

# ENDANGERED SPECIES

## Technical Bulletin

Department of the Interior, U.S. Fish and Wildlife Service, Washington, D.C. 20204

### Service Publishes Revised Plant Notice

The Fish and Wildlife Service (Service) published an updated and revised notice in the February 21, 1990, *Federal Register* identifying the vascular plant taxa native to the United States that are being reviewed for possible addition to the Federal List of Endangered and Threatened Plants. A major purpose of the notice is to solicit additional information on the status of these plants and the threats they face in order to assist the Service in determining whether or not to propose listing them for protection under the Endangered Species Act.

The identified plants are placed into one of three categories:

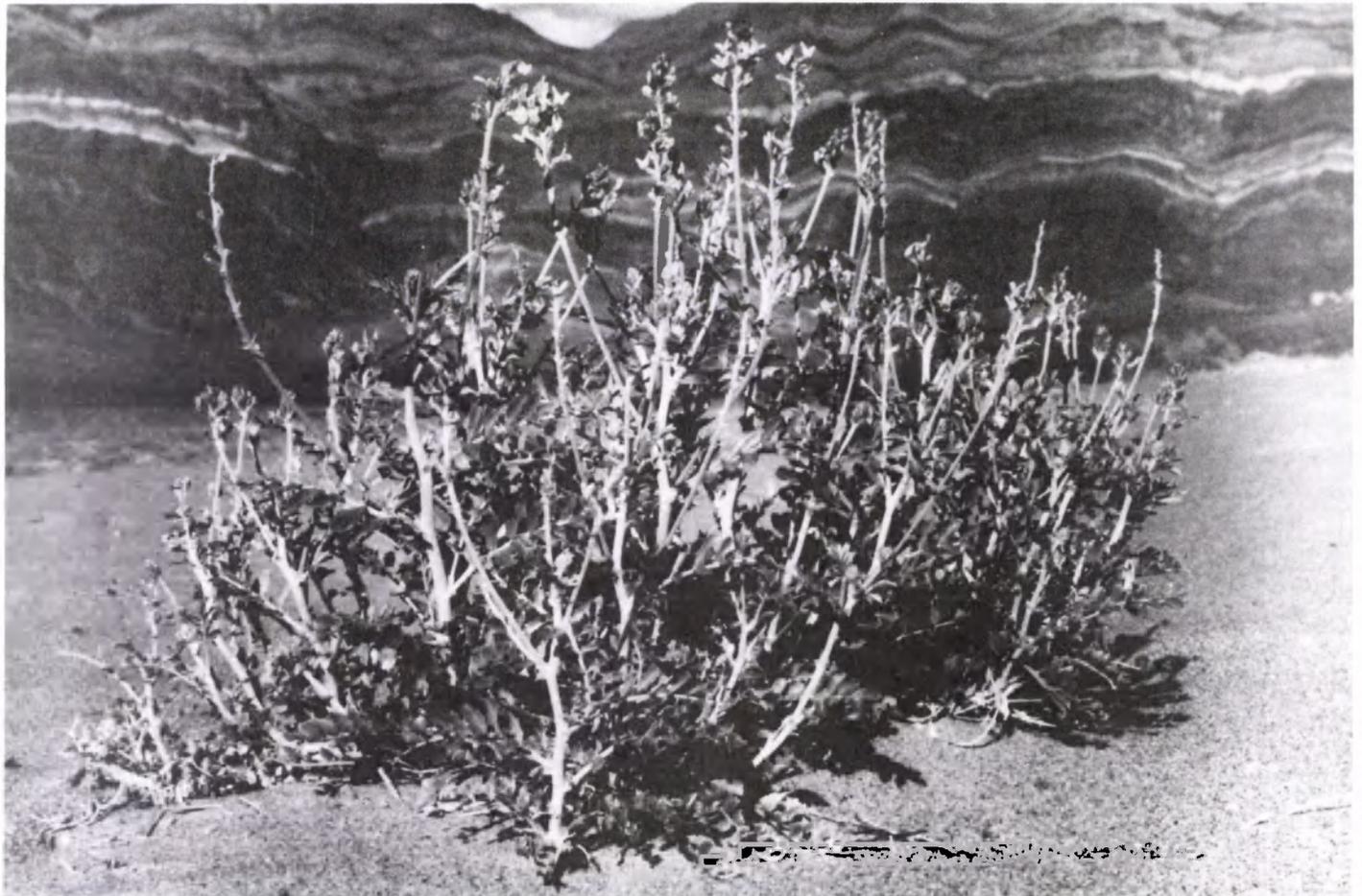
**Category 1** comprises those plants for which the Service has enough data on biological vulnerability and threats to support a proposal to list them as Endangered or Threatened. Currently, there are 527 taxa in this category. The development of proposed listing rules on these plants is anticipated; however, because of the large number, it will take years to clear the backlog. With its current resources, the Service estimates that it will be able to list approximately 50 taxa (plants and animals) per year.

**Category 2** contains taxa for which there is some evidence of vulnerability but for which there are not enough data at

this time to support a listing proposal. Further study will be necessary to ascertain the status of the 1,572 taxa in Category 2. It is likely that some will be found to be not in need of Endangered Species Act protection, while others could be determined in greater peril of extinction than some taxa in Category 1.

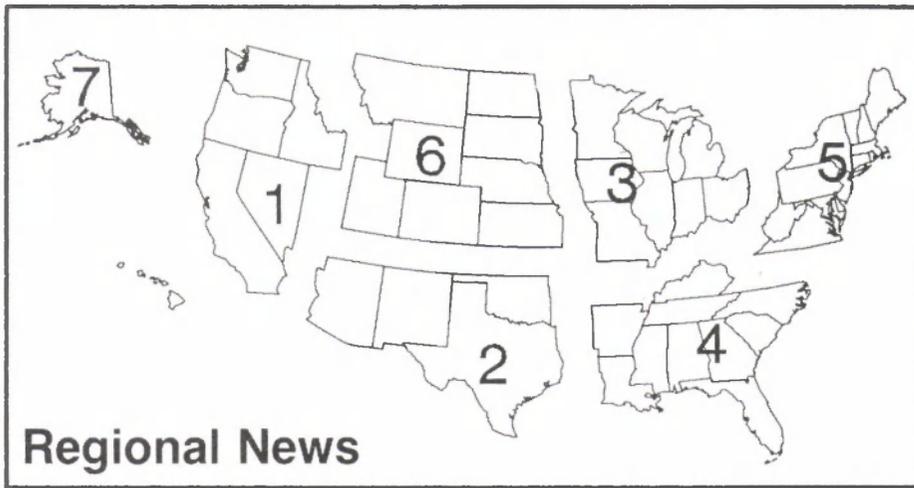
Those taxa in Categories 1 and 2 are considered by the Service as candidates for future listing. For the first time, California has the highest number of candidate plants (636) of any State. As a result of taxonomic revisions, the number of plant candidates in Hawaii has dropped

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The Eureka Dunes shining milk-vetch (*Astragalus lentiginosus* var. *micans*) is one of the 636 plant taxa in California that are candidates for listing proposals.

photo by P. Jeter Rowlands



## Regional News

### Regional endangered species staffers have reported the following news:

**Region 1**—The Fish and Wildlife Service's Boise, Idaho, Field Station staff reviewed and provided comments on the

draft 1989 Wolf Observation Public Survey Report prepared by the Central Idaho Wolf Recovery Steering Committee. During 1989, 78 sightings of gray wolves (*Canis lupus*) in Idaho were rated as probable.

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#### U.S. Fish and Wildlife Service Regions

**Region 1:** California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and the Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico and the U.S. Virgin Islands. **Region 5:** Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide. **Region 9:** Washington, D.C., Office.

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**Region 5**, One Gateway Center, Suite 700, Newton Corner, MA 02158 (617-965-5100); Ronald E. Lambertson, *Regional Director*; Ralph Pisapia, *Assistant Regional Director*; Paul Nickerson, *Endangered Species Specialist*.

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**Region 8** (FWS Research and Development nationwide), Washington, D.C. 20240; John D. Buffington, *Regional Director*; Al Sherk, *Endangered Species Specialist* (703-358-1710).

The Idaho Department of Fish and Game and the U.S. Forest Service (Boise, Challis, and Sawtooth National Forests) are planning a status survey study of the wolverine (*Gulo gulo*), a Category 2 candidate species, in the Sawtooth-Upper Wood River area of Idaho.

Three more Andean condors (*Vultur gryphus*) have been released from the hack site in the backcountry of Ventura, California (see BULLETIN Vol. XV, No. 2). There are no plans to release more Andean condors in southern California. The Service has begun capturing the four birds released there last year to determine if the condors released this year will assume the same movement patterns. The Andean condors released last year flew over populated areas. By removing the four older condors and using a different hack site, biologists hope to see if the six younger condors released this year stay in the backcountry. If the younger birds follow the same patterns and fly over populated areas, then the four older birds will be released back into the wild. If, however, the younger birds stay in the backcountry, then the older birds will be held for an indeterminate period.

The Andean condor release experiment is scheduled to end in December, although there may be a short extension. All of the Andean condors released in California will be captured and introduced back in Colombia, South America, part of their native habitat.

The first California condor (*Gymnogyps californianus*) egg laid in January 1990 hatched successfully March 12. As of March 14, the egg count for this year stood at 11, of which 6 were fertile, 2 were infertile, 1 was of unknown fertility, 1 was broken, and 1 had hatched. Eggs were produced from both captive-breeding flocks. Of the 8 eggs laid in February, 4 came from condors that had never laid eggs before, 3 came from condors that had laid eggs earlier this year and had recycled, and 1 egg came from a condor that had laid eggs in a previous year.

The Service's Office of Management Authority issued a permit in January under Section 10(a) of the Endangered Species Act for the California Department of Corrections' proposed Delano State Prison in Kern County, California. This action culminates a 5-month effort by the Department of Corrections, the California Department of Fish and Game, and the Service to resolve an Endangered species conflict on the proposed prison site. San Joaquin kit foxes (*Vulpes macrotis mutica*), Tipton kangaroo rats (*Dipodomys nitratoides nitratoides*), and blunt-nosed leopard lizards (*Gambelia silus*) were discovered there just prior to the scheduled commencement of construction in August 1989.

This is believed to be the first small-scale project that has been issued a section 10(a) permit. The Service worked

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# The Nature Conservancy and the Heritage Programs: Working Together to Preserve Biodiversity

Jeffrey Griffin  
Science Division  
The Nature Conservancy

Gifford Pinchot, one of the founders of the U.S. Forest Service, once said, "The most important quality for accomplishing anything is continuity of purpose." Since its formation in 1951, The Nature Conservancy has maintained a focus on one purpose: the preservation of biological diversity. Its philosophy in preserving biological diversity is simple: cooperation gets more results than confrontation. Today, with a membership of over 550,000 concerned citizens, a staff of nearly 1,000 people, and offices in 48 States, the Conservancy secures protection for an average of 1,000 acres (400 hectares) every day. To date, it has protected over 5 million acres (2 million ha) of land throughout the Americas. Although much of this land has been transferred to public agencies and other private conservation organizations for management, the Conservancy itself actively manages more than 1,000 preserves, encompassing over 1,000,000 acres (405,000 ha)—the largest privately owned nature preserve system in the world.

## The Natural Heritage Program Concept

One of the keys to ensuring that development is compatible with conservation is to put organized scientific information into the hands of planners and decision-makers. By knowing the location, abundance, and distribution of the rarest and most endangered species and ecosystems, we can set protection priorities and make the best use of our organizational resources. The Nature Conservancy realized this 15 years ago, when we initiated the natural heritage program network. Working with State, provincial, tribal, and national governments, the Conservancy has established natural heritage programs in every State and Puerto Rico, 3 national parks, the Navajo Nation, 2 hydroelectric authorities, 1 Canadian province, and 11 countries throughout Latin America and the Caribbean (where they are called conservation data centers, or CDCs)—a total of 76 centers as of February 1990.

Natural heritage programs conduct ongoing, cumulative inventories of their respective State or regional biological resources. Heritage biologists typically begin the process by gathering background information from published literature, individual scientists, museum collections, public agency files, and knowledgeable individuals. Information is



photo by George Fenwick

**Maryland heritage program staff seining for vertebrates in an intermittent wetland in eastern Maryland. This is one of many ongoing species inventories of the Maryland heritage program.**

gathered about species, biological community types, sites of conservation significance, existing preserves, and land ownerships. One of the most important kinds of data is the "element occurrence record," the individual examples of important species populations, natural communities, and other biotic features and phenomena. Field surveys are conducted to determine if the features are still extant, to verify the accuracy of the secondary information, and to look for occurrences in new areas. This continuing field work adds considerably to the depth and completeness of the heritage databases.

## Data Management

To effectively organize and use the massive amount of data collected, the heritage programs employ sophisticated PC-based data management systems composed of over 15 interrelated computer files and a full set of topographic maps of their States or regions.

The Conservancy recently completed development of the fifth generation of computer software for the heritage programs. We believe that this software, dubbed the Biological and Conservation Data System, or BCD, is the most advanced conservation data management system in existence. The BCD system integrates all of the Conservancy's various files, such as locations of species,

exemplary sites of natural communities, and bibliographies, plus a new set of files for managing cadastral, financial, and stewardship information in the Conservancy's field offices, into one powerful, user-friendly package.

Although not every heritage program uses BCD yet, every program, whether in Paraguay or Alaska, uses compatible data management systems. Such standardization, which allows data to be shared and compared among heritage programs, is the strength of the network.

## Priority Ranking of Elements

The Nature Conservancy and heritage programs have developed a system to rank elements in the heritage databases for conservation priority. The ranking process assigns global (G), national (N), and state (S) conservation priority ranks to every species and ecosystem. Each rank (G,N,S) is assigned a number on a scale of 1 to 5, with 1 being the rarest and most imperiled and 5 being the most widespread, abundant, and secure. This system allows for specificity on local and regional levels while maintaining a consistent global picture. For example, the tamarack (*Larix laricina*) is rare (G5N5S1) in Maryland but abundant (G5N5S5) in Minnesota and Michigan. Species ranked G1, G2, and G3 typically have been listed

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**The shaded areas are covered by the natural heritage programs/conservation data centers network**

map provided by The Nature Conservancy

## The Nature Conservancy and its Heritage Programs

(continued from page 3)

by the Fish and Wildlife Service under the Endangered Species Act or are candidates for listing.

An element's rank reflects such factors as its number of occurrences, estimated overall abundance, range, ecological fragility, and threats to its existence. These ranks, combined with site-specific data, enable the heritage programs to formulate site-by-site and State-by-State conservation priority lists, thereby directing the land protection efforts of the Conservancy and other conservation agencies.

### Uses of the Heritage Program Databases

Government and industry are the primary users of the heritage databases. Heritage data banks are consulted hundreds of times each day for conservation and development planning purposes. For example, the Idaho Natural Heritage Program is used by the Fish and Wildlife Service's Boise Field Office in its inter-agency consultations under Section 7 of the Endangered Species Act. Virtually all projects in Idaho that depend on Federal lands or Federal money are reviewed by the heritage program to determine if any listed, proposed, or candidate plants or animals are known or likely to be in the project area. Such advance planning helps to avoid potential conflicts.

Across the United States, heritage program data support Federal and State conservation agencies by providing the evidence needed to list a species as endangered or, in many cases, to remove it from consideration:

- In Arkansas, the heritage program is responsible for maintaining the State list of threatened and endangered plant species, and it works with the Game and Fish Commission to maintain the State threatened and endangered animals list.
- In Louisiana, the heritage program is playing a pivotal role in the development of the State's first official threatened and endangered species list.
- In California, the Natural Diversity Data Base or CNDDDB (heritage programs go by many names) is the repository and clearinghouse for the data upon which State listings are based. All 25 plants recently designated as State listing candidates were suggested by the CNDDDB.

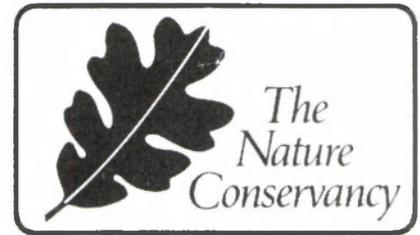
Heritage data also guide development decisions throughout the country. For example, MCI, a long-distance telephone company, used heritage program maps to route a new fiber-optic cable across New York State, enabling the company to anticipate environmentally sensitive areas and plan the route accordingly. By using heritage data, MCI shortened the review

## 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.

process, avoided conflicts, and saved money.

In just 15 years, the Conservancy, working with foundations, corporations, State and Federal agencies, universities, botanical gardens, museums, and other conservation organizations, has established a network of natural heritage programs throughout the Americas. Robert Jenkins, the Conservancy's Vice President for Science and originator of the heritage programs, notes, "The heritage network represents the most successful machinery ever developed for gathering and organizing biological and conservation information at all levels and for



putting it to use in conservation and development planning."

For more information on the Conservancy and the natural heritage programs, contact The Nature Conservancy, Science Programs, at 1815 N. Lynn Street, Arlington, Virginia 22209 (telephone 703/841-5300).

## Reference Note

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

## Final Listing Rules Approved for Three Plant Species

During February of 1990, Endangered Species Act protection was provided to these plant species:

### Palma de Manaca (*Calyptronoma rivalis*)

This arborescent palm, a member of the family Arecaceae, may reach up to 40 feet (10 meters) in height and 10 inches (25 centimeters) in trunk diameter. It is endemic to Puerto Rico, where it is found along streambanks in semi-evergreen seasonal forests of the northwestern karst region. Conversion of these forests to agricultural and pasture land has reduced habitat and may have eliminated some populations of the palm. Today, only three natural populations of about 275 plants are known. There are also two small, introduced populations. The species continues to be threatened by flash flooding (due to deforestation in surrounding areas), agricultural expansion, rural development, and resort construction. The Fish and Wildlife Service proposed the palma de manaca for listing as a Threatened species in the February 7, 1989, *Federal Register* (see BULLETIN Vol. XIV, No. 3), and the final rule was published February 6, 1990.

### Two Colorado Plants

The **Dudley Bluffs bladderpod** (*Lesquerella congesta*) and **Dudley Bluffs twinpod** (*Physaria obovata*) are two rare species in the mustard family (Brassicaceae) that grow in the Piceance Basin in Colorado. The Dudley Bluffs bladderpod is an extremely small, cushion-shaped plant up to 1.2 inches (3 cm) in diameter with long, bright yellow flowers and silvery leaves. The Dudley Bluffs twinpod, which grows to 7.2 inches (18 cm) tall, also has yellow flowers and silvery leaves. Both of these herbaceous perennial plants occur primarily on oil shale outcrops along two adjacent drainages. Five major populations of each species are known. Most of the sites are on public land administered by the Bureau of Land Management. This region contains rich deposits of oil shale and sodium minerals (nahcolite and dawsonite). If the deposits are mined, the survival of both species could be threatened.

Both of the Dudley Bluffs plants were proposed for listing as Threatened in the January 24, 1989, *Federal Register* (see BULLETIN XIV, Nos. 1-2), and the final rule was published February 6, 1990.

## Service Publishes Revised Plant Notice

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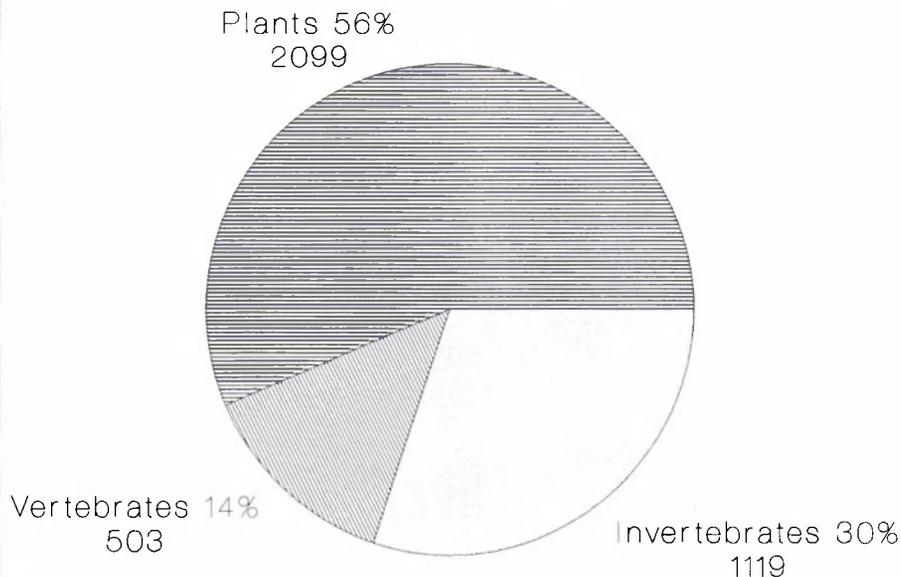
to 327. The third highest total is for Florida (160); Texas (159) and Utah (121) rank fourth and fifth. Categories 1 and 2 also contain some taxa whose status in the recent past is known but that may already be extinct.

**Category 3** is made up of taxa that once were considered for listing as Endangered or Threatened but that are no longer under consideration. There are three subcategories: **3A** (taxa for which the Service has persuasive evidence of extinction); **3B** (names that, on the basis of current taxonomic understanding, do not represent taxa that meet the Endangered Species Act's definition of a "species"); and **3C** (taxa that have been found to be widespread and/or not subject to any identifiable threat).

Until they are listed as Endangered or Threatened, plant candidates do not receive legal protection; however, it is the policy of the Service to advise other agencies of these candidates when inquiries are made about species in a project area that are already listed or proposed for listing. Federal land-managing agencies and others with the authority to conserve species prior to their listing under the Act now have more up-to-date guidance. Early consideration of these taxa in the planning process should lead to fewer potential land-use conflicts, since there is likely to be greater flexibility when accommodating the needs of such plants at an early stage.

The format of the 1990 plant notice is different from earlier versions in that plants already listed as Endangered or

## Listing Candidates\* Plants and Animals



\*These numbers, current through April 3, 1990, do not include species that have been proposed for listing.

Threatened, and those assigned to Category 3 in previous notices, are not included. Copies of the plant notice and the most recent list of Endangered and Threatened plants are available from the Publications Unit, U.S. Fish and Wildlife Service, 130 Arlington Square, Washington, DC 20240.

The Service requests additional status information on the plants named in the revised notice, data on threats to these plants, and nominations for additional

candidates. Data and comments should be sent to the appropriate Regional Directors (addresses on page 2 of the BULLETIN) or to the Chief, Division of Endangered Species and Habitat Conservation, 400 Arlington Square, U.S. Fish and Wildlife Service, Washington, DC 20240. All new information received will be considered in revising the Service's listing priorities, preparing listing documents, and compiling the next plant notice (tentatively scheduled for early 1992).

## Regional News

(continued from page 2)

closely with the applicant in preparing a conservation plan for the project, which expedited the permitting process. Construction of the much needed prison has begun.

**Region 4**—The results of a recent population survey for two Endangered mussels, the penitent mussel (*Epioblasma penita*) and Judge Tait's mussel (*Pleurobema taitianum*), in the lower Buttahatchee River of Mississippi are discouraging. The Buttahatchee River is a unique lotic (flowing water) ecosystem, with slow, deep, and swampy pool reaches connected by steep gradient gravel riffles. Cypress (*Taxodium distichum*) and tupelo gum (*Nyssa aquatica*) trees are among the dominant streamside vegetation. The river channel is in excellent shape, with a few localized exceptions. Impoundment of the Tombigbee River in Mississippi and Alabama for the

Tennessee-Tombigbee Waterway has affected the lower 1.9 miles (3 kilometers) of the Buttahatchee River by reducing the current and scouring capacity of the river. Abandoned kaolin (clay) mines and abandoned and active gravel mines also appear to be causing impacts. Above the portion of the river affected by the impoundment of the Tombigbee River, the Buttahatchee River channel has broken into gravel mines excavated adjacent to the channel, eroding former riffle areas and creating ponds. Further north, an estimated 17,000 tons (15,000 metric tons) of sediment are eroding annually from abandoned kaolin mines and moving through the Buttahatchee system.

All mussel populations in the lower reaches of the Buttahatchee River have declined dramatically. Over 1,200 individual mussels in the family Unionidae, including 92 specimens of *E. penita*, were sampled from two reaches in the lower portion of the river in 1977, but in 1989 only 75 unionids (including 3 penitent mussels) were found. Fortunately, the numbers of penitent mussels collected

from two reaches immediately above the gravel mines approached or exceeded the 1977 survey. Few specimens of Judge Tait's mussel have ever been collected from the Buttahatchee River, and none were collected there in 1989.

The Mississippi Department of Wildlife, Fisheries and Parks will continue its survey and recovery efforts during the 1990 field season to determine the numbers, condition, and location of penitent and Judge Tait's mussel populations in the upper Buttahatchee River.

The Fish and Wildlife Service has received an additional \$1.957 million for the recovery of the Puerto Rican parrot (*Amazona vittata*). This money came out of a special congressional supplemental appropriation to respond to the massive destruction wrought by Hurricane Hugo last September (see BULLETIN Vol. XIV, Nos. 9-10). Region 4 and Region 8 (Research) will use the funds to replace equipment and facilities that were lost or damaged, including the aviary where the

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## Regional News

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captive flock was housed, to conduct population assessments of the wild flock, and to continue other recovery efforts. The U.S. Forest Service also has received Hurricane Hugo relief funding for repairing damage and enhancing Puerto Rican parrot facilities in the Caribbean National Forest.

In addition to relief funding for the Puerto Rican parrot, Region 4 received \$74,000 to assist the Forest Service in its red cockaded woodpecker (*Picoides borealis*) recovery activities in the Francis Marion National Forest, South Carolina, \$5,000 to monitor the bald eagle (*Haliaeetus leucocephalus*) in South Carolina, and \$112,000 for other Endangered plants and animals in Puerto Rico and the U.S. Virgin Islands.

**Region 5**—The Service has awarded a special challenge grant to an authority on the American burying beetle (*Nicrophorus americanus*) to support the recovery of this Endangered insect in New England. The grant will match funds from The Nature Conservancy and a local historic preservation society. The funds will be used for research involving similar species, maintenance of a captive population, and survey work to identify a reintroduction site.

Region 5 has produced a new brochure entitled "What's all this about ... CRITICAL HABITAT FOR PIPING PLOVERS?" The brochure explains what a Critical Habitat designation means, why the Service is preparing a proposal to designate Critical Habitat for the piping plover (*Charadrius melodus*), how the designation process works, and what the effect of the designation will be. Copies of the brochure may be obtained from the Service's New England Field Office, 22 Bridge Street, Concord, NH 03301-4901 (telephone: 603/225-1411 or FTS 834-4411).

In December 1989 and January 1990, recovery planning meetings were held for the Cheat Mountain salamander (*Plethodon nettingi*) and two plants, the swamp pink (*Helonias bullata*) and shale barren rock cress (*Arabis serotina*). Interested biologists from Federal and State agencies and private organizations participated in the meetings. The Cheat Mountain salamander recovery plan will be prepared by the State of West Virginia. The recovery plan for the swamp pink is being prepared by Lynn Wilson from the Service's New Jersey Field Office, while the Virginia Department of Conservation and Recreation's Natural Heritage Program is preparing the shale barren rock cress recovery plan. Drafts of all three plans should be available for comment this spring.

**Region 6**—The number of gray wolves in Montana has increased since last year. For the past several years, the Wigwam Pack (with seven wolves) and the Camas Pack (with six wolves) have maintained home ranges in Montana and British Columbia, Canada. The surviving female wolf from the Marion Pack that the Service attempted to move to Glacier National Park in September 1989 (see BULLETIN Vol. XIV, Nos. 11-12) travelled from the relocation site to an area northwest of Missoula, Montana, about 35 miles (56 km) east of the designated Central Idaho Wolf Recovery Area. She has been seen with a large male wolf, and probably will breed and have a litter of pups this spring. In addition, a new pack with four or five wolves has been confirmed in an area west of Dupuyer, along the eastern foothills of the Rocky Mountains. The Forest Service is monitoring the pack and plans to work with the Fish and Wildlife Service to capture and radio-collar the wolves this summer.

The Service is administering a newly expanded wolf monitoring system to better document the presence of wolves in Montana. Wolf recovery in Montana will continue to rely on the dispersal of wolves from Canadian populations and the cooperation of local residents with State and Federal management agencies.

The Greenback Cutthroat Trout Recovery Team met in Denver, Colorado, in January 1990 to discuss 1989 activities and the future of the greenback cutthroat trout (*Onchorynchus clarki stomias*) recovery program. The recovery team, comprised of representatives from the Fish and Wildlife Service, National Park Service, Forest Service, Bureau of Land Management, and Colorado Division of Wildlife, concluded that the subspecies is approaching the recovery goal of 20 self-sustaining populations distributed adequately between the Arkansas and South Platte River systems. The recovery team will prepare a report on the fish's current status in both river systems and identify the tasks needed to attain full recovery. The team believes that the trout can be delisted within 5 years if currently planned recovery work is funded.

The Service's Pierre, South Dakota, Field Office is studying the effects of selenium on two Endangered birds, the piping plover (*Charadrius melodus*) and the interior least tern (*Sterna antillarum*). Selenium, a naturally occurring trace element, is essential in small amounts but toxic at higher concentrations. Addled least tern and piping plover eggs were collected in 1988 along the Missouri River in South Dakota and analyzed for selenium. Selenium concentrations in the eggs ranged between 4.4 and 8.7 milligrams/kilogram dry weight (1.06 to 2.31

mg/kg wet weight). The tolerance of tern and plover eggs to selenium toxicity is unknown; however, selenium levels in all of the collected eggs were within or over the range of concentrations associated with embryo deformity or mortality in other bird species. For this reason, we believe that selenium poisoning may have contributed to the hatching failure of least tern and piping plover eggs.

**Region 8 (Research)**—The Puerto Rico Research Group, including Patuxent Wildlife Research Center biologists, found territorial behavior by Puerto Rican parrots at three traditional nest sites in the Caribbean National Forest, but imminent nesting activity is likely in only two territories. The group will search rarely visited valleys in the national forest in an attempt to locate additional parrots.

Based on a January 1990 survey, the Hawaii Research Group, which includes Patuxent biologists, reports that the estimated population of palilas (*Loxioides bailleui*) on Hawaii's Mauna Kea volcano is 5,332 birds. This estimate is a significant increase over the January 1989 estimate of 3,567 birds. Palilas continue to concentrate in the island's mamane forests.

On Mauna Loa, efforts to control exotic animals and plants in Hawaii Volcanoes National Park have resulted in a dramatic improvement of the park's natural montane habitats. Native bird populations on Kulani Correctional Facility lands were surveyed during January with the help of Earthwatch Expeditions, Inc., in the hope of locating a source of native birds to reintroduce into the national park.

At least 17 brown pelicans (*Pelecanus occidentalis*) apparently died of exposure along the Mississippi and Texas Gulf coast during last December's unusually cold weather. Five of the birds were analyzed by the Service's National Wildlife Health Research Center in Madison, Wisconsin.

Twenty-nine captive propagated Mississippi sandhill cranes (*Grus canadensis pulia*) were released at the Mississippi Sandhill Crane National Wildlife Refuge during December 1989. As of mid-March 1990, two of the birds had died. Necropsies by scientists at the National Wildlife Health Research Center indicated that one of the birds had succumbed to attacks by a predator.

In January 1990, Dr. David Ellis of Patuxent's Captive Propagation Research Group conducted human avoidance tests with the released cranes. During the tests, all birds fled when approached by humans.

## BOX SCORE LISTINGS AND RECOVERY PLANS

Category	ENDANGERED		THREATENED		LISTED SPECIES TOTAL	SPECIES WITH PLANS
	U.S.	Foreign Only	U.S.	Foreign Only		
Mammals	52	244	7	22	325	25
Birds	75	145	10	0	230	59
Reptiles	15	59	17	14	105	24
Amphibians	6	8	5	0	19	5
Fishes	51	11	31	0	93	47
Snails	3	1	5	0	10	7
Clams	35	2	0	0	37	23
Crustaceans	8	0	1	0	9	4
Insects	11	1	7	0	19	12
Arachnids	3	0	0	0	3	0
Plants	169	1	53	2	225	102
<b>TOTAL</b>	<b>428</b>	<b>472</b>	<b>137</b>	<b>38</b>	<b>1075*</b>	<b>308**</b>

Total U.S. Endangered **428** (259 animals, 169 plants)

Total U.S. Threatened **137** (84 animals, 53 plants)

Total U.S. Listed **565** (343 animals, 222 plants)

\*Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

\*\*There are 257 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories: 51 fish & wildlife  
36 plants

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# ENDANGERED SPECIES

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