



ENDANGERED SPECIES TECHNICAL BULLETIN

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

COMMITTEE EXEMPTS GRAYROCKS; DENIES EXEMPTION FOR TELLICO DAM

In the first session of its kind, the newly created Endangered Species Committee met on January 23 and voted to deny an exemption for TVA's nearly completed Tellico dam while conditionally exempting the Grayrocks project from compliance with Section 7 of the Endangered Species Act.

Established through recent amendments to the 1973 Act (see October 1978 BULLETIN), the cabinet-level Committee was directed to consider exempting the two projects, thereby ruling on the fate of the Endangered species with which they conflict.

As defined by the new law, Interior Secretary Andrus serves as Committee chairman, with five additional voting (permanent) members and one collective vote cast by the State representative(s) for the affected States(s). Agriculture Secretary Bergland, Army Secretary Alexander, Council of Eco-

nomic Advisors Chairman Schultze, Environmental Protection Agency Administrator Costle, and National Oceanic and Atmospheric Administration Administrator Frank attended the meeting along with Secretary Andrus, all voting in person as required by the amendments. Wyoming's Governor Ed Herschler and Nebraska's Assistant State Attorney General, Paul Snyder, shared the vote on Grayrocks, while William R. Willis, Jr., voted for Tennessee on the Tellico exemption.

As expressly mandated by the 1978 amendments, Committee members were to exempt the Tellico and Grayrocks projects only if they determine that (1) there are no reasonable and prudent alternatives to the projects and (2) the benefits of the projects clearly outweigh the benefits of alternative courses of action consistent with conserving the affected species

or their Critical Habitats, *and* the projects are in the public interest.

In the case of the Tellico project, the unanimous decision by the Committee essentially stops completion of the dam and reservoir, which would have impounded the Critical Habitat of the snail darter (*Percina tanasi*) along the Little Tennessee River. In motioning for a Committee vote denying exemption for the dam, Charles Schultze questioned the cost-effectiveness of the Tellico project, saying "the costs clearly outweigh the benefits. It would be difficult to say there are no reasonable and prudent alternatives to this project," Schultze added.

A December 1978 TVA report puts forth two alternatives: (1) developing the reservoir and (2) removing part of the dam and developing the river. In its "Views and Recommendations," In-

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Secretary Andrus (center) chaired the first session of the cabinet-level Endangered Species Committee on January 23.

Endangered Species Covered

One day soon, you may call your "county agent" for advice on spraying fruit trees, and at the same time learn about Endangered species you could find in your own back yard.

This kind of information will be made available through the cooperative efforts of three Federal agencies—our Service, the Department of Agriculture's Federal Extension Service (FES), and the Commerce Department's National Oceanic & Atmospheric Administration (NOAA)—that in 1977 agreed to join hands to boost our

national extension education capability. Taking full advantage of a tried and proven administrative machinery and delivery system, the Fish and Wildlife Service is now exchanging information on endangered species, animal damage control, and other fish and wildlife topics using the same network that has for over 50 years brought agricultural tips to farmers and, more recently, reached the many users of the Nation's marine resources.

Becoming fully operational this past May, the Service's Office of Extension

Education has already forwarded more than 200 special mailings of bulletins, news releases, and other publications to NOAA's Sea Grant Program and the Federal Extension Service for distribution by State and county extension co-operators. But maintaining a cooperative national system of fish and wildlife education is only part of its mission, as the Office also strives to (1) advise FES and Sea Grant's Marine Advisory Service of fish and wildlife programs appropriate for extension education and (2) encourage the design, development, and support of such programs and related educational materials in our own Service.

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A Growing Network

The extension education concept arose from the needs of farmers for information on scientific agricultural knowledge and methods in the early 1900's. Enacted in 1914, the Smith-Lever Act created the Federal Extension Service as a cooperative educational program oriented toward the rural citizen, involving professional staff at the Federal, State, and local level. Administered by the Department of Agriculture, the Act also provided for Federal matching fund assistance to the States and initiated cooperation at local levels through a network of county agents and workers. As a result, extension became an important foundation of the agriculture industry, and has played a role in the success of modern agriculture in the U.S.

The Federal Extension Service addresses four program areas: (1) agriculture, forestry, and natural resources; (2) community resource development; (3) home economics; and (4) 4-H youth. Knowledge from expert sources in these areas is made available to the public through county agents as well as the State extension service, an off-campus arm of Land Grant universities generally associated with the State agricultural experiment station and with university research and resident teaching. Not only is the public reached through informational and educational materials and programs, but State extension offices have special radio-television-press facilities,

Through Extension Education

staffed with communications professionals to reach the public en masse.

In 1976, the entire cooperative extension system was financed at nearly \$500 million, with over \$300 million coming from State and local sources. More than 12,000 county agents and workers are now employed to carry out the program, with 4,500 staffers working at Land Grant universities and 200 positions at the Federal level.

Under separate authority, the Marine Advisory Service—a branch of NOAA's Sea Grant Program—was initiated in 1966 primarily to channel educational materials (and technical advice) to individuals involved in marine-related commercial activities. The Advisory Service has its own specialists at the Federal level, and funds advisory personnel at Sea Grant universities throughout the country under a plan similar to that accomplished under Agriculture. About 250 Sea Grant advisors and county "agents in hip boots" are employed in educational/advisory programs, distributing

"It's easy to understand our enthusiasm, when you realize we can now tap into a multi-million dollar communications network that reaches people in every county in the Nation."

information on everything from gill netting to fish cookery.

Through our recent agreements with Agriculture and Commerce, materials on an endless array of fish and wildlife management topics can now be shunted through these established extension and marine advisory networks, where they will be readily accessible to the interested public.

Dan Stiles, acting chief of our Service's Extension Education Office, believes "it's easy to understand our enthusiasm, when you realize we can now tap into a multi-million dollar communications network that reaches people in every county in the Nation. Good natural resource-oriented educational information we offer USDA's machine can be effortlessly magnified a thousand fold and delivered to the people." Stiles also sees the system

as "reversible," in that we can also be alerted to natural resource problems anywhere in the country in a very short time, enabling a quicker response to local needs.

Nearly all the credit for our Service's recent involvement in extension education goes to Jack H. Berryman, chief of the Service's Office of Extension Education until December 1978 (when he retired from the Service to serve as Executive Vice President of the International Assn. of Fish and Wildlife Agencies). Berryman has long recognized the need for a closer working relationship between wildlife managers and the concerned public, and believes that extension education may help bridge the gap, thus furthering the goals of the Endangered Species Program. Informative materials developed by the Service (as well as workshops and short courses sponsored cooperatively through Land Grant and Sea Grant universities) on Endangered species legislation, implementing regulations, misunderstood terms such as "Critical Habitat," and on the listed species themselves—when made available to local citizens—can promote a better understanding and support for conservation efforts. "For this reason," Berryman explains, "extension education considerations should be included in all recovery planning for Endangered and Threatened species."

State Agreements/Projects

The entire extension system now aims to serve all people, with services in the 50 States, Puerto Rico, Guam, the Virgin Islands, and the District of Columbia. Regional endangered species specialists are reviewing existing agreements with Land Grant and Sea Grant universities and State Extension Service personnel in an effort to negotiate "updated" versions, so that fish and wildlife extension education may be provided throughout the network. Memoranda of understanding on extension education have been signed with 24 States and one territory thus far, and others are in various stages of negotiation.

Cooperative States are already at

work on five Endangered species projects under the Service's Extension Education Program:

- The Massachusetts Division of Fish and Wildlife has drafted a brochure on the Plymouth red-bellied turtle (*Chrysemys rubriventris bangsi*) which the Service will print and distribute through the extension education network, once the turtle is listed.

- New York State Cooperative Extension at Cornell University is preparing educational materials on the indiscriminate shooting of bald eagles, peregrine falcons, and other raptors in hopes of reducing raptor shooting losses.

- The Florida Cooperative Extension Service is developing a publication on the State's endangered plants. The extension service will also distribute the volume, scheduled for completion in September 1979.

- The Colorado Extension Service plans to prepare, print, and distribute a publication on the endangered, threatened, and rare fishes of the Upper Colorado River Basin, to be directed toward water user groups, agricultural interests, and energy development interests.

- An information package on the endangered species of South Dakota is in preparation by the South Dakota Cooperative Extension Service.

Also under consideration is the development of publications on Idaho's endangered plants and on the whooping crane (*Grus americana*) in Idaho, on Washington's endangered plants, and on salt marsh values for California's endangered species, all to be prepared and distributed through the Cooperative Extension Service.

Passage of the Renewable Resources Extension Act of 1978 on June 30 has reaffirmed Congressional support for an effective extension education system. The legislation authorizes the appropriation of \$15 million annually for 10 years, and includes fish and wildlife as a full partner (with other renewable resources) within the Federal extension network. Although appropriations have not yet been made under the Act, we remain hopeful that this shot in the arm may also boost Endangered species conservation—through more and better education.

Puerto Rican Parrot On the Upswing

At the close of its eleventh year, the results of this season's Puerto Rican parrot research program have given biologists renewed hope that this critically Endangered species may yet recover. Tallies from the Service's Puerto Rico Field Station reveal increases in the wild population of Puerto Rican parrots from 19 in 1977 to as many as 28 birds in 1978, with the fledging of a record 9 chicks—evidence that the tireless, innovative efforts of Fish and Wildlife Service and U.S. Forest Service workers may finally be paying off.

Inhabiting the island's Luquillo Mountains within the Caribbean National Forest, the Puerto Rican parrot (*Amazona vittata*) population reached a low point of just 13 birds in 1975. (The species has been threatened by habitat and nest destruction (the latter by honey harvesters, who rob empty cavities often occupied by bees), taking as pets, parasitism, predation, and shooting.) Although its numbers have been building since that time, they have until this year consisted mainly of immature and non-breeding birds, with the number of breeders actually declining to only 3 pairs during 1976 and 1977. For James W. Wiley, wildlife biologist in charge of the Service's parrot research program in Puerto Rico, the year's most significant event was the increase in the wild to four breeding parrot pairs, all of which laid eggs (the new pair adopting a nest site it had been inspecting in 1977). Additional pairs were observed inspecting nesting areas during 1978, and may also settle down to breed during the next couple of years.

Initiated by Dr. Frank H. Wadsworth of the Forest Service's Institute of Tropical Forestry, research on the Puerto Rican parrot was at first funded by both the World Wildlife Fund and the Forest Service, with a Fish and Wildlife Service biologist assigned to the station (at first Cam Kepler, followed by Noel Snyder in 1972, and then Wiley). The Fish and Wildlife Service now oversees all research efforts on behalf of the parrot, while the Forest Service provides the Puerto Rico station aviary, building maintenance, logistical support, and a staff of experienced biologists.

Help for Mother Nature

Under the watchful eyes of Wiley and Forest Service biologists, three of the nesting pairs (including the new pair) were successful in fledging young: one nest fledged two, one fledged three, and one fledged four. (Eleven of the 14 eggs laid in the wild hatched.)

Without emergency treatment, one brood probably would not have fledged at all, as their feathers became thoroughly matted with a gooey muck that accumulated on the inner surface of their nest when it sprung a leak late in the season. After several crash landings upon fledging attempts, field staffers discovered the goo at the bottom of the nest hollow, and rushed the birds to the aviary for a toothbrush scrubbing and "blow dry" in the brooder. The three chicks were then slipped back into their home cavity (which had been cleaned and lined to prevent further accumulations), and two soon managed to fly from their nest in the company of parent birds. But the third again plummeted from the nest in its airborne attempts, with feathers too damaged to carry its weight. After a complete transplant of the chick's tail and flight feathers (grafting in feathers molted by captive

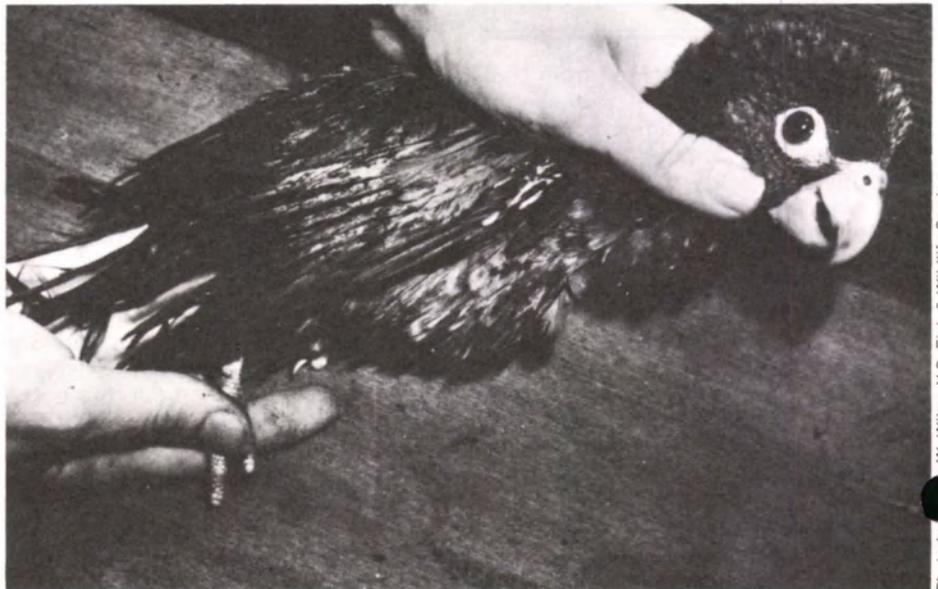
parrots), the bird maneuvered a 30-meter flight in its first try.

One of the four wild nests failed during the incubation stage. The female parrot laid three eggs—two that were broken in the nest, and a "runt" egg. All were taken into the aviary for artificial incubation, and dummy eggs were substituted in the wild nest. The first egg had been badly crushed, and the embryo soon died from moisture loss. The other broken egg was repaired and hatched, and the chick was fostered into another active nest as its own had been deserted by the adult pair. (It fledged successfully with its foster siblings.) While the pair did lay a second clutch, they again left their nest unattended, and the embryos perished during the overnight chill. (Wiley cites this as the second documented case of Puerto Rican parrots laying replacement clutches, suggesting that double clutching may prove useful as a management tool in the future.)

The Thrasher Problem

This year, all wild breeding parrots were also helped along in their nesting efforts with artificial and improved natural sites, which proved completely effective in preventing nest predation by pearly-eyed thrashers (*Margarops fuscatus*). In previous years, thrasher predation was regarded as the major cause of egg and chick losses.

The U.S. Forest Service (responsible for the area inhabited by Puerto Rican parrots) has boosted nest enhancement efforts by providing five polyvinyl chloride nest boxes this past year, constructed according to designs developed by project biologists. To discourage entry by the thrashers, existing nest hollows were also deepened and reinforced, increasing the number



Puerto Rican parrot chick with feathers matted from muck in its nesting hollow.

of suitable nesting sites for the wild parrots. Some were modified with baffles and angles, making the parrot eggs more difficult to spot by the predators.

Nest boxes especially designed for thrashers were also placed within 6-20 meters of active parrot nests to lure the robbers away from parrot cavities and decrease interactions between the two species. Using the provided box, the territorially resident thrasher effectively defends the parrot nests as well as its own against other thrasher pairs that might otherwise prey on the contents of the parrot cavity. These innovations were apparently successful, as none of the parrot nests was seriously threatened by the predators during the 1977 and 1978 breeding season.

The thrashers were also used this year as "guinea pigs" in an attempt to develop techniques for the control of warble fly (*Philornis pici*) parasitism on parrot chicks. (Thrashers were selected as they are generally heavily infested by warble fly larvae and also nest in cavities like the parrots.) Ex-

perimental use of two pesticides, Pyrethrin and Dermatron, in a number of thrasher nests was shown to be effective, with treated chicks having higher survival and fledgling rates. (None of the untreated, larvae-infested thrasher chicks survived, while Pyrethrin-treated nests were found 100 percent more successful and Dermatron-treated broods showed a 63 percent higher rate of survival.)

One of the three parrot nests with chicks was parasitized twice during the year by warble flies, but neither infection resulted in chick debilitation.

Success with Captives

Also this year, fertile eggs were produced for the first time by a captive Puerto Rican parrot pair. In an attempt to insure hatching and proper care of the eggs, all were removed from the nest (with dummy eggs substituted), and placed in the aviary incubator, where three appeared to be developing normally. Unfortunately, two of the embryos died just prior to hatching, and a third got to the "pip-

ping" stage but died just after the first effort to peck out of its shell. (The fourth egg was infertile.) The productive female sat on the dummy eggs for about 33 days before abandoning the nest.

A total of 15 Puerto Rican parrots are now housed at the Puerto Rico Field Station aviary for use in the captive breeding program. (In September 1977, the two parrots kept at the Service's Patuxent Wildlife Research Center in Maryland were transferred to Puerto Rico, and one additional nestling parrot from a wild nesting pair was taken into captivity this year when the adults failed to feed it.)

One of the most frustrating problems for researchers dealing with the captive flock has been sex determination, as the Puerto Rican parrot is monomorphic. Karyotype and nuclear density techniques have been tried in the past, but results proved inconclusive. In December 1977, research biologists Nancy Czekala and Arden Bercovitz from San Diego Zoo began analyzing steroids in the fecal samples of captive parrots with excellent results. (Findings for nearly all birds over one year old agreed with known sexes of the aviary parrots.) In 1978, the team continued its attempts to identify sexes of the younger birds, for which intermediate estrogen-testosterone values had been obtained earlier. Their results revealed a biased captive sex ratio of nine females to four males (with the sexes of two of the young captives remaining undetermined). Subsequent to their initial sexing, the captive birds were separated into three heterosexual pairs, with the positive reproductive results discussed earlier. (Mistaken matching in parrots can result in the development of strong homosexual bonds, making later re-pairings difficult.)

Field station staffers also received training during February in artificial insemination techniques from Dr. George Gee, research physiologist at Patuxent. It is hoped that the productivity of captives may be increased by distributing semen from the four males among the nine females (including the five "spinsters").

During the coming year, Wiley and his assistants will study the parrot's food habits, as well as limiting factors within the rain forest. Possible release sites for the introduction of a second Puerto Rican parrot population (in case of the spread of disease) will also be investigated.

Fish and Wildlife and Forest Service biologists are now at work on a comprehensive manuscript on Puerto Rican parrot biology (to include management recommendations), which will be drafted by Spring.



Photo by James W. Wiley, U.S. Fish & Wildlife Service

Its feathers replaced by molted feathers of captive birds, the chick successfully fledged.

Committee Exempts Grayrocks; Denies Exemption For Tellico Dam

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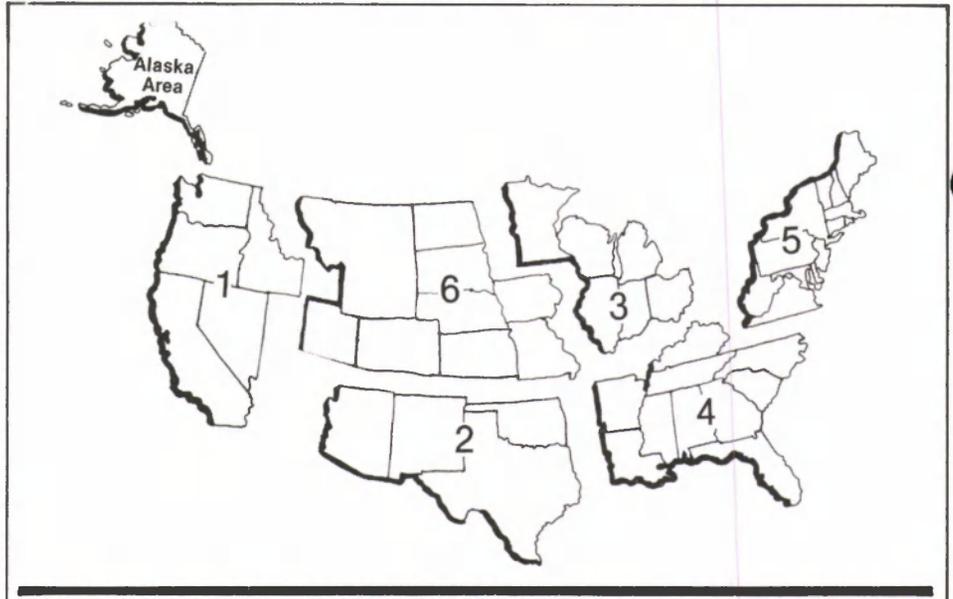
terior officials suggested postponement of the Tellico dam as one alternative and liquidation of landholdings as another. (Both of these options would likely be subsumed under the more general alternative of river development.) As reasoned in the Staff Report to the Committee, it appears that river development—which would maintain the Critical Habitat of the snail darter—is TVA's most feasible and economic alternative to the Tellico project. (Also, partial removal of the earthen dam structure, which now prevents migration of the darters, will allow the yearling fish to move upstream to spawning areas.)

In their unanimous exemption of the Grayrocks Dam and Reservoir Project, Committee members specified the adoption of mitigation and enhancement measures consistent with the provisions of an out-of-court agreement (see December 1978 BULLETIN) to insure maintenance of the Critical Habitat of the whooping crane (*grus americana*). The December 1978 agreement—recommended by Grayrocks' sponsor, the Missouri Basin Electric Power Cooperative, and supported by the National Wildlife Federation, State of Nebraska, and National Audubon Society (as plaintiffs) as well as the Rural Electrification Administration (REA) and Army Corps of Engineers (defendants)—provides for the following:

- The maximum annual water use by the Grayrocks project will be limited to 23,250 acre-feet/year.
- The project agrees to certain releases of water during various periods of the year.
- The project will replace up to 11,250 acre-feet (subject to certain adjustments) withdrawn by the Corn Creek Irrigation District.
- The project will establish a trust fund of \$7.5 million for the maintenance and enhancement of the cranes' Critical Habitat.

The mitigation and enhancement measures (required upon the exemption of any project from compliance with Section 7 of the Act) will serve to partially compensate for the impacts of water depletion anticipated on completion of Grayrocks, thereby providing for some maintenance of the crane's essential stopover points along the Platte River.

The Committee expects to issue its decisions in writing prior to the February 7 exemption deadline.



REGIONAL BRIEFS

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

Region 1: Bald eagles (*Haliaeetus leucocephalus*) began returning to the Bear Valley roost near Klamath Falls in October with increasing numbers noted during the latter part of the reporting period. Counts are now being made of the eagles in the three roost areas.

Approximately 1,200 Aleutian Canada geese (*Branta canadensis leucopareia*) have been recorded in the Faith-Mapes Ranch area of the San Joaquin Valley. Thirteen of the blue neck-collared guidebirds from the Agattu Island release have been recorded (see Regional Briefs in October 1978 BULLETIN), but to date none of the propagated Aleutians from the Agattu release have been sighted on the California wintering grounds.

Realty appraisals were received on five tracts of land inhabited by the blunt-nosed leopard lizard (*Crotaphytus silus*) in California. (One owner of 80 acres had planned to level his tract for irrigation in January, and the region was to attempt purchase prior to that time.)

A meeting was attended in Honolulu by Hawaii State Fish and Game, National Marine Fisheries Service, and Fish and Wildlife Service agents to discuss overlapping State and Federal sea turtle regulations and related enforcement problems.

The Sacramento Area Office is compiling and annotating a series of topographic maps of California and Nevada showing current distributional information on Endangered and Threatened animal and plant species in the area.

Region 2: Regional staffers met with representatives from Arizona Game and Fish, U.S. Forest Service, Bureau of Land Management, and the Navajo Nation to finalize plans for completion of a survey of Arizona's nesting peregrine falcon (*Falco peregrinus anatum*) population.

Region 3: Coincident with the annual Midwest Fish and Wildlife Conference in Columbus, Ohio, State endangered species coordinators for the Great Lakes States met to discuss future planning. Participants from private industry, as well as representatives from Region 4 and 6 and other Federal agencies, attended the session.)

Region 5: On December 21, the Boston Regional Director issued a biological opinion to the Environmental Protection Agency on the proposed Pittston Oil Refinery and Marine Terminal. The consultation involved two Endangered species, the Arctic peregrine falcon (*Falco peregrinus tundrius*) and the bald eagle. Region 5 found that impacts of the project on the falcon were expected to be negligible, but that the operation of the refinery (and the likelihood of debilitating oil spills) would likely jeopardize the continued existence of the eagle. (Two alternative construction sites were suggested in the opinion: Portland, Maine, and Penobscot Bay, Maine.)

Pittston submitted an application for exemption from compliance with Section 7 of the Endangered Species Act to the Secretary of the Interior on January 26—the first received since exemption consideration was allowed under the 1978 amendments to the Act. (Details on the Pittston opinion will be provided in the February 1978 BULLETIN.)

STATE REPORT

WISCONSIN UPS ITS PROTECTION OF NATIVE ANIMALS AND PLANTS



**Department of
Natural Resources**

A pioneer in endangered species conservation, Wisconsin has recognized the importance of protecting its declining wildlife since 1971, when it undertook a review of its native nongame animals. The Wisconsin Legislature passed the State's Endangered Species Act in 1972, calling for the development of a list of endangered wildlife and mandating protection of State listed species as well as those on the Federal list.

A State endangered species program soon began to take shape to implement the new law, and an eight-member Endangered Species Committee was established to coordinate program efforts in their infancy.

In March 1978, former Wisconsin Governor Martin Schreiber asked that greater attention be given nongame and endangered species. Wisconsin's Natural Resources Board endorsed this proposal, instituting the Office of Nongame and Endangered Species expressly to coordinate and administer the program in the Department of Natural Resources. In May, the State Legislature acted to further strengthen and extend the State's authority for jeopardized and other nongame species by providing for the protection of a "threatened" category of animals as well as both endangered and threatened plants.

Program Mission/Philosophy

Wisconsin's endangered species program is now becoming more formalized under the direction of James B. Hale, a wildlife researcher who has served on the State's Endangered Species Committee since its formation. Assisted by a research biologist, com-

munications specialist, and administrative assistant, Hale explains that his real function is to develop and coordinate conservation programs for endangered and threatened species with the assistance of other bureaus under the Department's Division of Resource Management and DNR field staff.

Wisconsin's Endangered Species Committee (formerly active in administering the State program) now serves in a scientific advisory capacity to the Office of Endangered and Nongame Species. Chaired by Dr. Ruth L. Hine, the Committee provides expertise in different areas of specialization to insure the soundness of proposed research and listing activities and otherwise assists in the gathering of biological data on the State's animals and plants.

Wisconsin's Endangered Species Program was created in the hope of not only determining the status and distribution of endangered and nongame species, but also to direct the restoration and management of habitat to benefit endemic species, to preserve natural areas, and to reintroduce declining or extirpated native species to the State.

Becoming operative this past October, the separate Office of Endangered and Nongame Species was established with a view toward applying the "ecosystem approach" in the conservation of endangered species. Its goal is to maintain populations of all native animals and plants, not only for their scientific and aesthetic value, but also for their own intrinsic worth in nature's scheme. The program was founded on the principle that knowledge of the changes in the distribution and abun-

dance of native species will serve to identify those areas where the life support system has been damaged and, at the same time, to guide the attitudes and actions of public and private interests toward better managing the total ecosystem. This concept is especially paramount in the administration of Wisconsin's program—that the State is working for the benefit of the whole biotic system, not just individual species.

To meet program objectives, Hale's office operates on an annual State budget of \$91,500, more than half of which is derived from the general revenue, with the remaining \$45,000 coming from hunting, fishing, and trapping licenses. District field staff time (or its equivalent worth) is then applied as part of the State's one-third matching fund share, enabling Wisconsin to receive greater Federal Endangered Species grant-in-aid assistance to boost program efforts. (For Fiscal Year 1979, Wisconsin is slated to receive \$175,300 in Federal matching funds.)

Species Lists

In line with the program's newly mandated responsibility for threatened species, Hale's office has proposed candidates for a State threatened species list as well as revisions to its present list of endangered species. The Natural Resources Board recently approved the office's recommendations for public hearings on the proposed list. (The public hearing on the posed list. (A hearing on the proposal is scheduled for 9:00 a.m. on March 16 at the State DNR building in Madison.)

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Currently, Wisconsin protects the following 19 species of animals as endangered:

- Pine marten (*Martes americana*)
- Canada lynx (*Lynx canadensis*)
- Timber wolf (*Canis lupus*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Osprey (*Pandion haliaetus*)
- Double-crested cormorant (*Phalacrocorax auritus*)
- Peregrine falcon (*Falco peregrinus*)
- Ornate box turtle (*Terrapene ornata*)
- Wood turtle (*Clemmys insculpta*)
- Queen snake (*Regina septemvittata*)
- Massasauga rattlesnake (*Sistrurus catenatus*)
- Shortjaw cisco (*Coregonus zenithicus*)
- Longjaw cisco (*Coregonus alpenae*)
- Shortnose cisco (*Coregonus reighardi*)
- Kiyi (*Coregonus kiyi*)
- Ozark minnow (*Dionda nubila*)
- Pugnose shiner (*Notropis anogenus*)
- Greater redhorse (*Moxostoma valenciennesi*)
- Higgin's eye pearly mussel (*Lampsilis higginsii*)

Thirteen additional species of animals (among them the barn owl, *Tyto alba Pratincola*, piping plover, *Charadrius melodus*, common tern, *Sterna hirundo*, Forster's tern, *Sterna forsteri*, northern and western ribbon snakes, (*Thamnophis sauritus septentrionalis* and *T. proximus proximus*, respectively) are now proposed for the endangered category. All seven fishes now listed are being recommended for transfer from the endangered list to other categories. Two formerly endangered fishes have joined eight other species of fish to be recommended for the threatened category. Five birds, one snake, one turtle, and four amphibians are also included in the office's recommendation for threatened classification. For the first time, 41 plants are proposed for endangered listing, and 24 are proposed as threatened (including the federally-listed northern wild monkshood (*Ac-*

nitus noveboracense).

Ongoing and Past Mammal Work

Once extirpated from the State (in 1932) due to extensive lumbering and fur trapping, the fisher (*Martes pennanti*) is now considered Wisconsin's success story. In 1956 and 1960, a total of 86 fishers were restocked in the Nicolet National Forest, and another 60 were brought to the Chequamegon National Forest in 1966 and 1967. Today, the fisher has recovered to the point that it is being considered for placement on the State's "watch list" (advisory only), with encouraging reports from many areas across the north.

Similar reintroductions have been attempted with the endangered pine marten, but as yet with undetermined success. Pine martens apparently occurred in most of Wisconsin's wooded areas at one time, and were not uncommon in spruce and pine forests until the mid-1800's. Few martens were recorded after the trapping season was closed in 1921, with the last recorded specimen taken in Douglas County in 1925. High fur value, ease of trapping, and destruction of habitat were responsible for the decline. A total of 124 pine martens were reintroduced into the Nicolet National Forest between January 1975 and April 1976, and Wisconsin hopes to obtain 25 additional female martens this year from Ontario to increase the chances of restoring healthy populations to the State.

Although not endangered in Wisconsin, the river otter (*Lutra canadensis*) is the subject of a cooperative effort with the State of Colorado. In an attempt to restore the otter to Colorado, where it has been extirpated for 75 years, Wisconsin is to provide ten animals to Colorado each year for three years. (The first shipment was delivered in 1978.)

The Kirtland's Warbler: A Special Case

The future of the federally Endan-

gered Kirtland's warbler (*Dendroica kirtlandi*) is uncertain unless ways can be found to increase its dwindling population (estimated at around 200 singing males, with an unknown number of females).

In the summer of 1978, two male Kirtland's warblers were identified in the jack pine flats of central Wisconsin, representing the first ever observed in the U.S. outside of their traditional Michigan range during the nesting season. If the warblers return



to Wisconsin during 1979, the area will probably be managed to maintain the low-growth vegetation the birds prefer. Working in cooperation with Michigan endangered species specialists, Wisconsin personnel are exploring possibilities for cross-fostering Kirtland's warbler eggs or introducing female warblers into the jack pine area in hopes of initiating a Wisconsin

population.

Michigan has been actively involved in Kirtland's warbler management for years, in an attempt to increase the species' numbers in the State. In line with the Service's Kirtland's Warbler Recovery Plan, both Wisconsin and Michigan are cooperating in this year's effort to establish warbler nesting populations in suitable habitat outside of

Wisconsin specialists have introduced more than 100 pine martens to the Nicolet National Forest in an attempt to restore the species in the State.

the species' remaining range in Michigan. As a result, both States qualify for 75 percent Federal matching fund assistance for their coordinated survey and habitat management activities.

Shorebirds, Terns . . . and Ospreys

Relatively little is known about the abundance and distribution of shorebirds in Wisconsin, and the State's nesting tern populations are declining due to habitat loss.

Of the few shorebird species that nest in Wisconsin, the piping plover is of greatest concern because of increasing habitat deterioration and human disturbance, and the bird's sensitivity to environmental alterations. While two and possibly three pairs of piping plovers nested on the shore of Lake Superior in the summer of 1977, only one nest was occupied in 1978. This area is now being studied to determine what protection and/or management may benefit the plover.

Wisconsin's "inland shorebird," the upland sandpiper (*Bartramia longicauda*), has declined in past decades and is also threatened by habitat degradation. A survey of this bird, using recently developed census techniques, will soon be conducted.

The common and Forster's terns are also declining due to habitat loss. Although excellent data are available on common tern nesting sites along the Lake Superior shoreline and in the Green Bay area of Lake Michigan, additional information is needed on the remainder of the Lake Michigan shoreline (to be gained through this year's survey effort). A survey now underway is providing information on the occurrence of colonies and habitat requirements of the Forster's tern. (High water destroyed a large colony nesting in substandard habitat in Green Bay in the spring of 1978.) Preliminary work has begun on the construction of permanent floating platforms for use by nesting Forster's terns.

Information from a 1977 Wisconsin
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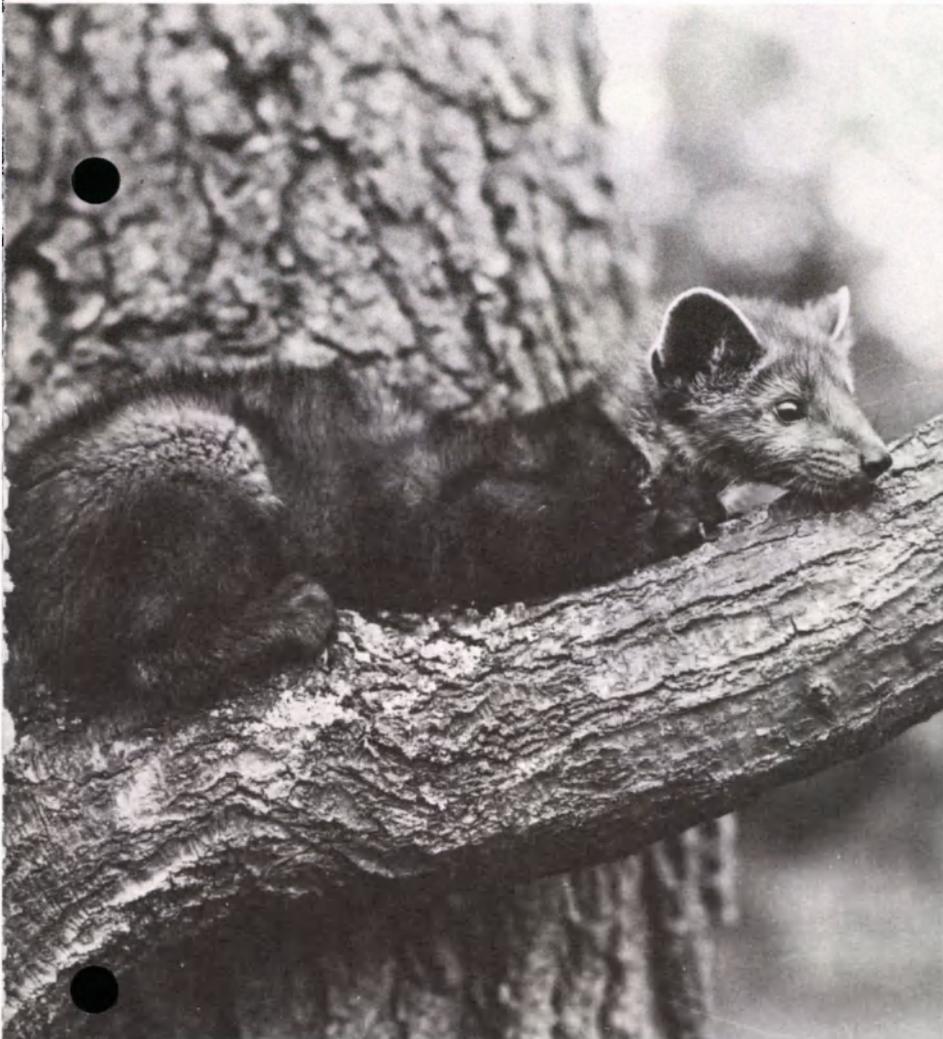


Photo courtesy of Wisconsin Dept. of Natural Resources

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Photo courtesy of Wisconsin Dept. of Natural Resources

Although the osprey remains on Wisconsin's endangered list, the species has been increasingly productive with the help of artificial nesting platforms.

survey showed a 17 percent decline in black terns (*Chlidonias niger*) since 1971. Inventories of nesting marshes are now underway in an effort to determine the current status of and threats to this species.

Wisconsin specialists have identified Hog's and Barker's Islands as ideal experimental management sites to develop and test habitat restoration techniques for potential use by nesting shorebirds and terns.

The osprey has been listed as endangered in Wisconsin since 1972. Ospreys once nested throughout the State, but are now limited to the heavily forested lake region of northern Wisconsin, central Wisconsin along the Wisconsin River, and rarely along the Mississippi River. Although down to .80 young per active territory (or less) from 1966-1974, osprey produc-

tion has increased to 1.20 young per active territory since 1975. In 1978, 129 osprey were produced in Wisconsin (more than double the number produced in 1973), making endangered species personnel even more optimistic about the potential success of their planned management efforts.

Ospreys continue to be threatened by pesticide contamination (causing eggshell thinning and reproductive failure), nest predation, human disturbance, direct loss from shooting and the destruction of nest trees, and the lack of suitable nesting habitat in the State. In hopes of boosting osprey populations to a level of stability in Wisconsin, program biologists are gathering population information through aerial surveys and improving and protecting existing osprey nesting sites. The increased use of manmade

nesting platforms has contributed to the bird's reproductive success in the past several years. In 1976, for example, production on artificial platforms averaged 1.86 young per active nest, significantly higher than production averages on natural sites.

Fishes

Seven species of fish are now included on Wisconsin's endangered list, but available information on their status is considered inadequate.

To rectify this situation, State specialists in 1977 embarked on a study of the distribution and abundance of Wisconsin fishes. Their preliminary findings have led them to recommend complete revision of the Wisconsin fish list. Species now listed as endangered are proposed for transfer to

PROTECTION AREAS TO BE AUTHORIZED FOR MANATEE

either the threatened, extirpated, or "watch list," while the gravel chub (*Hvbopsis x-punctata*), striped shiner (*Notroois chrvocephalus*), slender madtom (*Noturus exilis*), starhead topminnow (*Fundulus notti*), crystal darter (*Ammocrypta asprella*), gilt darter (*Percina evides*), and bluntnose darter (*Etheostoma chlorosomum*) are now recommended as endangered, and another 10 fish species (including two now listed as endangered) are proposed for the threatened list.

Under a separate project activity, Wisconsin specialists have also been attempting to determine the distribution, abundance, age, and species composition of the chub stock in Lake Superior. Four of the seven fishes now listed by Wisconsin are coregonids which—although formerly common in the deep water of Lake Superior—were drastically decreased as the result of overfishing, competition from alewives, and decimation by lampreys. Based on preliminary findings, both the longjaw and shortnose ciscos are now believed extirpated (and so have been proposed for transfer to this category). This study also aims to determine the impact of existing fisheries on these species to facilitate appropriate management recommendations on behalf of declining coregonids.

Molluscs

Although an inventory of the clams in large Wisconsin waters has been initiated, supplementary information is needed to round out the survey effort and determine the true status and distribution of Wisconsin molluscs. In addition to compiling a potential list of endangered and threatened clams and delineating their essential habitats, specialists will evaluate transplantation as a possible management technique (thus far never attempted with clams).

The Higgin's eye pearly mussel is now on the State and Federal endangered species list, and perhaps five additional Mississippi River clams are in need of protection. A completed survey of inland shallow waters and streams indicates that ten molluscs

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The Service has joined the State of Florida in proposing the establishment of protected areas especially for the Endangered manatee (F.R. 1/23/79).

Through these proposed regulations, the Service is seeking to provide the procedural means for establishing manatee protection areas, within which certain waterborne activities such as boating and swimming could be restricted to forestall disturbance of the marine mammals.

Protected under both the Endangered Species Act of 1973 and the Marine Mammal Protection Act of 1972, the West Indian manatee (*Trichechus manatus*) continues to decline in the State of Florida, where it is vulnerable to human activities and especially power boats—identified last year as the greatest cause of manatee mortality and injury.

The proposed regulations would authorize the Director to establish necessary protection areas within inland or coastal waters under U.S. jurisdiction, where boating and other human waterborne activities could be restricted (in "refuge" areas) or prohibited (within designated "sanctuaries").

The regulations would also prohibit persons from engaging in any waterborne activities prohibited by State laws or regulations promulgated for the protection of manatees. (Florida has recently proposed and held hearings on the establishment of 10 areas as manatee sanctuaries.)

Comments on the proposed regulations should be submitted to the Director (LE), U.S. Fish and Wildlife Service, P.O. Box 19183, Washington, D.C. 20036, no later than February 22, 1979.

SEA TURTLE MEAT SEIZED

Special agents of NOAA's National Marine Fisheries Service (NMFS) and the Fish and Wildlife Service have reported the seizure of 12,500 pounds of illegal sea turtle meat on December 22 from a cold-storage facility in east Los Angeles.

The meat is of Mexican origin, and it is believed that the importer may have been unaware of the sea turtles' protected status when the shipment was made. All sea turtles occurring in North American waters now receive protection under the Endangered Species Act of 1973 (with the recent addition of the green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), and loggerhead (*Caretta caretta*) to the Federal list, effective September 6, 1978.)

Prior to the seizure, several sales were apparently made from the Los Angeles warehouse, and some turtle meat may have reached local retail markets. (NMFS is now attempting to recover this meat.)

Prosecution in this case awaits completion of the investigation, and subsequent action by NOAA's Office of General Counsel.

Iowa Publication

A November 1978 report on *Endangered and Threatened Iowa Plants* is now available. Co-authored by Dean M. Roosa and Lawrence J. Eilers, this "Special Report No. 5" may be ordered from the State Preserves Advisory Board, State Conservation Commission, Wallace State Office Building, Des Moines, Iowa 50319.

Endangered Plant Symposium

The New England Botanical Club has organized a symposium on "Rare and Endangered Plant Species in New England," to be held May 4 and 5, 1979, at Harvard University. In addition to keynote addresses, sessions on the biology of endangered species, plant conservation concerns in New England, and conserving rare plants and their habitats are planned.

For further information, contact Dr. Garrett E. Crow, Department of Botany and Plant Pathology, University of New Hampshire, Durham, New Hampshire 03824.

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appear to be rare in Wisconsin.

Plants

Some plants proposed for Wisconsin's endangered species list represent remnant populations persisting since glacial ice advances, such as the alpine milkvetch (*Astragalus alpinus*). Wisconsin has 32 terrestrial vegetation types, ranging from prairie to deciduous forest to coniferous forest. Land use practices have made many of these native vegetation types rare, however.

Plants associated with rare habitats are especially subject to harm. The prairie white-fringed orchid (*Habenaria leupophaea*), for example, is proposed for the State's threatened list because of the loss of its prairie habitat. This scarce orchid is also being considered for protection as a federally Threatened species.

Wisconsin's program includes protection of undisturbed native habitat.

Public Awareness

Wisconsin's Office of Endangered and Nongame Species is especially concerned with public support. Many media projects are now in the works

BOX SCORE OF SPECIES LISTINGS

| Category | Number of Endangered Species | | | Number of Threatened Species | | |
|--------------------|------------------------------|------------|------------|------------------------------|-----------|-----------|
| | U.S. | Foreign | Total | U.S. | Foreign | Total |
| Mammals | 33 | 227 | 260 | 3 | 18 | 21 |
| Birds | 67 | 144 | 211 | 3 | | 3 |
| Reptiles | 11 | 47 | 58 | 10 | | 10 |
| Amphibians | 5 | 9 | 14 | 2 | | 2 |
| Fishes | 29 | 10 | 39 | 12 | | 12 |
| Snails | 2 | 1 | 3 | 5 | | 5 |
| Clams | 23 | 2 | 25 | | | |
| Crustaceans | 1 | | 1 | | | |
| Insects | 6 | | 6 | 2 | | 2 |
| Plants | 20 | | 20 | 2 | | 2 |
| Total | 197 | 440 | 637 | 39 | 18 | 57 |

Number of species currently proposed: 158 animals
1,850 plants (approx.)

Number of Critical Habitats proposed: 73
Number of Critical Habitats listed: 33
Number of Recovery Teams appointed: 64
Number of Recovery Plans approved: 18
Number of Cooperative Agreements signed with States: 22

December 31, 1978

to inform Wisconsin citizens of the status of State wildlife and their responsibility to it. The office's information-education program is based on the philosophy that the first step in getting people to take care of something is to help them appreciate it. As part of a comprehensive communications effort, the office plans a series of three booklets called "Life Tracks" discussing Wisconsin's program man-

agement and natural history of protected species and a fourth colorful booklet emphasizing the habitat needs of endangered species.

Other awareness activities include a multi-media slideshow/narration for use at public lectures and workshops, teaching aids, and an exhibit on endangered species, as well as radio documentaries and magazine and newspaper articles.



ENDANGERED SPECIES TECHNICAL BULLETIN

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



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