

# ENDANGERED SPECIES

## Technical Bulletin

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

### Final Protection for Seven Plants and an Insect in Ash Meadows

The Fish and Wildlife Service (FWS) has published a final rule (F.R. 5/20/85) putting seven plants and one insect endemic to the greater Ash Meadows region of Nevada and California on the U.S. List of Threatened and Endangered Wildlife and Plants. These species occur in small numbers at only a few sites in Nye County (NV) and Inyo County (CA), and are vulnerable to a number of activities that threaten their aquatic and terrestrial habitats.

Ash Meadows is an unusual desert wetland ecosystem maintained by several dozen springs and seeps, all fed by an aquifer of "fossil water" deposited more than 10,000 years ago when the region had a more mesic climate. The Ash Meadows area contains the greatest known concentration of endemic animals and plants in the continental United States, and most of them depend on the maintenance of adequate spring flows for their survival. Much of the aquatic and terrestrial habitat has been damaged or destroyed over the years by agricultural operations, drainage of wetlands for peat mining, road construction, and preliminary work on a large real estate development project. These and other means of habitat degradation jeopardized the survival of the unique plants and animals of Ash Meadows.

Four of the area's endemic fishes already are listed as Endangered. The FWS proposed listing an additional eight Ash Meadows species—seven plants and an insect—for Endangered Species Act protection on October 13, 1983 (see story in BULLETIN Vol. VIII No. 11). Subsequently, some of the threats were removed when The Nature Conservancy (TNC) bought approximately 11,173 acres in Ash Meadows from Preferred Equities Corporation, which had planned a large development complex in the area. This property was later purchased from TNC by the FWS for establishment of the Ash Meadows National Wildlife Refuge. The refuge protects some, but not all, of the designated Critical Habitat for seven of the newly listed Ash Meadows species: the Ash Meadows ivesia (*Ivesia eremica*), 45 percent on refuge lands; the Ash

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Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*)

Photo by Susan Cochrane



## REGIONAL BRIEFS

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

**Region 1**—An environmental assessment (EA) was completed recently for the proposed acquisition of approximately 2,000 acres of Coachella Valley fringe-

toed lizard (*Uma inornata*) habitat to create a National Wildlife Refuge (NWR) for this Threatened species. Editorial comments of previous drafts were consolidated, and the EA was released to the public for review through the Portland Regional Office in late April.

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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.

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To date, over 400 individual San Francisco garter snakes (*Thamnophis sirtalis tetrataenia*) have been trapped, marked, and released as part of a study being conducted at the San Francisco International Airport by the California Department of Fish and Game. Funds for the study were provided by the California Department of Transportation as a conservation measure for adverse impacts from highway construction. This is the final year of the 3-year population study. Although spring trapping efforts have only recently begun, several snakes have been captured, marked/remarked, and released.

The annual survey for the 'alala or Hawaiian crow (*Corvus hawaiiensis*) on the island of Hawai'i was recently completed by Fish and Wildlife Service (FWS) staff and Hawaii Department of Land and Natural Resources personnel. The survey covers most of the species' remaining habitat. Preliminary results suggest that the population is perilously low, with only three to five birds documented as being present.

The Rocky Mountain Program of The Peregrine Fund has moved from Fort Collins, Colorado, to Boise, Idaho. There was concern as to whether or not the breeding adult peregrine falcons (*Falco peregrinus*) would adapt to their new surroundings, but by April 15, 1985, 18 females laid a total of 43 eggs. In addition, the first two peregrine chicks have hatched at the Boise Center. One chick broke out from its shell on April 12 and the second on April 14. Dr. Bill Burnham and his staff are doing an outstanding job. The peregrine program will need to provide about 80 to 90 chicks for restocking into the Rocky Mountain Area in 1985.

**Region 2**—Canadian Wildlife Service and FWS biologists transferred 23 whooping crane (*Grus americana*) eggs this season from Wood Buffalo National Park, Northwest Territories, Canada, to Grays Lake NWR in Idaho. Another four were transferred to Patuxent Wildlife Research Center in Laurel, Maryland. The eggs in Idaho were placed under greater sandhill crane (*Grus canadensis*) foster parents and the resulting young will add to the approximately 30 birds already in that population.

One young whooper appears ready to spend the summer at Matagorda Island, Texas, and another at Monte Vista/Alamosa NWR in Colorado. To date, nine whoopers are at Grays Lake NWR and eleven are in western Wyoming, including one in Yellowstone National Park. Other sightings have been reported in Idaho and Wyoming, but these have not yet been confirmed. Two two-bird groups have been reported as associating to-

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# Four Western Species Proposed for Protection

Two birds, a fish, and a plant were proposed by the Fish and Wildlife Service (FWS) during May 1985 for addition to the U.S. List of Threatened and Endangered Wildlife and Plants. All four face a number of threats, mostly relating to habitat loss and the effects of competing animals.

## Least Bell's Vireo

No songbird in California has declined as dramatically in historical times as the least Bell's vireo (*Vireo bellii pusillus*), a gray, migratory passerine. Loss of riparian habitat and nest parasitism by another bird species have brought this subspecies to the brink of extinction, and the FWS proposed listing it as Endangered (F.R. 5/3/85).

### Reasons for Decline

This subspecies has very specific breeding habitat requirements—dense, willow-dominated riparian lands with lush understory vegetation—that restrict its range to the immediate vicinity of water courses. Within these areas, vireos find the food, cover, nest sites, and nestling and fledgling protection they need. Due to the limited amount of riparian habitat remaining throughout its range, the least Bell's vireo is particularly vulnerable.

Once widespread and abundant throughout California's Central Valley and other low-elevation riverine valleys, the least Bell's vireo had a breeding range that extended from interior northern California (Tehama County) to northwestern Baja California, Mexico. Today, however, over 95 percent of the riparian habitat has been lost within its former breeding range in the Central Valley, an area that may have supported 60–80 percent of the vireo's historical population.

Most of the remnants of least Bell's vireo habitat are in southwestern California. The majority of these remaining areas support fewer than five breeding pairs. After analysis of surveys conducted from 1977 to 1983, the FWS estimates that a total of about 300 breeding pairs occur in California. There are probably another several hundred breeding pairs in northern Baja California, where riparian habitat also is declining. The proposed listing rule covers all populations of the bird in the U.S. and Mexico.

Recent data indicate that the four largest remaining populations, representing about 65 percent of the bird's total U.S. numbers, occur along the Santa Margarita River (69 pairs), Santa Ynez River (60 pairs), Sweetwater River (34 pairs), and Prado Basin–Santa Ana River (25 pairs). Each of these populations is jeopardized by major urban development and water control projects planned for the near future. With the remaining 35 percent also subject to a variety of imminent

threats, the least Bell's vireo appears to be in serious danger.

Another threat is nest parasitism by the brown-headed cowbird (*Molothrus ater*), which has increased spectacularly in central and southern California since the 1930's. The cowbird lays its eggs in the nests of other bird species, usually to the detriment of the host bird's own eggs or young. Recent studies indicate that cowbird parasitism of vireo nests is occurring at a rate high enough to significantly reduce vireo reproductive success, which may lead to the extirpation of many smaller vireo populations in the future, as it undoubtedly has in the past.

### Available Conservation Measures

Included in the proposal to list the least Bell's vireo as Endangered was a proposed designation of Critical Habitat for 10 areas totalling approximately 44,000 acres (18,400 hectares) in southwestern California. These areas are along the Prado Basin–Santa Ana River (Riverside County); Santa Ynez River (Santa Barbara County); Santa Clara River (Ventura and Los Angeles Counties); and Sweetwater River, Tijuana River, Coyote Creek, Jamul–Dulzura Creeks, San Luis Rey River, Santa Margarita River, and San Diego River (all in San Diego County). Detailed maps are available in the May 3, 1985, *Federal Register*.

Under Section 7 of the Endangered Species Act, Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of a listed species or adversely modify its designated Critical Habitat. If an action may affect such a species, the agency involved would have to consult with the FWS. (For species that are merely proposed for listing, agencies are required only to "confer," a non-binding process.) When the needs of a listed species are considered early in the planning process, the proposed action usually can be modified to avoid jeopardy.

Types of actions that could adversely affect the proposed Critical Habitat include the removal or destruction of riparian vegetation; thinning of riparian growth, particularly near ground level (vireos typically nest within one meter of the ground); or increases in human-associated disturbances. Known proposals for projects that could require consultation include: modification of Gibraltar Reservoir on the Santa Ynez River (U.S. Army Corps of Engineers [COE] and U.S. Forest Service); a flood control project on the Santa Ana River (COE); a flood control project (COE) and highway construction project (Federal Highway Administration) along the San Luis Rey River; urban development in wetlands at Sweetwater Reser-



Least Bell's vireo

Photo by Herbert Clark

voir (COE); and a water project on the Santa Margarita River (Bureau of Reclamation and U.S. Marine Corps) at Camp Pendleton. It should be emphasized, however, that Section 7 consultations usually result in modification, rather than curtailment, of such projects. Economic and other impacts of designating or not designating Critical Habitat will be evaluated prior to a decision on a final rule.

If the proposal to list the least Bell's vireo becomes final, this bird will receive all of the benefits authorized under the Endangered Species Act. In addition to the habitat conservation measures mentioned above, there are the prohibitions on taking, possessing, and interstate or international trafficking in listed species without a permit. Further, the FWS would be required to develop and implement a recovery plan. Since California already lists the species for protection and has a Section 6 Endangered Species Cooperative Agreement with the FWS, it is eligible to apply for Federal aid to State conservation efforts for the species. A federal listing could raise the chances that such efforts might be funded.

Comments on the proposal to list the least Bell's vireo as Endangered and to designate its Critical Habitat are welcome from all interested agencies, organizations, and individuals, and should be sent to the Regional Director, Region 1 (see page 2 of the BULLETIN for address), by July 2, 1985.

## Northern Aplomado Falcon

One of our most colorful birds of prey, the northern aplomado falcon (*Falco femoralis septentrionalis*), is also one of the most vulnerable. This subspecies was extirpated from the U.S. because of habitat alteration, and the remnant population in Mexico is being contaminated by pesticide residues. The FWS believes it to

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## Four Species

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be heading toward extinction, and proposed listing it as Endangered (F.R. 5/20/85).

Adult aplomado falcons are characterized by rufous underparts, a gray back, a distinctive black and white facial pattern, long legs, and a long, banded tail. In size, they are intermediate between American kestrels (*Falco sparverius*) and peregrine falcons (*Falco peregrinus*). Northern aplomado falcons do not seem to be migratory.

The historical breeding range of the aplomado included southeastern Arizona, southern New Mexico, and southern Texas in the U.S., much of Mexico, and the western coast of Guatemala. Today, however, it is extirpated as a breeding species from the U.S., and is no longer known to nest in Guatemala or the central plateau of Mexico. According to Dean Hector, who conducted a status review for the FWS, the subspecies now nests regularly only in portions of northern and central Veracruz, northern Chiapas, western Campeche, and eastern Tabasco, mostly in palm and oak savannah.

Typical aplomado falcon habitat is open rangeland and tropical savannah containing scattered mesquites (*Prosopis juliflora*), yuccas (*Yucca elata* and *Y. treculeana*), oaks (*Quercus oleoides*), acacias (*Acacia farnesiana*), or palms (*Sabal mexicana*); in central Mexico, the falcon has been found also in open pine (*Pinus montezumae*) woodlands. The essential components of suitable habitat include relatively low ground cover, an abundance of small to medium-sized birds (some birds are among the prey species), and a supply of nesting platforms.

Considered together, these habitat requirements and the timing of the aplomado's decline in the U.S. implicate habitat degradation as the main reason for its extirpation from this country. Over the past 100 years, severe overgrazing, along with suppression of range fires and disturbances of native vegetation, have allowed brush encroachment of the open habitat. Land clearing for agriculture also contributed to the decline by reducing prey species and by eliminating nesting sites.

The most important *current* threat to the northern aplomado falcon, however, is the use of persistent organochlorine pesticides (such as DDT) within the range of this bird and some of its migratory prey species. Recent data strongly suggest that contamination from such pesticides is causing serious reproductive failure in some aplomado populations. Organochlorines interfere with the bird's ability to metabolize calcium, resulting in the formation of eggs whose shells are too thin to survive incubation. In eastern Mexico,

the levels of pesticide contamination and eggshell thinning found in the aplomado exceed even those found to have been the cause of nesting failures in the Endangered peregrine falcon in the 1960's and 1970's.

### Effects of a Final Rule

Because the northern aplomado falcon was last seen nesting in the U.S. in 1952, the benefits of a final rule listing it as Endangered would be limited. The Migratory Bird Treaty Act already regulates the taking, killing, possessing, transporting, and importation of migratory birds, including all subspecies of *Falco femoralis*. Trade in all falcons is further controlled by the Convention on International Trade in Endangered Species of Wild Fauna and Flora. In addition, Arizona, New Mexico, and Texas all have authority under State laws and regulations to give the bird protection if it should reappear within their borders. Since the proposed rule would list the aplomado throughout its historical range, any discovered in the U.S. would be eligible for full Endangered Species Act protection.

The main benefits of a listing would be the increased recognition of the aplomado's precarious status, which may encourage governmental or private conservation measures in Mexico, the potential for the U.S. to provide technical assistance, and the potential for reestablishing the aplomado in the U.S.

Comments on the listing proposal should be sent to the Regional Director, Region 2, by August 19, 1985.

## Little Colorado Spinedace

A small fish endemic to the Little Colorado River drainage in eastern Arizona, the Little Colorado spinedace (*Lepidomeda vittata*), was proposed for listing as

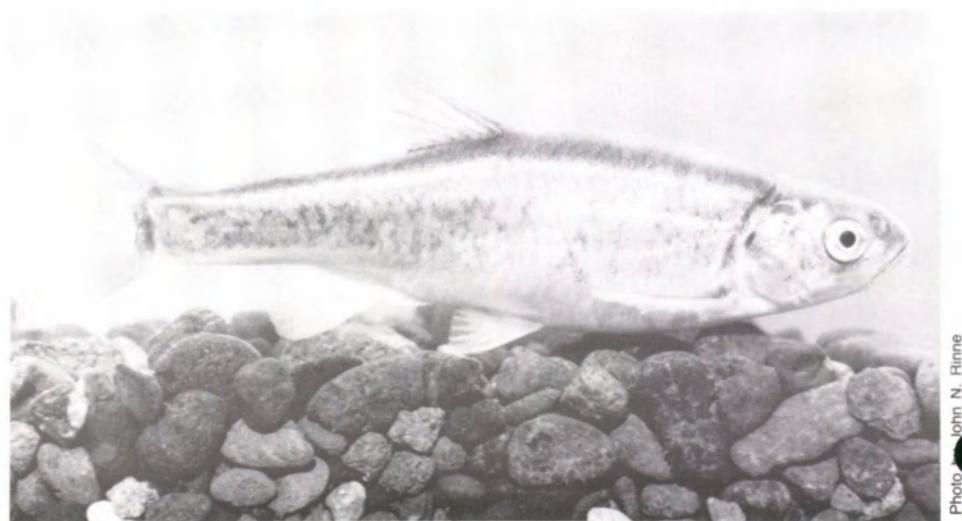
Threatened (F.R. 5/22/75). Its range and numbers have been significantly reduced over the past 50 years. The decline can be traced to various forms of habitat degradation, the effects of exotic fishes, and past applications of ichthyotoxins (fish poisons).

Generally, the Little Colorado spinedace reaches less than 10 centimeters (4 inches) in total length. Its former range included parts of the upper Little Colorado River and its north-flowing, permanent tributaries on the Mogollon Rim and the northern slopes of the White Mountains. Within its current range, the spinedace inhabits very small to moderate-sized free-flowing streams, and is characteristically found in pool areas that contain flowing water over fine gravel or silt-mud substrates. During periods of drought, spinedace persist in intermittent streambed pools; during floods, however, they tend to distribute themselves throughout the stream with no apparent microhabitat preferences.

### Habitat Loss

It is natural for populations of the Little Colorado spinedace, like those of many other desert fishes, to fluctuate dramatically. Historically, these fluctuations probably reflected alternating periods of drought and increased rainfall. In more recent times, however, human manipulation of the water supply has adversely affected the fish's habitat, accentuating population lows and reducing population highs. Such habitat changes could lead to the extirpation of the Little Colorado spinedace in areas that normally would have sustained the fish during drought periods.

The species' naturally restricted historical range has been significantly reduced over the past 50 years. Currently, the spinedace survives only in stretches of East Clear, Chevelon, Silver, and Nutrioso Creeks and the Little Colorado River.



The Little Colorado spinedace (*Lepidomeda vittata*) depends on clean, free-flowing streams that are free of non-native fishes.

Photo by John N. Rinne

This remaining stream habitat is on lands of private individuals, the State of Arizona, the U.S. Forest Service, and the Bureau of Land Management.

Much of the former habitat was destroyed by impoundments on the river and its tributaries. The spinedace is strictly a stream-dwelling fish, unable to exist in reservoirs, and there are now approximately 150 impoundments of various sizes within the Little Colorado River basin. Not only do these reservoirs inundate free-flowing streams, but they reduce the flow of water downstream, further shrinking or even drying-up spinedace habitat. Watershed disturbances, including the destruction of riparian vegetation, logging, road construction, urban construction, mining operations, and overgrazing, also are affecting water quality and availability. As a result, some streams have experienced siltation, organic and chemical pollution, and adverse changes in water temperatures and dissolved oxygen levels.

### Predators and Poison

The impacts of exotic fishes have contributed to the decline of many native southwestern species, and undoubtedly should receive much of the blame for the reduced status of the Little Colorado spinedace. It originally was subject to few if any predatory fishes, but now at least 15 exotic species have been introduced into Little Colorado spinedace habitats. Competition, as well predation, poses a threat to the spinedace, and parasites accidentally introduced with exotic fishes may be a problem. The spread of harmful exotic species and the threat of additional introductions is exacerbated by the construction of reservoirs, an unnatural habitat type that is suited to many predatory game fishes, most of which are purposely introduced for recreational purposes.

In attempts to develop sport fishing, most of the streams in the Little Colorado River drainage have been subjected to poisoning. Chemicals such as rotenone and toxaphene were applied to kill so-called "trash" fishes, including carp, suckers, chubs, and shiners, some of them native species. Although these treatments generally were unsuccessful in eliminating the target species, they undoubtedly reduced the numbers and range of the Little Colorado spinedace.

### Benefits of a Listing

If the proposal to list the Little Colorado spinedace as Threatened is made final, this fish will receive all of the protection authorized under the Endangered Species Act for listed animals. Because direct taking of this fish is not a significant threat to its survival, the listing proposal includes a special provision allowing take without a Federal permit if a State permit is obtained and all other State wildlife laws and regulations are obeyed. Arizona already

regulates take of the spinedace through the requirements for State collecting permits. This system will provide for appropriate research and conservation projects that benefit the species.

In relying upon the State's permitting system, however, the FWS is interpreting the Act as precluding any further applications of fish toxicants that could directly affect the spinedace unless done in accordance with an approved conservation plan for the species.

The special rule also acknowledges the fact that incidental take by State-licensed sport anglers is not a significant threat to the species' survival; therefore, such incidental take would not be a violation of the Act if the spinedace is immediately returned to the water.

As is often the case with other species, the habitat conservation measures contained in Section 7 of the Act are expected to be of prime importance for spinedace survival. Federal agencies are required to refrain from any action that could jeopardize the survival of a listed species or adversely modify its Critical Habitat. The proposed Critical Habitat for the Little Colorado spinedace totals about 44 stream miles (71 kilometers) along East Clear Creek (Coconino County), Chevelon Creek (Navajo County), and Nutrioso Creek (Apache County). (See maps in the May 22, 1985, *Federal Register*.)

At present, no known Federal activities would be affected by this listing proposal. On East Clear Creek, the Little Colorado spinedace habitat is primarily on the Coconino and Apache-Sitgreaves National Forests. The Forest Service does not expect any significant impact on its management of this area from this proposal since the Little Colorado spinedace is already one of its species of concern. Wilkin's Dam on Clear Creek, a proposed Bureau of Reclamation project, will require Section 7 consultation if plans for its construction are ever reactivated. No impacts of a listing are foreseen on current management of the State and private lands along either of the three creeks.

Comments on the listing proposal are welcome, and should be sent to the Regional Director, Region 2, by July 22, 1985.

## Tumamoc Globe-berry

A rare desert-growing vine, the Tumamoc globe-berry (*Tumamoca macdougallii*), was proposed for listing as an Endangered species (F.R. 5/20/85). This plant is known to occur only in Pima County, Arizona, and Sonora, Mexico. Its survival is threatened by habitat destruction from increasing agricultural development, urbanization, and construction of a proposed aqueduct.

The only species in its genus, *Tumamoca macdougallii* is named after its dis-

coverer, D.J. Macdougall, and the site where he first collected it in 1908, Tumamoc Hill, west of Tucson, Arizona. This member of the gourd family is a perennial that grows from a tuberous root. Each plant has small, yellow, separate male and female flowers. Before they ripen, the species' small fruits are pale green with darker green stripes, resembling tiny round watermelons; when ripe, however, they turn red on the outside. After fruiting, the slender herbaceous stems die back, but new stems will sprout from the tuber the next year.

*T. macdougallii* is found under "nursery" trees and shrubs, which apparently provide protection, shade from the desert sun, and support for the vines. The nurse plants for this species are usually the creosote bush (*Larrea divaricata*), triangle leaf bursage (*Ambrosia deltoidea*), white thorn acacia (*Acacia constricta*), all-scale (*Atriplex polycarpa*), and pencil cholla (*Opuntia arbuscula*).

Historically, *T. macdougallii* has been found in widely scattered populations from Pima County, Arizona, to northern Sonora, Mexico. Since 1970, however, the only plants collected or observed in the United States have been in the Avra Valley, an area that is undergoing rapid development as Tucson expands westward. This valley is considered desirable not only for agriculture, but also for houses, trailer courts, businesses, and such accompanying developments as roads, powerlines, and pipelines.

In 1984, researcher F.W. Reichenbacher surveyed 53,500 acres (21,651 hectares) in the Avra Valley and located 28 populations containing 355 mature plants and 1,627 juveniles. Ten of the populations occurred on privately owned land, eight were on lands administered by the city, the State, and several local universities, and ten (comprising about 25 percent of the plants) were under Federal jurisdiction.

### Potential Threats

One of the main potential threats to *T. macdougallii* and its habitat is the proposed construction of a Central Arizona Project (CAP) aqueduct, part of a large Bureau of Reclamation (BR) water diversion project. According to Reichenbacher, who surveyed the project area for rare plants, the largest known *T. macdougallii* population, which consists of about 468 plants, is on land that would be impacted by the agency's preferred CAP route. (Populations of another plant that is proposed for listing, Thornber's fishhook cactus or *Mamillaria thornberi*, also lie within the proposed aqueduct route; see story in BULLETIN Vol. IX No. 5.)

A portion of the CAP water would be allocated to the San Xavier and Papago Indian Reservations for irrigation. Independent surveys have revealed *T. macdougallii*

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on both reservations. Increased agricultural operations and future urban development of these Indian lands could have an impact on the species' habitat unless its needs are considered.

Arizona has applied for the transfer to State ownership of 6,274 acres (2,450 hectares) of land in the Avra Valley that are administered by the Bureau of Land Management (BLM). Some has already been transferred, including areas that contain two *T. macdougallii* populations. Lands obtained under the State indemnity land selections may be sold or leased in order to gain revenues for the State; such lands would then be expected to undergo development, with possible impacts on the plant.

Another population of *T. macdougallii* is on BLM-administered land near a range rehabilitation project that involves punching small holes into the ground with a large roller and then planting grass and shrub seeds. The impact (if any) of this

procedure on *T. macdougallii* is unclear; however, BLM is aware of the species' presence and is attempting to avoid or minimize any harmful effects.

### Available Conservation Measures

If the proposed rule to list *Tumamoca macdougallii* as Endangered is made final, it will receive the protection authorized for plants under the Endangered Species Act. Habitat conservation probably would be the main benefit. Even though the potential for vandalism or increased collecting makes a formal designation of Critical Habitat imprudent, the habitat would receive protection under Section 7 of the Endangered Species Act. The BR would be subject to Section 7 regulations regarding the alignment for its CAP aqueduct. Whatever degree of impact may occur depends on the route chosen; two alternate routes BR is considering would avoid the main population entirely. Since *T. macdougallii* and its habitat could be affected by BLM's range project, or by the transfer or sale of cer-

tain BLM lands, that agency also may have Section 7 obligations. Another possible subject of Section 7 consultations would be developments on the Papago and San Xavier Indian Reservations involving the Bureau of Indian Affairs (BIA). The BR, BLM, and BIA all are aware of the species' presence in the lands they administer, and are actively planning for it. (*T. macdougallii* is already on BLM's "sensitive species" list.)

It is illegal under Section 9 of the Act to "remove and reduce to possession" Endangered plants from lands under Federal jurisdiction, or to engage in interstate or international trafficking in listed species, except under permit. These prohibitions will apply to *T. macdougallii* if it is listed. Another benefit of listing would be the requirement for the Service to develop and implement a recovery plan.

Comments on the proposal to list *Tumamoca macdougallii* as an Endangered species are welcome, and should be sent to the Regional Director, Region 2, by July 19, 1985.

## Final Listing Actions

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### Ash Meadows

Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*), 39 percent; the spring-loving centaury (*Centaureium namophilum*), 37 percent; the Ash Meadows blazing star (*Mentzelia leucophylla*), 37 percent; the Ash Meadows milk-vetch (*Astragalus phoenix*), 30 percent; the Ash Meadows gumplant (*Grindelia fraxinoprattensis*), 26 percent; and an insect, the Ash Meadows naucorid (*Ambrysus amargosus*), 100 percent. Because of this limited habitat protection, the above species were listed as Threatened rather than Endangered as originally proposed. In the same final rule, one of the eight newly listed Ash Meadows species, the Amargosa niterwort (*Nitrophila mohavensis*), was listed as Endangered because none of this plant's range is included in the refuge.

Some of the threats still facing most of these species or their habitats include trampling and grazing by wild and free-roaming horses, introductions of exotic plants and/or animals, off-road vehicle use, mineral mining, road construction, and ground water depletion. Even habitat on refuge land has been damaged to an extent by activities in the past.

### Available Conservation Measures

The eight newly listed species and their Critical Habitats will now receive the protection authorized by the Endangered

Species Act. Under Section 7 of the Act, Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of listed species or adversely modify their Critical Habitats. Included in the May 20, 1985, final listing rule were designations of Critical Habitat for sites totaling about 6,930 acres (2,800 hectares), taking into account overlaps. Ex-

cept for the Ash Meadows gumplant and Amargosa niterwort, the designated Critical Habitats include the entire known current ranges of the newly listed species.

During the public comment period, H.D. Carpenter, Director of the California Department of Fish and Game, recommended that the Service add 80 acres (32.4 ha) for the Ash Meadows gumplant (continued on next page)



Ash Meadows ivesia (*Ivesia eremica*)

Photo by Joseph Dowhan

## Ash Meadows

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and 1,320 acres (535 ha) for the *Amargosa niterwort* to the designated Critical Habitat in California. Further, another 160 acres (65 ha) for the *Amargosa niterwort* in Nevada are being considered since the discovery of a new population in that State. Because these areas were not included in the original listing proposal, the Service will consider designating additional Critical Habitat after a 60-day comment period. Comments should be sent to the Regional Director, Region 1 (address on page 2 of the BULLETIN) by July 19, 1985.

The Bureau of Land Management (BLM) has jurisdiction over much of the

designated Critical Habitat outside the refuge. Many of the BLM's current activities are consistent with conservation of the listed species; however, mining operations and consideration of easements on BLM land are the types of activities that may require consultation with the FWS under Section 7 of the Act.

Interstate and international trafficking in listed species without a permit is prohibited. Seeds from cultivated specimens of Threatened plants are exempt from this prohibition, however, if a statement of "cultivated origin" appears on their containers. It is anticipated that few if any trade permits for the Ash Meadows species will ever be sought or issued since they are not common in cultivation or in the wild.

"Take" of the Ash Meadows naucorid also is prohibited by the Act. The rules for listed plants are different; it is illegal under Section 9 of the Act to "remove and reduce to possession" the *Amargosa niterwort*, which is listed as Endangered, from areas under Federal jurisdiction. Regulations to extend this protection to plants listed as Threatened have been proposed.

Among the other conservation measures provided by the Act are a requirement for the Service to develop a recovery plan for each species and the possibility of Federal funding to States that have Endangered Species Cooperative Agreements with the FWS. Currently, California is among the States having such an agreement for plants.

## Florida Plant

*Dicerandra immaculata*, a low-growing, dome-shaped shrub belonging to the mint family, is restricted to only a few sites in Indian River and St. Lucie Counties, Florida. It grows among the sand pine scrub vegetation found on relict dunes along former ocean shorelines in a highly drained, sterile soil. *D. immaculata* is one of the rarest plants known from the sand scrub community.

Commonly referred to as Lakela's mint, *D. immaculata* is in danger of extinction throughout its range, mostly because of threats from sand mining, commercial and residential development, and a fungal disease affecting the seeds. On July 23, 1984, the Fish and Wildlife Service (FWS) published a proposed rule in the *Federal Register* to list this species as Endangered (see story in BULLETIN Vol. IX No. 8). Since that time, one of the 10 colonies then known to exist has been completely destroyed by commercial development. Two other sites have been partially destroyed by clearing for housing construction and two more face immediate threats from sand mining. These commercial and residential development activities are expected to continue and could affect most or all of the remaining colonies of *D. immaculata*. Based on this information, the Service published a final rule in the *Federal Register* on May 15, 1985, to include Lakela's mint on the List of Endangered and Threatened Plants.

As a listed plant, Lakela's mint is now eligible for the protection authorized under the Endangered Species Act. Among the benefits it receives are protection from interstate/international trafficking, a requirement for the FWS to develop a recovery plan to help secure the status of the species, and Section 7 protection from certain Federal activities.

Under Section 7 of the Act, Federal agencies are required to ensure that any actions they fund, authorize, or carry out

are not likely to jeopardize the survival of a listed species. At the present time, however, there are no known Federal involvements that may affect *D. immaculata*'s existence. Section 7 will apply to future activities even though a designation of Critical Habitat was not included as part of the final rule. This species is found only on small areas of privately owned lands and, with the publication of the required descriptions and maps that are part of a Critical Habitat designation, the possibility of vandalism to the plants and trespassing on its habitat may be increased, further threatening the mint's survival.



Lakela's mint

## Interior Least Tern

Due primarily to the widespread loss and modification of its nesting habitat, the interior population of the least tern (*Sterna antillarum*) has been eliminated from most of its former territory in the mid-western United States. In recognition of its decline, and as a means of conserving this bird and its habitat, the Fish and Wildlife Service (FWS) has published a final rule listing it as Endangered (F.R. 5/28/85).

The interior least tern is a small bird, averaging 20–22 centimeters (7.8–8.6 inches) in length with a 50 cm (19.5 inches) wingspan. Both sexes are alike in their breeding plumage, which is characterized by a black crown, white forehead, grayish back and dorsal wing surfaces, snowy white undersurfaces, orange legs, and a black-tipped yellow bill. Breeding colonies are usually small, up to 20 nests spaced far apart, although larger colonies have been reported. Most colonies are on barren or sparsely vegetated alluvial islands or sandbars. Each nest is a simple unlined scrape on the ground and contains three brown-spotted buffy eggs.

The interior least tern historically bred along the Colorado (in Texas), Red, Rio Grande, Arkansas, Missouri, Ohio, and Mississippi River systems from North Dakota southward through South Dakota, Nebraska, eastern Colorado, Iowa, Kansas, Missouri, Illinois, Indiana, and Kentucky to eastern New Mexico, Oklahoma, Arkansas, Tennessee, central Texas, central Louisiana, and central Mississippi. Its wintering range is not known, but may include coastal areas of Central America and northeastern South America.

Under natural river conditions, the islands used by interior least terns for nesting are created and destroyed by the river's erosion and deposition processes. Periodic flooding scoured the islands of

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# Recovery Under Way for Small Whorled Pogonia

The Fish and Wildlife Service (FWS) approved a recovery plan on January 16, 1985, to protect and conserve the Endangered small whorled pogonia (*Isotria medeoloides*). This species, one of only two orchid species in the genus *Isotria* that is found in North America, will now have a chance to remain a self-sustaining member of the plant world.

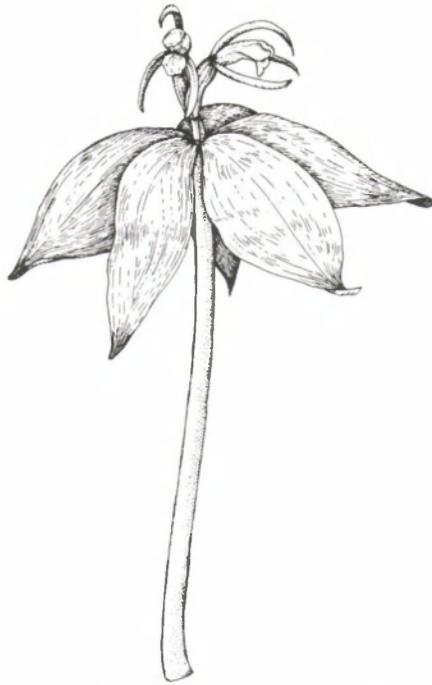
The small whorled pogonia is an inconspicuous, slender plant ranging in size from 9.5–25 centimeters (4–10 inches) tall with hairy roots. Five or six leaves form a whorl at the top of its pale, dusty green stem which terminates with one or two yellow-green flowers. This species is currently found at scattered sites from Ontario, Canada, and Maine in the north, south along the eastern seaboard to South Carolina and possibly Georgia, and west to Illinois. Although widespread, *Isotria medeoloides* is very localized in distribution and is rare in all parts of its range. Because this plant has physical characteristics that are somewhat similar to several other plants when not in bloom, and, since it also occupies an unspecialized habitat, it could easily go unnoticed. With this in mind, biologists familiar with the orchid unanimously agree that additional populations are to be discovered.

*I. medeoloides* is considered the rarest orchid east of the Mississippi River, exclusive of Florida. Historically, it was known to occur in 48 counties throughout 16 States on the east coast of the U.S. and in Canada. When the species was listed as Endangered under the Federal Endangered Species Act on September 10, 1982, approximately 18 populations (sites) were known to exist, totalling about 600 surviving individuals. In the past 2 years, several large colonies were discovered and, at the end of the 1984 field season, status survey results brought the known population totals to 33 populations with at least 2,500 individual plants. The largest concentration of these plants is found in New Hampshire and Maine.

Despite the rise in known population numbers over the last several years, in some areas plant numbers are very low. For example, only one population is now known to exist in Connecticut, where at one time there were eight; the species is believed to be extirpated in the State of Maryland due to the expanding suburban sprawl of Washington, D.C.; and of 12 individual plants previously known in Michigan, only one has been observed recently. Fortunately, the Michigan Nature Association has purchased the land where the remaining Michigan individual is located in an effort to protect it.

The small whorled pogonia faces threats from two major causes—collecting and habitat destruction. At the time the species was proposed for listing (September 11, 1980), herbarium collections ac-

counted for more plants than were known to exist in the wild. This species has always been popular with wildflower enthusiasts and will probably continue to be susceptible to taking. Under the provisions of the Endangered Species Act, there is a prohibition on the taking of *I. medeoloides* from Federal lands. (Currently the only plants known on Federal lands are at Nantahala National Forest, North Carolina; Sumter National Forest, South Carolina; and Fort A.P. Hill near Bowling Green, Virginia.) However, the States of Michigan, North Carolina, Massachusetts, Virginia, and Illinois, along with the Canadian government, also have officially listed the small whorled pogonia as endangered under their own laws, giving it further protection.



small whorled pogonia (*Isotria medeoloides*)

Destruction of habitat through construction and the inadvertent loss of additional plant populations are other serious concerns. Some of the historical pogonia sites under private ownership have been lost to development of shopping malls, housing areas, and golf courses, and the trend toward habitat alteration is expected to continue, increasing the urgency of locating and protecting as many extant populations as possible. Conserving the species will require that some habitat protection strategies be developed.

## Recovery Actions

The overall objective of the recovery plan for *I. medeoloides* is to establish or locate 30 populations of at least 20 individuals each. These populations must be

protected from taking and habitat alteration, and they must demonstrate long-term reproductive viability. They should be distributed throughout the species' historical range; however, at least 15 populations should be found or established in New England, a region that currently appears to include a major segment of the species' total population. Historical records indicate that the small whorled pogonia was found in approximately 60 sites, but the FWS believes that the establishment or location of 30 sites is sufficient to consider a change in the species' status from Endangered to Threatened, or possibly even a delisting.

The recovery guidelines for this species should be applied based on geographical distribution and concentrations of extant populations. Five of the six largest known populations that are considered to be the most vigorous are located in Maine and New Hampshire. These five sites have a total population of about 1,127 individuals, which represents approximately 73 percent of the species' known extant population. This high number of plants makes New England an area more conducive to the extensive field research that is needed to understand the species' biology and to assist in its recovery.

At the same time, the existing populations should be protected while areas are surveyed to identify new sites. Protection of the remaining populations of the small whorled pogonia can be accomplished by such methods as habitat acquisition, easements and cooperative agreements with landowners. For a species of such a wide range, landowner and general public awareness is probably the most efficient way to afford this plant immediate and maximum protection. Excellent success already has been achieved in protecting existing populations through the interest and support of cooperative landowners.

To further facilitate recovery for the pogonia, cooperation between State and Federal agencies should be increased. Some populations are under U.S. Forest Service jurisdiction, while others are protected by various State laws. Very often, State laws provide greater legal protection from collecting than the Federal Endangered Species Act (Act), so agreements between the FWS and authorized State agencies (as provided for in Section 6 of the Act) should be formalized whenever possible. The States of Connecticut, Georgia, Michigan, New Jersey, New York, North Carolina, Rhode Island, and South Carolina currently have Endangered Species Cooperative Agreements for plants and are therefore eligible to apply for Section 6 funds for *I. medeoloides* recovery projects.

Intensive efforts are being made to locate any additional existing populations of the small whorled pogonia not currently

Fish and Wildlife Service drawing

known to exist. With the continual loss of habitat in areas of known distribution, it is likely that unidentified sites are facing similar circumstances. However, the variation in most of the known habitat sites makes it difficult to identify other possible areas. To help minimize this problem, common factors of existing sites are being assessed, current populations are being monitored, and demographic studies are being conducted.

At the present time, too little is known about the mechanisms that control the growth and reproduction of this species. Management needs and recovery efforts cannot be properly addressed without adequate data on species biology. Studies must also be conducted to determine the association between mycorrhizal fungi and the small whorled pogonia, especially

the fungi's role in the life cycle of the species. Existing information documents that fungi assist in the development of orchid embryos by serving as a source of nutrients, and this subject should be further assessed.

As another important step toward recovery, specific management plans should be developed initially for all populations of the small whorled pogonia in excess of 100 plants. These plans should identify and discuss the implementation of actions needed to monitor the sites and/or provide the protection needed to bring about viable, self-sustaining populations. Once the management plans are put into effect for sites containing the larger populations, similar ones should be developed for the other sites.

## Black-footed Ferrets May be Bred in Captivity

### U.S. Fish and Wildlife Service Office of Public Affairs Denver, Colorado

Federal and State biologists plan to take action this fall that may lead to the captive breeding and reintroduction of black-footed ferrets (*Mustela nigripes*). The program is contingent upon whether or not the nation's only known colony of black-footed ferrets continues to produce an annual population that is apparently surplus to the colony's need. State and Federal biologists plan to make such a determination by late summer 1985. Maintaining the current wild population in a healthy condition will be of prime importance.

Current plans call for possibly capturing 6 to 10 ferrets from a population that ranged to well over 100 last year. Biologists hope to produce enough of these animals in captivity to establish other healthy colonies eventually in Wyoming and elsewhere in the West. Ferrets taken

this fall will be the nucleus of a captive breeding population. Not only could such a population increase the number of ferrets available for reintroducing into the wild, but it would help to safeguard the species' survival if plague or some other disaster were to strike the sole current wild population.

At a recent meeting, the U.S. Fish and Wildlife Service (FWS) and the States of Wyoming, Montana, Colorado, and Utah agreed to establish a working group to guide recovery of the Endangered ferret. Other States within the ferret's historical range will also be invited to participate in the working group, which will coordinate ferret recovery activities and plans for propagation. Efforts will include research, management, captive breeding, and relocation site examination.

Wyoming already has evaluated seven possible sites for establishment of a captive breeding facility, and the FWS and other participating States have agreed

that Wyoming will be the location of the first captive breeding site. Other States and institutions—including some outside the historic black-footed ferret range—also have expressed interest in providing such a facility. Funding for the initial operation is being sought.

The FWS has taken the position that building a captive-propagation population should be considered at this time rather than a direct trapping and translocation project since a relatively large number of ferrets will be needed to establish a new population. However, if captive propagation proves impractical, translocation may be considered.

The black-footed ferret originally ranged from Canada south to Texas, New Mexico, and Arizona. The ferrets have a close association with prairie dogs, relying on them for more than 90 percent of their food base, and utilizing prairie dog burrows for cover. Ferrets feed also on rodents, ground squirrels, and other small mammals.

During the late 1970's, some wildlife conservationists believed that the black-footed ferret had become extinct. However, Federal and State biologists continued to find evidence of the animal, which is extremely difficult to observe because almost all of its activities are nocturnal. In September 1981, a small population was discovered in northwestern Wyoming near Meeteetse. This single population represents this ferret's current known range. (See feature in BULLETIN Vol. VIII No. 3.)

The Wyoming population of ferrets is found on 18 to 20 white-tailed prairie dog (*Cynomys leucurus*) colonies covering over 130 square miles (337 square kilometers) of primarily private ranch lands. Current estimates indicate that this population varies from about 90 to 130 animals in summer and fall, and to about 30 to 50 wintering animals that form the breeding population. Biologists observing and studying the ferrets have not determined the causes of this population fluctuation, but it is known that predators such as owls, eagles, coyotes, badgers, and bobcats sometimes take ferrets.



Wyoming Game and Fish Department photo

Establishment of a captive breeding population may greatly assist in the recovery of the Endangered black-footed ferret.

### Ferret Survey Training

The Wyoming Cooperative Fishery and Wildlife Research Unit at the University of Wyoming will be hosting another black-footed ferret survey training session on October 2, 1985. There are openings for up to 30 trainees at the one-day workshop, and people with government or private agencies may participate. For information on fees and registration, contact Angela Brummond at the Wyoming Cooperative Research Unit, Box 3166, University Station, Laramie, Wyoming 82071; telephone 307/766-5415.

# Nontoxic Shot Zones for Bald Eagles

During May, the Fish and Wildlife Service (FWS) took several steps toward controlling environmental contamination from the use of lead shotgun pellets. Lead poisoning from these pellets has been shown to be a significant problem for various waterfowl species and the bald eagle (*Haliaeetus leucocephalus*).

Nontoxic shot has been required for waterfowl hunting in designated areas since 1976 to prevent lead poisoning in waterfowl. Ducks and geese are known to get lead poisoning from spent lead shot pellets that they swallow while eating seeds or grit. The FWS published final regulations February 12, 1985, designating nontoxic shot zones in portions of 30 States during the 1985-86 waterfowl season.

The FWS is now establishing new, additional nontoxic shot zones to protect bald eagles because eagles sometimes feed on sick, crippled, or dead waterfowl and may ingest lead shot contained in the bodies of such birds. The new regulation, published in the May 7, 1985, *Federal Register*, designated nontoxic shot zones in all or portions of Harrison and Pottawattamie Counties, Iowa; Stafford County, Kansas; and Potter, Sully, Hughes, Hyde, Buffalo, Lyman, Stanley, Marshall, and Charles Mix Counties in South Dakota.

The regulation follows a lengthy rulemaking process that began September 14, 1984, when the FWS announced its intention to establish nontoxic shot zones to protect bald eagles and identified counties where lead poisoning in bald eagles was thought to be a problem. After reviewing biological data and public comments, the Service proposed on February 13, 1985, to establish nontoxic shot zones

for eagles in all or portions of 30 counties in 8 States— California, Illinois, Iowa, Kansas, Missouri, Oklahoma, Oregon, and South Dakota.

However, the FWS is required by law to obtain State approval for implementation and enforcement of Federal nontoxic shot regulations. In this case, the States of Illinois, Missouri, Oklahoma, California, and Oregon declined implementation of the nontoxic shot zones proposed for the protection of bald eagles for 1985. (This action does not affect nontoxic shot zones previously established for waterfowl.)

Accordingly, the FWS announced in a separate May 7, 1985, *Federal Register* notice its intention not to open waterfowl hunting on selected areas during the 1986-87 waterfowl hunting season unless the States involved approve the use of nontoxic shot on those areas. The areas include the portions of California, Oregon, Illinois, Missouri, and Oklahoma that the FWS originally proposed as nontoxic shot zones to protect bald eagles from lead poisoning.

Also to be closed in 1986-87 are four national wildlife refuges where monitoring studies indicate a waterfowl lead poisoning problem. The refuges are Stillwater, Nevada; Benton Lake, Montana; and Tule Lake and Lower Klamath, California. The FWS proposed these refuges as nontoxic shot zones for 1985 on October 30, 1984, but the respective States declined to approve the proposal.

The FWS also announced on May 7 a modified proposal on criteria to be used in determining other areas where lead poisoning in waterfowl is a significant problem and nontoxic shot should be required.

order to produce additional chicks for eventual release into the wild.

Two new bald eagle nests have been discovered on two additional river drainages in Arizona. One nest, believed to have been built last year, was found with two fledgling chicks in west-central Arizona. The adult female is most likely from the Arizona nesting population and fledged in 1979. This eagle still retains the backpack transmitter attached to it during a cooperative research project funded by the FWS. The second nest, attended by one adult and one subadult, was found on the Gila River in southeast Arizona with no eggs. This nest appears to have been built this year. Helicopter surveys, conducted cooperatively by the Bureau of Reclamation, the Arizona Game and Fish Department, and the FWS, discovered both nests in cottonwood trees. These discoveries bring the total number of occupied bald eagle nesting sites in Arizona to 18, the highest known to date. The FWS expects this to be the best reproductive season for the bald eagle in Arizona since record-keeping began, with the possibility that up to 23 chicks could be fledged.

During the FWS's annual winter waterfowl surveys in Baja California, Mexico, two new bald eagle nest sites were discovered. One adult was observed in the area as well. Neither nest was successful in producing chicks this year.

During the 1985 whelping season, the red wolf (*Canis rufus*) captive breeding program produced four litters totaling 17 pups, while the Mexican wolf (*Canis lupus baileyi*) captive breeding program produced one litter of three pups. Twelve of the red wolf pups survived, bringing the captive red wolf population to its current high of 66 animals distributed among six facilities. All of the Mexican wolf pups lived, bringing the captive population of that gray wolf subspecies to 30 animals distributed among three facilities.

The red wolf is considered extinct in the wild, while the Mexican wolf is rapidly nearing extinction in the wild. For the time being, captive maintenance is the only hope for both wolves; however, the long-range objective for both programs is to reestablish populations in the wild. Biologically, the animals in both programs have a virtually unlimited breeding potential, but responsible management of the breeding facilities dictates that production be limited to a few litters each year. Efforts are under way to increase the number of participating facilities in each program in order to expand the total population.

Region 2 has contracted with the Oklahoma Cooperative Fish and Wildlife Research Unit at Oklahoma State University to conduct a management study of the Ozark big-eared bat (*Plecotus*

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gether on a regular basis. It is not known if these associations indicate pairing-type activity among sexually immature birds or more serious pair interactions.

Dexter National Fish Hatchery reports the successful spawning of the Endangered Colorado squawfish (*Ptychocheilus lucius*) and the razorback sucker (*Xyrauchen texanus*). Nineteen Colorado squawfish produced 1.5 million eggs from which hatchery personnel estimate 600,000 fry will be hatched for eventual stocking in central Arizona streams as part of experimental, "non-essential" populations. Eight million razorback sucker eggs were spawned with 2 million fry stocked in four tributaries of the Salt River in Arizona. An additional 100,000 razorback sucker fingerlings will be stocked in Arizona soon.

Results of the annual cooperative statewide census conducted by the FWS, the Texas Parks and Wildlife Department, and the University of Texas on the Attwater's greater prairie-chicken (*Tympanuchus cupido attwateri*) indicate that the total 1985 population is down 12 percent from 1984. The prairie chicken population on the Attwater Prairie Chicken NWR, however, is at an all-time high of 206 birds, a 23-percent increase from 1984. In off-refuge portions of Colorado County, where the refuge is located, prairie chicken numbers are down 20 percent. These figures illustrate the key role that the refuge plays in the conservation of this species.

A bald eagle (*Haliaeetus leucocephalus*) chick recently hatched at the Rio Grande Zoo in Albuquerque, New Mexico. The chick will probably be utilized in the FWS's captive breeding program in

*townsendii ingens*) in Oklahoma. Of the five Townsend's big-eared bat subspecies in North America, both the Ozark and Virginia big-eared bats (*P. t. virginianus*) are listed as Endangered. Historically, the Ozark big-eared bat occurred in adjacent areas of Oklahoma, Arkansas, and Missouri. Today, however, the total population is estimated to be less than 450 bats, about equally split between Oklahoma and Arkansas. The subspecies may be extinct in Missouri. It is currently thought that the greatest threat to this subspecies is human disturbance of maternity and hibernating colonies in Ozark caves. The study is expected to take 5 years, and is being initiated in cooperation with Regions 3 and 4.

\* \* \*

**Region 3**—The Region 3 endangered species staff met with the Wisconsin Department of Natural Resources and the U.S. Forest Service on May 13 to discuss comprehensive planning for the two national forests in Wisconsin—Nicolet National Forest and Chequamegon National Forest. The major topic of discussion was the future management of the timber wolves (*Canis lupus lycaon*) and the bald eagles that occupy these forests.

\* \* \*

Six peregrine falcons will be released in the near future from the Multi-Foods Tower (owned by a Canadian firm, Oxford Properties, Ltd.) located in downtown Minneapolis. The birds were placed at the tower on May 21. This project is the joint effort of the Minnesota Department of Natural Resources, the FWS, The Nature Conservancy, and several other conservation groups.

\* \* \*

**Region 4**—A status survey of the Nashville crayfish (*Orconectes shoupi*) has recently been completed. Based on the study's results, the species appears to qualify for Endangered Species Act protection. The Nashville crayfish has historically been collected from four river systems in Tennessee, three of them tributaries of the Cumberland River and one a Tennessee River tributary. However, the recent studies have found the species to be restricted only to Mill Creek, a Cumberland River tributary in Davidson and Williamson Counties, Tennessee. Mill Creek lies within the greater Nashville metropolitan area, and the species is threatened by developmental pressures within the watershed. The Nashville crayfish's restricted range also makes it extremely vulnerable to a single catastrophic event, such as a chemical spill. Meetings have been held with Federal, State, and local agencies to discuss the species' status and the measures taken to protect it and its habitat.

\* \* \*

In April, personnel with the FWS Asheville Endangered Species Field Office met with personnel from the U.S. Forest Service and the Tennessee Heritage

Program to survey Blue Ridge goldenrod (*Solidago spithamea*) sites on National Forest lands in North Carolina and Tennessee. Potential management options, including the possible designation of some sites as Research Natural Areas, were discussed. Only three populations of this rare goldenrod, recently listed as Threatened, are known to exist. Similar work with the National Park Service (NPS) resulted in discovery of two new potential localities for this species adjacent to an unfinished section of the Blue Ridge Parkway. The FWS is working with the NPS in this area to avoid impacts from a proposed trail system on the plant and on nearby caves used by Virginia big-eared bats.

\* \* \*

University of Florida researchers recently received funding from Florida's new Nongame Wildlife Program to study declining populations of the Endangered Schaus swallowtail butterfly (*Papilio aristodemus ponceanus*), a species currently restricted to a few of the Florida Keys in Dade and Monroe Counties. The research will focus on the status and habitat needs of this rare butterfly. Initial work in May 1985 started mark-recapture studies for the species. The new studies build on work previously funded by the FWS to determine the species' current distribution.

\* \* \*

Nevius' stonecrop (*Sedum nevillei*), a Category 2 listing candidate, is a plant historically known from only four locations, with two populations in Alabama and one each in Georgia and Tennessee. Recent field work in Alabama by the Jackson, Mississippi, field office staff, in combination with local botanists, has resulted in the discovery of six additional populations in Alabama. Previously thought to be restricted in Alabama to Tuscaloosa and Bibb Counties, the range of *Sedum nevillei* is now known to include Jefferson and Talledega Counties. Further field work will be conducted to determine its rarity and to accurately assess the threats to this species.

\* \* \*

One of the primary threats to gopher tortoise (*Gopherus polyphemus*) populations is the taking of individuals for food, sale, and pets. The loss of mature gopher tortoises is magnified by the length of time required by the species to reach maturity and by their low reproductive rate. This loss is particularly significant in Mississippi where the remaining limited habitat is fragmented. Recently, the supervisor of the national forests in Mississippi signed an order prohibiting the hunting and possession of the gopher tortoise, a Category 2 listing candidate, and the hunting of any wildlife species by the practice of "gassing" or the introduction of chemicals into burrows. Violation of this order is punishable by fine and/or imprisonment. The executive director of the

Mississippi Department of Wildlife Conservation wrote a letter of support, stating that the order would facilitate their efforts to control poaching, and offering the assistance of State officers in controlling illegal take of gopher tortoises.

\* \* \*

**Region 5**—Twelve young Plymouth red-bellied turtles (*Pseudemys rubriventris bangsi*) that are being "head-started" by personnel at the New England Aquarium in Boston, Massachusetts, are doing exceptionally well, showing rapid growth rates. As part of the recovery program for this Endangered species, all 12 turtles will be released in several Plymouth County, Massachusetts, ponds in late July.

\* \* \*

Early indications are that bald eagle production in Maine and the Chesapeake Bay region will reach record highs this year. Following completion of eaglet banding, final numbers will be available. Also, preparations for the Canadian/United States eagle translocation project are under way with plans made to place up to 36 young birds into the States of Pennsylvania, New Jersey, and Massachusetts.

\* \* \*

**Region 6**—On May 22, 1985, the steering committee for the Platte River coordinating effort met in Denver for the third time this spring. This effort, sponsored by the Bureau of Reclamation, is to spearhead a joint program for resolving conflicts between water development and the habitat requirements of the Endangered whooping crane, the Endangered interior least tern (*Sterna antillarum athalassos*), and the piping plover (*Charadrius melodus*), which is proposed for listing, as well as other nonlisted species. Representatives from the States of Colorado, Nebraska, and Wyoming, numerous Federal agencies, and private environmental and water development groups are participating in this effort. It is anticipated that recommendations will be developed through further study of the river and comprehensive data analysis, and will be ready for implementation in late 1986. A working group was established at this meeting to develop a plan of action for the committee to follow.

\* \* \*

On May 24, 1985, the steering committee for the Upper Colorado River Basin coordinating effort met in Denver to continue discussions aimed at resolving conflicts between water development and Endangered fish in this river basin. The effort, initiated in May 1984, is expected to produce a list of recommendations by this fall. As with the Platte River program, this is the effort of several State and Federal agencies and private groups. Analysis of data collected on the river is proceeding rapidly, and the committee will

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begin to move into the next phase which includes the generation of recommendations to resolve the conflicts.

Grizzly bears (*Ursus arctos horribilis*) are not faring too well this year. This spring, three bears—two females and one yearling male—have been accidentally killed. One female was killed by a car and one was killed by a train in an area south of Glacier National Park. The male was accidentally killed by a hunter near Chateau, Montana. The FWS and the U.S. Forest Service are investigating these incidents.

## Least Tern

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most vegetation, keeping them open enough for tern nesting. Over the past 70 years, however, the extensive systems of of reservoirs and other water management projects throughout the greater Mississippi River drainage has so regulated natural processes that fewer islands are being created, while some have been inundated under impoundments. Moreover, the scouring effect of spring floods has been reduced so much that open nesting habitat on remaining islands is being crowded out by permanent vegetation.

As a result of these and other pressures, including predation and disturbance by people using the islands for recreation, the interior least tern survives only in remnant populations. About 1,400 to 1,800 are thought to remain. In fact, the interior least tern already is officially listed (under State law) as endangered in South Dakota, Iowa, Illinois, Missouri, Texas, and New Mexico; as threatened in Kansas and Nebraska; and as extirpated in Indiana. The FWS proposal to list the

## BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED			THREATENED			SPECIES* TOTAL	SPECIES HAVING PLANS
	U.S. Only	U.S. & Foreign	Foreign Only	U.S. Only	U.S. & Foreign	Foreign Only		
Mammals	20	19	234	4	0	22	299	23
Birds	60	13	144	3	1	0	221	54
Reptiles	8	6	60	3	4	13	99	16
Amphibians	5	0	8	3	0	0	16	6
Fishes	30	4	11	17	3	0	65	37
Snails	3	0	1	5	0	0	9	7
Clams	22	0	2	0	0	0	24	18
Crustaceans	3	0	0	1	0	0	4	1
Insects	8	0	0	5	0	0	13	9
Plants	71	5	1	19	2	2	100	41
TOTAL	230	47	461	65	10	37	850	212**

\* Separate populations of a species, listed both as Endangered and Threatened, are tallied twice. Species which are thus accounted for are the gray wolf, bald eagle, American alligator, green sea turtle, Olive ridley sea turtle, and leopard.

\*\* More than one species may be covered by some plans, and a few species have more than one plan covering different parts of their ranges.

Number of Recovery Plans approved: 178

Number of species currently proposed for listing: 29 animals  
33 plants

Number of Species with Critical Habitats determined: 79

Number of Cooperative Agreements signed with States: 42 fish & wildlife  
17 plants

May 31, 1985

interior least tern under the Federal Endangered Species Act as Endangered was published in the May 29, 1984, *Federal Register* (see story in BULLETIN Vol. IX No. 6).

Under the Endangered classification, a number of benefits are now available for the interior least tern. It will receive additional protection from take, possession, or interstate/international sale without a permit. Those States having Endangered Species Cooperative Agreements with the FWS may receive some Federal funding for their own conservation efforts. The FWS will be responsible for developing and implementing a recovery plan.

Habitat protection, authorized under

Section 7 of the Act, may be the most beneficial for the tern. Federal agencies are required to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of Endangered species. If a proposed activity may affect a listed species, the appropriate agency must consult with the FWS to find ways of avoiding jeopardy. Among the types of actions that may require consultation are construction and operation of reservoirs, river channelization projects, and water management practices. In most cases, if the needs of the species are considered early enough in the planning process, an activity may be able to proceed with some modifications.

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# ENDANGERED SPECIES

## Technical Bulletin

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Endangered Species Program, Washington, D.C. 20240

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