



ENDANGERED SPECIES TECHNICAL BULLETIN

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

SERVICE LISTS 32 PLANTS

Acting to protect some of the world's rarest plant species, the Service has added 30 native and 2 foreign plants to the U.S. List of Endangered and Threatened Species.

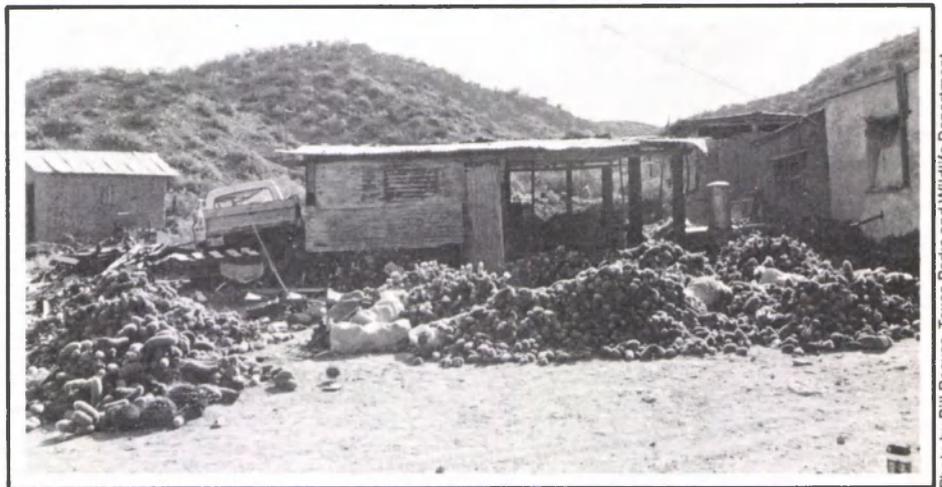
Most of the U.S. plants (listed between October 2 and November 7) are cacti—generally prized by collectors for their unique beauty, and threatened by domestic and international commerce (as well as other factors) which will be more readily controlled under Endangered Species Act provisions.

As with most endangered species, plants are especially vulnerable once they are distinguished for their rarity—a label that sometimes boosts their value (until they are sufficiently propagated and available in cultivation), making their protection difficult. International commerce in cacti (all of which are protected under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, or CITES) and other plant species remains lucrative, and massive taking of these plants for the world market has seriously diminished their numbers in the wild.

According to the Agriculture Department's Animal and Plant Health Inspection Service (APHIS)—having import/export enforcement responsibility for plants, some 6.8 million specimens of cacti and succulents were shipped into the U.S. during Fiscal Year 1978. The Fish and Wildlife Service's Wildlife Permit Office recorded the lawful export of over 5,000 cacti from the U.S. during calendar 1978.

In addition to exploitation by collectors and dealers, entire plant communities are often obliterated by urban development, strip mining, land drainage, flooding, habitat erosion, fire, grazing, and ORVs (off-road vehicles).

All of the native plants protected in the Service's recent rulings were



The practice of cactus rustling, as seen here, poses severe problems for the existence of many species.

among 1,783 plant taxa proposed for Endangered classification in the June 16, 1976, *Federal Register*. This proposal was based in large part on the January 9, 1975, report of the Secretary of the Smithsonian Institution, which cited over 3,100 U.S. vascular plant taxa considered endangered, threatened, or extinct. (On July 1, 1975, the Service published a notice of review indicating acceptance of the Smithsonian report as a petition, and soliciting data on these plants. This notice remains in effect, with comments sought.)

Two foreign species, the Guatemalan fir and Chilean false larch, were proposed separately for listing (F.R. 9/26/75) after the Fund for Animals petitioned the Service to provide Federal protection to all species included on Appendix I of CITES.

Public hearings were held on all of the proposed plant listings, and comments have been summarized in the

respective final listings. General comments on the native plants were contained in the Service's final rules detailing permit regulations for protected plants (F.R. 6/24/77) and with the listing of 13 plants last year (F.R. 4/26/78).

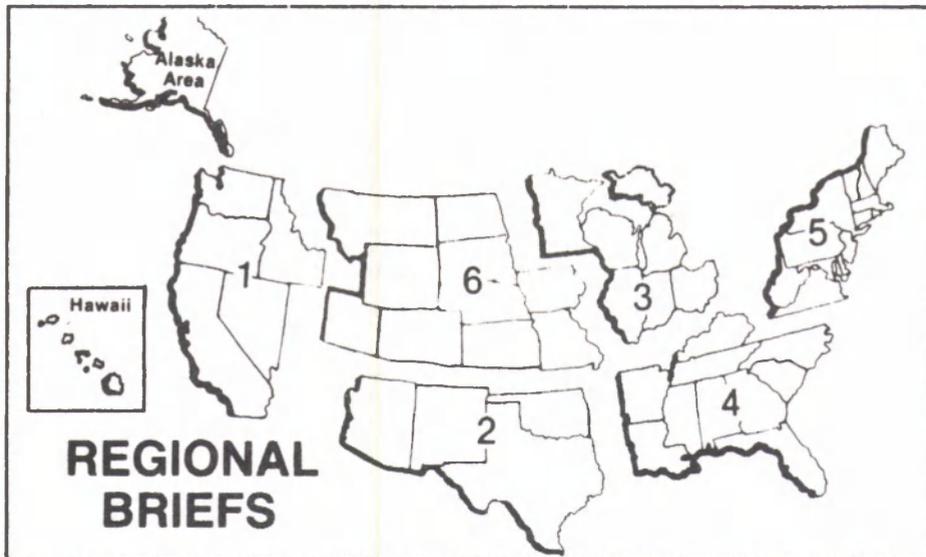
Native Plants

Twenty-one of the recently listed plants are members of the cactus family. The status and distribution of all 30 native taxa (as well as threats to their existence) are discussed below by family.

Asteraceae (Aster family):

- *Lipochaeta venosa*—This shrubby, sunflower-like plant, belonging to a genus that has evolved extensively in the Hawaiian Islands, has been listed as Endangered (F.R. 10/30/79). Once more widespread on the Island of Hawaii, *Lipochaeta venosa* is now confined to Kipuka Kalawamauna on the "Big Island" (on the western flank of

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REGIONAL BRIEFS

Endangered Species Program regional staffers have reported the following activities for the month of October.

Region 1. The results of this past summer's Hawaiian forest bird survey indicate that the Hawaiian hawk (*Buteo solitarius*) is more widely distributed on the "Big Island" than had been expected. On the Island of Lanai,

only two native species—'Apapane (*Himatione sanguinea sanguinea*) and Pueo (*Asio flammens sandwichensis*)—were found; neither is Endangered.

The California Department of Fish and Game assisted in a survey of birds of San Clemente Island. Five San Clemente loggerhead shrikes (*Lanius ludovicianus mearnsi*) and 15 San

Clemente sage sparrows (*Amphispiza belli clementae*) were observed during the 2-day survey.

Region 2. Jack Woody was part of a group invited to review the mariculture operation (PIOSA) of Sr. Antonio Suarez in Oaxaca, Mexico. Sr. Suarez requested the review to receive comments on his commercial use of Olive Ridley sea turtles (*Lepidochelys olivacea*). The group, which included sea turtle biologists from the U.S. and Mexico, saw every phase of the operation—nesting beaches, catching of turtles, slaughterhouse, and packaging. It was agreed that discussions should continue in order that the turtles be maintained as a viable part of Mexican wildlife.

Region 4. With the closure of Tellico Dam expected around the first of the year, a concerted effort was made during October to remove all remaining snail darters (*Percina tanasi*) from the Little Tennessee River. A very low catch rate at month's end indicated that few fish were left. As of October 31, 410 adults had been captured and stocked in the Holston River, 5 pairs of adults were kept at TVA facilities for development of propagation techniques, and 324 young of the year were placed in the Morristown State Hatchery for further rearing. These latter fish are to be stocked in the Holston River upon reaching adult size. (See October 1979 BULLETIN.)

Region 5. Public hearings/meetings on proposed Critical Habitat for the Virginia big-eared bat (*Plecotus townsendii virginianus*) and the Plymouth red-bellied turtle (*Chrysemys rubriventris bangsi*) were held in Elkins, West Virginia, and Plymouth, Massachusetts, respectively.

Region 6. A contract has been awarded to Mr. Wayne Winter to use three Labrador retrievers to search a minimum of 10,000 acres of prairie dog colonies for black-footed ferrets (*Mustela nigripes*). Most of the work will be conducted in South Dakota, but provisions are included for searches outside the State.

A year-old member of the Gray's Lake whooping crane flock was observed on the eastern side of the Rockies near Longmont, Colorado, and later at Monte Vista National Wildlife Refuge, a stopover spot for this flock. The sighting relieved concerns that the bird might join the Canada-Aransas flock, whose members occasionally migrate through eastern Colorado. The bird is somewhat of an eccentric, as it did not summer at Gray's Lake and it spent last winter in Mexico rather than at the Bosque del Apache Refuge in New Mexico.

The Indiana/Gray Bat Recovery Team met to discuss the Gray Bat Recovery Plan. A final draft plan will

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U.S. Fish and Wildlife Service Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, and Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands. **Region 5:** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. **Region 6:** Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Alaska Area:** Alaska.

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

likely be completed at a December team meeting.

Alaska Area. Two peregrine falcons (*Falco peregrinus tundrius*) trapped on Padre Island, Texas, in early October were banded as nestlings this summer in Alaska. The falcons were from separate eyries on the upper Yukon River between the Canadian border and Circle, Alaska.

Region 3 Plant Surveys

The Twin Cities Regional Office is sponsoring a literature review and herbarium search as well as field checks in an effort to compile data on rare plants of the Great Lakes States. Anyone with information of value on the status of plants that may be candidates for Federal protection should contact one of the following:

- Illinois:** Natural Land Institute, 904 South Anderson, Urbana, IL 61801 (Attn: Dr. John White, Tel. 217-367-8770)
- Indiana:** Dr. Theodore Crovello, Department of Biology, University of Notre Dame, Notre Dame, IN 46556 (Tel. 219-283-7496)
- Michigan:** Dr. John Beaman (Beal-Darlington Herbarium, East Lansing, MI 48823 (Tel. 517-355-4696)
- Minnesota:** Minnesota Department of Natural Resources, Natural Heritage Program, Research & Policy Section, Box 11, Centennial Office Building, St. Paul, MN 55155 (Attn: Barbra Coffin, Tel. 612-296-4284)
- Ohio:** Ohio Department of Natural Resources, Division of Natural Areas & Preserves, Fountain Square, Building D, Columbus, OH 43225 (Attn: Richard Moseley, Tel. 614-466-7803)
- Wisconsin:** Wisconsin Department of Natural Resources, Box 7921, Madison, WI 53707 (Attn: James Hale, Tel. 608-266-9168)

PUBS CORRECTION

In the September 1979 BULLETIN, we inadvertently failed to mention the \$.50 per copy cost of *Life Tracks*, published by the Wisconsin Office of Endangered and Nongame Species. We regret the inconvenience.

Wesley Named to Head Management Operations Branch

David J. Wesley, 30, has been appointed Chief of the Office of Endangered Species' Branch of Management Operations—responsible for overseeing land acquisition, cooperative

agreements with the States, recovery planning, and consultations with Federal agencies under Section 7 of the Endangered Species Act.

Formerly staff biologist for Headquarters, U.S. Air Force, Wesley joined the Office of Endangered Species in January 1978, and has recently served as coordinator for Section 7 consultations. He is a graduate of the University of Florida, and holds a master's degree in wildlife management from the Virginia Polytechnic Institute and State University.

BALD EAGLE RECOVERY TEAM APPOINTMENTS COMPLETED

The fifth and final Bald Eagle Recovery Team, this one for the Pacific coast population, was appointed in September. The team will be responsible for preparing a recovery plan for the bald eagle (*Haliaeetus leucocephalus*) in Washington, Oregon, California, Nevada, and Idaho. Working with team

leader Ronald M. Jurek, California Department of Fish and Game, are: Carroll Rieck, Washington Department of Game; Ralph Opp, Oregon Department of Fish and Wildlife; Dick Norell, Idaho Department of Fish and Game; and Gary Herron, Nevada Department of Wildlife.

WHOOPING CRANE FALLS TO EAGLE

Although many wildlife species are protected under the laws of man, they are not necessarily protected from one another. A six-month old whooping crane (*Grus americana*) making its first migration was apparently attacked in flight and killed by an eagle in Colorado last month.

An examination by the Colorado Division of Wildlife indicated that the whooper received fatal talon wounds from a large raptor, presumed to be a golden eagle (*Aquila chrysaetos*). A party of nine hunters witnessed the

attack and reported that the whooper rose from a pond with two small birds, probably sandhill cranes (*Grus canadensis*), and was struck by a large, dark bird. The hunters retrieved the carcass, noticed it was banded and fitted with a radio transmitter, and turned it over to the State agency.

The whooper was part of an experimental program using sandhill crane foster parents from Gray's Lake National Wildlife Refuge in Idaho in an effort to establish a second migratory population.

BOBCAT EXPORTS TEMPORARILY ENJOINED

Following a suit brought against the Endangered Species Scientific Authority (ESSA) by Defenders of Wildlife, Judge June Green of the U.S. District Court of the District of Columbia has granted a temporary restraining order halting exports of bobcat pelts (taken during 1979-80) from the U.S.

Defenders challenged the action of ESSA (acting as U.S. Scientific Authority for the Convention on International Trade in Endangered Species of Wild Fauna and Flora, or CITES) in finding that the export of the pelts of bobcats (*Lynx rufus*) taken in the 1979-80 season would not be detrimental to the survival of that species, and the action of the Fish and Wildlife Service's Wild-

life Permit Office (acting as U.S. Management Authority for CITES) in issuing export permits "... absent the existence of an adequate management program to ensure that bobcats are not taken in violation of any State or Federal laws."

Under the November 9 order, no further (1979-80) bobcat exports will be allowed until a decision is made on Defenders' request for a temporary injunction, which it believes is warranted until additional supporting data can justify ESSA's export findings. The Court will hear arguments in the case on December 3-5, after which a final decision on the allowability of exports will be made.

Under the new Service ruling (proposed January 23, 1979), two types of protection areas—sanctuaries and refuges—may now be designated where water-related activities need to be restricted or prohibited to prevent injuries to manatees. Upon the establishment of a manatee "refuge," specified activities likely to harass, injure, or kill a manatee may be limited. (Restrictions may affect boating, swimming, snorkeling, and other water activities.) All waterborne—and possibly other water-related activities would be prohibited in areas designated as "sanctuaries," where substantial evidence has shown the manatees to be highly vulnerable.

The State of Florida, which passed a Manatee Sanctuary Act in 1978, has already established manatee sanctuaries in 10 counties under similar regulations (now enforceable by both Federal and State agents—see November 1978 BULLETIN). The Florida Marine Patrol also operates a manatee hotline (toll-free 800-342-1821) to report manatee harassment or injuries.

Properly called the West Indian manatee (*Trichechus manatus*), this sirenian has continued to decline in the U.S., where its remaining numbers (estimated at under 1,000) are protected under both the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.

Manatees occur primarily in Florida's inland and coastal waters (occasionally moving into neighboring States), where they are threatened by human activities, especially the use of motor boats—identified as the major cause of manatee injury and mortality in recent years. (Almost all living manatees bear scars or deformities from boat propellers.) Manatees have also been injured in water control structures and by fishing gear, and may be harassed or unintentionally chased by boaters, scuba divers, snorklers, or swimmers into intolerably cold waters. (The animals are in greatest danger in the winter months, when they congregate near natural warmwater springs and power plant thermal discharges, making them even more vulnerable to boat strikes and harassment.)

Emergency Provision

Under the new procedures, protection areas may be immediately established through emergency ruling upon (1) the publication of such notice in a general circulation newspaper in an affected county, (2) the posting of area boundaries, and (3) the publication—to the extent practicable—of emergency designation in the *Federal Register*. Areas established under emergency provisions will be so designated for 120 days, after which the areas must be protected through standard rulemaking procedures.

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Mauna Kea). Its decline has been attributed to grazing by feral animals, competition with exotic vegetation, and human disturbance.

Berberidaceae (Barberry family):

- *Berberis sonnei*—Known from only two small patches along the Truckee River in California, where it is vulnerable to vandalism, horticultural collecting, and changing land uses, the Truckee barberry has been listed as Endangered (F.R. 11/6/79). This small evergreen shrub, described as "the phantom plant of the Sierras" was the subject of intense searching until its rediscovery in 1973 by a high school biology student in Truckee, California. Originally discovered in the 1880's, it had been "lost" for nearly 90 years. Cuttings have been taken from this stand and the species may be successfully propagated for reintroduction into the wild.

Cactaceae (Cactus family):

- *Ancistrocactus tobuschii*—Found in the Hill Country of central Texas, on the escarpment of the Edwards Plateau, with fewer than 200 remaining specimens, the Tobusch fishhook cactus has been listed as Endangered (F.R. 11/7/79). This cactus is found in an unusual habitat—on the banks of streams and on loose, water-deposited gravel bars, where it has been reduced by flooding and stream bank erosion. (The 100-year flood of August 1978 destroyed one of the two known populations of significance.)

- *Coryphantha minima*—Now confined to a single ranch in Texas, the Nellie cory cactus has been listed by the Service as Endangered (F.R. 11/7/79). This and another listed cactus, the Davis' green pitaya, were known from a single mineral outcrop in northern Brewster County on two large adjacent ranches. *C. minima* was completely extirpated from one ranch during the 1960's when the owner allowed cacti collectors free access to his land. This species is greatly threatened by further taking, and is vulnerable to any alteration of its habitat through range management or mining of its mineral base.

- *Coryphantha ramillosa*—Also native to Texas, the bunched cory cactus—listed by the Service as Threatened—occurs on dry desert lands in two Texas counties overlapping into Mexico (F.R. 11/6/79). *C. ramillosa* is a spherical cactus bearing pinkish to rose-purple colored flowers. Although its range had been considered remote, this species is now threatened by further development which could modify its habitat and make specimens more readily accessible to collectors.

- *Coryphantha sneedii* var. *leei*—Found only in a few populations in Carlsbad Caverns National Park (southeastern New Mexico), the risk of damage to the Lee pincushion cactus from illegal collecting is so great that Threatened classification is warranted (F.R. 10/25/79). A small plant with white spines and pink flowers suffused with brown, this cactus was first discovered in 1924 (and described in 1933), and has also been called *Escobaria leei*. It can be readily cultivated, so that wild populations need not be exploited.

- *Coryphantha sneedii* var. *sneedii*—Occurring in the mountains east of Las Cruces, New Mexico, and north of El Paso, Texas, in the northern Chihuahuan Desert, the Sneed pincushion cactus has been listed as Endangered (F.R. 11/7/79). *C. sneedii* var. *sneedii*, with its many branches forming clumps a foot or more across and bearing small pink to pale rose flowers, has been heavily collected since its discovery in 1921. The plant has also declined from past road construction between Las Cruces and El Paso, while general urban expansion and use of portions of the Organ Mountains on Fort Bliss as an artillery impact area are probable threats to some specimens.

- *Echinocactus horzonthalonius* var. *nicholii*—The Nichols turks head cactus, a native of Arizona now restricted to two adjacent counties, has been listed as Endangered (F.R. 10/26/79). This turks head cactus is blue to yellowish-green, with a single stem, bearing pink flowers and fruits. The plant has been overcollected throughout its range, and its habitat is currently threatened by mining operations, urban development, and ORV use.

- *Echinocereus engelmannii* var. *purpureus*—Occurring in small numbers only in the arid, sandy soil of the Mojave Desert in southwestern Utah, the purple-spined hedgehog cactus has been listed as Endangered (F.R. 10/11/79). This spiny plant usually displays its purplish flowers on a solitary cylindrical spire, although it sometimes forms clumps. This species is widely sought by amateur and professional cactus growers, and its existence is further threatened by urban expansion and ORVs.

- *Echinocereus kuenzleri*—Discovered in 1961 and only described as a unique species in 1976, the Kuenzler hedgehog cactus—listed as Endangered (F.R. 10/26/79)—is found only in one general area on the eastern edge of the Sacramento Mountains in the Central Highlands of New Mexico. Fewer than 200 specimens of this cactus are known in nature, as most of the original population was destroyed

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by highway maintenance. The species (an unbranched or few-branched plant with cup-shaped, purplish-pink flowers) is now mostly threatened by collectors.

- *Echinocereus lloydii*—Found in only one Texas county, Lloyd's hedgehog cactus has been listed as Endangered (F.R. 10/26/79). This species' range was reduced when a strip of its habitat was destroyed during highway widening. Its numbers have continued to decline primarily due to overcollecting. First collected in 1909, Lloyd's hedgehog usually occurs in clusters, having large beautiful flowers with scarlet petals and greenish-orange fruits.

- *Echinocereus reichenbachii* var. *albertii*—Commonly called the black lace cactus for its dark purple, black-tipped spines, this native Texas plant has been listed as Endangered (F.R. 10/26/79). It has a rose-pink flower, is cylindrical and generally single-stemmed, occurring in the undisturbed brush community of the south Texas coastal bend. The black lace cactus is ecologically interesting because it is adapted for living in this "juncture" community at an extreme edge where no other lace cacti can survive. The plant is threatened by brush clearing for range improvement (known populations have been reduced by 50 percent) as well as overcollecting.

- *Echinocereus triglochidiatus* var. *arizonicus*—Known only from a few locations in the rugged mountainous country of central Arizona, the Arizona hedgehog cactus has been listed as Endangered (F.R. 10/25/79). Remaining individuals (about 1,000) are sought by collectors, attracted by the plant's large, red flowers. In addition to overcollection, this cactus may become threatened by the expansion of copper mining.

- *Echinocereus triglochidiatus* var. *inermis*—The spineless hedgehog cactus, known from four populations in western Colorado and eastern Utah, has been listed as Endangered (F.R. 11/7/79). While the major threat to this cactus is overcollection (cacti enthusiasts are attracted by its scarlet red flowers and its curious spinelessness), remaining individuals may be threatened by future mineral and oil exploration and extraction as well as increased recreational use of the high desert.

- *Echinocereus viridiflorus* var. *davisii*—Davis' green pitaya, found together with the Nellie cory cactus on a single mineral outcrop in Brewster County, Texas, has been listed as Endangered (F.R. 11/7/79). Occurring primarily on two large adjacent ranches, this cactus was extirpated



Abandoned alerce sawmill, Vicente Perez Rosales National Park, Chile.

from one ranch in the 1960's, and is now nearly confined to one protected ranch area. Overcollection as well as possible future mineral and oil exploration and extraction threaten its continued existence.

- *Neolloydia mariposensis*—Occurring on dry desert land in one Texas county (and possibly extending into Mexico, as its known range is within one mile of the border), Lloyd's Mariposa cactus has been listed as Threatened (F.R. 11/6/79). Most of the range of this plant (a spherical to egg-shaped cactus with pinkish flowers) is very remote, although future residential development (followed by increased accessibility) could threaten the species.

- *Pediocactus bradyi*—Confined to an area of about 20 square kilometers in one Arizona county, the Brady cactus has been listed as an Endangered species (F.R. 10/26/79). A small semi-globose cactus with usually one stem, *P. bradyi* retracts into the soil during dry, hot periods. It is restricted to a specific soil type, and factors limiting its distribution are not well understood. Populations have been reduced by both highway and powerline construction and maintenance activities, and the use of ORVs on National Park Service land. Overcollection of the species—prized as one of the most desirable ornamental plants—is the major threat to its survival.

- *Pediocactus knowltonii*—The Knowlton cactus, discovered when unearthed by a bulldozer in 1958 and known from only one general location in northeastern New Mexico (and perhaps barely extending into Colorado), has been listed as Endangered (F.R. 10/29/79). Most of the plant's original range was flooded by the Navajo Reservoir. Although readily available in cultivation, the greatest threat to this

small, globular cactus (with pinkish flowers) is overcollecting.

- *Pediocactus peeblesianus* var. *peeblesianus*—A desert species of the Colorado Plateau, the Peebles Navajo cactus (listed as Endangered, F.R. 10/26/79) occurs only in Navajo County, in northern Arizona. This is a small and globular cactus (with yellow to yellow-green flowers) that pulls down underground during the dry season. Although available in cultivation, it is greatly threatened by overcollecting. Road construction has destroyed much of its habitat, and a gravel pit operation poses an additional threat. Only a few hundred individuals of Peebles Navajo cactus are known to remain in nature.

- *Pediocactus sileri*—Listed as Endangered (F.R. 10/26/79), the Siler pincushion cactus occurs in scattered areas along the Utah-Arizona border, where it is restricted to a specific soil type (gypsiferous clays and sands). Small, solitary, and globose, this cactus is prized for its maroon and yellow flowers, and bears greenish-yellow fruits. The species' survival is threatened by gypsum strip-mining operations and ORV use, and Utah populations could be impacted by the Warner Valley Power Project. Some plants have also been lost to grazing, although overcollection is by far the greatest threat to the species.

- *Sclerocactus glaucus*—Found on mesas of the Colorado Plateau of far western Colorado and eastern Utah, the Uinta Basin hookless cactus has been listed as a Threatened species (F.R. 10/11/79). The species is known from only eight sites (mostly on federally-owned land), and numbers about 15,000 individuals. Valued for its magenta-colored flowers, overcollection is the major threat to this otherwise nondescript "ball" cactus (which



Photo by Keith Woolliams

Kokia cookei, the last remaining specimen.

contracts underground to become nearly invisible during long dry seasons). The species may also be threatened by future mineral and oil exploration and increasing recreational use of the high desert.

- *Sclerocactus mesae-verdae*—The Mesa Verde cactus—a grayish-green, globular plant found in southwestern Colorado and northwestern New Mexico (primarily on the Navajo Indian Reservation)—has been listed as Threatened (F.R. 10/30/79). Although known to be difficult to maintain in cultivation because of its unusual and exacting soil requirements, this species is greatly threatened by hobby and commercial collectors. Portions of its habitat have also been damaged by highway construction and ORV activity.

- *Sclerocactus wrightiae*—The Wright fishhook cactus—so named because its spines look like fishhooks—has been listed as Endangered (F.R. 10/11/79). First discovered in 1961, it occurs only at five sites in the Navajoan Desert (in two Utah counties), where its habitat is threatened by mineral exploration, potential industrial use, and ORVs. As with all other cacti, overcollecting poses the most serious direct threat to this species.

Ericaceae (Heath family):

- *Arctostaphylos hookeri* ssp. *ravenii*—Occurring on the U.S. Army's Presidio in San Francisco County, Raven's manzanita has been listed as Endangered (F.R. 10/26/79). Only a single individual of this subspecies is known to remain in the wild, where it is extremely vulnerable to destruction. Competition from nonnative plants also poses a threat to this and other indigenous plants on the Presidio. (Specimens of Raven's manzanita are held by several botanical gardens in the U.S.)

Lamiaceae (Mint family):

- *Haplostachys haplostachya* var. *angustifolia*—This last living representative of an entire genus that was once widespread on the Hawaiian Islands has been listed for protection as Endangered (F.R. 10/30/79). *H. haplostachya* var. *angustifolia* is found together with two other listed species (*Stenogyne angustifolia* var. *angustifolia* and *Lipochaeta venosa*) in a single patch of forest on the "Big Island," within the U.S. Army's Pohakuloa Training Area (on the western flank of Mauna Kea). Extirpation of historic populations of this mint is apparently due to human disturbance as well as the impacts of feral animals and introduced weedy vegetation.

- *Stenogyne angustifolia* var. *angustifolia*—Another member of the mint family, this plant (listed as Endangered, F.R. 10/30/79) also belongs to a genus found only in Hawaii. Fewer than 100 individuals of this variety are known to persist in the wild within the Pohakuloa Training Area, where their existence is threatened by grazing and browsing, human trampling, and exotic weedy plants.

Liliaceae (Lily family):

- *Harperocallis flava*—Known to occur in three locations of the Apalachicola National Forest in Florida's panhandle, Harper's beauty has been listed as Endangered (F.R. 10/2/79). No more than 100 individuals of this species—a perennial herb bearing yellow flowers—are believed to survive, making it very vulnerable to accidental loss. The Forest Service is actively managing two of the lily's known locations to enhance perpetuation of this monotypic genus. However, changes in current land management, vandalism, and overcollection could easily threaten the existence of this species.

Malvaceae (Mallow family):

- *Kokia cookei*—Once native to the Hawaiian Islands, Cooke's kokio has been listed as Endangered (F.R. 10/30/79). The last wild individuals of this species—a small tree with showy red flowers which originally grew in the dry hilly country of western Molokai—died early in this century. Only a single specimen now exists in an arboretum, where it was grown from a branch grafted onto a rootstock of a closely related species. Leaves taken from this last individual have been used to establish tissue cultures of the species, which may eventually lead to successful propagation.

Nyctaginaceae (Four O'Clock family):

- *Mirabilis macfarlanei*—Known from only two populations with a total of 20–25 individual plants, the MacFarlane's four o'clock has been listed as Endangered (F.R. 10/26/79). Occurring in Idaho and Oregon, surviving specimens are within federally-man-

aged lands. However, one population is adjacent to a main hiking trail along the Snake River—recently designated a National Recreation Area, where recreational use is expected to increase. Taking would also pose a serious threat to the species (which has a showy pink flower), considering the critically small number of remaining individuals.

Papaveraceae (Poppy family):

- *Arctomecon humilis*—One of a genus of three species known only from the southwestern U.S., the dwarf bear-poppy of Utah has been listed as Endangered (F.R. 11/6/79). The building of the city of Bloomington, Utah, apparently eliminated about a third of the plant's known habitat, and it is now confined to Washington County. Because of its exacting soil requirements, the species does not survive in cultivation. Collecting for home gardens remains a major threat, however, along with general land development and heavy ORV activity. Strip mining of gypsum deposits and the routing of roads and powerlines through the plant's general habitat also threaten the species.

Foreign Plants

Cupressaceae (Cypress family):

- *Fitzroya cupressoides*—The alerce or Chilean false larch, a long-lived evergreen conifer of southern Chile and southwestern Argentina, has been listed as Threatened (F.R. 11/7/79). Found in lowland and highland areas from Valdivia, Chile, and Lake Nahuel Huapi, Argentina, to a little south of Rio Corcovado in Chile, it is the only species in its genus. The false larch may grow to over 150 feet tall and live over 3,000 years. It has been exploited since 1599 for its wood, which has remarkable durability and resistance to fungal and insect attack. (The tree was nearly eliminated from all accessible sites by 1900.) The species' habitat has also been lost with colonization, involving clearing and burning in one of the most massive and rapid deforestations ever recorded in Latin America until recent times.

Pinaceae (Pine family):

- *Abies guatemalensis*—Also a long-lived evergreen conifer (primarily of the temperate highlands of southwestern Mexico and western Guatemala), the Guatemalan fir or *pinabete* has been listed as a Threatened species (F.R. 11/8/79). This tree may grow to over 130 feet tall, with a trunk diameter of 3 feet, occurring between elevations of 5,500 and 12,000 feet. It has been exploited for its wood and has lost much of its habitat to agriculture since at least the time of the Mayan Empire (prior to 1524). Increasing land use pressures from growing

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human populations continue to take their toll on this tree, which has declined so rapidly in Guatemala since the 1940's that it is in imminent danger of extirpation from the country. The fir's wood has been used locally for lumber, and saplings cut as Christmas trees for local residents. Sheep and other livestock grazing prevents regeneration of the tree, which reproduces poorly in the southern portion of its range. It is also severely attacked by a coleopteran insect.

Listing of these foreign evergreens will supplement protection now afforded them under CITES (both are listed on Appendix I) and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (both are on its Annex).

Federal Protection

While not prohibiting their direct taking from the wild (when Section 7 is not involved), the Endangered Species Act of 1973 affords protection to listed plants on several other fronts.

Under Service regulations, a permit system has been established to control trade in plants listed under the 1973 Act (as well as under CITES), while generally allowing legitimate commerce in cultivated specimens and seeds—thereby discouraging trade in field-collected plants. (Permit conditions differ with listing categories, purposes of interstate commerce and import/export, and origin of the plant. Kindly consult the June 24, 1977, *Federal Register* for details, or order a copy of Service plant regulations from the Wildlife Permit Office, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.)

Many listed plants occur on federally-owned or managed lands, afford-

BOX SCORE OF SPECIES LISTINGS

Category	Number of Endangered Species			Number of Threatened Species		
	U.S.	Foreign	Total	U.S.	Foreign	Total
Mammals	33	251	284	3	21	24
Birds	67	145	212	3		3
Reptiles	11	48	59	10		10
Amphibians	5	9	14	2		2
Fishes	29	11	40	12		12
Snails	2	1	3	5		5
Clams	23	2	25			
Crustaceans	1		1			
Insects	6		6	2		2
Plants	42		42	5		5
Total	219	467	686	42	21	63

Number of species currently proposed: 161 animals
1,830 plants (approx.)

Number of Critical Habitats listed: 34
Number of Recovery Teams appointed: 66
Number of Recovery Plans approved: 29
Number of Cooperative Agreements signed with States:
31 (fish & wildlife)
1 (plants)

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ing them extra protection under Endangered Species Act mandates. Section 7 of the law requires all Federal agencies to insure that actions they fund, authorize, or carry out do not jeopardize the continued existence of Endangered or Threatened species or adversely modify or destroy their Critical Habitats. (Moreover, the Act calls upon all Federal agencies to carry out conservation programs for listed animals and plants.)

Because of their extreme vulnerability, the Service has determined that designation of Critical Habitat—and accompanying publication of maps detailing the location of remaining populations—would only serve to jeopardize the recently listed native plants. (Nevertheless, these plant taxa are protected through the jeopardy

provisions of Section 7 of the Act, which may include taking controls.)

Funding is now available to the Service through the Land and Water Conservation Fund program to acquire and protect Endangered and Threatened plant habitat. Also, the Service is now authorized to enter into cooperative agreements with the States for the purpose of furthering plant conservation and protection under the Federal Endangered Species grant-in-aid program. Connecticut recently became the first State to sign such a matching fund agreement with the Service, and many more States are now developing active programs for their protected plants.

For foreign plants, there are measures for international cooperation under Section 8 of the Act.



ENDANGERED SPECIES TECHNICAL BULLETIN

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



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U.S. DEPARTMENT OF THE INTERIOR

Int 423

November 1979, Vol. IV, No. 11