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ENDANGERED SPECIES

Technical Bulletin

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

Two Animals Proposed for Listing

During December 1986, the Fish and Wildlife Service (FWS) proposed to add two animals—a bird and a toad—to the U.S. list of Endangered and Threatened species. If the proposals are later made final, protection under the Endangered Species Act will be extended to these taxa:

Black-capped Vireo (*Vireo atricapillus*)

Once a widely distributed bird, the black-capped vireo bred from north-central Kansas through Oklahoma and Texas to central Coahuila, Mexico (with an outlying, possibly temporary, colony in Nuevo Leon, Mexico). Its wintering range was from Sonora to Oaxaca, with most activity in Sinaloa and Nayarit. Unfortunately, however, this small but attractive songbird is disappearing. Habitat loss and the spread of a competing bird species have eliminated the black-capped vireo from most of its breeding territories in the U.S., and it likely faces similar problems in Mexico. In an effort to prevent its extinction, the FWS has proposed to list this species as Endangered (F.R. 12/12/86).

Black-capped vireos require a specific type of habitat consisting of a few small trees scattered among separated clumps of many shrubs or bushes. The clumps of bushes are in the open, surrounded by bare ground, rocks, grasses, or wildflowers. Bushes with low-reaching foliage are particularly important for breeding because the nests are usually only 18 to 40 inches (0.5 to 1.0 meter) above ground and need to be screened from view.

These specific habitat characteristics have proved to be highly vulnerable to damage or destruction from certain land use practices. Urbanization has completely eliminated many former vireo breeding areas. Elsewhere, grazing sheep, goats, and other exotic herbivores remove the vegetation cover near ground level that is necessary for vireo nesting. Range management also can be a factor when it involves the removal of low, broad-leaved bushes. On the other hand, natural vegetational succession can overwhelm the clumped habitat needed by the vireo. In the past, overgrown areas periodically would be opened by such events as wildfires; now, however, the amount of available habitat has been drastically reduced.

Competition is another big problem for the black-capped vireo. The extensive human-related changes in the landscape and land-use patterns—in particular, the opening up of forested areas and the spread of cattle and grain fields in North America over the past 150 years—appear to have favored the spread of the brown-headed cowbird (*Molothrus ater*). This more adaptable bird seems to be increasing in numbers as well as in range. (It threatens not only the black-capped vireo but also a related subspecies in California, the Endangered least Bell's vireo, *Vireo bellii pusillus*.) Cowbirds parasitize vireo nests, laying their eggs before the vireo clutches are completed. The cowbirds eggs hatch 2 to 4 days before the vireos and, by the time the vireos do hatch, the cowbird nestlings outweigh them tenfold. A 1961 study found that in all places where a cowbird nestling occupied the nest, no black-capped vireo chicks survived.

Based on extensive field surveys over the past decade, the FWS believes that the black-capped vireo is a candidate for extinction. Trends in all parts of the species' range are downward; the vireo has disappeared from Kansas, is gravely endangered in Oklahoma, and no longer occurs in several parts of its former range in Texas. Its current breeding range is from central Oklahoma (Blaine County) south through Texas (Dallas, the Edwards Plateau, and Big Bend National Park), to at least the Sierra Madera in central Coahuila, Mexico. The largest remaining breeding population, which occurs near Austin, Texas, could lose its breeding habitat as a result of proposed development and road construction projects. The city of Austin, which endorses listing the vireo, is considering ways to protect this habitat.

A proposed designation of Critical Habitat was not included in the listing proposal for the black-capped vireo because this bird occurs in scattered, small areas that can vary over time due to vegetational suc-

(continued on page 9)

photo by Roger Clapp

Adult male black-capped vireos are olive green on the upper surface and white underneath, with faintly yellowish-green flanks. Their crown and the upper half of the head is black with a partial white eye ring and lores. Adult females are duller in color, with a slate gray crown and underparts washed in greenish-yellow.

Regional News

Endangered Species Program regional staff members have reported the following activities for the month of December:

Region 1—The Regional Director announced on December 4, 1986, that an agreement was signed for the purchase of the 11,360-acre Hudson Ranch by the Fish and Wildlife Service (FWS). Hudson Ranch is considered one of the most important California condor (*Gymnogyps californianus*) use areas in the species' current range. Along with several other smaller parcels, the ranch will make up the Bitter Creek National Wildlife Refuge, which is being established for this highly Endangered bird.

On December 13, 1986, a male condor, one of the last three wild birds, was captured with a cannon net on Hudson Ranch by biologists from the Condor Research Center. It was subsequently transported to the San Diego Wild Animal Park to join the 11 other condors there as part of the captive breeding program. Trapping operations will continue in an effort to bring the two remaining wild male condors into captivity for propagation.

The California Condor Recovery Team has recommended a limited experimental release of Andean condors (*Vultur gryphus*) in California to test the suitability of release sites and methods for future releases of California condors, and to train a team in effective release techniques. The proposed experiment would involve 10-15 fledgling Andean condors of the same sex from various captive flocks. They would be released at two sites and monitoring would be conducted for 1-2 years. These experimental releases of Andean condors will ensure that future releases of California condors are accomplished as smoothly as possible.

At the conclusion of the experiment, all of the released Andean condors will be captured and returned to captivity. Because all of the Andean condors to be used will be young birds of a single sex and will be radio-tagged to facilitate close monitoring, no problems of escape and/or expansion of the released group are expected. No overlapping release of California condors is planned.

For a current breakdown on the condor population, see table on page 3.

Region 2—A prolonged period of bad weather prevented an aerial survey of whooping cranes (*Grus americana*) at Aransas National Wildlife Refuge (Texas) in late December. However, subsequent surveys have identified 107 birds on the refuge (as of January 7, 1987). Birds that had not yet been seen include one of the oldest pairs and six color-marked subadults.

The wintering flock exceeded the 100-bird mark for the first time since early this century, in time for the 50th anniversary (1987) of Aransas National Wildlife Refuge. This good news was tempered by the death of Frank Johnson, manager of the refuge since 1973. Frank died in his sleep, apparently from a heart attack.

In October, Dr. Rod Drewien confirmed that 26 whooping cranes were surviving in the Rocky Mountain population. Another three might still be alive but have not been seen since the spring migration. However, during December, project personnel have only been able to find 20 whooping cranes in the middle Rio Grande Valley. Further

(continued on next page)

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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, 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 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, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska. **Region 8:** Research and Development nationwide.

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Regional News

(continued from previous page)

work is planned in January to search for the missing cranes.

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The attempt to reestablish thick-billed parrots (*Rhynchopsitta pachyrhyncha*) into southeast Arizona's Chiricahua Mountians has been a conditional success. A total of 29 birds were released during September and October. (See BULLETIN Vol. XI No. 10-11 for details.) The original flock separated into two groups. A large group of 14-15 birds left the Chiricahuas and are now residing in the Graham Mountains, about 68 miles northwest of the Chiricahuas. Difficult access and poor weather conditions have precluded any monitoring of this group since December 5th. A second group containing 8 birds left the Chiricahuas in early November, but their current location remains unknown. Future aerial searches in northern Mexico and southeastern Arizona may help us to relocate these wide-ranging birds, some of which were radio-tagged.

Observations of the parrots during their short stay in the Chiricahua Mountains provided some interesting ecological information. The birds feasted on a variety of foods that seemed to be in abundance in the Chiricahuas. They ate (in decreasing order of preference) Chiricahua pine seeds, Douglas fir seeds and terminal buds, ponderosa pine seeds, and Arizona white oak acorns. Although running water is available for drinking, the birds preferred water-filled potholes atop cliffs. Nine different overnight roosting sites were documented; all were in densely-crowned pines or firs and were usually at relatively high elevations on north-facing slopes. Apparently, seven of the 29 parrots released have died. Only two of these were radio-collared, indicating that the radios were not detrimental to the parrot's survival. Only one dead parrot was recovered. The probable cause of death was raptor predation.

The reestablishment of the thick-billed parrot is being conducted cooperatively by the Arizona Game and Fish Department, the U.S. Forest Service (USFS), the San Diego Zoo, and the FWS.

* * *

A Turtle Excluder Device or Trawling Efficiency Device (TED) mediation meeting between representatives of environmental groups and the shrimping industry was held in Houston, Texas, during the week of December 1. This final meeting marked the end of lengthy discussions between the two parties and produced a tentative agreement that provides suggestions for the draft regulations for mandatory TED use by shrimp trawlers. The National Marine Fisheries Service's (NMFS) draft regulations will incorporate the suggestions of the mediation board and are scheduled to be published in the *Federal Register* by the end of January 1987.

The phase-in procedure agreed to by the mediation panel will not only allow manufacturing time for the TED's required and allow shrimpers to learn to use TED's properly, but will afford immediate protection for sea turtles. During Phase One (effective July 15, 1987), shrimpers fishing in 10 fathoms or less in the Gulf of Mexico from Mobile Bay to Mexico will have to use TED's during the spring, summer, and fall. Phase Two begins July 15, 1988, when all inshore bay and estuary shrimpers will be required to use TED's. By Phase Three, in 1990, NMFS expects to mandate TED use by more than 80 percent of the Gulf shrimping fleet.

The southeast Atlantic shrimping fleet will experience a similar phase-in. In the Canaveral area (east coast of Florida), TED's will be required year-round. From Cape Hatteras, North Carolina, to north Florida, shrimpers will have to use TED's from May through August.

Provisions were incorporated into the agreement to monitor the effectiveness of the program and to adjust the regulations accordingly. Mandatory use of TED's will

(continued on page 7)

According to the California Department of Fish and Game, the tally of California condors as of December 13, 1986, was as follows:

Total population size—27 birds (13 males, 14 females)
Captive population size—25 birds (11 males, 14 females)
Wild population size—2 birds (2 males, both radio-tagged)

Captive California Condor Population *(current distribution):*

San Diego Wild Animal Park	**Los Angeles Zoo**
2 adult males	2 adult males
1 adult female	2 adult females
3 immature males	3 immature males
5 immature females	6 immature females
1 nestling (male)	

Sources of captive birds:

Captured wild bird (1967)	1
Captured wild birds (1981-1986)	7
Removed as nestlings from the wild (1982-1984)	4
Hatched in captivity from 16 eggs removed from the wild (1983-1986)	13

* * *

Final Listing Actions for Two Species

The following species were added to the U.S. list of Endangered and Threatened species during December 1986:

Loch Lomond Coyote Thistle (*Eryngium constancei*)

Despite its common name, this plant is not a thistle but an herb in the parsley family (Apiaceae). It occurs only on the bed of a 7-acre vernal lake in southern Lake County, California. Potential dredging and filling of this seasonal wetland are the main threats to the survival of *E. constancei*, and the species was proposed March 26, 1986, for listing as Endangered (see story in BULLETIN Vol. XI No. 4). The final listing rule was published in the December 23 *Federal Register*.

Ringed Sawback Turtle (*Graptemys oculifera*)

This small basking turtle is found only in the Pearl River system of Mississippi and Louisiana. It apparently needs riverine habitat with a moderate current, numerous logs for basking, and high sand and gravel bars for nesting. Some of its former habitat has been modified by reservoir construction and flood control projects, while other areas are now marginal habitat due to water quality degradation and a corresponding reduction in the turtle's molluscan food supply. Because of these threats, the FWS proposed on January 21, 1986, to list the ringed sawback turtle as a Threatened species (see BULLETIN Vol. XI No. 2). The final listing rule was published in the December 23 *Federal Register*.

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Both of these newly listed species now are protected under the Endangered Species Act, the terms of which are summarized in this BULLETIN at the end of the story on species newly proposed for listing.

Creation of Artificial Foraging Habitat for Wood Storks

Nora A. Murdock
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Endangered Species Field Office

The southeastern U.S. population of the wood stork (*Mycteria americana*) was listed as Endangered after several decades of steady decline had reduced the population from approximately 60,000 individuals in the early 1930's to 10,000 breeding birds in 1984. The principal cause of this decline was the loss or deterioration of the wetlands that, with their naturally fluctuating water levels, provided the required foraging habitat for the storks. Although many of the large traditional rookery sites in south Florida have remained essentially undisturbed, nesting attempts by the species in those areas have met with repeated failures in recent decades due to inadequate foraging habitat.

The first formal interagency consultation under Section 7 of the Endangered Species Act involving the wood stork began after the bird was officially added to the Endangered Species List in February 1984. This consultation, which was between the Fish and Wildlife Service and the Department of Energy (DOE), involved restarting an old nuclear reactor at the DOE's Savannah River Plant in South Carolina. Downstream of the reactor, and in the path of its thermal effluent, was the rich Steel Creek delta area, which served as one of the most important foraging sites for a nearby colony of wood storks. The colony, appropriately located near the community of Birdsville, Georgia, had been formed only recently; however, nesting success at this rookery, measured in terms of young fledged per nest, ranked consistently higher than most of the other known wood stork rookeries. In addition, this rookery, being the farthest north and farthest inland ever recorded for the species, was believed by some biologists to represent a response by the birds to repeated nesting failures in the traditional south Florida habitat. In essence, this rookery was extremely important to survival and recovery of the species because it represented a potential "pioneering" adaptation.

Work on the Savannah River Plant's "L-Reactor" was already proceeding when the wood stork was listed as Endangered. The DOE had been advised a year earlier of the intent to list the stork and of the potential conflict with the reactor. Eventually, the DOE abandoned its original plan for discharging hot effluent directly into a tributary of the Savannah River and constructed a 1,000-acre cooling reservoir instead. (These decisions were based on issues other than endangered species concerns.) Despite the elimination of thermal impacts on the stork foraging habitat, the increased water levels produced by reactor operations would have increased the depth of water in the foraging habitat to the point that it could not be used for feeding by storks. After evaluating several alternatives, the DOE agreed to attempt the construction of artificial stork foraging habitat to replace that habitat lost due to reactor operation. Such a habitat creation experiment had been carried out several years earlier by the National Audubon Society (NAS) at its Corkscrew Swamp Sanctuary in Florida, where one of the last large stork rookeries was experiencing repeated nesting failure. The NAS effort indicated that the idea was feasible, but work was discontinued due to lack of funds.

(continued on page 16)

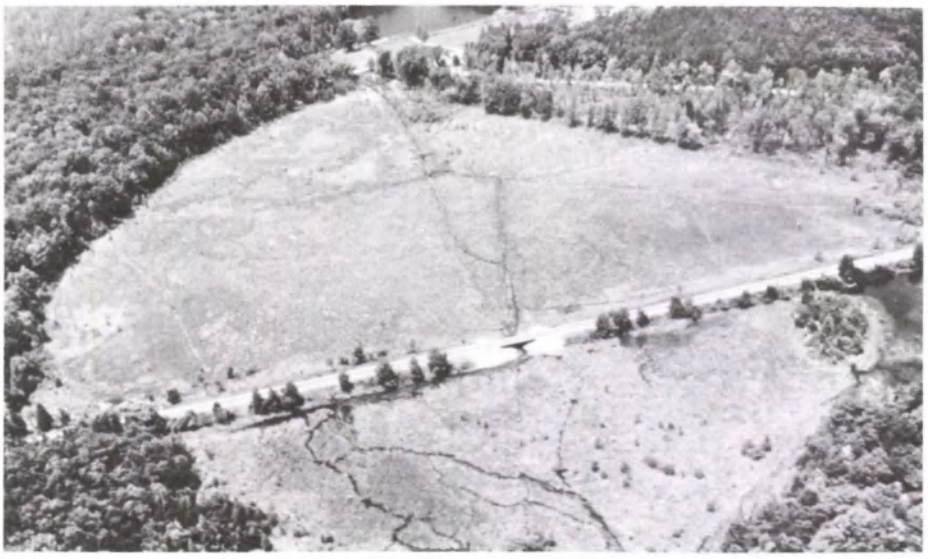

photo by Sue Jewell

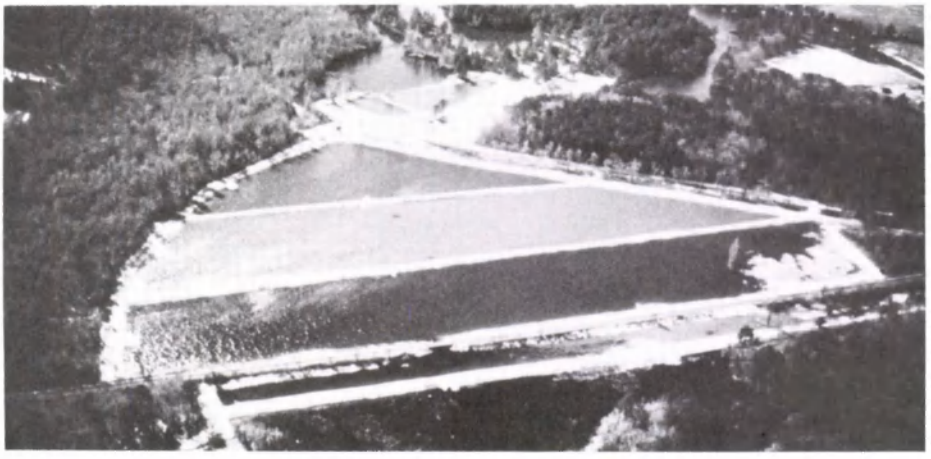

photo by Lisa Huff

dry bed of old Kathwood Lake at the Silverbluff Sanctuary before (above) and after (below) the creation of wood stork foraging habitat

photo by Larry Bryan

wood storks at newly created foraging habitat at the Silverbluff Sanctuary, South Carolina

Captive 'Alala Moved to New Breeding Facilities

Peter A. Stine
Honolulu, Hawaii, Field Office

photo by Ernest Kosaka

new Olinda captive breeding facility for Hawaiian birds on the island of Maui

Efforts to breed the critically Endangered 'alala or Hawaiian crow (*Corvus hawaiiensis*) in captivity were given a major boost recently when the nine birds existing in captivity were moved to a new home. The anxiously awaited transfer of these birds from an old facility on the island of Hawai'i to the State's new captive breeding facilities on the island of Maui took place on November 20, 1986. It is hoped that these new facilities and their surroundings will provide a favorable environment for successful reproduction in this captive flock.

The production of birds from the captive flock for eventual reintroduction into the wild is currently the top priority of the 'alala recovery program. There are probably fewer than 10 individuals of this critically Endangered and unique relative of the common crow (*C. brachyrhynchos*) surviving in their native habitat. The few remaining birds are located in remnants of native forest on the island of Hawai'i's Kona coast. Habitat loss, avian diseases, predation by mongoose and feral cats, and a lack of the necessary social stimuli in the relict population all have been implicated to some extent in the decline of this species. Because of its extremely precarious status, captive propagation and reintroduction into protected, managed habitat is the only hope for preventing the extinction of the 'alala.

There currently are nine Hawiian crows in captivity, and it is hoped that additional birds can be brought into captivity from the remnant wild population. Unfortunately, there has been no reproduction in the captive flock in the last 5 years. This captive breeding program has been housed at several different locations, but since 1976 it was located in modified goose breeding pens at the Pohakuloa Endangered Species Breeding Facility. This facility, located on the upper slopes of Mauna Kea on the island of Hawai'i, was originally developed 37 years ago to breed the Endangered nene or Hawaiian goose (*Nesochen sandvicensis*) and was never well suited for the 'alala. It is not clear why the captive 'alala have not bred successfully there, but the dry, higher elevation environment (which differs considerably from the normal 'alala habitat) and the diverse, high-intensity military training activities on the U.S. Army's adjacent Pohakuloa Training Area likely had a significant negative impact on these sensitive birds. Despite the efforts of the Army to limit the disruptive impact of its training, it was clear that these activities were affecting the captive 'alala flock. For these reasons, it became necessary to move the captive 'alalas to a better facility.

Providing the proper environment and facilities for captive 'alala was no easy task. However, a major commitment of funds and effort from the State of Hawaii's Department of Land and Natural Resources (DLNR), the U.S. Fish and Wildlife Service (FWS), and the invaluable assistance of the U.S. Army-Western Command made it possible. The State dedicated the abandoned Olinda minimum security prison, located in a fairly secluded area on the mid-elevation slopes of east Maui, for developing a captive breeding facility for

photo by Peter Stine

native 'alala habitat on the slopes of Hualalai, a volcano on the island of Hawai'i

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'Alala

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Endangered Hawaiian birds. The 45-acre site had all the basic requirements needed for such a program, but the buildings and grounds needed major renovation and additional construction before they would be suitable. Entirely new buildings were designed specifically to house the 'alala. The FWS provided some of the needed funds under Section 6 of the Endangered Species Act to assist in this renovation. Technical support from the FWS Patuxent Wildlife Research Center was provided to DLNR engineers regarding the design of the cages and support facilities needed.

The Army, recognizing the conflict at Pohakuloa and the need to relocate the birds as soon as possible, stepped in and provided manpower from B Company of the 84th Engineer Battalion to do much of the construction and renovation work. Their tireless effort resulted in the construction of two large, house-sized cages, each containing four interconnecting pens, within four months. Each pen is intended to hold one breeding 'alala pair and its offspring. The two cages thus can accommodate a maximum of eight adult pairs plus young offspring.

These buildings were carefully designed to accommodate the species' needs, including the need to have social contact with neighboring birds. The pens were completed in July 1986, and the State DLNR has since taken care of the lengthy list of small details necessary to make them and the support facilities fully operational.

Transport of the nine birds to the new breeding facility was accomplished on November 20, 1986, without any significant problems. The birds appeared to have adapted very well to their new surroundings, and there is renewed hope for the next breeding season (spring 1987).

Under the guidance of Dr. Fern Duvall and the veterinary care of Dr. Renate Gassman-Duvall, the 'alala captive breeding program now holds new promise. The Olinda Captive Breeding Center will continue to be upgraded with the anticipation that eventually it will become a fully equipped, first-rate facility housing captive breeding flocks of a number of Hawaii's Endangered birds, including the nene and some endemic forest birds.

Although the new captive breeding facility is a significant recovery action, much more needs to be done. The first priority is to add more birds to the captive flock, if at all possible. The vitality of the existing nine birds as future breeders is uncertain and cannot be depended upon. Also, the limited genetic diversity of the "founder" (captive) population must be enhanced. Other vital recovery actions include protection and management of remnant native forest habitats to provide suitable areas for eventual reintroduction of captive offspring into the wild. The 'alala is a fascinating and unique component of Hawai'i's natural heritage. Hopefully, it is not too late to prevent the loss of this species.

photo by Winston E. Banko

The 'alala is an important part of the native Hawaiian heritage. According to legend, these birds are spirits that were protected by the ancient Hawaiians. 'Alala were quite common before the turn of this century, but today they are on the verge of extinction.

Florida Panther Recovery Program

David J. Wesley
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An active, well coordinated effort to recover the Endangered Florida panther (*Fells concolor coryi*), Florida's official State mammal, is under way.

In May 1986, the Fish and Wildlife Service (FWS), National Park Service, Florida Game and Fresh Water Fish Commission, and Florida Department of Natural Resources entered into a Memorandum of Agreement to establish a Florida Panther Interagency Committee. The long-term goal of the committee is to promote a coordinated effort to restore the Florida panther to a secure status in the wild. Initial committee objectives are to:

1. provide a forum for exchange of information among the agencies on their continuing conservation efforts;
2. minimize duplication of efforts;
3. review and evaluate new conservation alternatives and their likely effects on the panther and other resources; and
4. coordinate decisions about which recovery measures should be implemented by each agency.

The impetus behind the establishment of this committee was to bring together the directors and administrators of those agencies most responsible for activities affecting the panther in Florida. As other agencies are identified, they will be asked to participate on an *ad hoc* basis. Mr. James W. Pulliam, Jr., Regional Director of the FWS Southeast Region, is serving as committee chairman.

One of the first tasks of the committee has been to revise the existing recovery plan. A technical subcommittee worked diligently for months, completely rewriting the existing plan, and a draft revision was released on October 31, 1986, for comment. This document represents a cooperative effort of many agencies, and incorporates all of the new information that has become available during the past few years of panther research.

The draft recovery plan revision emphasizes interagency coordination and public participation, and is divided into three major sections. Part one is an introduction describing the basic biology of the panther (its distribution, taxonomy, food and habitat needs, movements, reproduction, health status, etc.), reasons for its decline, and current threats to the species. The purpose of this section is to present a more complete biological picture of the panther.

Part two states the recovery goals and identifies, in an outline format, the necessary steps to be taken. This outline is followed by a narrative providing details and

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photo by Wendell Metzer

Florida panther

Florida Panther

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describing the projects and studies listed in the outline. Agencies responsible for each action also are identified. The revised Florida panther plan establishes a recovery goal of three viable, self-sustaining populations within the historic range of the panther, which extends from Arkansas south to Louisiana and east to South Carolina and into Florida. Major objectives of the plan include: (1) identifying, protecting, and enhancing existing populations of Florida panthers and protecting and managing their habitat; (2) establishing positive public support for the management of the Florida panther; and (3) reintroducing panthers into areas of suitable habitat.

Part three of the recovery plan is the implementation schedule. This section identifies tasks described in the recovery section as research, management, or administrative in nature and assigns specific responsibilities. It also establishes priorities for specific actions and identifies an estimated cost and duration for each action. Cost figures are not included in the revised draft, but will be added by the agencies during the review process for inclusion in the final revision.

Copies of the draft revised Florida Panther Recovery Plan are available by writing to the Public Affairs Office, U.S. Fish and Wildlife Service, 75 Spring Street, SW, Atlanta, Georgia 30303.

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In addition to the progress being made on the recovery plan, other critical tasks necessary for panther recovery are under way. Research on the panther has been conducted for a number of years. In November 1986, the National Park Service began efforts to capture and radio tag panthers in Everglades National Park, with the assistance of the Florida Game and Fresh Water Fish Commission. In January 1987, the Game Commission will resume its panther capture and radio telemetry work in the Big Cypress National Preserve. Research on deer also will be conducted in both places. Plans are to expand research and management actions in all State and Federal lands and to study panthers on private lands.

Progress on captive breeding efforts also has been made. A male panther that was struck and injured by an automobile in 1984 has been obtained by the Game Commission. This animal was rehabilitated at the University of Florida Veterinary School and will become part of a captive breeding program, since it has been determined that he could not survive if returned to the wild. A captive breeding facility has been developed by the Gilman Paper Company, and the company has generously offered to finance the captive breeding program. Two female panthers from Texas have been brought to the captive breeding facility to be used in evaluating the fertility of the male and the effectiveness of introducing captive-bred cats to the wild, although these hybrid cats would be sterilized and therefore would not become part of the permanent Florida panther population.

In the area of land acquisition, the FWS is in the process of completing purchase agreements for 15,000 acres of the proposed 32,000-acre Fakahatchee Strand National Wildlife Refuge (NWR). The refuge will be located immediately to the north and west of the intersection of SR-29 and Alligator Alley in south Florida. Mr. Steve Gard, currently assistant manager of the Merritt Island NWR, has been selected as the first manager for the new refuge. Mr. Gard will be establishing a temporary office in the Naples area to administer the new refuge. His first efforts will be to develop a comprehensive management plan for the refuge lands and facilities. The FWS is hopeful of completing the acquisition process by the end of 1987.

Regional News

(continued from page 3)

be an important step toward the protection of endangered sea turtles. TED's are expected to substantially reduce trawl-related mortality of sea turtles, estimated at over 11,000 turtle deaths per year.

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On December 23, 1986, a jeopardy biological opinion on the Stacy Dam was signed by the Regional Director. The Colorado River Metropolitan Water District (CRMWD) has proposed to build the Stacy Dam, which would impound the Colorado and Concho Rivers in west-central Texas. The dam will impact 26 percent of the Threatened Concho water snake's (*Nerodia harteri paucimaculata*) proposed Critical Habitat. Section 7 of the Endangered Species Act (ESA) was involved when the U.S. Army Corps of Engineers received an application from the CRMWD for permits under Sections 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

Reasonable and prudent alternatives will remove the jeopardy by reviving over 30 miles of the Colorado River above Stacy Reservoir and creating up to 49 miles of new Concho water snake habitat downstream from the Stacy Dam. The upstream habitat was lost when another dam, Robert Lee, was built in 1968 without provisions for minimum or channel-forming flows. Reaches below Stacy lack sufficient riffle habitat to sustain large numbers of snakes. Minimum and channel-forming (flushing) flows from Robert Lee and Stacy Dams, and the addition and maintenance of rocky shoals, will provide the habitat the juvenile snakes need to survive. Although there will be some loss of habitat, newly created habitat will approximately equal the amount of habitat loss. In addition, tributary habitats known to support Concho water snakes will be protected, rocky areas within Stacy Reservoir will be created, numerous monitoring and research efforts will be initiated, and snakes will be transferred above and below Stacy Dam to maintain genetic heterogeneity of the isolated populations.

Juvenile Concho water snakes need shallow shoals (riffles) where they hunt for fish, and sun-warmed rocky flats near the water edge for thermoregulation and cover. Adults are more wide-ranging and occupy pools as well as shoals. Concho water snakes do not occupy reservoirs in either the Concho or the Colorado River, but the Brazos water snake (*N. h. harteri*) has been found in reservoirs on the Brazos River. Reservoirs inundate preferred Concho water snake habitat, and the reduced stream flows cause downstream habitats to become clogged with silt and vegetation.

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The Texas Nature Conservancy and the FWS have entered into a cooperative

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Regional News

(continued from page 7)

agreement for the recovery of the Texas poppy-mallow (*Callirhoe scabriuscula*), a rare plant restricted to Runnels County. The agreement will promote landowner awareness and involvement, an essential aspect for the species' recovery because the poppy-mallow occurs exclusively on private land.

* * *

A proposed road into the Gila National Forest of New Mexico prompted concern over the possible impact the road would have on two snail species that are candidates for future Federal listing: the Gila spring snail and the New Mexico hot spring snail, both undescribed species of the genus *Fontelicella*. These two snails, which have been petitioned for listing, were previously known from two springs along the East Fork of the Gila River and from a third spring on the main Gila River near its confluence with the East Fork. A brief survey of the road impact area was conducted by personnel from the FWS, USFS, and New Mexico Department of Game and Fish. The snail species were found in four springs along 1.5 miles of the East Fork. Three of the springs may be threatened by the road because of expected increased recreational or vehicular use. Restrictions and requirements on road construction, maintenance, and use, along with rigorous enforcement of the restrictions, may alleviate some of the threats to the snails' survival.

* * *

Region 4—The Memphis, Tennessee, District of the U.S. Army Corps of Engineers contracted with the Tennessee Valley Authority (TVA) to survey certain reaches of the St. Francis River drainage for the presence of an Endangered clam, the fat pocketbook (*Potamilus capax*). This survey is one provision of a conservation plan contained in a biological opinion issued by the Jackson, Mississippi, Endangered Species Field Office. The search included intermittent 5-mile reaches from the mouth of the St. Francis River up to Wappapello Lake and in several tributaries and ditches. Information indicates that the fat pocketbook occurs in two ditches in Straight Slough; ditches within Oak Donnick Floodway up to the St. Francis Sunk Lands; Iron Mines Creek at Marked Tree siphon, and the St. Francis River below Marked Tree siphon. The clam also occurs at the mouth of the St. Francis River.

The TVA survey expands the known range of the species from 43.2 miles to over 80 miles of the St. Francis floodway, up to 30 miles of drainage west of the floodway, and a short reach of the St. Francis River near Marked Tree, Arkansas. Quantitative estimates for an assessment of the density of these additional populations were made but are not yet available. The species was found in gravel, sand, and mud where there was flowing water. Many of the tributaries and ditches were very small. The TVA survey was designed to expand the area that was surveyed in 1985. The Memphis Office of the Corps of Engineers and the FWS Jackson, Mississippi, Endangered Species Field Office will continue to implement the conservation plan over the next few years.

* * *

The 1986 annual Gopher Tortoise Council meeting was held at Wekiwa Springs State Park in Apopka, Florida, on November 7-9, 1986. At this meeting, talks were given by three biologists on the Bolson tortoise (*Gopherus flavomarginatus*), an Endangered resident of the highlands of northern Mexico. This animal digs lengthy burrows that serve as homes to dozens of other small creatures and is the nearest living relative of the southeastern gopher tortoise (*G. polyphemus*). The focus of the meeting was non-sandhill habitats in which gopher tortoises are found and the management techniques used to maintain these habitats.

* * *

Citrus groves and housing developments are rapidly displacing the remaining tracts of sand pine-evergreen oak vegetation in Polk and Highlands Counties of central Florida. This vegetation has a large endemic flora, and one of the endemics, the scrub mint (*Dicerandra frutescens*), is already listed as Endangered. Nine other scrub plants in the two counties are currently listed or proposed for listing as Endangered or Threatened.

Fragmentation of the remaining tracts of scrub is so great that only a very few large tracts are available for acquisition. One is an 800-acre tract at Saddle Blanket Lakes, where The Nature Conservancy (TNC) recently bought 77 acres. The State is planning to purchase the rest under its Conservation and Recreation Lands Program.

A landowner adjoining TNC's preserve recently proposed a zoning change to allow development of a large recreational vehicle park. The county zoning board approved the change, but TNC, acting as an adversely affected landowner, appealed to the Polk County Commission. TNC maintained that the proposed development would make prescribed burning in the preserve impossible, and that it would probably lead to further residential development in the area, making the proposed State land purchase impossible. The FWS, State agencies, the Regional Planning Council, and local private organizations, including Bok Tower Gardens and Archbold Biological Station, submitted comments supporting TNC. The county commission voted to deny the proposed zoning change.

* * *

The Jacksonville, Florida, Endangered Species Field Station convened a meeting in December for Federal agencies that manage lands on Cape Canaveral to review and discuss sea turtle conservation programs. Forty-two miles of Cape Canaveral beaches are jointly managed by the National Park Service (Canaveral National Seashore), FWS (Merritt Island National Wildlife Refuge), and U.S. Air Force (Canaveral Air Force Station). Over 6,000 sea turtle nests were made there in 1986, most by loggerheads (*Caretta caretta*), but there also were 37 green (*Chelonia mydas*) and 5 leatherback (*Dermochelys coriacea*) nests.

Overall nesting success was 55 percent. This represents a dramatic increase in successful nests compared to two or three years ago when at least 85-90 percent of all nests were destroyed by predators. The increase is due to nest screen efforts at the National Seashore and raccoon and hog removal on refuge and Air Force beaches. In spite of these efforts, hogs destroyed 646 nests at the Air Force Station, while raccoons destroyed over 95 percent of all unscreened nests (1,857) at the National Seashore. Efforts to further increase nesting success are planned for next year.

* * *

Recovery plans for two Florida plants, the Florida torreya (*Torreya taxifolia*) and Key tree-cactus (*Cereus robinii*), have been issued. The Florida Torreya Recovery Plan is unusually complex because the decline of the tree in its native habitat is poorly understood. The trees are killed by stem and needle blight, cankers, and perhaps other diseases that are probably caused by opportunistic infections by common fungi.

Attempts to keep cultivated torreya trees healthy in the Tallahassee, Florida, area have failed, but cultivated trees in the southern Appalachians and the Pacific Northwest are thriving. Gene pool conservation may be possible by establishing garden collections from cuttings taken from the wild. For persons wishing to see the Florida torreya, the best group of specimens is at Biltmore House and Gardens in Asheville, North Carolina.

The recovery plan for the Key tree-cactus focuses on conservation of its habitat, tropical hardwood hammocks in the lower Florida Keys. These hammocks can appropriately be called thorn scrub or thorn forest because of their low (15 to 25 feet tall) tree canopies and abundant cacti.

* * *

Region 5— The FWS regional endangered species office recently completed a 2-year project with the eastern regional office of TNC to determine the status of 32 plant candidates that are under review for possible Federal listing. Using the expertise in the eastern States' Natural Heritage Programs, intensive field surveys were conducted throughout the species' range. The heritage program network provided the opportunity to assess the status of several wide-ranging plants in a systematic and cost effective manner. The FWS/TNC/State project was particularly beneficial

(continued on page 14)

photo by Paul Gertler

Puerto Rican crested toads are yellowish-olive to blackish-brown in color, with prominent crests above the eyes and a long, upturned snout.

Proposed Listings

(continued from page 1)

cession. Further, pinpointing the breeding areas with the detailed habitat descriptions and maps required for a Critical Habitat designation could expose the bird to more harassment. Nevertheless, if the vireo is listed, this bird and its habitat will receive protection from jeopardy that might result from Federal actions. Federal agencies with lands from which the bird has been reported recently include the National Park Service (Big Bend National Park, Texas), the U.S. Army (Fort Hood, Texas), and the FWS (Wichita Mountains National Wildlife Refuge, Oklahoma). Fort Hood officials already have expressed interest in protecting the species, and therefore few adverse Federal impacts are expected. No Federal activities are known to occur on the State and private lands that contain black-capped vireos.

Comments on the listing proposal are welcome, and should be sent to the Regional Director, Region 2 (address on page 2 of the BULLETIN), by March 12, 1987.

Puerto Rican Crested Toad (*Peltophryne lemur*)

Historically, this amphibian was known from only two islands, and it may already be extirpated from one. No *P. lemur* have been seen on Virgin Gorda (one of the British Virgin Islands) for at least 20 years. It evidently is now restricted to a few coastal lowland areas in northern and southern Puerto Rico. One sizeable breeding population is known to remain, and its largest breeding site is threatened by development. To help prevent the extinction of the Puerto Rican crested toad, the FWS has proposed to list it as a Threatened species (F.R. 12/23/86).

P. lemur occurs at low elevations where there is exposed limestone or porous, well-drained soil offering an abundance of fissures and cavities. Like most bufonids (true toads), adults of this species spend most of their time in burrows, surfacing mainly to feed and breed. They are widely dispersed except at breeding time, when the adults concentrate. Although not completely understood, *P. lemur* breeding appears to be sporadic and highly dependent on occasional heavy rains. The species shows a high fidelity to breeding sites.

Many breeding sites are known to have been eliminated as wet areas were filled or drained for construction, cultivation, and mosquito control. The only known remaining breeding sites are within Guanica Commonwealth Forest on the southwestern coast of Puerto Rico. The largest of these sites is being used as an unimproved parking lot. There have been proposals to pave it over, which would eliminate its value as a breeding site for the toad. A large resort development proposed for construction on private land adjacent to the site would likely add to the pressure on the breeding habitat. Discussions among Federal and Commonwealth of Puerto Rico agencies have begun in an effort to find acceptable alternatives that will avoid destruction of the critical breeding site.

Critical Habitat was not proposed for the Puerto Rican crested toad because such a designation would make the species more vulnerable to collectors, especially when the toads congregate for breeding. Overcollection of other Puerto Rican herptofauna has been documented. However, the toad will, if listed, receive protection under other provisions of the Endangered Species Act.

Comments on the proposed listing of the Puerto Rican crested toad as a Threatened species are welcome, and should be sent to the Field Supervisor, Caribbean Field Office, U.S. Fish and Wildlife Service, P.O. Box 491, Boqueron, Puerto Rico 00622, by February 23, 1987.

* * *

Available Conservation Measures

Among the conservation benefits provided to a species if its listing under the Endangered Species Act as Threatened or Endangered is approved are: protection from adverse effects of Federal activities; prohibitions against certain practices; the requirement for the FWS to develop and implement recovery plans; the authorization to seek land purchases or exchanges for important habitat; and the possibility of Federal aid to State or Commonwealth conservation departments that have signed Endangered Species Cooperative Agreements with the FWS. (Oklahoma and the Commonwealth of Puerto Rico have such agreements.) Listing also lends greater recognition to a species' precarious status, which encourages further conservation efforts by State and local agencies, independent organizations, and individuals.

Section 7 of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the survival of a listed species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the FWS on ways to avoid jeopardy. For species that are *proposed* for listing and for which jeopardy is found, Federal agencies are required to "*confer*" with the FWS, although the results of such a conference are non-binding.

Further protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or traffic in listed animals, except by permit for certain conservation purposes. For plants, the rule is different; the prohibition against collecting applies only to listed plants found on lands under Federal jurisdiction. Some States, however, have their own laws against take of listed plants.

LIST OF APPROVED RECOVERY PLANS

Restoring Endangered or Threatened animals and plants to the point where they are again secure, self-sustaining members of their ecosystems is one of the main goals of the Endangered Species Program. To help guide the recovery effort, the Fish and Wildlife Service is working to develop plans for all listed species native to the United States. As of December 31, 1986, 209 recovery plans for 243 species were completed and approved. Many others are in various stages of development. Recovery plans also may be revised, if and when appropriate; the dates given below are for the original plans.

The amount of available funding and personnel resources affects the speed at which recovery plans can be implemented. Guidelines for setting priorities in preparing and carrying-out recovery plans were published in the September 21, 1983, *Federal Register*. (See story in BULLETIN Vol. VIII No. 10.)

Copies of recovery plans are available for purchase from the Fish and Wildlife Reference Service about 6 months after they are approved. Inquiries should be addressed to the Fish and Wildlife Reference Service, 6011 Executive Boulevard, Rockville, Maryland 20852, or call toll-free 800/582-3421 (in Maryland call 301/770-3000). Ask for any revisions.

Endangered and Threatened Species With Approved Recovery Plans

Common Name	Scientific Name	Date Plan Approved
MAMMALS 23 species		
Big-eared bats		05/08/84
Ozark big-eared bat	*Plecotus townsendii ingens*	
Virginia big-eared bat	*Plecotus townsendii virginianus*	
Black-footed ferret	*Mustela nigripes*	06/25/78
Columbian white-tailed deer	*Odocoileus virginianus leucurus*	10/21/76
Delmarva Peninsula fox squirrel	*Sciurus niger cinereus*	11/06/79
Eastern cougar	*Felis concolor couguar*	08/02/82
Eastern timber wolf	*Canis lupus lycaon*	06/05/78
Florida panther	*Felis concolor coryi*	12/16/81
Gray bat	*Myotis grisescens*	07/08/82
Grizzly bear	*Ursus arctos horribilis*	01/29/82
Hawaiian monk seal	*Monachus schauinslandi*	04/01/83
Indiana bat	*Myotis sodalis*	06/01/76
Key deer	*Odocoileus virginianus clavium*	06/10/80
Mexican wolf	*Canis lupus baileyi*	08/09/82
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	08/18/82
Northern Rocky Mountain wolf	*Canis lupus irremotus*	05/28/80
Red wolf	*Canis rufus*	07/12/82
Salt marsh harvest mouse	*Reithrodontomys raviventris*	11/16/84
San Joaquin kit fox	*Vulpes macrotis mutica*	01/31/83
Sonoran pronghorn	*Antilocapra americana sonoriensis*	12/30/82
Southern sea otter	*Enhydra lutris nereis*	02/03/82
West Indian manatee	*Trichechus manatus*	
Mainland U.S. Population Plan		04/15/80
Puerto Rico Population Plan		12/24/86
Woodland caribou	*Rangifer tarandus caribou*	04/12/85
BIRDS 55 species		
Aleutian Canada goose	*Branta canadensis leucopareia*	03/07/79
Attwater's greater prairie chicken	*Tympanuchus cupido attwateri*	12/16/83
Bald eagle	*Haliaeetus leucocephalus*	
Chesapeake Bay Region Plan		05/19/82
Southwestern Population Plan		09/08/82
Pacific States Population Plan		08/25/86
Northern States Plan		07/29/83
Southeastern States Plan		08/03/84
California brown pelican	*Pelecanus occidentalis californicus*	02/03/83
California clapper rail	*Rallus longirostris obsoletus*	11/16/84
California condor	*Gymnogyps californianus*	04/09/75
California least tern	*Sterna antillarum browni*	04/02/80
Cape Sable seaside sparrow	*Ammospiza maritima mirabilis*	04/06/83
Channel Islands species		01/26/84
San Clemente loggerhead shrike	*Lanius ludovicianus mearnsi*	
San Clemente sage sparrow	*Amphispiza belli clementeae*	
Dusky seaside sparrow	*Ammospiza maritima nigrescens*	04/26/79

Common Name	Scientific Name	Date Plan Approved
Eastern brown pelican	*Pelecanus occidentalis carolinensis*	
Mainland U.S. Population Plan		07/19/79
Puerto Rico and Virgin Islands Population Plan		12/24/86
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	03/11/83
Hawaiian crow or 'alala	*Corvus hawaiiensis*	10/28/82
Hawaiian forest birds		02/03/83
Akiapola'au	*Hemignathus munroi*	
Hawai'i 'akepa	*Loxops coccineus coccineus*	
Hawai'i creeper	*Oreomystis mana*	
'O'u	*Psittirostra psittacea*	
Hawaiian hawk	*Buteo solitarius*	05/09/84
Hawaiian seabirds		04/25/83
Hawaiian dark-rumped petrel	*Pterodroma phaeopygia sandwichensis*	
Newell's Townsend's shearwater	*Puffinus auricularis newelli*	
Hawaiian waterbirds		06/19/78
Hawaiian coot	*Fulica americana alai*	
Hawaiian duck or koloa	*Anas wyvilliana*	
Hawaiian gallinule	*Gallinula chloropus sandvicensis*	
Hawaiian stilt	*Himantopus himantopus knudseni*	
Kaua'i forest birds		07/29/83
Kaua'i 'akialoa	*Hemignathus procerus*	
Kaua'i 'o'o	*Moho braccatus*	
Large Kaua'i thrush	*Phaeornis obscurus myadestina*	
Nuku-pu'u	*Hemignathus lucidus*	
'O'u	*Psittirostra psittacea*	
Small Kaua'i thrush	*Phaeornis palmeri*	
Kirtland's warbler	*Dendroica kirtlandii*	10/22/76
Laysan duck	*Anas iaysanensis*	12/17/82
Light-footed clapper rail	*Rallus longirostris levipes*	07/03/79
Masked bobwhite	*Colinus virginianus ridgwayi*	02/15/78
Maui-Moloka'i forest birds		05/30/84
Crested honeycreeper	*Palmeria dolei*	
Maui 'akepa	*Loxops coccineus ochraceus*	
Maui parrotbill	*Pseudonestor xanthophrys*	
Moloka'i creeper	*Oreomystis flammea*	
Moloka'i thrush	*Phaeornis obscurus rutha*	
Nuku-pu'u	*Hemignathus lucidus*	
Po'ouli	*Melamprosops phaeosoma*	
Mississippi sandhill crane	*Grus canadensis puila*	10/24/79
Nene or Hawaiian goose	*Nesochen sandvicensis*	02/14/83
Northwestern Hawaiian Islands passerine birds		10/04/84
Laysan finch	*Telespyza cantans*	
Nihoa finch	*Telespyza ultima*	
Nihoa millerbird	*Acrocephalus familiaris kingi*	
Pallia	*Loxioides bailleui*	01/23/78
Peregrine falcon	*Faico peregrinus*	
Rocky Mountain/Southwest Plan		08/03/77
Eastern Plan		08/20/79
Alaska Population Plan		10/04/82
Pacific Plan		10/12/82
Puerto Rican plain pigeon	*Columba inornata wetmorei*	10/14/82
Puerto Rican parrot	*Amazona vittata*	11/30/82
Puerto Rican whip-poor-will	*Caprimulgus noctitherus*	04/19/84
Red-cockaded woodpecker	*Picoides borealis*	08/24/79
Whooping crane	*Grus americana*	01/23/83
Wood stork	*Mycteria americana*	09/09/86
Yellow-shouldered blackbird	*Agelaius xanthomus*	05/25/83
Yuma clapper rail	*Rallus longirostris yumanensis*	02/04/83
REPTILES 21 species		
American crocodile	*Crocodylus acutus*	02/13/79
Blunt-nosed leopard lizard	*Gambelia silus*	04/18/80
Culebra Island giant anole	*Anolis rooseveiti*	01/28/83
Coachella Valley fringe-toed lizard	*Uma inornata*	9/11/85
Eastern indigo snake	*Drymarchon corals couperi*	04/22/82
Island night lizard (Channel Islands Plan)	*Xantusia riversiana*	01/26/84
Leatherback sea turtle	*Dermochelys coriacea*	10/23/81

Common Name	Scientific Name	Date Plan Approved
Marine turtles		09/19/84
Green sea turtle	*Chelonia mydas*	
Hawskbill sea turtle	*Eretmochelys imbricata*	
Kemp's Ridley sea turtle	*Lepidochelys kempii*	
Leatherback sea turtle	*Dermochelys coriacea*	
Loggerhead sea turtle	*Caretta caretta*	
Olive Ridley sea turtle	*Lepidochelys olivacea*	
Mona boa	*Epicrates monensis monensis*	04/19/84
Mona ground iguana	*Cyclura stejnegeri*	04/19/84
Monito gecko	*Sphaerodactylus micropithecus*	03/27/86
New Mexico ridge-nosed rattlesnake	*Crotalus willardi obscurus*	03/22/85
Plymouth red-bellied turtle	*Pseudemys rubriventris bangsi*	03/26/81
Puerto Rico boa	*Epicrates inornatus*	03/27/86
St. Croix ground lizard	*Ameiva polops*	03/29/84
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	09/11/85
Virgin Islands tree boa	*Epicrates monensis granti*	03/27/86
AMPHIBIANS 6 species		
Desert slender salamander	*Batrachoseps aridus*	08/12/82
Golden coqui	*Eleutherodactylus jasperi*	04/19/84
Houston toad	*Bufo houstonensis*	09/17/84
Red Hills salamander	*Phaeognathus hubrichti*	11/23/83
San Marcos salamander	*Eurycea nana*	12/03/84
(San Marcos River Plan)		
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	09/28/77
FISHES 43 species		
Alabama cavefish	*Speopiatyrhinus poulsoni*	09/17/82
Amber darter	*Percina anteseila*	06/20/86
Arizona trout	*Salmo apache*	08/20/79
Bayou darter	*Etheostoma rubrum*	09/08/83
Big Bend gambusia	*Gambusia gaigei*	09/19/84
Blue pike*	*Stizostedion vitreum glaucum*	06/29/76
Bonytail chub	*Gila elegans*	05/16/84
Chihuahua chub	*Gila nigrescens*	04/14/86
Clear Creek gambusia	*Gambusia heterochir*	01/14/82
Colorado River squawfish	*Ptychocheilus lucius*	03/16/78
Comanche Springs pupfish	*Cyprinodon elegans*	09/02/81
Conasauga logperch	*Percina jenkinsi*	06/20/86
Cui-ui	*Chasmistes cujus*	01/23/78
Devils Hole pupfish	*Cyprinodon diabolis*	07/15/80
Gila trout	*Salmo gilae*	01/02/79
Greenback cutthroat trout	*Salmo clarki stomias*	11/11/77
Humpback chub	*Gila cypha*	08/22/79
Kendall Warm Springs dace	*Rhinichthys osculus thermalis*	07/12/82
Leon Springs pupfish	*Cyprinodon bovinus*	08/14/85
Leopard darter	*Percina pantherina*	09/20/84
Maryland darter	*Etheostoma sellare*	02/02/82
Moapa dace	*Moapa coriacea*	02/14/83
Mohave tui chub	*Gila bicolor mohavensis*	09/12/84
Okaloosa darter	*Etheostoma okaloosae*	10/23/81
Owens River pupfish	*Cyprinodon radiosus*	09/17/84
Pahranagat roundtail chub	*Gila robusta jordani*	03/28/86
Pahrump killifish	*Empetrichthys latos*	03/17/80
Paiute cutthroat trout	*Salmo clarki seleniris*	01/25/85
Pecos gambusia	*Gambusia nobilis*	05/09/83
San Marcos River species		12/03/84
Fountain darter	*Etheostoma fonticola*	
San Marcos gambusia	*Gambusia georgei*	
Slackwater darter	*Etheostoma boschungi*	03/08/84
Slender chub	*Hybopsis cahni*	07/29/83
Smoky madtom	*Noturus baileyi*	08/09/85
Snail darter	*Percina tanasi*	05/05/83
Spotfin chub	*Hybopsis monacha*	11/21/83
Topminnows		03/15/84
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	
Yaqui topminnow	*Poeciliopsis occidentalis sonoriensis*	
Unarmored threespine stickleback	*Gasterosteus acuieatus williamsoni*	12/27/77
Warm Springs pupfish	*Cyprinodon nevadensis pectoralis*	11/10/76

Common Name	Scientific Name	Date Plan Approved
Watercress darter	*Etheostoma nuchale*	06/25/80
Woundfin	*Plagopterus argentissimus*	07/09/79
Yellowfin madtom	*Noturus flavipinnis*	06/23/83
SNAILS 7 species		
Chittenango ovate amber snail	*Succinea chittenangoensis*	03/24/83
Flat-spired three-toothed snail	*Triodopsis platysayoides*	05/09/83
Iowa Pleistocene snail	*Discus macclintocki*	03/22/84
Noonday snail	*Mesodon clarki nantahala*	09/07/84
Painted snake coiled forest snail	*Anguispira picta*	10/14/82
Stock Island tree snail	*Orthalicus reses*	03/08/83
Virginia fringed mountain snail	*Polygyriscus virginianus*	05/09/83
CLAMS 21 species		
Alabama lamp pearly mussel	*Lampsilis virescens*	07/02/85
Appalachian monkeyface pearly mussel	*Quadrula sparsa*	07/09/84
Birdwing pearly mussel	*Conradilla caelata*	07/09/84
Cumberland bean pearly mussel	*Villosa trabalis*	08/22/84
Cumberland monkeyface pearly mussel	*Quadrula intermedia*	07/09/84
Curtis' pearly mussel	*Epioblasma florentina curtisi*	02/04/86
Dromedary pearly mussel	*Dromus dromas*	07/09/84
Fat pocketbook pearly mussel	*Potamilus capax*	10/04/85
Fine-rayed pigtoe pearly mussel	*Fusconaia cuneolus*	09/19/84
Green-blossom pearly mussel	*Epioblasma torulosa gubernaculum*	07/09/84
Higgins' eye pearly mussel	*Lampsilis higginsi*	07/29/83
Orange-footed pearly mussel	*Plethobasus cooperianus*	08/30/84
Pale lilliput pearly mussel	*Toxolasma cylindrella*	08/22/84
Rough pigtoe pearly mussel	*Pleurobema plenum*	08/06/84
Shiny pigtoe pearly mussel	*Fusconaia edgariana*	07/09/84
Tan riffle shell mussel	*Epioblasma walkeri*	10/22/84
Tubercled-blossom pearly mussel	*Epioblasma torulosa torulosa*	01/25/85
Turgid-blossom pearly mussel	*Epioblasma turgidula*	01/25/85
White wartyback pearly mussel	*Plethobasus cicatricosus*	09/19/84
Yellow-blossom pearly mussel	*Epioblasma florentina florentina*	01/25/85
CRUSTACEANS 1 species		
Soccoro isopod	*Thermosphaeroma thermophilus*	02/17/82
INSECTS 12 species		
California butterflies		10/10/84
San Bruno elfin butterfly	*Callophrys mossii bayensis*	
Mission blue butterfly	*Icaricia icarioides missionensis*	
Delta green ground beetle	*Elaphrus viridis*	09/11/85
El Segundo blue butterfly	*Euphilotes battoides allyni*	01/22/86
Kern primrose sphinx moth	*Euproserpinus euterpe*	02/08/84
Lange's metalmark butterfly (Antioch Dunes Plan)	*Apodemia mormo langei*	03/21/80
Lotis blue butterfly	*Lycaeides argyrognomon lotis*	12/26/85
Oregon silverspot butterfly	*Speyeria zerene hippolyta*	09/22/82
Palos Verdes blue butterfly	*Glaucopsyche lygdamus palosverdesensis*	01/19/84
Schaus swallowtail butterfly	*Papilio aristodemus ponceanus*	11/17/82
Smith's blue butterfly	*Euphilotes enoptes smithi*	11/09/84
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	08/01/84
PLANTS 54 species		
Antioch Dunes plants		03/21/80
Contra Costa wallflower	*Erysimum capitatum* var. *angustatum*	
Antioch Dunes evening primrose	*Oenothera deltoides* ssp. *howellii*	
Brady pincushion cactus	*Pediocactus bradyi*	03/28/85
Bunched arrowhead	*Sagittaria fasciculata*	09/08/82
Channel Islands species		01/26/84
San Clemente Island broom	*Lotus dendroideus* ssp. *traskiae*	
San Clemente Island bush-mallow	*Malacothamnus clementinus*	
San Clemente Island Indian paintbrush	*Castilleja grisea*	
San Clemente Island larkspur	*Delphinium kinkiense*	
Chapman rhododendron	*Rhododendron chapmanii*	09/08/83
Clay phacelia	*Phacelia argillacea*	04/12/82
Davis' green pitaya	*Echinocereus viridiflorus* var. *davisii*	09/20/84
Dwarf bear-poppy	*Arctomecon humilis*	12/31/85

Common Name	Scientific Name	Date Plan Approved
Eureka Valley Dunes plants		12/13/82
Eureka Valley dunegrass	*Swallenia alexandrae*	
Eureka Valley evening-primrose	*Oenothera avita* ssp. *eurekensis*	
Florida torreya	*Torreya taxifolia*	09/09/86
Furbish lousewort	*Pedicularis furbishiae*	06/30/83
Green pitcher plant	*Sarracenia oreophila*	05/11/83
Gypsum wild buckwheat	*Eriogonum gypsophilum*	03/30/84
Hairy rattleweed	*Baptisia arachnifera*	03/19/84
Harper's beauty	*Harperocallis flava*	09/13/83
Hawaiian vetch	*Vicia menziesii*	05/18/84
Key tree-cactus	*Cereus robinii*	09/09/86
Knowlton cactus	*Pediocactus knowltonii*	03/29/85
Kuenzler hedgehog cactus	*Echinocereus fendleri* var. *kuenzleri*	03/28/85
Lee pincushion cactus	*Coryphantha sneedii* var. *leei*	03/21/86
MacFarlane's four-o'clock	*Mirabilis macfarlanei*	03/28/85
McDonald's rock-cress	*Arabis mcdonaldiana*	02/28/84
McKittrick pennyroyal	*Hedeoma apiculatum*	04/12/85
Mesa Verde cactus	*Sclerocactus mesae-verdae*	03/30/84
Mountain golden heather	*Hudsonia montana*	09/14/83
Navasota ladies'-tresses	*Spiranthes parksii*	09/21/84
Nellie cory cactus	*Coryphantha minima*	09/20/84
Nichol's Turk's head cactus	*Echinocactus horizonthalonius* var. *nicholii*	04/14/86
North Park phacelia	*Phacelia formosula*	03/21/86
Northern monkshood	*Aconitum noveboracense*	09/23/83
Peebles Navajo cactus	*Pediocactus peeblesianus* var. *peeblesianus*	03/30/84
Persistent trillium	*Trillium persistens*	03/27/84
Raven's manzanita	*Arctostaphylos pungens* var. *ravenii*	07/10/84
Robbins' cinquefoil	*Potentilla robbinsiana*	07/22/83
Salt marsh bird's-beak	*Cordylanthus maritimus* ssp. *maritimus*	12/06/85
San Diego mesa mint	*Pogogyne abramsii*	07/10/84
Santa Barbara Island liveforever	*Dudleya traskiae*	06/27/85
Sller pincushion cactus	*Pediocactus sileri*	04/14/86
Small whorled pogonia	*Isotria medeoloides*	01/16/85
Sneed pincushion cactus	*Coryphantha sneedii* var. *sneedii*	03/21/86
Solano grass	*Tuctoria mucronata*	09/11/85
Spineless hedgehog cactus	*Echinocereus triglochidiatus* var. *inermis*	04/02/86
Tennessee purple coneflower	*Echinacea tennesseensis*	02/14/82
Texas poppy mallow	*Callirhoe scabriuscula*	03/29/85
Texas wild-rice (San Marcos River Plan)	*Zizania texana*	12/03/84
Todsen's pennyroyal	*Hedeoma todsenii*	03/22/85
Truckee barberry	*Mahonia sonnei*	06/20/84
Virginia round-leaf birch	*Betula uber*	03/03/82
Wright fishhook cactus	*Sclerocactus wrightiae*	12/24/85

(More than one species are covered by some plans, and some species have several plans covering different parts of their ranges.)

* Recovery efforts did not come in time to save this fish; it was recognized by the FWS as extinct on September 2, 1983.

Regional News

(continued from page 8)

since it provided to the FWS the necessary information to proceed with listing qualified candidate plants and aided TNC in establishing its land protection priorities. Fourteen of the 32 species have been recommended for Federal listing.

* * *

On December 10, a meeting was held at Wye Mills, Maryland, to discuss the Maryland Forest, Park, and Wildlife Service's nongame and endangered species program and the first draft of the revised Chesapeake Bay Bald Eagle Recovery Plan. Representing Maryland was Glenn Therres, who was recently hired as the head of the State's nongame and endangered species program.

* * *

Region 6—The new black-footed ferret (*Mustela nigripes*) captive breeding facility at the Sybille Wildlife Research Unit near Wheatland, Wyoming, has been completed. The final inspection was made on December 16, 1986. Dr. Donald Kwiatkowski, Wyoming Game and Fish Department, started work at the facility on December 1. He will be responsible for the day-to-day care and maintenance of the captive ferrets.

Captive black-footed ferrets currently being held in Laramie, Wyoming, will be transferred to Sybille in their current cages, which will then be connected to new, larger cages using a pipe tunnel. The ferrets will be allowed to move into their new cages gradually, softening any trauma associated with being transported to their new building. With a total of 17 black-footed ferrets now being held in captivity, all involved are hoping for a successful captive breeding effort within the next few months.

* * *

The Upper Basin Colorado River Coordinating Committee, which has been involved in a 3-year process to resolve conflicts between water developers and conservation of Endangered fishes, met in the FWS Denver Regional Office on December 8 to discuss the final changes to the draft Endangered Species Recovery Implementation Plan for the Upper Colorado River Basin. A task group established under the Coordinating Committee has been developing the plan for the past year and a half.

As a result of the meeting, the Coordinating Committee agreed to three final changes and directed the task group to complete this last revision of the implementation plan for acceptance and signa-

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Regional News

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ture by committee members in January 1987. The task group met on December 15 to make these final revisions, and a consensus was reached on most issues. Efforts will continue on the remaining issues to keep the plan on track, with the implementation of the cooperative agreement among the States of Colorado, Utah, and Wyoming and the Department of the Interior scheduled for February. If completed, this plan will initiate a 15-year effort at recovering the listed fishes in the upper Colorado River basin.

* * *

The Interagency Grizzly Bear Committee (IGBC) held its fall meeting in the FWS Denver Regional Office on December 2-3. Attendees included members of the IGBC (top level managers of the USFS; FWS; National Park Service; Bureau of Land Management; and the States of Wyoming, Montana, Idaho, and Washington), agency grizzly bear experts, Canadian biologists, representatives from environmental organizations, the press, and private citizens. Some of the key highlights of the meeting follow:

Revision of the Grizzly Bear Recovery Plan is under way. However, a partial interim revision is being prepared to provide updated information on grizzly bear recovery zones and recovery target levels for all grizzly bear ecosystems. The target date for completion of the interim draft is February 1987.

In 1986, six grizzlies were captured as nuisance bears in the Northern Continental Divide Ecosystem in Montana, and 33 were captured as nuisance animals in the Yellowstone Ecosystem. More than 60 percent of the bear/human conflicts in the Yellowstone Ecosystem occurred on the 1 percent of habitat that is in private ownership. Many problems occurred in towns bordering the park that resulted from incorrect garbage disposal and storage, which attracted the bears.

Results from the first year of a study on aversive conditioning of grizzly bears using rubber bullets are somewhat optimistic. Only a few bears were actually "tested" in 1986. However, preliminary indications show that although bears "shot" once at a specific location did not avoid all areas with humans, after three hits they did begin to avoid areas associated with humans for up to a 1-month period. A report on this study, which is being conducted by the Wyoming Game and Fish Department, should be available soon.

A state-of-the-art compendium on the grizzly bear has been completed by the National Wildlife Federation. The 830-page document includes a list and abstract of all available information on the biology, research, and management of the grizzly bear in North America.

A special task force report was submitted to the IGBC on the availability and distribution of foods for grizzly bears in the Yellowstone Ecosystem. It provides details on the amounts of carrion and fish available to bears, the distribution and annual abundance of these food sources, and the known feeding ecology of grizzly bears in relation to the foods available in this ecosystem. The report notes that significant amounts of carrion are available to bears in both spring and fall. The majority is available within Yellowstone National Park in the spring, while in the fall most is available outside the park as a result of big game sport hunting. Available data on grizzly bear foods and the population in the Yellowstone area indicate that sufficient foods are available to maintain a viable population in this ecosystem. Thus, concerns about the need to artificially feed grizzly bears are not supported by the available data.

Current data for the Yellowstone Ecosystem indicate that management efforts are resulting in fewer bear mortalities and, as a result, higher reproduction. Twenty-three adult females were seen with cubs in the Yellowstone Ecosystem in 1986. Although two of these bears are now dead due to human/bear conflicts, this is the highest number of unduplicated adult female sightings ever reported in the ecosystem. In comparison, the highest number of adult females with cubs counted from 1959 to 1967, when the garbage dumps in the park were open, was 19. It is important to note that approximately 2 million acres or 40 percent of the Yellowstone ecosystem have yet to be adequately censused for adult females with cubs due to logistics and limitations on access. Thus, the number of sightings in 1986 represents a *minimum* number known to be alive. At least one adult female at 4 years of age was known to have cubs in 1986. This first documentation of breeding at such a young age in Yellowstone is a positive indication that grizzly bears are able to obtain sufficient foods.

There also has been a reduction in the average number of human-induced bear mortalities, from 18.8 per year for the period 1959-1967 to 10.1 per year for the period 1981-1986. These data support a cautiously optimistic attitude about the future of the Yellowstone grizzly bear population. Continuing efforts to minimize human-induced mortality and reduce human-related food sources will promote achievement of recovery goals for this important grizzly bear population.

Members of the press also attended the meeting. At the end of the meeting, an opportunity was provided for them to interview key participants. Several local television stations carried a brief story on the event during their evening newscast. At the end of the meeting, Earth First!, an environmental organization, staged a mock funeral for the Yellowstone grizzly bear to protest government bear management policies.

* * *

Region 7—With the advent of autumn, Aleutian Canada geese (*Branta canadensis leucopareia*) migrate from their Alaska breeding islands to the more favorable environs of Oregon and California. They began arriving in the Crescent City, California, area in mid-October. Since Aleutian geese commonly mix with other Canada geese that are similar in appearance, a precise count of their numbers is difficult. However, preliminary estimates of the flock in California indicate a new population high for the Aleutian subspecies (4,500 - 5,000 birds).

Another interesting report from the wintering grounds is that all ten Aleutian birds banded from a population breeding in the Semidi Islands, Alaska, in 1980 and 1981 have again been observed in the Pacific City, Oregon, area where this population winters. Such a high survival rate is remarkable.

* * *

BULLETIN Available by Subscription

Although we would like to send the BULLETIN to everyone interested in endangered species, budgetary constraints make it necessary for us to limit general distribution to Federal and State agencies and official contacts of the Endangered Species Program. However, the BULLETIN is being reprinted and distributed to all others, on a non-profit subscription basis, by the University of Michigan. To subscribe, write to the *Endangered Species Technical Bulletin Reprint,* School of Natural Resources, University of Michigan, Ann Arbor, Michigan 48109-1115, or telephone 313/763-1312. The price for 12 monthly issues is $15.00 (in Canada, $18 US).

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.*

Wood Stork

(continued from page 4)

Several sites were considered for construction of the new artificial foraging habitat, with the final selection being Kathwood Lake at the NAS Silverbluff Plantation Sanctuary near Jackson, South Carolina. This site, approximately the same distance and direction from the rookery as the Steel Creek delta area on the Savannah River Plant, consisted of an old lakebed of approximately 35 acres that had been drained several years earlier when its dam collapsed. Through the cooperative efforts of the FWS, NAS, Soil Conservation Service, Auburn University, DOE, Savannah River Ecology Lab (University of Georgia), and E.I. du Pont de Nemours and Company (major contractor for the DOE at the Savannah River Plant), a design for creating foraging habitat was developed, a management plan was drawn up, and construction began.

Orangeburg National Fish Hatchery provided fish for stocking the ponds initially, and on July 30, 1986, the first four storks from the Birdsville rookery discovered the artificial habitat. One week later, 72 wood storks were actively foraging in the ponds. The birds placed their stamp of approval on the design and concept by continuing to return to the ponds in large numbers until late September, when they began to move south for the winter.

Part of the idea behind this project was to develop a detailed construction and management design that eventually would provide fish for the storks on a self-sustaining basis, eliminating the need for continued fish stocking. The first year's results indicate that the fish population in Kathwood Lake potentially may be self-sustaining by the second year of operation. The DOE, in addition to funding the construction and maintenance of this habitat, has provided funds to researchers at the University of Georgia's Savannah River Ecology Lab to conduct detailed and intensive studies of the storks that occupy the Birdsville rookery and use the Savannah River Plant's wetlands for feeding. This ongoing research already has produced information on the breeding, foraging, and migratory habits of the stork, which will materially assist in recovery efforts for the species.

Requests have been received by the FWS from private landowners and public land managers for directions on how to reproduce the design and management scheme used at Kathwood. Several National Wildlife Refuges also are evaluating these techniques for possible use in managing their own resident storks. The successful results of this first consultation on the species have already provided, and should continue to yield, invaluable knowledge and techniques for ensuring the survival of the Birdsville colony as well as struggling wood stork rookeries in other areas of the Southeast.

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES HAVING PLANS
Mammals	25	20	242	5	0	22	314	23
Birds	61	16	141	3	2	0	223	55
Reptiles	8	6	60	10	4	13	101	21
Amphibians	5	0	8	3	0	0	16	6
Fishes	39	4	11	21	6	0	81	43
Snails	3	0	1	5	0	0	9	7
Clams	23	0	?	0	0	0	25	21
Crustaceans	4	0	0	1	0	0	5	1
Insects	8	0	0	5	0	0	13	12
Plants	107	6	1	24	3	2	143	54
TOTAL	283	52	466	77	15	37	930	243**

*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, leopard, and piping plover.

**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: 209
Number of species currently proposed for listing: 26 animals
38 plants

Number of Species with Critical Habitats determined: 96
Number of Cooperative Agreements signed with States: 47 fish & wildlife
26 plants

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