

ENDANGERED SPECIES

Technical Bulletin

U.S. Department of the Interior
Fish and Wildlife Service

The California Clapper Rail: A Beleaguered Bird Faces New Threats

For over 20 years, California's three clapper rail subspecies—California, light-footed, and Yuma—have been listed by the U.S. Fish and Wildlife Service as Endangered. Fewer than 500 California clapper rails (*Rallus longirostris obsoletus*) may remain, primarily in the salt marshes of South San Francisco Bay. About 380 light-footed clapper rails (*Rallus longirostris levipes*) remain in southern California, and there are as many or more in Mexico. About 550 Yuma clapper rails (*Rallus longirostris yumanensis*) survive in the fresh and brackish marshes of the lower Colorado River in the United States and 200 in Mexico. All three subspecies have suffered extensive habitat loss.

The California clapper rail is a secretive bird, slightly smaller than a crow, with a long bill and cinnamon-buff breast. It once was found in tidal salt marshes along half the State's coast, from Humboldt Bay possibly as far south as Morro Bay. The bird feeds mostly on clams, spiders, mussels, and crabs.

Early Declines

The California clapper rail once was locally abundant. Early this century, however, market hunting sharply reduced its numbers. In the San Francisco Bay area, many market hunters would each shoot 50 rails a day for restaurants in the city. Boasts of up to 200 birds shot per day were not uncommon. One 1897 account in the *San Mateo Leader* referred to 5,000



Palo Alto Baylands Park, on the western side of San Francisco Bay, is one of the few places where California clapper rail numbers have remained relatively stable.

rails of various species being killed in one week in the Bay area alone.

With the passage of the Migratory Bird Treaty Act in 1918, this slaughter was brought under control and rail numbers temporarily increased in areas with suitable habitat. However, the overall decline resumed with the destruction of the rail's marsh habitat. Marshes were diked for salt production, drained and plowed for agriculture, and filled in for commercial development. The tidal marshes in the San Francisco Bay ecosystem alone shrank from about 290 square miles (730 square kilometers) 200 years ago to 50 square miles (150 square km)

today. By the mid-1960's, only about 10 percent of the California clapper rail's original wetland habitat remained, most of it around the south end of San Francisco Bay. Much of this habitat is now protected within the San Francisco Bay National Wildlife Refuge.

The rail's population was estimated at between 4,000 and 6,000 birds by the mid-1970's, the bulk of it residing in the refuge. However, intensive winter surveys later failed to confirm this earlier estimate. In the early to mid-1980's, the Fish and Wildlife Service and California Department of

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Regional News

Regional endangered species staffers have reported the following news:

Region 1 - Clark County and the cities of Henderson, Las Vegas, Boul-

der City, and North Las Vegas, Nevada, have proposed an interim habitat conservation plan for the Threatened desert tortoise (*Gopherus*

agassizii) in the Las Vegas Valley. This area has been experiencing a rapid increase in human population, which is affecting desert tortoise habitat. The habitat conservation plan is designed to accommodate both economic development and the needs of the desert tortoise. The county and cities have prepared a draft environmental assessment on the plan and submitted an incidental take permit application under Section 10(a)(1)(B) of the Endangered Species Act to the Fish and Wildlife Service. The permit, if approved, would allow development and other lawful activities to occur in habitat occupied by the desert tortoise.

* * *

As of February 19, 8 California condor (*Gymnogyps californianus*) eggs have been laid this year and more are expected. The first egg was laid at the San Diego Wild Animal Park on January 19, and the second was laid about an hour later at the Los Angeles Zoo. These eggs are early in the condor breeding season, which gives biologists hope that these pairs can be induced to produce two or even three eggs this year. This level of early egg production raises hopes that the California condor population will grow fast enough that birds can be released back into the wild later this year. Forty California condors survive in captivity, 19 at the Los Angeles Zoo and 21 at the San Diego Wild Animal Park.

* * *

Service biologists conservatively estimate that over 1,000 acres (400 hectares) of habitat occupied by the Endangered Stephens' kangaroo rat (*Dipodomys stephensi*) in southern California have apparently been destroyed or degraded by grading or disking, primarily by developers. This habitat loss occurred after the species was listed on October 31, 1988, and prior to the issuance of an incidental take permit under Section 10 of the Endangered Species Act. Many of these incidents have been forwarded

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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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Listing Proposals — January 1991

Three species of plants were proposed by the Fish and Wildlife Service during January 1991 for listing as Endangered or Threatened. If the listing proposals are made final, the following plants will receive Endangered Species Act protection:

Hawaiian Red-flowered Geranium (*Geranium arboreum*)

A rare species in the family Geraniaceae, the Hawaiian red-flowered geranium is found only on the northern and western slopes of Haleakala Crater on the island of Maui. Botanists know of about 300 remaining plants, 240 of which are on the State-owned Kula Forest Reserve. The others are within Haleakala National Park and on privately-owned lands.

Historically, *G. arboreum* had a wider range that included the mountain's southern slope. Its decline may have been caused by habitat damage from cattle grazing, feral pigs, invasions of non-native plants, and fire. Isolated populations of this species



photo by Joan E. Cartfield

Geranium arboreum is a densely branched, woody shrub growing up to 12 feet (3.7 meters) tall. Its attractive red flowers are non-symmetrical, a characteristic that distinguishes *G. arboreum* from related species. Botanists believe that this plant is the only member of its genus that is adapted to bird pollination.

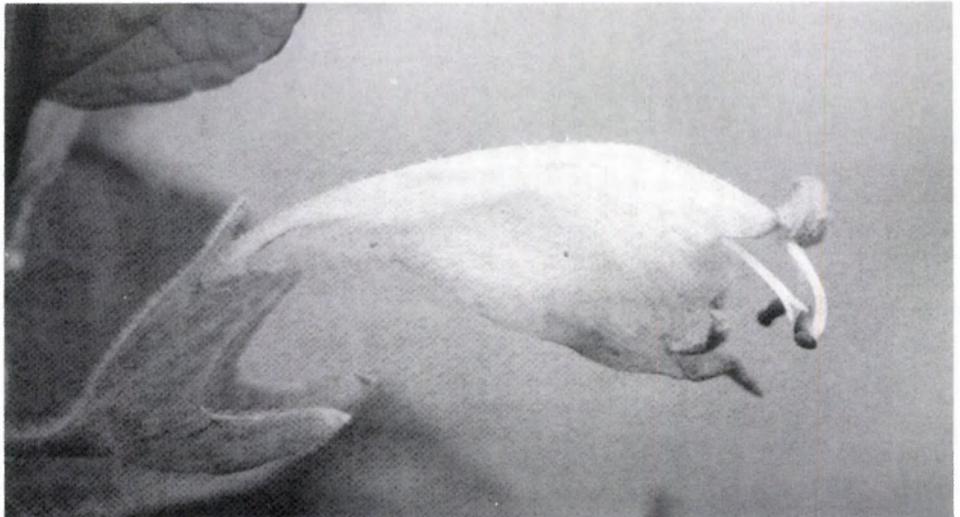


photo by Derral Herbst

Stenogyne kanehoana, a vine in the mint family (Lamiaceae), produces stems up to 6 feet (2 m) in length with densely hairy, oppositely arranged leaves. Its flowers are borne in clusters of three to six per leaf axil. The petals are fused into a sickle-shaped tube up to 1.5 inches (42 millimeters) long, and are white or pale yellow with short, pink corolla lobes.

can still be found in steep, narrow canyons, where the plants "comb" moisture out of the drifting fog.

Competition from naturalized exotic plants now poses the greatest danger to the Hawaiian red-flowered geranium. The spread of these non-native species is promoted by feral pigs (*Sus scrofa*), which root up native plants and distribute the seed of exotics. Introduced grasses invading geranium habitat form dense sod-like mats that prevent the seedlings of *G. arboreum* and other native plants from becoming established. Pine trees that were established for a forestry operation in the Polipoli area are having an impact of a different kind. The windborne pine pollen covers the stigmas of nearby geranium flowers, which blocks the reception of geranium pollen and thus reduces the species' annual reproduction. Because of these and other threats, the Service has proposed to list *G. arboreum* as Endangered (F.R. 1/23/91).

Stenogyne kanehoana

Another Hawaiian plant, *S. kanehoana* is endemic to the island of O'ahu, where it is found on a single ridge in the Wai'anae Mountains. One population is known, consisting

of only two to four individual plants.

Like the Hawaiian red-flowered geranium, *S. kanehoana* (which has no common name) is threatened by encroachment and competition from naturalized, exotic plants. Koster's curse (*Clidemia hirta*), a rapidly spreading bush, has recently invaded the *S. kanehoana* habitat. Two other non-native species, lantana (*Lantana camara*) and Christmas berry (*Schinus terebinthifolius*), also have become established in the area. Much of the unique Hawaiian flora already has been reduced or even eliminated by these and other aggressive, introduced plants. Because of the species' extremely low numbers and the imminent threats, the Service has proposed *S. kanehoana* for listing as Endangered (F.R. 1/23/91).

Cumberland Rosemary (*Conradina verticillata*)

Named for the Cumberland Plateau region of the eastern U.S., this small shrub is known only from short reaches of three river systems — the Obed, Caney Fork, and South Fork Cumberland Rivers — in north-central Tennessee and adjacent Kentucky. Specific areas supporting the Cum-

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Listing Proposals

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berland rosemary include gravel and sand bars, sandy river bank terraces, and pockets of sand among large boulders on islands and stream banks. All sites are open or only slightly shaded, a condition that apparently is maintained by periodic scouring during floods.

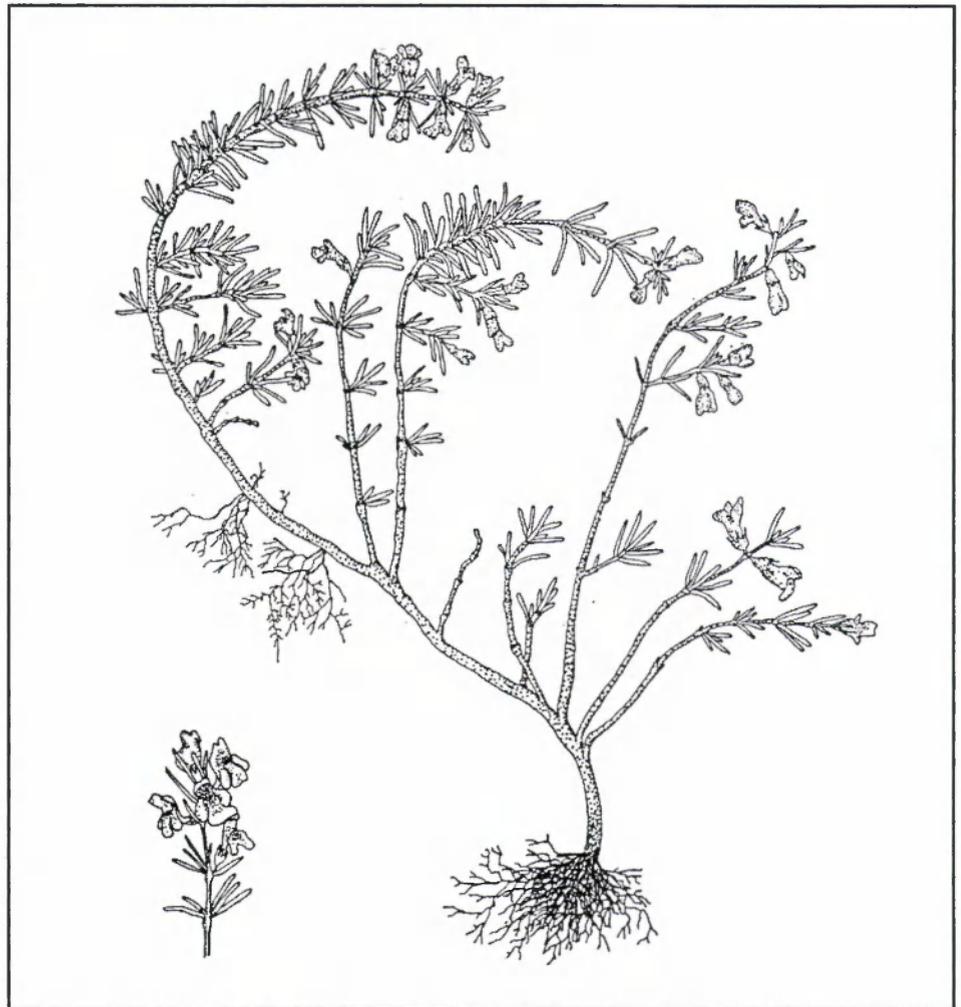
Botanists studying the Cumberland rosemary believe that the distribution of this plant has been reduced by dam construction and general deterioration of water quality. Pollution resulting from coal mining, poor land use practices, and waste discharges continues to degrade the species' habitat, and chemical spills are a potential threat. Intensive recreational use of the fragile riparian habitat by hikers, campers, white-water enthusiasts, and off-road vehicle users is having increasingly destructive impacts. This is especially true for the Big South Fork National River and Recreational Area, where visitation grew from 120,000 in 1986 to 730,000 in 1989. The area superintendent expects this trend to continue.

The Cumberland rosemary already is listed by the State of Tennessee as endangered, and the Service proposed on January 18, 1991, to give the species additional protection by listing it federally as Threatened.

* * *

Available Conservation Measures

Among the conservation benefits authorized for Threatened and Endangered plants and animals under the Endangered Species Act are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and carry out recovery plans; the authorization to seek land purchases or exchanges for important habitat; and Federal aid to State and Commonwealth conservation departments that have approved cooperative agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encour-



Cumberland rosemary (*Conradina verticillata*), a perennial shrub in the mint family, grows to about 18 inches (45 cm) tall. Its reclining branches bear small, narrow leaves arranged in tight bunches that appear as whorls around the stems. The small but attractive flowers are purple, lavender, or occasionally white in color.

ages other conservation efforts by State and local agencies, independent organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal 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 fund, authorize, or carry out are not likely to jeopardize the survival of any Endangered or Threatened species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service 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 Service, although the results of such a

conference are not legally binding.

Additional protection is authorized by Section 9 of the Act, which makes it illegal to take, possess, transport, or engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, the rules regarding "take" are different. It is unlawful to collect or maliciously damage any Endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal trespass law also is illegal under the Act. In addition, some States have more restrictive laws of their own specifically against the take of State or federally listed plants and animals.

California Clapper Rail

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Fish and Game estimated the count at 1,000 birds, mostly confined to about 8 marshes in the south bay.

Spread of the Red Fox

The California clapper rail population continued to decline in the late 1980's. By 1988, it had plummeted to less than 700 birds—more than a 30 percent decline in 2 years. One of the primary causes of this drop is the spread of red foxes (*Vulpes vulpes*) into the area.

The red fox is a versatile, highly efficient lowland predator, one of the most widely distributed carnivores in the world. Hunters and commercial fox breeders first brought the red fox from the upper Midwest to California's Central Valley and coastal counties in the early 1900's. A hunt club in southern California, for example, imported and released 30 foxes in 1919, although only 2 were ever caught. Before 1986, red foxes had never been seen at San Francisco Bay National Wildlife Refuge. Although it is not clear how they arrived in the Bay area, foxes had spread through the wetlands of south San Francisco Bay by 1987. Refuge biologists noted red foxes actively foraging for small mammals and birds in salt marshes and along salt ponds and levees during all tides and seasons. Circumstantial evidence indicated that foxes were preying on clapper rails and their eggs. In April 1990, refuge biologists uncovered the remains of three dead clapper rails around the entrances of two active fox dens, providing further evidence that foxes are feeding on rails.

"The clapper rail has declined severely," refuge biologists Kevin Foerster, Jean Takekawa, and Joy Albertson wrote in 1990 of four salt marsh sites they studied in south San Francisco Bay the previous year. "New terrestrial predators were found in all marshes and nest predation was high. We believe the red fox poses a

severe threat to clapper rails and other ground-nesting species in the San Francisco Bay area."

Other Threats

Predation by other species, marsh erosion, and water pollution also threaten the remaining California clapper rails in south San Francisco Bay. Of 155 eggs from 24 rail clutches surveyed by the 3 refuge biologists in 1989, 56 percent were lost to predation or flooding, or failed to hatch. In addition to the red fox, feral house cats (*Felis catus*), raccoons (*Procyon lotor*), Norway rats (*Rattus norvegicus*), and northern harriers (*Circus cyaneus*) were implicated in the rail's decline during the study. Other known predators of the rail include common ravens (*Corvus corax*), red-tailed hawks (*Buteo lineatus*), and peregrine falcons (*Falco peregrinus*).

Many San Francisco Bay tidal wetlands have been eroding an average of 3 to 6 feet (1 to 2 meters) per year for many decades due to wave action. The reasons why this is occurring are not fully understood, but there appear to be several factors involved. Tidal wetlands used by the rails may be lost if the trend continues.

Most of the marshes that still support rails have been degraded to some extent due to water pollution. For example, there are indications that bioaccumulation of heavy metals is occurring in the South Bay. Elevated levels of mercury and selenium have been detected in rail eggs. The effect of these metals on the rails is unknown, but the detected mercury concentrations approach the level known to affect reproduction in waterfowl. High mercury levels could affect embryos, egg hatching, the development of young chicks, and adult rail behavior. At low levels, mercury can also affect the birds' sense of hearing. Rails depend on this sense for locating other rails during the breeding season and for avoiding some predators.

Predation, habitat loss, and environmental degradation continue to affect

the California clapper rail's numbers. Winter surveys in 1989 in the Bay estimated between 400 and 500 birds. A 1990 winter census by the Service and the California Department of Fish and Game indicated that although the rail populations appeared more stable along the western shoreline of south San Francisco Bay (where the red fox apparently has not yet become well-established), populations along the eastern shoreline within the refuge are continuing to decline (see *Bulletin* Vol. XVI, No.1). Several populations in important marshes averaged only 50 percent of the 1989 count.

Recovery Efforts

The Fish and Wildlife Service, California Department of Fish and Game, and local governments are taking actions to stop the decline of the California clapper rail. The Service is in the early stages of forming the Western Rail Recovery Team, which will cover both the California and light-footed clapper rails. Efforts are also under way to restore and expand rail habitat and to control the spread of non-native predators.

The Service is attempting to expand San Francisco Bay National Wildlife Refuge by some 20,000 acres (8,100 hectares). Tidal marshes and areas that can be restored to tidal marsh, which would provide additional habitat for the clapper rail, are among the key acquisition priorities. The California Department of Fish and Game and local governments, such as the East Bay Regional Parks District, are also acquiring habitat for the rail.

This past summer, the Service published a draft predator management plan and environmental assessment for the refuge, which is currently being revised. Control of non-native predators such as the red fox is one of the options that is being examined to protect the California clapper rail within the refuge. No decision has yet been reached on this controversial action.

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California Clapper Rail

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The California Department of Fish and Game recently received funds under Section 6 of the Endangered Species Act to control red foxes and other predators throughout the range of the California clapper rail. The State will focus its efforts outside of the refuge. In addition, the State has received Section 6 funds to begin a captive propagation program for the light-footed clapper rail. It may be possible to use

propagation techniques that are developed in this program to breed the California clapper rail.

The Service is continuing to closely monitor the remaining California clapper rails and their habitat. This year, the Service is beginning a 2-3 year study on the effects of contaminants on the California rails and their embryos. As part of this study, nest sites will be identified, abandoned eggs collected, and birds banded with radios to monitor nesting activity, an-

nual movements, and other behavior.

The California clapper rail clearly has been losing ground to habitat loss, non-native predators, and environmental pollution. If the species' current decline in south San Francisco Bay continues, it could eventually become extinct. The efforts of the Service, State, local governments, conservation groups, and the public will likely determine the fate of this subspecies in the next few years.

Regional News

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to the Service's law enforcement office in Gardena, California.

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Region 2 - Tom Stehn, a Service biologist at Aransas National Wildlife Refuge, Texas, confirmed that 146 whooping cranes (*Grus americana*), including 13 young, are wintering on the refuge. One of the chicks was not accompanied by its parents. A total of 142 birds migrated north from Aransas last April, 9 of which are unaccounted for and presumed dead. A Spiritwood, Saskatchewan, resident reportedly killed one of the birds in Canada in April and was charged with the violation.

The present whooper population on the refuge is equal to the peak population of last winter. However, the production of young is down from the period 1984 to 1989, when the annual number of young birds reaching the refuge was 15, 16, 21, 25, 19, and 20, respectively. The decline in nesting success is due to drought in the crane's nesting grounds in Wood Buffalo National Park, Canada.

One of the family groups at Aransas is comprised of two adult whooping cranes and a sandhill crane (*Grus canadensis*) chick. These birds behave like a normal family group. The source of the sandhill chick is believed to be "dump nesting," in which a sandhill crane placed an egg in a whooping crane nest. Such an in-

stance was documented in 1988 when two whooping crane eggs and a sandhill crane egg were found in a nest in Wood Buffalo National Park.

* * *

Region 4 - Last summer, a graduate student from the University of Michigan conducted a survey of the sedge *Carex impressinervia* in conjunction with his thesis work. This plant is a Category 2 listing candidate. Two populations were found in Alabama and one in North Carolina. Other populations that previously had been reported in Mississippi were not verified. This plant may be a relict species, with disjunct populations in the Southeast. It occurs locally in vegetatively diverse ravines, with population estimates ranging from several hundred to thousands. The areas near two of the populations have been clearcut, which may threaten the species' survival. The student will complete additional studies on this species shortly, after which the Service will review the plant's status to assess its eligibility for listing.

* * *

On January 28, two breeding pairs of Endangered red wolves (*Canis rufus*) were brought into the Cades Cove area of Great Smoky Mountains National Park in North Carolina and Tennessee and placed in large acclimation pens. This is the first time red wolves have been in this area since the turn of the century. It is hoped that the wolves will eventually breed. One pair of these wolves and their pups,

which should be born in late April or early May if all goes well, will be selected for experimental release into the park in August. The pair that is not released will be returned to the captive breeding program.

* * *

The Service is moving forward on a plan to remove a limited number of Endangered Florida panthers (*Felis concolor coryi*) from the wild to establish a possible captive breeding program. An environmental assessment on the proposed plan was completed recently (see *Bulletin* Vol. XV, No. 7). However, under the terms of an out-of-court settlement of a lawsuit brought by the Fund for Animals and Holly Jensen, the Service has agreed to prepare a supplement to the environmental assessment. This supplement, which will be completed by November 30, 1991, will focus on the genetic enrichment of the Florida panther population with other cougar subspecies and the reintroduction of captive-bred panthers into the wild. It will also contain a discussion of the feasibility of captive breeding and reconditioning techniques employed before the animals are released to the wild, and public attitudes toward the reintroduction of Florida panthers.

The settlement allows the Service to take the first steps in establishing a possible captive breeding program. The Service issued two subpermits on February 15 to the State and the

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Final Listing Rules Approved for Nine Species

During January 1991, the Fish and Wildlife Service published final listing rules for nine species—five plants, one snail, one reptile, and two mammals. Endangered Species Act protection is now available to the following:

Remya spp.

All three plants in this genus are endemic to the Hawaiian Islands: *R. kauaiensis* and *R. montgomeryi* are known only from Kaua'i, and *R. mauiensis* occurs only on Maui. These members of the aster family (Asteraceae) are small, perennial shrubs. They grow about 3 feet (90 centimeters) tall, and have many slender, sprawling branches and dark yellow flowers. The plants grow chiefly on steep, north or northeast-facing slopes between 2,800 and 4,100 feet (850 to 1,250 meters) in elevation.

The introduction of non-native animals, including cattle, goats, pigs, and deer, destroyed or degraded much of the *Remya* habitat. Most of the remaining populations are now found growing only in areas relatively inaccessible to these animals. There are seven populations of *R. kauaiensis* left in the Koke'e area of Kaua'i, totalling fewer than 200 individuals distributed over an area of less than 2 acres (1 hectare). (One of these populations was discovered in 1990.) Two populations of *R. mauiensis*, totalling 9 plants on less than 2 acres (1 ha), remain on west Maui. Only one population of *R. montgomeryi*, believed to consist of fewer than 50 plants, exists on 0.5 acre (0.2 ha) on the rim of the Kalalau Valley, Kaua'i. The primary threats to all three species continue to be browsing and grazing by feral and domestic animals, erosion and degradation of habitat by these animals, and competition from non-native plant species. The Service proposed in the October 2, 1989, *Federal Register* to list all three species in the genus *Remya* as Endangered (see *Bulletin*

Vol. XIV, Nos. 11-12), and the final rule was published January 14, 1991.

Aupaka (Isodendron hosakae)

This small, erect shrub, a member of the violet family (Violaceae), is endemic to the island of Hawai'i (the "Big Island"). It grows to about 30 inches (76 cm) tall, has narrow, lance-shaped leaves, and yellowish-green to white colored flowers. Like much of the native Hawaiian vegetation, the *aupaka*'s numbers have been reduced and its habitat modified by domestic cattle. Today, an estimated 275 plants are known, distributed over less than 2 acres (0.8 ha) on three privately-owned cinder cones in the Waikoloa area.

Browsing and habitat disturbance by domestic cattle continue to threaten the *aupaka*'s survival. Although the State and one landowner recently fenced off the largest population to protect one cinder cone from grazing cattle, it is too soon to tell how effective this measure will be in protecting the species. Potential threats to the species include range fires during the dry season, rooting by feral pigs, and disturbance by U.S. Army training activities. The Service proposed on October 10, 1989, to list the *aupaka* as Endangered (see *Bulletin* Vol. XIV, Nos. 11-12), and the final rule was published January 14, 1991.

Fringed Campion (Silene polypetala)

The fringed campion is a perennial herb, a member of the pink or carnation family (Caryophyllaceae), that grows in rosette-clusters and has large, pink flowers. It is found within hardwood forests in four counties in central Georgia, one county in southwest Georgia, and two counties in adjoining northwestern Florida. Fifteen natural populations of the fringed campion are known, most of which

are in private ownership. (Recently, the Georgia Department of Natural Resources and the University of Georgia successfully established two new populations.) Most populations are threatened by habitat disturbance from logging, encroachment by non-native Japanese honeysuckle (*Lonicera japonica*), and residential development. The Service proposed listing the fringed campion as an Endangered species on July 11, 1990 (see *Bulletin* Vol. XV, No. 8); the final rule was published January 18, 1991.

Tulotoma Snail (Tulotoma magnifica)

This large, gill-breathing, freshwater snail has a distinctively ornamented shell. Historically, the tulotoma snail was locally abundant in the main channels of the Coosa and Alabama Rivers and the lower reaches of some of their tributaries in Alabama. However, extensive dredging and construction of impoundments for navigation and hydropower have eliminated at least 98 percent of the snail's main channel habitat and 50 percent of its known tributary habitat. Today, the snail is known to occur in approximately 3 miles (5 kilometers) of the main channel of the Coosa River and in localized portions of four tributaries. Water pollution and siltation continue to threaten the remaining populations. The Service proposed on July 11, 1990, to list the tulotoma snail as an Endangered species (see *Bulletin* Vol. XV, No. 8), and the final rule was published in the January 9, 1991, *Federal Register*.

Yellow-blotched Map Turtle (Graptemys flavimaculata)

This medium-sized aquatic turtle has irregular yellow or orange spots on its shell. It is found only in the Pascagoula River system, including the

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Final Listings

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Leaf, Chickasawhay, and Escatawpa Rivers and other tributaries in south-east Mississippi. The turtle's riverine habitat has been reduced due to the construction of navigation and flood control projects, gravel dredging, and sedimentation from gravel mining, timber harvesting, and agricultural activities. Several flood control and channel modification projects that have been proposed could affect the turtle's remaining habitat. Other serious threats include water pollution from municipal and oil field runoff, commercial collectors who capture the turtles for the pet trade (the turtles are considered very attractive), and people shooting the turtles for target practice. The Service proposed in the July 11, 1990, *Federal Register* that the yellow-blotched turtle be listed as a Threatened species (see *Bulletin* Vol. XV, No. 8), and the final rule was published January 14, 1991.

Regional News

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White Oak Plantation (a private facility in Yulee, Florida, that specializes in breeding animals that are difficult to propagate in captivity) to capture and care for up to six panther kittens in 1991. As of February 27, four kittens (3 males and 1 female) had been captured and sent to White Oak Plantation for possible future captive breeding. Upon completion of the supplemental environmental assessment, the Service will determine whether or not to proceed with a long-term captive breeding program. The goal of such a program would be to increase the number of Florida panthers in captivity for eventual release to augment the critically low wild population and to reestablish new populations in the panther's historic range.

Efforts are also under way to continue protecting the panther's habitat and reducing known risk factors. Recent legislation authorizing expansions

Florida Salt Marsh Vole (*Microtus pennsylvanicus duke-campbelli*)

This small, short-tailed rodent is known from only one salt marsh of Waccasassa Bay on Florida's gulf coast. The subspecies has declined in numbers apparently due to natural climatic changes and an associated rise in sea level that has altered its habitat. The remaining population, believed to be a small remnant of a formerly wide-ranging population, could easily be extirpated by a single storm. The Service proposed that the Florida salt marsh vole be listed as Endangered on April 11, 1990 (see *Bulletin* Vol. XV, No. 5), and the final rule was published January 14, 1991.

Indus River Dolphin (*Platanista minor*)

The National Marine Fisheries Service (NMFS), an agency in the Department of Commerce that has the lead Endangered Species Act responsi-

bility for all dolphins, proposed to list this freshwater dolphin as Endangered on November 9, 1989 (see *Bulletin* Vol. XV, No. 1). An estimated 500 survive, mainly in the lower Indus River in Pakistan. The species has declined primarily due to the construction of irrigation dams, which have modified the dolphin's habitat, and overharvesting by local fishermen (who use the animals' meat and oil). NMFS published a final rule designating the Indus River dolphin as Endangered on December 11, 1990. The Fish and Wildlife Service, which is responsible for maintaining the Federal List of Endangered and Threatened Wildlife and Plants, then formally added the species to the list on January 14, 1991.



photo by Bill Greer

This male Florida panther, a 5- to 6-month-old cub, was darted and captured in southern Florida for the captive breeding effort. An examination showed that he weighed 34.5 pounds (15.7 kilograms) and is healthy.

for Big Cypress National Preserve and Everglades National Park will add approximately 146,000 acres (59,100 hectares) and 108,000 acres (43,700 ha) respectively. Additional land is

being added to the Florida Panther National Wildlife Refuge, which will total approximately 30,000 acres (12,100 ha) when completed. The

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Florida Department of Natural Resources is also in the process of acquiring about 40,000 acres (16,200 ha) within the southern Golden Gate Estate development in southwest Florida, adjacent to the Fakahatchee Strand State Preserve. Finally, the Florida Panther Interagency Committee (which consists of the National Park Service, Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, and Florida Department of Natural Resources) is developing a program designed to work directly with private landowners to protect panther habitat. Of the 2.2 million acres (890,000 ha) currently used by Florida panthers, approximately 1.2 million acres (486,000 ha) are publicly owned and 1 million acres (405,000 ha) are in private ownership.

Results of a recent study on the genetic makeup of Florida panthers suggest that the remaining 30 to 50 free-ranging panthers contain genetic material traceable to two distinct stocks, one of North American origin and one that may be from Central or South America. Available data indicate that the "outside" genetic material was already in the Florida panther population when it was listed in 1967 as Endangered. Biologists studying the Florida panther believe that this genetic material does not threaten the Florida panther genetic makeup. Indeed, it may have benefited the Florida panther by increasing the genetic variability of the remaining animals.

* * *

Region 5 - The Atlantic coast population of the Threatened piping plover (*Charadrius melodus*) increased slightly from 724 pairs in 1989 to 738 pairs in 1990. However, average productivity dropped from 1.29 fledged chicks per nesting pair to 1.06 chicks per pair. Biologists involved in collecting this data report that the intensity of the 1990 survey effort was very similar to that of the 1989 survey. Al-

though the efforts of resource agencies and organizations in 1990 to protect the species was deemed equal to or slightly greater than in 1989, wind and storm-driven high tides washed out nests. This is believed to be the major reason why the bird's 1990 productivity levels were lower than the 1989 level. In addition, predators and human disturbance continued to result in nest loss and chick mortality. The Service believes that several more years of population monitoring will be needed before any solid conclusions about the trend for the Atlantic coast piping plover population can be reached.

The Atlantic coast portion of the 1991 international piping plover breeding census will take place June 1-9. Final guidelines for the interior portion of the census will be issued by the Great Lakes/Northern Great Plains Recovery Team in March but are not anticipated to vary significantly from the draft guidelines provided last year.

The Service is requesting the public to report incidents of piping plover mortality (chicks or adults) and crushed nests. Anyone who has evidence of such an incident is requested to contact the nearest Service law enforcement office. A brief summary of the incident, including the date, location, description of what was observed, and any information about possible cause should also be sent to the Service's Region 5 Endangered Species Office, One Gateway Center, Newton Corner, Massachusetts 02158, and to your State wildlife agency.

The Service has almost completed work on a draft proposal to designate critical habitat for the Atlantic coast population of the piping plover. On November 29, 1990, staff from Region 5 met with managers of federally administered lands under consideration for designation as critical habitat. Meeting attendees included biologists and managers from 16 national seashores, national recreation

areas, and national wildlife refuges; Regional and Washington Office representatives of the National Park Service; and Fish and Wildlife Service endangered species biologists from field offices in Regions 4 and 5. The critical habitat designation process and the economic analysis of the proposed designation were discussed.

Some additional educational material on piping plovers will be available this year. A 17-minute video entitled "Before It's Too Late - Restoring the Atlantic Coast's Piping Plover" has been produced by the National Fish and Wildlife Foundation and should be available soon. The Service also has produced and distributed 10- and 30-second television spots and a 60-second radio spot entitled "Beaches are for Plovers." These public service announcements were used in 1990 and will be made available again this year. Finally, the Connecticut Department of Environmental Protection has prepared a Spanish translation of the Service's brochure "You Can Help Protect the Piping Plover." The Service will be distributing the brochure, which should be available for the 1991 plover nesting season.

* * *

In December 1990, Dr. Arthur Clark of Ecosearch, Inc., discovered a healthy, 8-year-old specimen of the Endangered ring pink mussel (*Obovaria retusa*) on the upper Kanawha River in West Virginia. This is the only recent evidence of *O. retusa* reproduction throughout its range. Dr. Clarke made this find while conducting a study to document the importance of the upper 5 miles (8 kilometers) of the Kanawha River as a reproduction site for the Endangered pink mucket pearly mussel (*Lampsilis orbiculata*). This stretch of the river supports over 35 other native mussel species and a diverse warm-water fish and benthic community. The Endangered tubercled-blossom pearly mussel (*Epioblasma torulosa torulosa*) was recorded in this area 22

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years ago and the Endangered fanshell (*Cyprogenia stegaria*) was recorded there 9 years ago. Efforts will be made in 1991 to reconfirm the presence of both mussels. The major threats to the river's freshwater mussels are associated with siltation from coal mining and the discharge of sewage.

* * *

One of eleven known populations of the sandplain gerardia (*Agalinis acuta*), which is located along a highway on Long Island, New York, has been protected by a fence erected by the Town of Brookhaven. The Service's New York Field Office has been working with town officials and The Nature Conservancy to protect this extremely vulnerable site, which has undergone repeated disturbance and is threatened by development. Efforts are under way to conclude a cooperative agreement between the town, the Conservancy, and the Service to manage the site and ensure long-term protection.

* * *

The State of New York recently completed the purchase of over 6,400 acres (2,600 hectares) and obtained perpetual conservation easements on over 5,500 acres (2,200 ha) in the Mongaup River basin, a major roosting and feeding area for about 80 bald eagles (*Haliaeetus leucocephalus*) that overwinter in the Catskill region in southeastern New York. This area is one of two major eagle wintering areas in the State. (The other is along the St. Lawrence River on the State's northern border, where up to 20 eagles overwinter.) The acquisition will enable the State to manage this important habit and reduce human disturbance.

* * *

The Pennsylvania Department of Transportation has included special restrictions in a contract for maintenance work on a Delaware River bridge to protect nesting peregrine fal-

cons (*Falco peregrinus*). Falcons nested on the bridge in 1989 and 1990. On the advice of the Service and the Pennsylvania Game Commission, bridge repairs will be scheduled to avoid the peregrine falcon nesting season, which runs from March 1 to July 1.

* * *

Region 6 - In the fiscal year 1991 appropriation bill for the Department of the Interior, Congress established a Wolf Management Committee to develop a gray wolf (*Canis lupus*) reintroduction and management plan for central Idaho and Yellowstone National Park. The plan is to be submitted to the Secretary of the Interior and Congress by May 15, 1991. The Committee consists of 10 members appointed by Secretary of the Interior Manuel Lujan: the Service's Region 6 director (who serves as chairman); the National Park Service's Rocky Mountains regional director; the U.S. Forest Service's Region 1 (Northern Rockies) director; the Wyoming, Montana, and Idaho fish and game directors; 2 representatives of conservation organizations; a representative of the hunting community; and one from the livestock industry.

The first meeting of the Wolf Management Committee was held January 23-24, in Denver, Colorado. About 12 major issues were identified at the meeting, including livestock depredation and potential land use restrictions. Major discussions focused on using the "experimental population" provisions of Section 10(j) of the Endangered Species Act as a vehicle for wolf reintroduction. The Idaho Department of Fish and Game recommends wolf recovery via natural recolonization in Idaho; the State's current policy opposes reintroduction.

A technical staff committee was developed to support the Management Committee, with Wayne Brewster, National Park Service, as chair and Dr. Steve Fritts as the Fish and Wildlife Service representative. Jay Gore, from the Service's Boise, Idaho, Field

Office, is assisting the technical committee in an *ad hoc* position. Together with the Idaho Fish and Game representative, he is coordinating State and Federal information on wolves pertaining to central Idaho. At the January meeting, he gave a briefing on the status of wolves in central Idaho and presented three reports detailing Idaho wolf survey information for the past 15 years.

The Wolf Management Committee recently held workshops in Cheyenne, Wyoming, Boise, Idaho, and Helena, Montana, to give the public an opportunity to comment on wolf reintroduction issues.

* * *

To facilitate local development, the Washington County Commission in Utah has initiated work on a Habitat Conservation Plan proposal covering 7 listed species and 27 listing candidates. The plan will place emphasis on conservation measures for the desert tortoise in an area immediately north of St. George. The highest known densities of desert tortoise in the United States have been documented in this area. The plan will also address several other listed species, including the bald eagle, American peregrine falcon (*Falco peregrinus anatum*), dwarf bear-poppy (*Arctomecon humilis*), and Siler pincushion cactus (*Pediocactus sileri*). The County is expected to seek a Section 10(a) incidental take permit from the Service.

* * *

Work is proceeding on revising the recovery plan for the Threatened grizzly bear (*Ursus arctos*). The original recovery plan, approved in 1982, is being revised in cooperation with State and Federal agencies involved with the Interagency Grizzly Bear Committee. A draft revised plan was distributed to the public in October 1990. Eleven public workshops were held in various cities throughout the West and in Washington, D.C., to inform the public about the proposed revisions to the plan. An estimated

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600 people attended these workshops, demonstrating the public's interest in the plan. As a result of the workshops and news releases about the plan, the Service received over 1,700 individual written letters by the close of the public comment period, which was extended to February 4, 1991.

* * *

The only known habitat of the Endangered Wyoming toad (*Bufo hemiophrys baxteri*) was acquired by The Nature Conservancy in late January. Wyoming toads once were abundant throughout the Laramie Basin in Wyoming, but they experienced a rapid decline in the mid-1970's. The causes of this decline are still unknown. The toad population on the property acquired by the Conservancy is apparently stable, and annual monitoring continues. Plans for habitat enhancement will be developed. Meanwhile, the Service, State of Wyoming, and University of Wyoming will continue conducting surveys in other potential habitats to locate any additional toad populations.

* * *

Regions 6 and 1 have begun cooperative efforts to identify and document threats to the mountain plover (*Charadrius montanus*), a Category 2 listing candidate. This bird winters from California to southern Texas and nests in the grasslands of Colorado, Wyoming, Montana, Nebraska, Kansas, Oklahoma, New Mexico, and northern Texas. Wintering birds from California and eggs from the Plains States will be analyzed in the upcoming year for evidence of pesticide contamination.

* * *

Region 8 - In Puerto Rico, biologists from the Patuxent Wildlife Research Center are investigating the feasibility of conducting a mark-recapture study of the Endangered Puerto Rican parrot (*Amazona vittata*). Radio-tagged orange-fronted parakeets (*Aratinga canicularis*) and red-crowned

parrots (*Amazona viribigenalis*) are serving as surrogates for the Puerto Rican parrot to test the feasibility of the mark-recapture method and to train staff in this technique. If this method can be used, biologists will be able to recognize individual parrots and follow their movements outside of the breeding season.

* * *

In mid-January, Patuxent Wildlife Research Center Director Hal O'Connor transferred a female sandhill crane from the Center to the Soviet Union's Okskiy State Nature Reserve, 130 miles (210 kilometers) south of Moscow. It is hoped that this crane will pair up with a male sandhill crane already at the Reserve, and that the pair will then serve as foster parents for Endangered Siberian white crane (*Grus leucogeranus*) chicks. If successful, the sandhill cranes will help the Soviets increase their efforts to propagate the Siberian white crane. The sandhill crane pair also will give the Soviets a surrogate species with which they can practice crane propagation techniques. This donation is a continuation of a multi-year cooperative program between American and Soviet scientists.

* * *

Patuxent's Minnesota Research Group reports that a male gray wolf radio-tagged in Superior National Forest, Minnesota, in August 1989 was killed in Canada, 170 miles (270 kilometers) northwest of the original capture site. Another wolf captured 11 years earlier in the same vicinity also dispersed to the same area. This suggests a possible genetic basis for the distance and direction wolves disperse, although details of this relationship are unknown.

* * *

The Florida Department of Natural Resources and other cooperators found a record 216 dead West Indian manatees (*Trichechus manatus*) in the southeastern United States' coastal waters in 1990. The majority (206) were recovered in Florida waters. Fifty of

the deaths were due to collisions with boats, close to the record 51 that were killed by boats in 1989. Other human-related factors, such as crushing in water control structures and entanglement in fishing nets, accounted for seven deaths in 1990. A period of unusually severe winter weather, which led to the loss of at least 49 manatees due to cold stress, contributed substantially to the increase over the 174 deaths reported in 1989. Other identifiable natural causes accounted for 20 deaths in 1990. The cause of death for 45 manatees was undetermined and an additional 45 were perinatal deaths (i.e., dependent calves that had died for unknown reasons).

Working closely with Region 4, the Florida Department of Natural Resources, and other cooperators, the Service's National Ecology Research Center will expand its manatee research in 1991 to assist in preventing mortality and to better understand the implications of this mortality for manatee population dynamics. The State estimates that a minimum of 1,500 manatees remain in Florida's waters.

* * *

In December, the diagnostic virology laboratory at the Service's National Wildlife Health Research Center in Madison, Wisconsin, evaluated the results of a serology test for antibodies to eastern equine encephalitis (EEE) virus among 123 sandhill and whooping cranes housed at the Patuxent Wildlife Research Center in Maryland. EEE has killed a number of whooping cranes at Patuxent in the past. Thirty-five of the serum samples tested were from whooping cranes taken in July 1990. Thirty-two of the whoopers, which had hatched prior to 1990 and were previously vaccinated against the virus, had a positive antibody response. The remaining three whoopers, which had hatched in 1990 and were not vaccinated, tested negative for the antibody.

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Fifty-nine dead Aleutian Canada geese (*Branta canadensis leucopareia*) were picked up in January during an avian cholera outbreak in the San Joaquin Valley, California. Ducks began dying on one of the Aleutian Canada goose roosting ponds at a water treatment plant near Modesto in mid-December 1990.

* * *

Region 9 - Two more countries have joined the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), bringing the total number of Parties to 110. The two newest CITES Parties are Namibia, an African country that recently gained its independence, and Bulgaria in eastern Europe. Bulgaria's membership is effective April 16, 1991. Namibia's membership is effective March 18, and includes reservations to the African elephant (*Loxodonta africana*) and the cheetah (*Acinonyx jubatus*), both of which are listed in Appendix I of CITES. These reservations mean that Namibia does not accept the Appendix I listing of the species and therefore is not required by CITES to abide by the Appendix I trade prohibitions. Namibia joins Botswana, Malawi, South Africa, Zambia, and Zimbabwe with reservations to the African elephant listing. The largest population

Category	ENDANGERED		THREATENED		LISTED SPECIES TOTAL	SPECIES WITH PLANS
	U.S.	Foreign Only	U.S.	Foreign Only		
Mammals	54	249	8	22	333	29
Birds	72	153	12	0	237	67
Reptiles	16	58	18	14	106	24
Amphibians	6	8	5	0	19	6
Fishes	53	11	33	0	97	49
Snails	4	1	6	0	11	7
Clams	37	2	2	0	41	29
Crustaceans	8	0	2	0	10	5
Insects	11	1	9	0	21	12
Arachnids	3	0	0	0	3	0
Plants	186	1	60	2	249	120
TOTAL	450	484	155	38	1127*	348**
Total U.S. Endangered	450	(264 animals, 186 plants)				
Total U.S. Threatened	155	(95 animals, 60 plants)				
Total U.S. Listed	605	(359 animals, 246 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 276 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: 53 fish & wildlife
39 plants

Number of Cooperative Grant Agreements signed for the African Elephant Conservation Act: 7

Number of CITES Party Nations: 110

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of the Endangered cheetah in Africa is in Namibia, and this is the only CITES Party with a reservation to the species.

February 1991

Vol. XVI No. 2

ENDANGERED SPECIES

Technical Bulletin

Department of Interior, Fish and Wildlife Service
Washington, D. C. 20240

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