the fifth site, the breeding pair has produced two eggs so far this season. Both eggs were collected for artificial incubation to supplement the captive population. One embryo died, but the other egg hatched on April 11. The chick's sex will be determined in several weeks.

On April 9, a severely emaciated, barely alive male condor (which was not one of the missing breeding birds) was found by a rancher, and was turned over to Condor Research Center biologists the next day for care. Unfortunately, it quickly died. The bird showed no external signs of trauma and there was no lead in its gizzard. Tissue samples have been submitted to various laboratories for analysis to see if there were any diseases or toxic substances present that would cause the bird's death. Biologists are concerned that the missing birds, which may number as many as six, reduce the wild population to as few as 9 birds. A final count of the 1985 population will be made in September when distinct feather patterns are apparent, allowing biologists to identify individual birds.

Only one of the four missing breeding condors had been fitted with a radio transmitter, and it is not sending a signal. Given the vastness of the condor's range, this lack of tracking ability will make it difficult for researchers to locate the carcasses (if in fact the missing birds have died) and determine the causes of death. The California Condor Recovery Team—made up of Federal, State, and private biologists—is reviewing the condor's current status, and will recommend whether or not the planned recovery effort for this great bird needs any modification.

The captive population numbers 17 condors, all but one of them (the male Topa Topa) too young for breeding. Biologists hope that this population will eventually produce offspring that can be introduced into the wild.

Photo by Gerald D. Carr

Each flowering head on a Mauna Kea silversword measures about one inch (2.5 cm) in diameter, and is ringed by about a dozen pinkish, petal-like ray flowers.

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and degraded the mountain's vegetation in general. Their direct effects include trampling and other mechanical damage to the plants, browsing of plant material, and dispersal of exotic competing plant species. Secondary effects include wind and water erosion of the thin soil mantle after it has been stripped of stabilizing vegetation.

Currently, the Mauna Kea silversword survives in an area measuring only 50 meters by 500 meters (about 165 feet by 1,650 feet) in the upper Wailuku River drainage. A portion of the population has been fenced by the State of Hawaii; unfortunately, however, the exclosure has not been effective against the mouflon sheep, an animal introduced for sport hunting. This exotic threatens the remaining silverswords through trampling and browsing.

Most of the remaining 35 plants occur on undeveloped land held in trust by the Hawaiian Homes Commission, part of the property (known as the Hawaiian Home Lands) set aside in 1920 for the benefit of the native Hawaiian people. The rest are on land owned by the State of Hawaii, which has taken some preliminary steps for the species' protection. Almost all of the species' historical range is on State-owned property.

The listing proposal did not include a designation of Critical Habitat because

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pinpointing the silversword's location would make this distinctive plant more vulnerable to overcollection or vandalism; however, if listed, the species will receive the benefits authorized by Section 7 of the Endangered Species Act. Moreover, in accordance with Hawaiian law, listing the silversword under the Federal Endangered Species Act automatically would give it protection from take under the State's own endangered species legislation.

Comments on the proposal to list the Mauna Kea silversword as Endangered are welcome from all interested agencies, organizations, and individuals, and are due to the Regional Director, Region 1 (see page 2 of the BULLETIN for the address), by May 6, 1985.

Lana'i sandalwood

Another rare plant endemic to the Hawaiian Islands, the Lana'i *'iliahi* or sandalwood *(Santalum freycinetianum* var. *lanaiense)*, is imperiled primarily by the effects of exotic game animals and rat predation on its fruits. At last count, only 39 individuals of this variety survived, and it has been proposed for listing as Endangered (F.R. 3/6/85).

This small, gnarled tree has leaves that are dark green above with red veins, and its bright red flowers are borne in small clusters. It may have been one of the native Hawaiian sandalwoods that were extensively cut for trade from 1790 to 1820. (Sandalwood is valued for its fragrance and beauty, and was used in making incense and in decorative woodworking.) Although the Lana'i variety is no longer common enough for profitable commercial exploitation, it remains vulnerable to individuals that might seek the wood.

The tree is found in a variety of habitat types on the Island of Lana'i, from dry lowland forests to mesic forests at higher elevations. Although the variety once may have occurred over a wider range, the 39 remaining individuals of the Lana'i sandalwood can be divided into two populations, one near Kanepu'u and the other near the summit of the island. Both populations are on private lands owned by Castle and Cook, Inc.

Although the sandalwood trade likely had an effect on Lana'i sandalwood numbers, the more recent decline can be traced largely to modification and destruction of its natural habitat. Agricultural development has resulted in the loss of large areas of native vegetation, first for pastures and then for pineapple production. Cattle, sheep, and axis deer, all of which were introduced onto the island, have trampled and consumed much of the vegetation on non-cultivated areas, contributing to severe wind erosion of the soil. In earlier years, the erosion problem was so bad that whaling ships reported seeing large dust clouds coming from the island.

The Lana'i sandalwood itself is eaten by introduced browsers, including the axis deer that are maintained for hunting, as demonstrated by the high browse line on the remaining trees. Reproduction in this plant has been virtually halted by other predators—accidentally introduced rats—that consume the fruits and seeds. In fact, only one sapling has been observed recently.

Due primarily to these threats and to the sandalwood's low numbers, the Service believes that the Lana'i sandalwood is in need of Endangered Species Act protection. The listing proposal did not include a designation of Critical Habitat, since pinpointing the sites of the known populations would make this valued tree vulnerable to illegal harvesting. If listed, however, the sandalwood will receive protection from adverse effects of any Federal activities. At this time, no such impacts are anticipated. As is the case with the Mauna Kea silversword, listing the Lana'i sandalwood under the Federal act will make it illegal under Hawaii's own endangered species law to take this tree.

Comments on the proposal to list the Lana'i sandalwood as Endangered are welcome, and should be sent to the Regional Director, Region 1, by May 6, 1985.

Drawing by Marian Sharp

The Cochise pincushion cactus is a small, unbranched species. Its bell-shaped flowers are pale yellow-green with a slight bronze cast.

Photo by Derral Herbst

Lana'i sandalwood

Cochise pincushion cactus

The Cochise pincushion cactus *(Coryphantha robbinsorum)* was first collected by James, Jimmy, and John Robbins in 1976, and was named for them later that year by botanist W.H. Earl. Until recently, it was known only from several isolated hills in the semidesert grasslands of Cochise County, southwestern Arizona. In late 1984, however, a population was discovered in adjacent Sonora, Mexico.

Little is known thus far about the status of the Sonoran population, but the Arizona plants are vulnerable to extirpation. Surveys have located a total of only 88.8 acres (approximately 40 hectares) in Cochise County that are occupied by the plants. The colonies are situated on hills scattered within an overall area of 4 to 6

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square miles (2.5 to 3.7 square kilometers). The entire known range in Arizona is on an active cattle range that includes privately owned land and State lands leased for grazing. Although the ranch owners are conservation-oriented and grazing currently is not a serious problem for the cactus, a change in ranch ownership and/or grazing practices could lead to rapid deterioration of the habitat. Cattle do not intentionally graze the cacti, but they can trample the small plants and cause soil erosion. One of the colonies is immediately adjacent to a livestock water source.

Exploration for oil in the area is another potential threat to the species. At least one well was drilled in about 1976, and the access road passed through a Cochise pincushion cactus site. Although no oil was found, exploration continues. The current ranch owners do not own the mineral rights to the area.

Collecting from the wild may ultimately be the most serious threat to the species' survival. The relatively recent discovery, attractive appearance, and rarity of the Cochise pincushion cactus make it desirable for some private collectors and potentially valuable for the commercial trade. Recent information from A.D. Zimmerman indicates that more than one-half of the species' total Arizona population is concentrated on less than 4 percent of its known habitat. If illegal collectors locate this colony, they could reduce the cactus population to such a low level that it might be unable to recover. Zimmerman reports that the Cochise pincushion already has a much lower reproductive potential that most other cacti.

The Arizona Native Plant Law includes all members of the cactus family on its list of protected plants. They may be collected only with a State permit and the permission of the landowner; however, the law provides no protection against habitat loss or incidental take, which are major risks to the species.

Although the status of the Sonoran population of the Cochise pincushion cactus is uncertain, it presumably faces threats similar to those jeopardizing the Arizona population; therefore, the species has been proposed for listing as Threatened throughout its entire range (F.R. 3/6/85). Because pinpointing the population sites with a map and detailed habitat description would make the cactus even more vulnerable to collection, the listing proposal did not contain a designation of Critical Habitat. Nevertheless, the species will receive protection from any adverse effects of Federal activities. Restrictions in interstate and international trade also will apply.

Comments on the proposal to list the Cochise pincushion cactus as a Threatened species are welcome, and should be sent to the Regional Director, Region 2 (address on page 2) by May 6, 1985.

Fragrant prickly-apple cactus

One of Florida's native columnar cacti, the fragrant prickly-apple *(Cereus eriophorus* var. *fragrans)*, gets its common name from its strongly scented nocturnal flowers, its heavily spined stems, and its round, dull red fruits. This variety is positively known historically from only two locations along the west coast of Florida near Port St. Lucie and Malabar. Based on recent field work by Florida botanists, however, the Malabar population no longer exists. The cactus has been proposed for listing as Endangered *(F.R. 3/6/85)*.

Photo by Andy Robinson

Stems of the fragrant prickly-apple cactus can reach lengths of up to 5 meters (16.4 feet). Although they usually grow upright at first, longer stems often sprawl over the surrounding vegetation.

A survey by Fish and Wildlife Service personnel, using the field notes of Dr. Daniel Austin (Florida Atlantic University), located only 14 plants at the Port St. Lucie site, all on a single sandy ridge about 12 square acres (4.86 square hectares) in size. Fortunately, however, a private landowner recently reported a probable additional population of about 200 plants located about one mile away.

Due to its extremely small size, the Port St. Lucie population of the fragrant prickly-apple could, like the Malabar population, become extirpated. Rapid urbanization in central Florida is resulting in inadvertent modification or destruction of the native coastal hammock habitat required by the cactus. Further threats come from off-road vehicle (ORV) use; the August 1984 survey revealed ORV tracks within 50 feet (15.24 meters) of the cactus at one section of the Port St. Lucie site.

Like many other rare cacti, the fragrant prickly-apple may be in demand by some collectors of unique species and lucrative to commercial dealers that seek to satisfy that demand. An area near the Port St. Lucie population has been extensively dug up by shovel and, while there is no proof, there is at least a possibility that some of the plants have been removed. Because of the potential threat to the plant from collectors, the Service decided not to publicize the population site by publishing a designation of Critical Habitat with the listing proposal. The site is privately owned.

Under Florida law, it is illegal to take without landowner authorization, transport, or sell the fragrant prickly-apple, but the State law does not provide for protection of the plant's habitat. If it is listed under the Federal Endangered Species Act, however, the prohibitions against Federal actions that would harm the plant or its habitat will apply. Interstate and international trafficking in the species also will become illegal.

Comments on the proposal to list the fragrant prickly-apple as Endangered are welcome, and should be sent to the Field Supervisor, U.S. Fish and Wildlife Service, 2747 Art Museum Drive, Jacksonville, Florida 32207 by May 6, 1985.

Two Florida Mints

Another two Florida plants have been proposed as Endangered (F.R. 3/29/85), **Dicerandra frutescens (scrub balm)** and **Dicerandra cornutissima (longspurred balm).** Both are members of the mint family. Rapidly expanding commercial and residential development in central Florida has been detrimental to these species in the past and still poses a severe threat to their survival.

Dicerandra frutescens is a strongly aromatic plant that grows up to 1.6 feet (0.5

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Eight Plants

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meter) tall with erect non-woody shoots growing from a woody base. Its small leaves are narrowly oblong with blunt tips, and occur opposite one another on the stems. Flowers are borne in pairs, tubular in shape, and white or pale pink with purplish-rose dots in color. This plant is endemic to Highlands County, Florida, where it is known from two privately-owned areas. It occurs in the Southern Central Florida Ridge Sandhill geographical province and in sand pine communities, growing primarily on well-drained fine sand soils.

Apparently, *D. frutescens* has always been rare and confined to a small region in Highlands County. Today it is known from near Lake June in Winter, where it was first collected in 1925, and from the Archbold Biological Station, a privately funded research facility. In the Lake June in Winter area, the species' current sites are surrounded by developments along U.S. Highway 27. The habitat of *D. frutescens*, located in the pine scrub community near the highway, is prime property for further development. The populations that occur at the Archbold Biological Station are largely in areas undisturbed by humans except for vehicular traffic on the fire lanes. Continuation of the species here depends on successful implementation of a prescribed burning program by the Archbold staff.

Dicerandra cornutissima is very similar in appearance to *D. frutescens*, but the two are readily distinguishable upon close examination. *D. cornutissima* has narrower leaves, purple-rose flowers with deep purple markings, and flowers that are borne in groups rather than in pairs. Both species exude the same strong, pleasant, minty smell.

D. cornutissima has probably always been a rare plant, too. At one time, it occurred in Sumter and Marion Counties. Now, however, it is known from only a single area in Marion County, where it is found in sand pine or oak scrub and in the ecotones between these and turkey oak communities. This area, 11 miles southwest of Ocala, Florida, is currently being developed and, if Federal protection is not provided, the few remaining plants could be eliminated. Several sites where the species formerly occurred, both in Sumter and Marion Counties, have been lost to commercial and residential development already. Peninsular Florida has one of the highest population growth rates in the United States, and development pressures on the limited areas in which both *D. cornutissima* and *D. frutescens* still occur can only be expected to intensify over the next decade.

Factors that make both species even more vulnerable are their high visibility and their easy identification by the public, especially due to the strong, aromatic odor common to members of the mint family. Both plants occur in close proximity to public highways, and easy access could intensify the threats from vandalism and taking. Due to these factors, Critical Habitat was not proposed for either species.

Comments on the proposal to list *D. frutescens* and *D. cornutissima* as Endangered species are welcome, and should be sent by May 28, 1985, to the Field Supervisor, Endangered Species Field Station, U.S. Fish and Wildlife Service, 2747 Art Museum Drive, Jacksonville, Florida 32207.

Hymenoxys texana

Hymenoxys texana, a member of the aster family, is a small, single-stemmed annual that reaches up to 10 centimeters (3.9 inches) tall. Its flower heads are yellowish, 4–6 millimeters (0.16–0.23 inches) tall, and can be seen during late March through early April. The species grows in poorly drained swales or depressions in open grasslands with very few other plants.

H. texana was first collected around 1879 in an area of southwest Texas between the Nueces and Frio Rivers. This population seems to be extirpated and only three other populations are currently known to exist, all near Houston in Harris County, Texas, in the northern part of the Gulf Coastal Prairie. Two of the existing populations are on private property near a housing development, and the other is located on public land adjacent to a county road right-of-way. The species' entire known range totals only about 1,600 square feet (490 square meters).

Drawing by Jessica Proctor

Hymenoxys texana

All three populations of *H. texana* are now being threatened by habitat destruction as a result of housing and road development. A portion of one population has already been destroyed by construction during the enlarging and paving of a county road. Since it is the policy of Harris County to maintain and improve county roads as needed, this species could be severely damaged or even destroyed unless there is proper planning to ensure its protection. In addition to road improvements. anticipated increases in housing construction in the area may completely eliminate the few remaining populations of *H. texana*.

Currently, there are no State or Federal laws or regulations to protect *Hymenoxys texana*. To provide protection for this declining plant, the Service has proposed to list it as an Endangered species (F.R. 3/6/85). The listing proposal did not include a designation of Critical Habitat since publicizing the sites could subject the plant to collecting or vandalism. This species is not known to occur on Federal lands, and no Federal involvement with it is known or expected.

Comments on the proposal to list *H. texana* are welcome, and should be sent to the Regional Director, Region 2 (address on page 2), by May 6, 1985.

Oxypolis canbyi

Oxypolis canbyi (Canby's dropwort) is a perennial plant found at a few locations in Maryland, Georgia, and the Carolinas, where it grows in swamps, shallow pineland ponds, and wet pine savannahs. This plant reaches up to 1.2 meters (47 inches) in height, has slender quill-like leaves, and gives off a slight fragrance of dill. The small flowers are white and green, sometimes tinged with red. In suitable habitat, *O. canbyi* has a strong colonizing habit and spreads vigorously by means of fleshy rhizomes.

The most significant threat to *O. canbyi* has been, and continues to be, the loss of wetland habitat on the lowland plain of the mid-Atlantic Coast. Several populations were lost as shallow ponds and wetlands were drained for conversion to lowland pastures, pine plantations, soybean fields, and other agricultural uses. Natural hydrological conditions also have been altered by suburban sprawl, road construction, and other forms of human encroachment, with resulting degradation of wetland habitat. Because of these threats, *O. canbyi* has been proposed for listing as Endangered (F.R. 3/29/85).

Seven populations of the plant are known to survive. A State-by-State summary of its status follows:

- Maryland—One population of approximately 36 stems is known from a site in the Chester River watershed in Queen Anne's County; however, it is within the area that would be af-

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Eight Plants

(continued from page 7)

fected by the proposed Upper Chester River Watershed Channelization Project. The Soil Conservation Service (SCS) has been advised of the species' presence in the project area, and of the Fish and Wildlife Service's intention to proceed with the listing process. Careful project planning and implementation may provide a means of conserving the site while meeting SCS objectives.

- Georgia—Populations of *O. canbyi* are present in Burke, Lee, and Sumter Counties, but several historical populations may be extirpated. The plant is officially considered by Georgia as an endangered species, a classification under State law that authorizes some protection.

- North Carolina—*O. canbyi* is recorded from one site in Scotland County, North Carolina. Its habitat is owned in part by The Nature Conservancy. Under a State law for the conservation of rare plants, North Carolina gives protection from intrastate trade in the species and has provisions for monitoring and proper management.

- South Carolina—Historically, *O. canbyi* is known from four sites in South Carolina, but only two still support the species. A vigorous population consisting of about 600 stems occurs on private land in Bamberg County, and a second of approximately 500 stems exists in Colleton County. The Colleton site is now owned by The Nature Conservancy. Efforts are underway to protect the Bamberg site also, but both populations remain vulnerable to harm from certain roadside maintenance practices.

- Delaware—Although it once occurred in Sussex County, *O. canbyi* apparently is extirpated in Delaware. Its former habitat has been ditched and drained for agricultural purposes.

Most of the remaining population sites are vulnerable to habitat modification. If it is listed under the Endangered Species Act, however, *O. canbyi* and its habitat will receive protection from any adverse effects of Federal activities.

Comments on the proposal to list *Oxypolis canbyi* as an Endangered species are welcome, and should be sent to the Regional Director, Region 5 (address on page 2) by May 28, 1985.

* * *

Available Conservation Measures

If the proposals to list these eight plant taxa as Threatened or Endangered become final, they will receive the full protection authorized under the Endangered Species Act. Among the measures available for the conservation of listed plants are: restrictions on interstate/international trafficking of the plants and their parts or derivatives; protection from any adverse effects of Federal activities; a requirement for the Service to develop recovery plans; and the possibility of Federal aid to States with endangered species cooperative agreements. (Hawaii, Georgia, South Carolina, and North Carolina are among the 16 States that currently have such agreements for Threatened and Endangered 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 Endangered or Threatened species. If an agency determines that a planned activity may affect a listed species or its habitat, it must consult with the Fish and Wildlife Service in order to find ways of avoiding jeopardy. Until a listing proposal is made final, however, agencies must only "confer" with the Service, a non-binding procedure. Except for the planned SCS project within the Maryland range of *Oxypolis canbyi*, no Federal actions that may affect the eight proposed plants are anticipated.

Although the protection given Threatened plants is the same in most respects as that given Endangered plants, the regulations governing trade in plants listed as Threatened are somewhat more flexible. Permits for trade in Threatened plants are available in a few more circumstances, although they still may be issued only for conservation-oriented purposes. Seeds from cultivated specimens of Threatened plants are exempt from trade controls if a statement of "cultivated origin" appears on their containers.

In any case, it is anticipated that few permits for the eight plants proposed for listing would be sought or issued any time soon because they are not common in cultivation or in the wild.

RECOVERY NEWS

(continued from page 1)

Two Butterflies

The mission blue also exists on Twin Peaks in San Francisco and at Ft. Baker in Marin County. The reduced range of both butterflies and continued threats to the remaining colonies led the Fish and Wildlife Service to list the San Bruno elfin and mission blue butterflies as Endangered on June 1, 1976.

The San Bruno elfin is a brown butterfly with a wingspread of about one inch (26mm). Although the San Bruno elfin inhabits a region studied by entomologists for more than a century, it was not discovered until 1962. Perhaps its relatively subdued color, small size, and short adult flight period (very late February to mid-April) may be responsible for its late discovery. Even during peak adult flight periods, it can be easily overlooked.

Today, 14 colonies of the San Bruno elfin butterfly are known to exist, all restricted to the coastal mountains of north-

(continued on next page)

Photo by Larry Orsak

The male mission blue butterfly can be identified by its irridescent blue upper wings, which are outlined in black and pale white.

Two Butterflies

(continued from page 8)

ern San Mateo County. All colonies are located in the fog belt on steep, north-facing slopes. Direct sunlight is minimal on these slopes, so moisture is conserved, and the butterfly's larval food plant, stonecrop, grows in abundance. Additional colonies may occur near Montara Mountain and Crystal Springs Reservoir, but the rugged terrain and inaccessibility of these areas have prevented a thorough search.

The mission blue butterfly, first described in 1937, also has a wingspan of about one inch (25 mm). Males of the species are irridescent blue on the upper wings with narrow black and pale white margins, and the lower wings are gray. The female's upper wings are primarily brown with some irridescent blue overlay, and its lower wings are grayish-brown. Both sexes are marked with an array of dark spots on their undersides. Mission blue butterflies can be observed from late March well into June. They are often seen perched on a lupine food plant or nectaring at coastal buckwheat flowers.

This butterfly was first collected on Twin Peaks in the Mission District of San Francisco. Only a small colony remains there today, and it is threatened by loss of habitat from residential development and trampling by tourists visiting Twin Peaks. Another colony exists at Ft. Baker in Marin County, but the largest populations occur on San Bruno Mountain, where the butterfly inhabits approximately 1,500 acres (about 615 hectares) of grassland. Here the butterfly has suffered loss of habitat from industrialization, urbanization, agricultural activities, quarrying, and encroachment of exotic plant species.

In addition to providing habitat for most of the remaining colonies of these two butterflies, San Bruno Mountain serves as a refugium for other species of animals and plants that are candidates for listing under the Endangered Species Act and for one species that has already been listed, the San Francisco garter snake *Thamnophis sirtalis tetrataenia).* Although some of the fauna and flora can still be found at other localities, most have major populations on San Bruno Mountain.

Today, San Bruno Mountain is described as an island of habitat encompassed by a sea of urbanization, although human activities have substantially altered the natural vegetation and topography of the mountain. Habitat loss has already resulted from roadway, utility, home, industrial, and commercial construction, rock and sand quarrying, livestock grazing, and invasion of exotic species.

Both of the Endangered butterflies have suffered a great loss of habitat throughout their ranges, and minimum areas to sustain butterfly populations and their habitats are difficult to estimate. Today, the San Bruno elfin inhabits only about 740 acres (300 ha) and the mission blue inhabits about 1,975 acres (800 ha). To ensure the continued existence of these bufferflies, it is important to maintain the maximum area of undeveloped habitat for them.

Concerned local citizens have strived for years to preserve much of San Bruno Mountain in a near-natural state, but, due to its proximity to San Francisco, the mountain is very valuable real estate development property. In 1980, the San Bruno Mountain Steering Committee was formed to investigate issues surrounding the potential developments as they relate to rare plant and animal species on the mountain. This committee, composed of representatives from the Fish and Wildlife Service, the California Department of Fish and Game, the California Department of Forestry, the County of San Mateo, nearby city governments, and landowners and developers, was asked to develop a Habitat Conservation Plan (HCP) for the San Bruno Mountain area that would address the conflict between housing construction and Endangered species in a manner that would provide for the protection of the species. Implementation of the HCP is designed to allow private and public developments on the mountain to proceed without adversely affecting Endangered species, including the mission blue and San Bruno elfin butterflies.

Recovery Actions

The recovery plan for these two species addresses their recovery needs, discusses their life histories and requirements for survival, and describes characteristics of their remnant habitats. Its focus is to help maintain these species through conservation of their habitats. Because the two butterflies occur at other sites in the San Francisco Bay area, similar concerns of habitat protection, management, and rehabilitation also apply at these sites.

The primary objective of the recovery plan for the San Bruno elfin and mission blue butterflies is to maintain and enhance existing populations of these species throughout their ranges. Reclassification of the San Bruno elfin to Threatened can be considered when secure, self-sustaining colonies are established and/or reestablished. Numbers of colonies necessary for this butterfly's reclassification are seven on San Bruno Mountain, five on Montara Mountain, and two on Milagra Ridge. Reclassification of the mission blue to Threatened can be considered when secure, self-sustaining colonies of this species are established and/or reestablished on Twin Peaks and Ft. Baker (one colony at each site), and when existing colonies on San Bruno Mountain are made secure. Colony sizes and dynamics necessary for a population to be self-sustaining still need to be determined for both species.

Delisting of the species will be contingent upon protection, maintenance, and/or expansion of current colonies and establishment of additional ones. Population segments of these butterflies will probably remain small in size and distant from potential recolonization sources. Therefore, they will continue to be vulnerable to extirpation by natural catastrophe, disease, parasitism or pollution. These populations will need to be enhanced to maximize their chances for long-term survival.

Other objectives of the recovery plan are to rehabilitate ecosystems that have been altered by exotic plant introductions, ORV activity, and urbanization. Inadequate implementation of this plan, especially the habitat protection and management phases, will result in further loss and alteration of habitat, and increased threats to the survival of the two butterflies.

The recovery plan also identifies known essential requirements for the recovery and perpetuation of the San Bruno elfin and mission blue butterflies. It proposes a comprehensive array of short- and long-term activities to meet these objectives. The protection, management, and rehabilitation activities will benefit the two butterflies as well as numerous other wildlife and plant species not specifically mentioned in the plan, and will enhance public awareness of these conservation issues.

One of the first steps to help bring about the recovery of the butterflies is to secure essential habitat on and around San Bruno Mountain through cooperative agreements, easements, or other appropriate protective means. The San Bruno HCP provides security for much of the essential habitat for the butterflies on the mountain. In addition to this, further degradation of current habitat must be prevented by minimizing the use of herbicides, insecticides, and other toxic substances, by controlling ORV activity, and by removing exotic weeds. Protection of these areas is a high priority and is absolutely necessary to prevent further declines in distribution and abundance of the species.

In line with protecting the habitat, specific management plans for the existing colonies of San Bruno elfin and mission blue butterflies must be developed and implemented. To aid in developing these management plans, additional information on bionomics of the species must be obtained. Surveys and inventories on the butterflies and their food plants will be conducted, as well as studies on climatic and geologic factors, which are needed to more adequately understand the interactions of these species, their habitats, and their physical environments. The recovery plan also includes guidelines to help reestablish populations of the two butterflies in restored or rehabilitated habitat within their historical ranges.

Peregrine Falcon Restoration in the Southern Appalachians

by V. Gary Henry
Endangered Species Field Station
Asheville, North Carolina

In late 1982, the States of North Carolina, Tennessee, and Virginia were canvassed regarding their desire to participate in a program to restore the peregrine falcon *(Falco peregrinus)* in its historical range in the Southern Appalachians. The Fish and Wildlife Service's (FWS) Endangered Species Field Station in Asheville, North Carolina, had initiated activities earlier that year to prepare for releasing birds in North Carolina. These activities included: contacting ornithological societies, natural resource groups, and knowledgeable individuals for information on great horned owl *(Bubo virginianus)* distribution and historical peregrine use; field evaluation of historical and potential peregrine sites; and great horned owl surveys at potential release sites. (Great horned owl predation on young peregrines can have a serious impact on restoration efforts.)

A Southern Appalachian contingent, consisting of FWS, Tennessee Wildlife Resources Agency (TWRA), and North Carolina Wildlife Resources Commission (NCWRC) personnel, was invited to the Eastern Peregrine Falcon Recovery Team meeting in fall 1983. Information on potential North Carolina and Tennessee release sites, including detailed information on the top priority site in North Carolina, was presented. At the time, the recovery team decided to delay extensive expansion to the Southern Appalachians until 1986 because of the continued need for available birds in the Northeast and Atlantic Coastal Regions. However, because of preparations already made in North Carolina and Tennessee, it was decided that initiation of hacking at one or two sites should begin in 1984 and continue in 1985.

Photo by Craig Koppie

immature female peregrine falcon

The recovery team requested that I serve as coordinator for peregrine restoration efforts in the Southern Appalachians and develop a proposal for the region, in lieu of each State submitting individual proposals. The recovery team also recommended that personnel in the Southern Appalachians who will be involved in hacking peregrines should visit interior sites in New England to gain firsthand knowledge concerning site selection and hacking procedures.

Our first task was to develop guidelines and a form for evaluating potential Southern Appalachian sites. This was done with input from Dr. Don Hammer, Tennessee Valley Authority (TVA), and the late Mr. Art Renfro, U.S. Forest Service. Dr. Hammer had previously surveyed historical sites by air in 1980, accompanied by Peregrine Fund personnel. The guidelines and evaluation form were submitted to the recovery team and The Peregrine Fund for review, comments, necessary modifications, and concurrence. State wildlife agencies received these guidelines in April 1984 with a request for completion by December 31, 1985.

The Eastern Peregrine Falcon Recovery Plan had defined the Southern Appalachians Region to include western North Carolina and Virginia, eastern Tennessee, northern Georgia and South Carolina, and one site on the Virginia-Kentucky border. Included in the more recent guidelines was an expansion of the Southern Appalachians Region to include three sites in West Virginia, five additional sites in Virginia, one in Kentucky, and one in Alabama. In addition to North Carolina and Tennessee, some of the other States have also done several evaluations of potential and historical sites.

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Peregrine Falcon

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Field evaluations of sites in North Carolina and Tennessee were conducted by The Peregrine Fund and the FWS in April 1984. Grandfather Mountain, North Carolina, was selected as the first site for hacking peregrines in the Southern Appalachians and additional evaluations of Tennessee sites were scheduled for May 1984. Evaluation, preparation, and hacking peregrines on this privately-owned site was a cooperative effort involving The Peregrine Fund; Grandfather Mountain, Inc.; the North Carolina Wildlife Resources Commission; the FWS; and the TVA. On May 21, 1984, four young peregrines arrived and were placed in a hack box. They were granted their freedom as fledglings on June 1 and remained in the vicinity until July 10, with no mortality. The effort was a complete success.

Further evaluation of Tennessee sites in the Great Smoky Mountains National Park by the FWS resulted in the selection of a site within the park boundaries for a late 1984 hacking project. Cooperators included The Peregrine Fund, the National Park Service, FWS, TVA, TWRA, and the Tennessee Ornithological Society. Four birds were received and placed in the hack box on July 31. The front of the cage was removed on August 10, and the birds remained in the vicinity until September 8. The effort at this site was also considered a complete success, although some concern has been expressed about the birds' somewhat early dispersal.

The Peregrine Fund experienced its best production year in 1984, with 124 birds produced. Each successful year results in the elimination of hacking sites from further use in the Northeast and Atlantic Coastal Regions due to the return of adult birds, therefore freeing up new birds for use on sites in the Southern Appalachians. Based on this trend, I requested that each State in the Southern Appalachians submit a minimum of one site by March 31, 1985, for possible use as hacking sites in 1985. (For North Carolina and Tennessee, this means one site each in addition to the sites used in 1984.) The sites are being prioritized and will be used as birds become available.

Recovery efforts in the Southern Appalachians for the peregrine falcon will continue, and will possibly be expanded in 1985, hopefully to as many as 50 birds or more a year beginning in 1986. This, however, will depend not only upon production at The Peregrine Fund and return of adult birds to hack sites, but also upon funding to State agencies through Section 6 of the Endangered Species Act.

REGIONAL BRIEFS

(continued from page 3)

The Yazoo darter, *Etheostoma* sp., is a small undescribed species occurring in the Little Tallahatchie and Yocona River systems of northern Mississippi. Known collections of this darter indicated that it was restricted to four or five sites, and was not very abundant at any of these sites. The FWS contracted with Dr. Ken Thompson (University of Mississippi) and Dr. Jess Muncy (FWS Cooperative Research Unit, Mississippi State University) in September 1983 to survey the status of this fish. Their final report, delivered in January 1985, documents abundant darter populations in 16 different tributaries of the two river systems. Two of the sites are on federally-owned property and one is owned by the University of Mississippi. Based on the widespread distribution and lack of an identifiable threat, the Yazoo darter does not appear to warrant a proposal for listing under the Endangered Species Act at this time. Should a significant and identifiable threat materialize, the FWS will reevaluate this determination.

* * *

Region 5—Representatives from 17 eastern States participated in a 2-day workshop in Airlie, Virginia, to coordinate activities for an inter-regional project to determine the rangewide status of 32 candidate plants. Botanists from the FWS, The Nature Conservancy, State natural resource agencies, and private organizations met to exchange information on the species prior to initiation of the 1985 field work. This is the first year of what Region 5 personnel believe will become a multi-year project between the FWS and The Nature Conservancy.

* * *

Region 6—The Greenback Cutthroat Trout Recovery Team recently received the "Researcher of the Year" award from the Colorado Chapter of the National Wildlife Federation. This award was given in recognition of the efforts that the recovery team and its supporters have achieved toward recovery of the greenback cutthroat trout *(Salmo clarki stomias)*. When the Endangered Species Act was enacted in 1973, there were fewer than 3,000 of these trout occupying only three sites. Recovery efforts through 1984 have resulted in 16 sites with greenbacks in 35 miles of stream habitat and 46 surface-acres of flatwater. If recovery efforts continue at their present rate, there is hope for future delisting of the species.

* * *

Region 7—During the 19th and early 20th centuries, fur traders introduced Arctic foxes *(Alopex lagopus)* to many islands of the Aleutian Chain—islands previously free of mammalian predators. The effect on native avifauna was devastating. The now Endangered Aleutian Canada goose *(Branta canadensis leucopareia)*, which once nested throughout the Aleutian Islands, was extirpated from all islands onto which foxes were introduced. Remnant goose populations survived on two small islands that remained fox-free.

* * *

The FWS proposes to restore Aleutian Canada geese to the Aleutians and provide for the recovery of other bird populations by removing foxes from as many as 32 islands. Because of the large land areas involved and the remoteness of the islands, dispersal of toxic baits is the most cost-effective and possibly the only feasible means of removing foxes. Compound 1080 was chosen as the preferred toxicant because of its high toxicity to foxes and relatively low toxicity to birds, the only non-target species likely to be affected. Other alternatives that were considered, including mechanical removal (i.e., shooting or trapping), biological control, and the use of sterilants, are neither economically nor technologically feasible.

As a precursor to any large-scale fox removal effort, the Region 7 Endangered Species Office, in conjunction with the Alaska Maritime NWR, proposes to implement, under authority of an EPA permit, an experimental fox removal program on 69,500-acre Kiska Island. This experimental program is planned as a 3-year study to assess the effectiveness of Compound 1080 and to document resultant changes in populations of native species. Findings will be used to seek EPA registration of Compound 1080 for Arctic fox removal from the Aleutians and aid in designing future fox removal efforts.

* * *

Foreign Mailings

Some of our readers pass along extra copies of the BULLETIN to their colleagues in foreign countries. While this is fine, please note that the BULLETIN self-mailer works *only* for mailing to an address in the United States. When mailing to another country, the BULLETIN must be enclosed in an envelope or the U.S. Postal Service *will not* deliver it.

We Need Your Help

To make this *your* BULLETIN, as well as ours, we need your help. Please send the Editor any comments for improving the format, ideas for articles, photographs, and reports on current research and management activities.

Recovery Plan Update

The following recovery plans were recently approved: *Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan* (11/16/84); *Paiute Cutthroat Trout Recovery Plan* (1/25/85); *New Mexican Ridge-nosed Rattlesnake Recovery Plan* (3/22/85); *Todsen's Pennyroyal Recovery Plan* (3/22/85); *Bald Eagle-Pacific States Recovery Plan* (3/28/85); *MacFarlane's Four-O'Clock Recovery Plan* (3/28/85); *Kuenzler's Hedgehog Cactus Recovery Plan* (3/28/85); *Texas Poppy-mallow Recovery Plan* (3/29/85); and *Knowlton Hedgehog Cactus Recovery Plan* (3/29/85).

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.

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreigr Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES HAVING PLANS
Mammals	20	19	234	4	0	22	299	22
Birds	59	13	144	3	1	0	220	54
Reptiles	8	6	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	67	5	1	11	2	2	88	40
TOTAL	225	47	461	56	10	37	836	210**

*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: 177
Number of species currently proposed for listing: 28 animals
42 plants

Number of Species with Critical Habitats determined: 69
Number of Cooperative Agreements signed with States: 42 fish & wildlife
16 plants

March 31, 1985

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ENDANGERED SPECIES

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