

ENDANGERED SPECIES

Technical Bulletin

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Austin Regional Habitat Conservation Plan

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and
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Austin, Texas, and its environs contain one of the largest known concentrations of Endangered and other vulnerable species in a major metropolitan area. Because of concerns for these animals and plants, and for the effects that their protection could have on development in the Austin area, a committee of developers and conservationists has been formed to prepare an Austin Regional Habitat Conservation Plan (Regional Plan).

The committee's objective is to identify and carry out measures, such as the establishment of a habitat preserve, that would ensure the survival of Austin's endangered wildlife while accommodating orderly economic development. Interest in these issues is running high. In 1988, an environmental organization, Texas Earth First!, gave notice of intent to sue several developers and government agencies for alleged violations of the Endangered Species Act. Although no suit has been filed, the organization's notice helped to bring the divergence between advocates for Austin's endangered wildlife and many development interests into focus. Both sides now appear to have a greater appreciation for the benefits of a conservation partnership.

The six listed species in the Austin area covered by the Regional Plan are a songbird, the black-capped vireo (*Vireo atricapillus*), and five cave-dwelling invertebrates: the Tooth Cave spider (*Lep-toneta myopica*), Tooth Cave pseudoscorpion (*Microcreagris texana*), Tooth Cave ground beetle (*Rhadine persephone*), Bee Creek Cave harvestman (*Texella reddelli*), and Kretschmarr Cave mold beetle (*Texamaurops reddelli*). The Regional Plan also addresses three Category 2 listing candidates: another songbird, the golden-cheeked warbler (*Dendroica chrysoparia*), and two plants, the bracted twistflower (*Streptanthus bracteatus*) and the Texas amorphia (*Amorpha roemeriana*).

The status of the black-capped vireo is of particular concern. Biologists with the Service's Fort Worth, Texas, Field Office



photo by Alisa Shull

black-capped vireo

report a continuing decline in the species' nesting population within Travis County (which includes Austin). In 1987, there were indications of 81 nesting pairs in the area. By 1988, however, the number had dropped to 40, and in 1989 only about 27 nesting pairs remained.

Take and Incidental Take

Under certain circumstances, construction activity within the habitat of a listed species can constitute "take," a violation of the Endangered Species Act and its implementing regulations. Take is defined in the Act as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Fish and Wildlife Service regulations define "harass" and "harm" as follows:

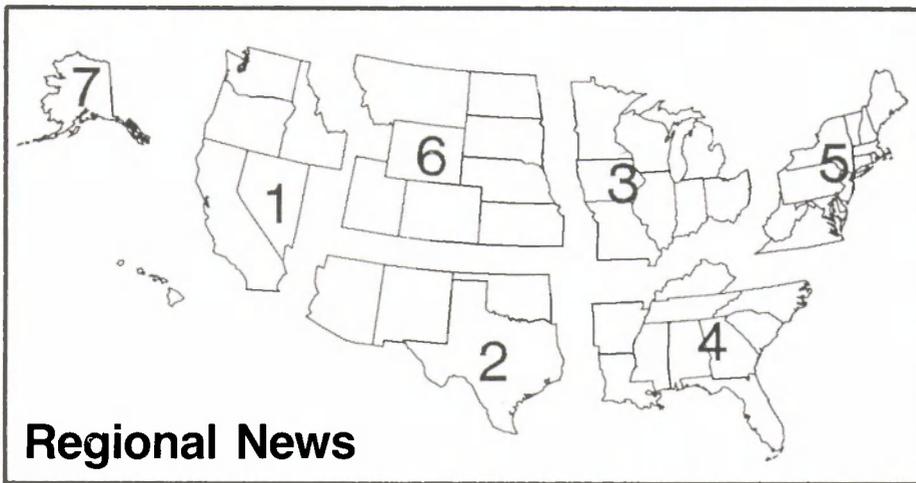
harass—an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but

are not limited to, breeding, feeding, or sheltering.

harm—an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Section 10(a) of the Act authorizes the Service to grant permits to non-Federal entities for the "incidental take" of listed species under certain circumstances. The Service defines this term as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity." To obtain an incidental take permit, the applicant must submit a Habitat Conservation Plan to the Service outlining the likely impacts on listed species from the taking, procedures for minimizing and mitigating the impacts, and funding sources for implementing these procedures. (See 50 CFR 17.22.) At a minimum, the Habitat Conservation Plan must ensure that any

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Regional News

Regional endangered species staffers have reported the following news:

Region 1—The new Western Peregrine Falcon Recovery Team is now in place. (See previous note in BULLETIN Vol. XIII,

Nos. 9-10.) The team consists of five biologists: Dr. James Enderson, team leader (Colorado College); Dr. Al Harmata (Montana State University); Dr. Grainger Hunt (Biosystems Analysis, Incorpo-

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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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rated); Lloyd Kiff (Western Foundation of Vertebrate Zoology); and Dr. Clayton White (Brigham Young University). The Fish and Wildlife Service coordinator for the team is Rich Howard from the Boise, Idaho, Field Office. He is being assisted by David Harlow (Region 1), Robert Mesta (Region 2), and Rob Hazelwood (Region 6).

The team is working on two tasks: 1) developing recommendations for the Fish and Wildlife Service on producing a 1990 peregrine falcon (*Falco peregrinus*) reintroduction plan for the western United States (Regions 1, 2 and 6); and 2) preparing an addendum plan that combines the existing Pacific and Rocky Mountain/Southwest recovery plans. The addendum also will provide an outline for the recovery effort during the next 5 years.

Three geographic working groups, composed of State and Federal biologists, are being formed to help the team develop the addendum plan. The Pacific area working group (covering Oregon, Washington and California), Northern area working group (Idaho, Montana, Wyoming, North and South Dakota, and Nebraska), and Southwest area working group (Nevada, Utah, Colorado, Kansas, New Mexico, Arizona, Oklahoma, and Texas) also will monitor the status of the peregrine populations.

The Western Peregrine Falcon Recovery Team can be contacted through Dr. Jim Enderson, Department of Biology, Colorado College, Colorado Springs, Colorado 80903. Inquiries concerning Service responsibilities should be directed to Rich Howard, 4696 Overland Road, Room 576, Boise, Idaho 83705 (telephone: 208/334-1931, or FTS 8/554-1931).

Region 2—The small Arizona desert nesting population of bald eagles (*Haliaeetus leucocephalus*) fledged only 13 young from 9 successful nests in 1989—the lowest production since 1983. This year's production is in sharp contrast to 1988, when the population fledged 24 young from 15 successful nests. The primary cause for the drop in production appears to be the higher than normal temperatures that occurred during the incubation period and throughout the breeding season. Arizona experienced a record 143 days with temperatures exceeding 100° F (38° C). Temperatures recorded at exposed cliff nest sites late in the breeding season commonly exceeded 120° F (49° C). It is very difficult for the eagles to successfully incubate eggs or brood young if they are subjected to such high temperatures early in the nesting cycle.

Fish and Wildlife Service observers documented that the eagles suffered much more from the heat this year than in previous years. One pair of eagles abandoned their nest during incubation after a week of temperatures between 100 and 110° F (38 and 43° C). Later in the season, older chicks were observed seeking

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Emergency Protection for Winter-Run Chinook Salmon in the Sacramento River

The National Marine Fisheries Service (NMFS), U.S. Department of Commerce, published a notice in the August 4, 1989, *Federal Register* taking emergency action to list the winter run of chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento River, California, as Threatened and to designate a section of the river as Critical Habitat. During the 240-day life of the emergency rule, NMFS will proceed with plans to give these fish long-term Endangered Species Act protection.

Winter-run chinook salmon are distinguishable from the other runs of chinook salmon in the Sacramento River by the timing of their upstream migration and spawning season. They return to the river almost exclusively as 3-year-old fish. According to NMFS, the winter run of chinook salmon in the Sacramento River declined between 1967 and 1985 from a 3-year (1967-1969) mean size of nearly 84,000 fish to a 3-year (1983-1985) mean size of just under 3,000 fish. Since then, the decline has continued. The California Department of Fish and Game estimates that the 1989 winter run numbered only about 500 fish. On the basis of this information, California has listed the winter run of chinook salmon in the Sacramento River under State law as endangered.

The primary causes for this steep decline in the winter run are believed to be the Red Bluff Diversion Dam and human activities that degraded spawning and rearing habitat in the Sacramento River. The dam has acted as a barrier to upstream spawning areas and restricted the passage of fish downstream to the ocean. Some salmon are captured by fisheries workers and helped over the barrier, and others pass up through fish ladders, but the numbers are not high enough to ensure the run's survival. In addition, changes in river flows resulting from operation of the dam can alter water temperatures and make them unsuitable for fish reproduction.

In 1988, NMFS, the California Department of Fish and Game, the U.S. Bureau of Reclamation, and the U.S. Fish and Wildlife Service signed an agreement to implement a 10-Point Winter-Run Restoration Plan. The plan assigns a number of tasks to the Bureau of Reclamation, including raising the gates at the Red Bluff dam seasonally to allow fish access to spawning habitat above the dam and maintaining water temperatures in the spawning habitat below the levels that are lethal to salmon eggs. The Fish and Wildlife Service is cooperating by attempting

to propagate winter-run stock from the Sacramento River at Coleman National Fish Hatchery. Service biologists also are conducting various studies to determine measures to restore the winter-run.

Under Section 7 of the Endangered Species Act, interagency consultations on the restoration plan will be conducted to consider whether additional conservation measures are needed. Consultations are being conducted with the U.S. Army Corps of Engineers on the effects of gravel dredging and with the Pacific Fishery Management Council on the effects of sport and commercial fishing.

The incidental take of chinook salmon during sport and commercial fishing is not considered a primary cause for the winter run's decline; therefore, the emergency listing rule contains a provision exempting fishermen who incidentally take salmon from the winter run while fishing lawfully under applicable State and Federal regulations.

The Critical Habitat designated in the emergency listing rule includes the Sacramento River channel and adjacent riparian zones from the Red Bluff Diversion Dam (River Mile 243), Tehama County, upstream to the Keswick Dam (River Mile 302), Shasta County.

Regional News

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shade on their nest cliffs. In a few cases, they ended up falling. Although the observers were able to capture these chicks and return them to their cliff nest, one eaglet died from injuries suffered in the fall.

The loach minnow (*Tiaroga cobitis*) population in the East Fork and mainstem White Rivers on the White Mountain Apache Indian Reservation in Arizona was sampled during the summer and fall of 1989. Not much was known about this population, which was rediscovered in 1985. As a result of the study, the loach minnow appears to be much more abundant and widespread in the East Fork than previously thought. More work needs to be done to determine the downstream limits of the fish in the mainstem and its distribution in the North Fork.

Surveys conducted in 1989 show the status of the Gila topminnow (*Poeciliopsis occidentalis*) to be declining. In Arizona, this Endangered fish apparently is extirpated from 2 of the 11 sites where it once naturally occurred. One disappearance is due to an invasion of competing mosquitofish (*Gambusia affinis*) and the other was the result of unknown factors. Mosquitofish also have reinvaded a third site

from which they had been removed several years ago, and their return could threaten the native topminnow population there as well.

The 1989 surveys also found that 14 reintroduced Gila topminnow populations have failed since the last survey in 1987. There remain approximately 50 topminnow populations, many of which are located in aquaria and other captive facilities. Several of the wild populations were introduced in 1989, including the first in the topminnow's historic range in New Mexico. The status of the topminnow in the Mexican portion of its range is believed to be stable, but information is sketchy.

A second year of below average rainfall in Arizona has adversely affected the habitat of two Endangered small mammals, the Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*) and the Mount Graham red squirrel (*Tamiasclurus hudsonicus grahamensis*). Dry conditions have restricted the moist seep and spring-side habitats of the vole in the Hualapai Mountains, further restricting and isolating the vole populations. In the Pinaleno Mountains, the drought is believed to have contributed to the failure of the Englemann spruce (*Picea engelmannii*) and corkbark fir (*Abies lasiocarpa* var. *arizonica*) cone crops, the primary winter food for the Mount Graham red squirrel.

This is the second year in a row that the spruce-fir cone crops have failed. Trials to assess the usefulness of artificial feeding are under way. If Arizona's dry conditions persist into the 1990's, as climatologists predict, additional measures may have to be considered to ensure the survival of both the Hualapai Mexican vole and the Mount Graham red squirrel.

Status surveys have been initiated for two caddisflies (*Metrichia volada* and *Protopila balmorhea*), one amphipod (*Crangonyx gracilis* ssp.), and one snail (*Pyrgulopsis morrisoni*) at the Page Spring/Bubbling Springs/Oak Creek aquatic complex in central Arizona. With the exception of *Protopila balmorhea*, these species are thought to be localized endemics. Records of *P. balmorhea* indicate it is found at this site and at one other spring system in West Texas. Development, recreational use, and the planned expansion of a State fish hatchery threaten the habitat of these species.

The northern aplomado falcon (*Falco femoralis septentrionalis*) inhabits savanna and desert grasslands of the Neotropics. Its range once extended as far north as southern Texas, New Mexico, and southeastern Arizona. This subspecies disappeared from the United States by the late 1940's, probably due to

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Pacific Flying Foxes Surveyed

Don E. Wilson

Biological Survey, National Ecological Research Center
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Biologists from the U.S. Fish and Wildlife Service's Honolulu, Hawaii, Field Office and Biological Survey Office (Washington, D.C.) recently surveyed fruit bat populations in American Samoa, Western Samoa, and Fiji. These large, fruit-eating mammals are often called flying foxes. The Service's Office of Scientific Authority recently supported moving several species of fruit bats protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) from CITES Appendix II to the more protective Appendix I and adding all remaining species of the genus *Pteropus* to Appendix II. This was in response to a growing demand for importation of these animals to Guam, where they are a traditional delicacy. The Service is particularly interested in the status of the Samoan fruit bat (*Pteropus samoensis*).

One objective of the surveys was to determine the status of a subspecies of *P. samoensis* endemic to Fiji. Service biologists were joined by research staff from Bat Conservation International for surveys on Viti Levu, the major island in the Fiji group. A rough assessment of the habitat potential suggested that both *Pteropus samoensis* and *P. tonganus*, the Pacific flying fox, should continue to do well on Fiji. The team found large numbers of *P.*

tonganus and fewer, but significant, numbers of *P. samoensis*.

The Service has been concerned with the status of flying foxes in American Samoa since the early 1980's, when botanical researchers suggested that drastic declines had occurred. A subsequent petition to list *P. samoensis* as Endangered led to a survey of the populations in American and Western Samoa. As a result of that survey, the petition was ultimately found to be "not warranted," but controversy over the species' status continued and a plan to resurvey the areas was developed.

In both Western and American Samoa, sites that had been surveyed in 1986 were revisited to assess population trends for both species. Data were gathered using the same methodology. The team found that both species were numerous and that there apparently is little immediate danger of extinction.

Overall results for 49 sites surveyed for *P. samoensis* showed a total of 242 bats in 1986 and 176 in 1989. The bulk of this decrease was at 17 sites on the island of Upolu in Western Samoa, where the total dropped from 96 in 1986 to 29 in 1989. Upolu has a high human population and the terrain favors clearing for plantations, which has resulted in considerable habitat loss for the bats. Several important new

sites with high bat population densities were found on Savaii, the other island of Western Samoa. The government of Western Samoa has taken steps to reduce the take from hunting by restricting the season on fruit bats.

In American Samoa, on the main island of Tutuila and the smaller islands of Ofu, Olesega, and Ta'u, the outlook was considerably better, with population numbers stable or slightly increasing. In 1987, a typhoon devastated these islands, but the population has recovered from any losses sustained at that time.

In both American and Western Samoa, concern for the fruit bats has been conveyed to the general public quite effectively. On all islands visited, residents were knowledgeable about the plight of the bats, and frequently were aware of steps being taken to ensure bat survival. Conservation efforts will continue. A meeting in Honolulu in February 1990 allowed appropriate representatives from most of the Pacific islands to discuss management concerns for fruit bats. That meeting was made possible by Bat Conservation International, with logistic support from the Fish and Wildlife Service and considerable input from the academic and conservation communities.



Many tropical plants depend on fruit bats like the Samoan flying fox for pollination and seed dispersal. People donating \$6.50 or more to the protection of the 30,000-acre Falealupo lowland rainforest in Western Samoa, which contains important fruit bat habitat, can receive a 16.5 by 27-inch color edition of the above poster. Donations can be sent to the Botany Department (attn: Janice Jutila), Brigham Young University, Provo, Utah 84602; make checks payable to "Brigham Young University—Falealupo Rainforest."

Endangered Mussel Studies on the Upper Mississippi River

Leslie E. Holland-Bartels
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The National Fisheries Research Center in La Crosse, Wisconsin, recently completed studies on the habitat needs, host fish requirements, and early life history of the Higgins' Eye pearly mussel (*Lampsilis higginsii*). This Endangered mollusk is found only in the upper Mississippi River.

All hosts identified for the parasitic larval stage of the Higgins' Eye pearly mussel in laboratory studies are perciform fishes common to abundant in much of the upper Mississippi River. They include the walleye (*Stizostedion vitreum*), sauger (*S. canadense*), largemouth and smallmouth bass (*Micropterus salmoides* and *M. dolomieu*), white bass (*Morone chrysops*), and freshwater drum (*Aplodinotus grunniens*). The identified host fishes for the Higgins Eye mussel are the same ones needed by the closely related pocketbook mussel (*Lampsilis cardium*).

Juvenile Higgins' Eye pearly mussels were routinely produced in large numbers at the laboratory using hatchery-reared largemouth bass and walleye as hosts. Metamorphosed juveniles were maintained easily for 2 weeks with minimal mortality, but rearing of young for longer periods has been relatively unsuccessful.

The Center also found that habitat characteristics of adult Higgins' Eye mussels do not vary noticeably from those of many common species of mussels in the upper Mississippi River. Adult Higgins' Eye mussels were found in a wide range of main channel border habitats with various current velocities and sediment types. However, the mussel was most common at sites where summer currents ranged from 0.5 to 0.7 feet per second and where there were medium-fine to fine sand substrates. These are common habitats in the main channel border area throughout much of the upper Mississippi River. Therefore, it appears unlikely that a lack of suitable hosts or habitat is responsible for the observed sparse distribution of this species. How host fish distribution

relates to the distribution of the Higgins' Eye pearly mussel is still unknown, but it may be that there is an insufficient overlap of the range of the mussel and its needed hosts. This hypothesis remains untested and is difficult to study directly in the large Mississippi River system, but it may be supported by the abundance of the pocketbook mussel, which has similar hosts but prefers coarser substrates.

It has been hypothesized that habitat requirements for juveniles may be limiting factors for many species. Unfortunately, it was not possible to distinguish larval and early juvenile Higgins' Eye pearly mussels from pocketbook mussels and other common lamprolittid mussels under light microscopy. It is possible to use scanning electron microscopy to distinguish among juveniles of different species on a statistical basis, but even then individual specimens cannot be identified with certainty. Thus, field verification of hosts and identification of juvenile habitat needs for the Higgins' Eye pearly mussel in the upper Mississippi River appear to be impractical at this time.

Evaluating Translocation Strategies

Brad Griffith¹ and J. Michael Scott²

Many endangered species recovery plans include options for translocating (reintroducing) species into their former ranges. (In unusual cases where the historical range no longer contains suitable habitat, a plan may recommend introducing a species into a new range.) Most recovery plans, however, do not quantitatively assess the probability that translocation will result in a self-sustaining population, nor do they evaluate alternate translocation strategies.

Translocation success and strategies can be evaluated with replicated experimental releases or simulation modeling, but these approaches are complex, time consuming, and often impractical for extremely rare organisms. Alternatively, managers can estimate success and evaluate strategy by examining the outcome of similar translocations.

In a recent article, Griffith et al. (1989) analyzed contemporary (1973-1986) translocations of native birds and mammals in Australia, Canada, New Zealand, and the United States. Factors associated with successful translocations were identified, and regression models were presented for use in predicting the probability of success from alternate translocation strategies prior to testing them in the field.

Estimated translocation success rates varied widely (from less than 10 percent to greater than 90 percent) depending on the type of animal involved and the condi-

tions of release. Releasing small numbers of captive-reared Threatened, Endangered, or other vulnerable animals over a short time in areas of fair or poor habitat quality on the periphery or outside of their historical ranges, and where there were physically similar competitors present, was the least (less than 10 percent) successful approach. Releasing large numbers of wild-caught native game animals over several years into the core of the species' historical ranges in areas of high habitat quality, and where there were no physically similar competitors, was most (more than 90 percent) successful. Among wild-caught animals, translocations of animals from growing populations of moderate or high density were more successful than were translocations from low density, declining populations. Herbivores were translocated more successfully than carnivores or omnivores.

The success rate from releasing larger numbers of animals quickly leveled off, indicating that: 1) there is an optimum number of animals that should be released for specific situations, and 2) releasing more than the optimum number does little to increase the success of translocations. For translocations in the core of a species' historical range, the optimum number for release ranged from 80-120 for Threatened, Endangered, or other vulnerable birds to 20-40 for native game mammals.

Without high habitat quality, translocations had a low chance of success regardless of how many animals were released or how well they were conditioned. This reinforces the need to ameliorate the factors responsible for the species' original decline before attempting to reestablish a self-sustaining population. Species recovery through translocation is likely to work only in exceptionally favorable circumstances. Establishment of multiple captive breeding populations should be considered, and adequately planned for, long before translocation becomes a last resort for recovering a rare species. This will ensure that a single event could not cause the entire captive stock to become extinct. It should also help to build sufficient numbers for multiple releases, thereby increasing the chances of a successful translocation.

Griffith, B., J. M. Scott, J. W. Carpenter, and C. Reed. 1989. Translocation as a species conservation tool: status and strategy. *Science* 245:477-480.

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photo by Don Bleitz

The golden-cheeked warbler, a candidate for Endangered Species Act protection, has a restricted breeding range. It is reported to nest only in timbered parts of the Edwards Plateau region of south-central Texas. Some of its nesting habitat may receive protection under the Austin Regional Habitat Conservation Plan.

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incidental take will not appreciably reduce the likelihood of the species' survival and recovery. The accompanying table provides an outline of some previous Habitat Conservation Plans.

Austin Regional Plan

Acquisition of a habitat preserve in the Austin area is a likely cornerstone of mitigation measures that will be outlined in

the Regional Plan. The acquisition may require a mix of private, local, and Federal funding. Other anticipated provisions will encourage developers to incorporate on-site mitigation as part of their projects, to the extent practical, and to contribute toward acquisition of the preserve. Development of the Regional Plan requires extensive coordination, and is expected to take up to 2 years to complete.

The Service must determine whether issuing a Section 10(a) permit would be controversial or would be "a major Federal action significantly affecting the quality of the human environment." If either criterion is met, the Service will

likely publish an Environmental Impact Statement (EIS). Considering the potentially broad effects of the proposed permit and the public debate that will likely ensue, an EIS may indeed be necessary. The Service will also be required to conduct an internal, formal, Section 7 consultation under the Endangered Species Act prior to issuing the permit.

Austin's economic prosperity in the 1970's and early 1980's was reflected in numerous development projects, proposals, and plans as the business community took action to accommodate population growth. As land development projects and roads multiplied, habitat for the native wildlife was often damaged or even eliminated. The cumulative effects have contributed to the decline of the listed species covered by the Regional Plan. However, through careful planning to minimize the incidental take of listed species, secure a portion of the species' habitat, and compensate for take that does occur, it is possible that this trend can be reversed.

Interpretation of what constitutes take has been problematic, and is likely to require a case-by-case analysis wherever proposed development actions have the potential to impact listed species. For example, destruction of black-capped vireo breeding territories would clearly constitute taking. However, there are no definitive data on the extent to which small development actions adjacent to or surrounding these relatively small territories could affect the birds; in the extreme, such activity could render the territory unsuitable for vireos.

Austin's environmental community, development interests, and government agencies have undertaken an effort that, if successful, will benefit them all, and improve the outlook for some listed species as well. Implementation of the Regional Plan can provide a lasting framework for avoiding conflicts and, at the same time, conserving endangered species.

It is important to note, however, that factors beyond the Austin area could influence the fate of some species covered by the Regional Plan. For example, the black-capped vireo and the golden-cheeked warbler are both migratory species. The vireo winters on the west coast of Mexico, with the center of the range in the states of Sinaloa and Nayarit. The warbler spends the winter in the highlands of southern Mexico, Guatemala, Honduras, Nicaragua, and possibly Belize. Conservation of wintering habitat will be essential for the survival of these and other migratory birds.

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Examples of Habitat Conservation Plans

Plan Area	San Bruno Mountain California	Coachella Valley California	North Key Largo, Florida	Laguna Niquel California
Planning Committee Members	Cities, county, private landowners, FWS, State, conservation group	Cities, 2 conservation organizations, and Federal and State agencies	Primarily local developers	Federal, State, and local agencies, industry, and conservation group
Listed Species Covered by Plan	Butterfly	Lizard	Butterfly, 2 mammals, American crocodile	Least Bell's vireo [other species (candidate) considered but incidental take only for vireo]
Plan Status	Complete 3+ years	Complete 2+ years	2+ years (then process abandoned)	Ongoing
Plan Features	Preserved 86% of butterfly's habitat Private land conveyed to city Funding from developers to allow continued management 2-year study involving 50 field personnel Resulted in enhancement of butterfly's survival	Preserves 11% of remaining occupiable habitat Funding from government, developers, and conservation organizations acquired preserves	Clustered Development Pesticide restrictions and other management Government financing of habitat acquisition No conclusion about long term effect of taking There was no commitment from a local government to hold the permit	Habitat involved is covered under Section 404 of the Clean Water Act Acquisition or zoning to compliment public ownership along a riparian corridor Loss of some habitat not essential to the corridor 4 separate plans under 1 umbrella

Prairie Dawn-- A New Common Name for an Uncommon Plant

Julie Massey
Clear Lake, Texas,
Ecological Services Field Office

Hymenoxys texana, the scientific name for one of Texas' endangered wildflowers, is a useful term for botanists, but admirers of this species decided that it needed a descriptive common name as well. Elementary school children in the Houston, Texas, area had a chance last year to create a common name and, at the same time, learn more about the conservation of rare plants and animals.

The Service's Clear Lake Field Office sponsored a poster contest to name the species, attracting over 250 entries from the 12 schools that participated. Separate prizes were awarded for the best name, best explanation of a proposed name, and best poster. The contest judges included representatives of the Texas Parks and Wildlife Department, U.S. Army Corps of Engineers, and Mercer Arboretum, which is conducting research on cultivation of the species.

Entries for a new common name ranged from "Yellow Stud" to "Texas Moon Dance," but Shataria Green, a sixth grader, won with "Prairie Dawn." Eric Craft won the prize for best poster. Another student, Alison Gadinez, won a prize for the explanation of her proposed name for the plant:

"I named the *Hymenoxys texana* the Lemon Drop because it has a lemon-like top and if you were to put the leaves that are on the bottom at the top it would look like a regular wildflower but they're at the bottom so you could say they dropped, and that's why I called it the Lemon Drop."

The contest provided an excellent opportunity for the Service to educate the children of Houston on the rare plants and animals of their area; slide shows on endangered species conservation were shown to more than 2,200 students. Their interest in the Prairie Dawn will be important for the long-term survival of this and other vulnerable species.



***Hymenoxys texana*, a rare Texas plant, was given the common name of "Prairie Dawn" for its bright yellow flowers.**

drawing reprinted from *Endangered, Threatened, or Protected Plants of Texas* with permission

Listing Protection is Proposed for Two Animal Species

Two species of animals that now occur only in foreign countries were proposed recently by the United States for listing protection under the Endangered Species Act:

White-necked Crow (*Corvus leucognathus*)

An island dwelling bird, the white-necked crow originally inhabited the forests of Haiti, the Dominican Republic, Puerto Rico, and St. Croix in the U.S. Virgin Islands. Due to habitat destruction and hunting, however, this species has been eliminated from almost all of its former range in the United States. Threats to the remaining birds and their habitat prompted the Fish and Wildlife Service to propose listing the white-necked crow as an Endangered species (F.R. 12/27/89).

The white-necked crow resembles the crows of the mainland United States, but it is distinguished by the pure white base of the feathers on the nape of its neck. Although crows are generally considered highly adaptable birds that can thrive in a variety of habitats, even if extensively disturbed by people, those species that are endemic to island ecosystems often cannot tolerate habitat alteration or close human activity. The Hawaiian crow (*Corvus hawaiiensis*) and Mariana crow (*Corvus kubaryi*) are examples of island crow species that are in danger of extinction from these factors.

The white-necked crow seems to thrive only where there are extensive growths of natural forest, and to disappear when the forests are cut down. This bird was extirpated from St. Croix long ago, and the last sighting on Puerto Rico was in 1963. Apparently, the white-necked crow still occupies remnants of forest in Haiti and the Dominican Republic, which share the island of Hispaniola. However, the same process of deforestation that eliminated the species elsewhere threatens these remaining birds.

Although habitat loss is the main problem, hunting has been a contributing factor. White-necked crows are considered to have good-tasting meat, and the species was extensively taken as a game bird on Puerto Rico and Hispaniola. Pressure on dwindling populations increased as the clearing of forests made the crows more accessible to hunters.

Although the Endangered Species Act does not provide protection from habitat loss or hunting in other countries, the Service hopes that recognizing the white-necked crow as an Endangered species will encourage local conservation efforts. In the event that the species is rediscovered or reintroduced in Puerto Rico and is therefore under U.S. jurisdiction, the white-necked crow and its habitat will receive full Endangered Species Act protection.

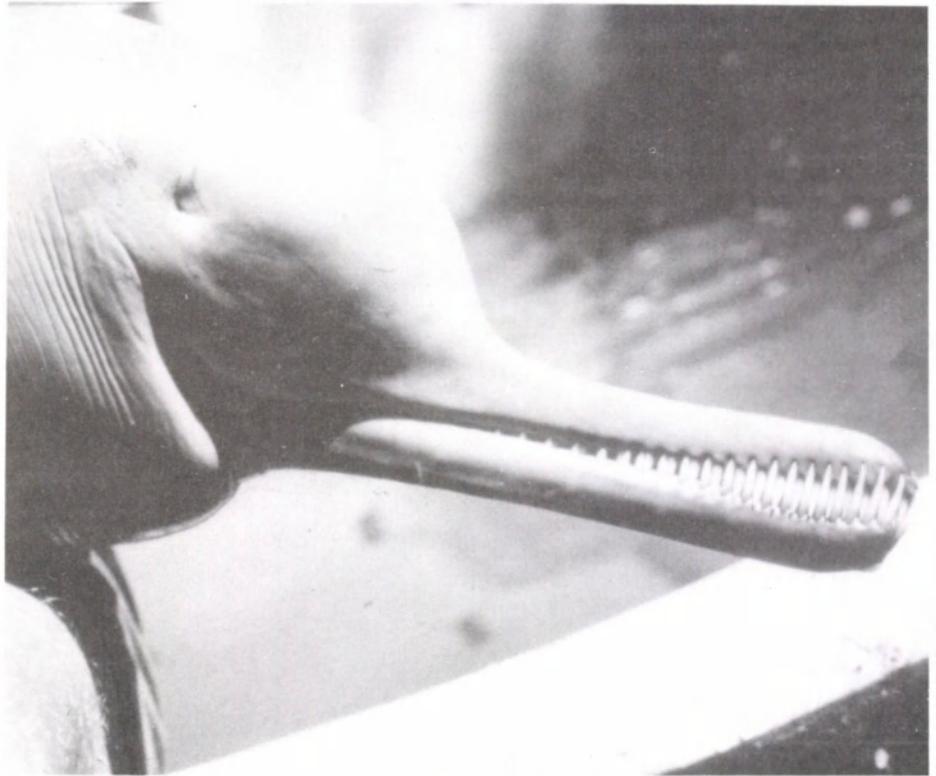


photo by E. S. Herald

The Indus River dolphin, sometimes called the blind dolphin, has only rudimentary eyes that cannot resolve images but may be able to detect light. It is believed to navigate its turbid riverine habitat by means of echolocation. The above immature female shows the species' distinctive gar-iike snout.

Indus River Dolphin (*Platanista minor*)

Known only from Pakistan, this freshwater dolphin historically occurred throughout the Indus River and up into the Sutlej, Ravi, Chenab, and Jhelum Rivers to the foothills of the Himalayas. Today, however, the species survives only in the middle section of the Indus River. In the November 9, 1989, *Federal Register*, the National Marine Fisheries Service proposed to list this species as Endangered.

A series of dams have divided the total population into six isolated subpopulations, at least two of which are on the verge of extirpation, and diversions of water have decreased the dolphin's dry-season range. Over-exploitation of these animals for their meat and oil has been another major factor in the decline. The establishment of one or more dolphin reserves and better enforcement of local restrictions on dolphin hunting are urgently needed to prevent the species' extinction.

Travelling Exhibit on Bears Tours Nation

The nation's first major exhibit on the black bear (*Ursus americanus*) and the Threatened grizzly bear (*Ursus arctos*) is beginning a 3-year tour of the United States. Almost 5 years in the making, "Bears: Imagination and Reality" was put together by the Science Museum of Minnesota—the same museum that developed the award-winning "Wolves and Humans" exhibit. The new exhibit will explore bear behavior, natural history, and management, and will examine the role of bears in art, myth, folklore, literature, and history. It includes over 25 taxidermic displays, North American Indian artwork and artifacts, films, videos, touch-and-feel objects, computer games, a live

theatre presentation on bear-human issues, and material for schoolchildren and teachers. A section in the exhibit will examine human-caused bear mortality, habitat issues, bears on public and private lands, and the survival prospects for six other bear species worldwide.

"Bears: Imagination and Reality" opens at the Science Museum of Minnesota in Saint Paul on February 17 and runs through December 1990. From there, the exhibit will tour museums in Yellowstone National Park, Indianapolis, Boston, Boise, Green Bay, Denver, New York, Cincinnati, Philadelphia, and Washington, D.C. At least 10 more museums are on a waiting list for the exhibit.

Current Status of the U. S. Ginseng Export Program

S. Ronald Singer¹

Ginseng (*Panax* spp.) root is believed by some people to hold potent curative effects. It is consumed in teas, powders, and pills for a variety of ills or as a preventative medicine. Consequently, ginseng is a commercially valuable product and is widely traded. Demand is greatest in the Orient, although ginseng is used in many regions.

American ginseng (*Panax quinquefolius*) was placed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to manage exports and avoid depletion of wild populations. Accordingly, wild and cultivated American ginseng may only be international traded under CITES regulations. The cultivated form is usually priced at 75 to 80 percent below the cost of the wild root.

Wild ginseng may be exported from the United States only if the CITES Management Authority is satisfied that the specimens were legally obtained and the CITES Scientific Authority has determined that harvest for export will not be detrimental to the survival of the species. For exports of cultivated ginseng, a Certificate of Artificial Propagation may be issued by the Management Authority upon proof that the specimens were propagated in accordance with the provisions of CITES. In the United States, both the Management Authority and Scientific Authority are within the Fish and Wildlife Service.

While ginseng export is controlled by Federal law, the Department of the Interior's position is that States control and regulate the management, taking, and possession of resident species within State boundaries. Therefore, each State has been allowed to develop its own ginseng management and certification programs, provided that these programs satisfy the Service's export requirements.

A September 1, 1987, *Federal Register* notice discussed Management Authority requirements that all wild and cultivated ginseng for export from the U. S. is to be State-certified as to: whether it is wild or cultivated; whether it was legally taken; State of origin; year of harvest; and weight of shipment. States were urged to establish conservation programs and regulations that would enable the Scientific Authority to make appropriate findings for ginseng export.

Beginning with the 1982-1984 ginseng harvest seasons, the Service began to issue multi-year export findings. Such multi-year findings are beneficial because they allow ginseng export for 3 years without annually requalifying State ginseng programs. All State ginseng programs were reevaluated in 1985 and again in 1988, with export approval granted to qualifying States for the succeeding 3-year harvests.

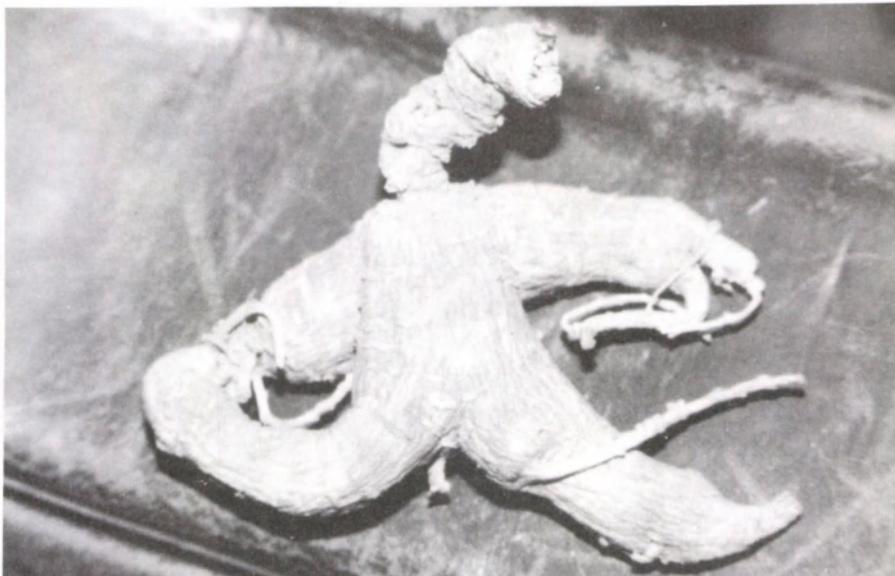


photo by S. Ronald Singer

Wild ginseng often has roots that are shaped somewhat like a human figure.

Legally obtained ginseng from export-approved States in an approved year may enter international trade at any time, provided that the export is accompanied by valid U. S. Department of Agriculture and CITES permits, a State certificate of origin, and a signed shipper's invoice. Thus, for example, ginseng harvested and certified during 1985 in compliance with CITES regulations could be exported from an approved port in 1989, if accompanied by a current CITES ginseng export document for 1985 ginseng, a valid 1985 State certificate of origin, a permit from the Department of Agriculture, and a shipper's invoice for the export.

American ginseng is grown extensively in China, Korea, and other parts of the

world from seed exported from the United States. Roots from these plants are now entering international trade and vying with the American-grown crop for the market. Although the supply of cultivated ginseng is increasing, making this form less expensive to users, there will likely always be a market for wild ginseng. Many people believe that only the wild root is the "real" ginseng. Thus, the demand for wild American ginseng root will probably continue to put stress on natural populations in North America.

¹Formerly with the Service's Office of Management Authority, Ron Singer is now located in the Division of Endangered Species and Habitat Conservation.

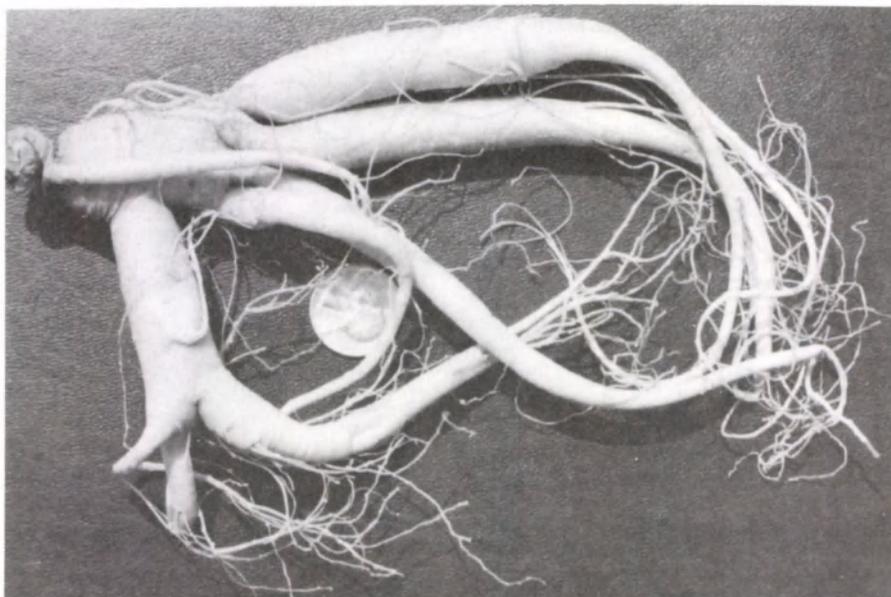


photo by S. Ronald Singer

Cultivated ginseng produces large, fleshy roots that are usually readily discernible from those of the more slowly growing wild plants.

Regional News

(continued from page 3)

the effects of livestock overgrazing and brush encroachment on its habitat. It was listed in 1986 as Endangered. (See story in BULLETIN Vol. XI, No. 3.)

The Santa Cruz Predatory Bird Research Group of The Peregrine Fund began releasing aplomados in 1985 at Laguna Atascosa National Wildlife Refuge in southern Texas. Nineteen birds have been released there, and 16 are known to have successfully dispersed. Of the seven birds hatched in 1989, however, two were killed by barn owls. Aplomados have now been sighted nearly year-round in the release area. A male released in 1988 returned to the hatch site in 1989 and remained there through that season's release, roosting and feeding with the young birds.

Releases at the refuge are planned for several more years. As production increases at Santa Cruz, releases may be expanded to Arizona and New Mexico.

Region 4—The U.S. Forest Service has initiated efforts to augment small red-cockaded woodpecker (*Picoides borealis*) populations by transplanting juvenile females to colonies that contain single adult males. The Southeastern Forest Experiment Station developed the transplant technique, and experimentally transferred two juvenile females from the Francis Marion National Forest in South Carolina to two single male colonies at the Department of Energy's Savannah River Plant. Both transplants were successful, resulting in pairing and breeding. The Forest Service subsequently conducted six more transplants. One transplant involved subpopulations located in the Georgia piedmont, where woodpeckers were transferred from the Piedmont National Wildlife Refuge to the Oconee National Forest.

The other five transplants were between separate populations: two from the Kisatchie National Forest in Louisiana to the DeSoto National Forest in Mississippi; two from the Sam Houston National Forest to the Davy Crockett National Forest in Texas; and one from the Apalachicola National Forest to the Ocala National Forest in Florida. All of the transplanted birds were successful in pair bonding. Since most of the transplants were made late in the year, they could not be evaluated to determine whether breeding had occurred. However, the Oconee National Forest transfer was earlier in the year and those birds attempted to breed during the nesting season. All of these transplants have prevented colony abandonments, and have the potential to increase the number of red-cockaded woodpecker breeding colonies and enhance genetic diversity.

Robert Brannon, an officer of the Mississippi Department of Wildlife, Fisheries and Parks, recently arrested two

individuals for possession of 11 gopher tortoises (*Gopherus polyphemus*). The tortoises were taken from the DeSoto National Forest in Green County, Mississippi, where the species is protected both under Federal law as a Threatened species and under State law. The two men were prosecuted in Green County Justice Court, convicted, and fined \$1,200 each under the Mississippi Endangered Species Act.

During the Great Depression, the gopher tortoise was a significant food item for some people in the southeast, as reflected in its nickname—the "Hoover Chicken." Taking gopher tortoises from their burrows by "pulling" (use of a long flexible rod) remains a tradition in many rural areas throughout the species' range. The gopher tortoise is often unable to overcome the effects of even limited taking because of its low reproductive rate, the naturally high mortality of eggs and young, and the length of time required to reach sexual maturity. The fact that many gopher tortoise populations are in degraded habitats may further exacerbate the effects of taking.

Region 5—Eight of the 10 known sandplain gerardia (*Agalinis acuta*) populations in Massachusetts, Rhode Island, New York, and Maryland apparently grew from 1988 to 1989. Four of the populations were at 6-year highs, and three others had their second-best year since 1984. The two Massachusetts populations numbered 314 and 45 plants, which were the highest recorded counts for these sites. The Rhode Island site, which was discovered in October 1988, had 40 plants.

Although 1989 apparently was a good year for this Endangered plant, no new sites were discovered in spite of intensive searching. Also, one population on Long Island, New York, experienced a major decrease (from 266 plants in 1988 to 6 in 1989) when it was inadvertently covered with about 18 inches (46 centimeters) of 1-inch (2.5-cm) stone for about a week in April. The stones were placed along a railroad right-of-way to prevent the growth of weeds. However, the fact that six plants flowered and formed fruit was deemed encouraging for the future of the site. The completion of a recovery plan in November 1989 should help to prevent incidents like this in the future.

Region 6—The Cabinet/Yaak Grizzly Bear Management Citizens Involvement Group has endorsed the plan to augment the declining grizzly bear (*Ursus arctos*) population in the Cabinet Wilderness Area in northwestern Montana. The plan, which calls for the relocation of two wild grizzly bears from British Columbia, Canada, into the Montana wilderness area, was halted 2 years ago due to concerns about the effect of the relocation on the local economy and fears about public safety. With the aid of a pamphlet and slide show, the citizens involvement group was able to inform local citizens about grizzly bear

management and satisfy concerns regarding the augmentation proposal. Relocation of the bears is scheduled to occur in the summer of 1990.

Fall of 1989 marked the twenty-ninth whooping crane (*Grus americana*) migration monitored by the Cooperative Whooping Crane Tracking Project. The Service's Grand Island, Nebraska, Field Office is responsible for collecting data on the location of whooping cranes during migration. The first confirmed observations of migrant whooping cranes were recorded September 2 in Canada and September 17 in the United States. Sightings during the fall migration were reported from: Canada (37), North Dakota (4), Montana (1), South Dakota (2), Nebraska (5), Kansas (3), Oklahoma (2), and Texas (2). As of December 13, 1989, 146 whooping cranes were reported at Aransas National Wildlife Health Refuge in Texas.

A new livestock enclosure fence was erected this summer by the U.S. Forest Service around the Kendall Warm Springs, located along the upper Green River north of Pinedale, Wyoming. The springs are the only remaining habitat of the Kendall Warm Springs dace (*Rhinichthys osculus thermalis*), an Endangered fish. An old, dilapidated fence had been allowing livestock to reach the springs, thus reducing the water quality.

Region 8—During the final week of the deer-hunting season in Minnesota, four radio-collared gray wolves (*Canis lupus*) were shot in Superior National Forest. One of the animals had been studied since 1981. The Service's Division of Law Enforcement is investigating the incidents. Publicity from the cases led private individuals to offer a reward of \$3,000 for information leading to the first conviction of the wolf killers.

The Service's National Wildlife Health Research Center in Madison, Wisconsin, performed a necropsy examination of the juvenile red wolf (*Canis rufus*) that was killed by a car last November on Alligator River National Wildlife Refuge, North Carolina (see BULLETIN Vol. XIV, Nos. 11-12). The examination found that this wolf had a wide variety of parasites, including numerous heartworms (*Dirofilaria immitis*). Heartworm is a slowly progressive, frequently fatal infection transmitted by mosquitoes. This could be of particular concern in terms of the health of the other red wolves on the refuge.

The Service's National Fisheries Research Center at Gainesville, Florida, is conducting basic ecological research on the Endangered boulder darter (*Etheostoma [Nothonotus] sp.*), found in south-central Tennessee, and the Endangered Okaloosa darter (*Etheostoma okaloosae*), found in Florida's western

(continued on page 12)

Expanding the Range of The Endangered Species Technical Bulletin

In 1981, cuts in the U.S. Fish & Wildlife Service budget forced the Office of Endangered Species to limit distribution of the Endangered Species Technical Bulletin. Prior to the cutbacks the bulletin was sent free of charge to anyone who wished to receive it. Since 1981, however, the Service has been able to distribute the bulletin to only federal and state agencies and official contacts of the Endangered Species Program.

The Endangered Species Update fills the gap left by this budget crunch. Published by the School of Natural Resources at The University of Michigan, the Update is part of a reprint program initiated in 1983. Since its inception, the program has established itself as an important forum for information exchange on endangered species issues. In addition to providing a reprint of the latest issue of the ESTB, the Update includes:

A Feature Article - concerning research, management activities, and policy issues for endangered species protection. (Upcoming topics include the Alaskan oil spill and the EPA's proposed endangered species and pesticides program.)

A Book Review - covering a recent publication in the field of species conservation.

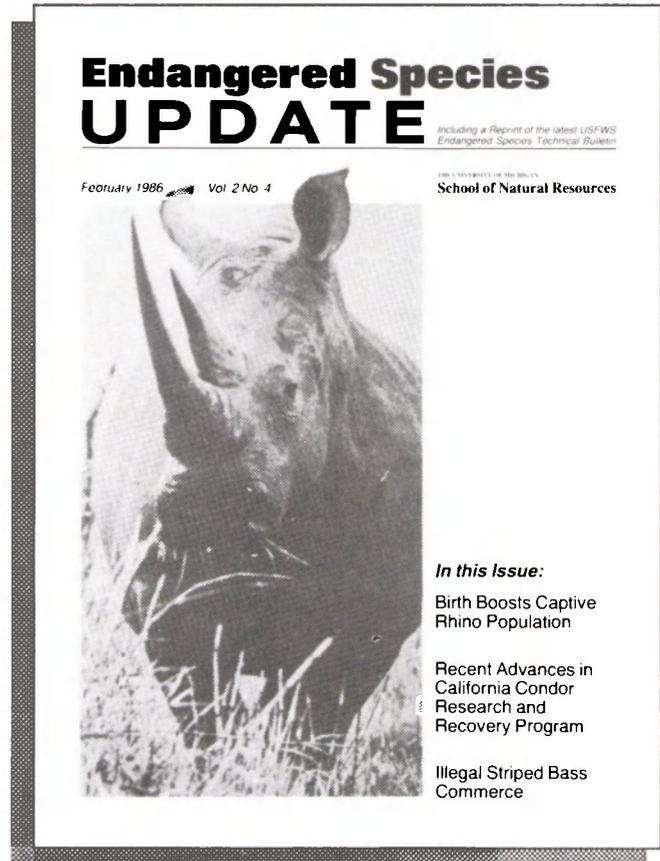
Opinion Page - containing editorials and essays about endangered species protection issues.

Bulletin Board - listing upcoming meetings, current announcements, and news items.

NEW RATES

From its inception, the UPDATE has been subsidized by the School of Natural Resources. Unfortunately, due to rising publication costs, the School can no longer afford to supply this support. Thus revenues from the UPDATE must now cover all printing and postage costs. Consequently, as of December 1, 1989, subscription rates for the UPDATE were increased. The new rates are \$18 for students and senior citizens, and \$23 for others (add \$5 for postage outside the US).

While we regret the increase, it is necessary in order to keep this unique source of information available to all of those working in species conservation. Obviously, we will need your support to make this happen. If you know of anyone who might be interested in receiving the Endangered Species UPDATE, please pass on the subscription information. Every subscription is vitally important to the continued operation and improvement of the reprint program.



To receive the UPDATE (approximately 10 issues/year), the rates are \$18 for students & senior citizens (please enclose advisor's signature or proof of age), and \$23 for others. (Add \$5 for postage outside of the US.) Send check or money order (payable to The University of Michigan) to: The Endangered Species UPDATE
School of Natural Resources
The University of Michigan
Ann Arbor, MI 48109-1115

Name _____

Organization _____

Address _____

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Regional News

(continued from page 10)

panhandle. The research on the boulder darter involves spawning behavior and habitat requirements. The Okaloosa darter research is focusing on the biological interaction of the species with the introduced and ecologically similar brown darter (*Etheostoma edwini*). The study shows that the pattern of displacement by the brown darter, first detected in the 1970's, is continuing. This displacement is the most significant form of habitat degradation for the Okaloosa darter.

The Gainesville Center, in cooperation with the Service's field offices in Panama City and Jacksonville, Florida, and Asheville, North Carolina, also is studying the distribution and status of two Category 2 fishes, the bighead redhorse (*Moxostoma* sp.) and Cherokee darter (*Etheostoma [Ulocentra]* sp.).

Rare Lichens Project

A project to determine the status of the lichens of Hawaii and North America (north of Mexico) was begun recently by Mason E. Hale, Jr., and Sherry K. Pittam of the Department of Botany, Smithsonian Institution, in cooperation with The Nature Conservancy. The goal is to generate a list of lichens that are rare and in need of protection. When possible, potential threats to individual species, as well as factors such as geographic distribution and abundance, will be noted. Taxonomy will follow Egan's checklist (as revised). The information gained will be provided to the Conservancy, other conservation organizations, and land-management agencies.

Interested persons are invited to provide names of potentially rare or endangered species of lichens, with available supporting information, to Sherry K. Pittam, Rare Lichens Project, Smithsonian, Botany/NHB 166, Washington, D.C. 20560 (telephone 202/357-2545).

BOX SCORE LISTINGS AND RECOVERY PLANS

Category	ENDANGERED			THREATENED			SPECIES TOTAL	SPECIES WITH PLANS
	U.S. Only	U.S. & Foreign	Foreign Only	U.S. Only	U.S. & Foreign	Foreign Only		
Mammals	32	19	241	6	2	23	323	25
Birds	60	15	145	7	3	0	230	59
Reptiles	9	7	59	13	4	14	106	23
Amphibians	6	0	8	4	1	0	19	5
Fishes	49	2	11	25	6	0	93	47
Snails	3	0	1	6	0	0	10	7
Clams	34	0	2	0	0	0	36	23
Crustaceans	8	0	0	1	0	0	9	4
Insects	10	1	1	7	0	0	19	12
Arachnids	3	0	0	0	0	0	3	0
Plants	163	6	1	46	7	2	225	102
TOTAL	377	50	469	115	23	39	1073*	307**

Total U.S. Endangered **427**

Total U.S. Threatened **138**

Total U.S. Listed **565**

Recovery Plans approved: 256

*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.

**More than one species are covered by some recovery plans, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

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

March 1, 1990

January 1990

Vol. XV No. 1

ENDANGERED SPECIES

Technical Bulletin

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

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