March 1980, Vol. V, No. 3

ENDANGERED SPECIES TECHNICAL BULLETIN

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

SERVICES ADOPT NEW LISTING REGULATIONS

Procedures for listing, delisting, and relassifying species, determining Critical Habitat, the handling of petitions, and other related activities called for under the amended Endangered Species Act of 1973 have been adopted with the publication of final "Section 4" regulations (F.R. 2/27/80).

Issued jointly by our Service and Commerce's National Marine Fisheries Service (the two agencies respectively charged with administering the law for terrestrial and marine species), these final rules implement many of the changes and additional requirements imposed by 1978 and 1979 Amendments to the Endangered Species Act (see the January 1980 and October 1978 BULLETINS). The regulations had been proposed on August 15, 1979 (see the September 1979 BULLETIN), although minor subsequent changes under the 1979 amendments have also been incorporated in this comprehensive document.

We will review significant sections in the following pages, although you may wish to order the complete text of the regulations (supplies are limited) from the Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

Listing and Related Definitions

Essentially all provisions pertaining to the listing process (with the exception of Sections 17.11, 17.12, 17.13, and 17.94, which actually include the U.S. Lists of Endangered and Threatened Wildlife and Plants and designated Critical Habitats) have been incorporated under a new Part 424 of Title 50 of the Code of Federal Regulations.

Definitions under this new part include standard language provided under the 1973 law as well as terms reflecting changes brought by the recent amendments. The following definitions for Endangered and Threatened remain unchanged:

Endangered: A species which is in danger of extinction throughout all or a significant portion of its range.

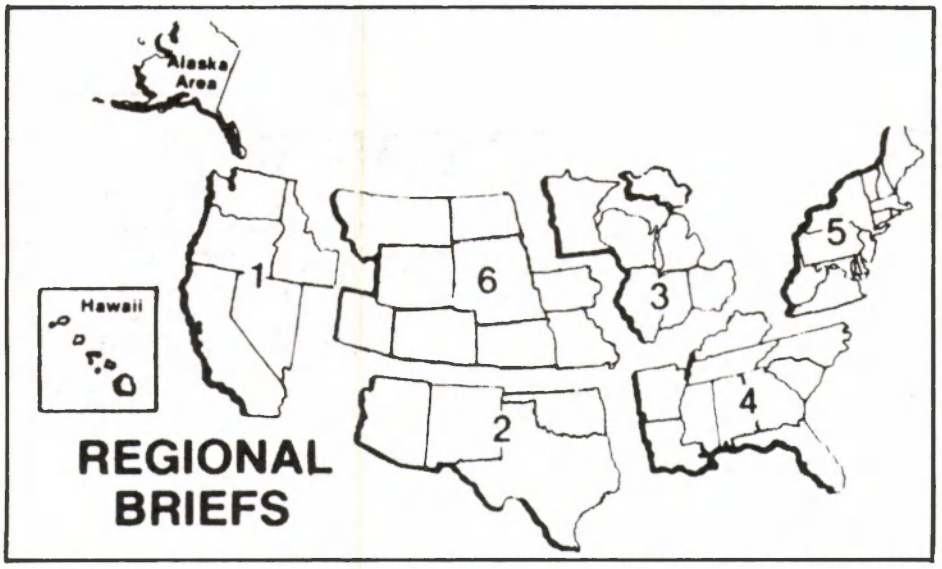
Threatened: Any species which is likely to become an Endangered species within the foreseeable future

continued on page 3

U.S. Fish and Wildlife Service Photo

One of three dusky seaside sparrows captured last year on the St. Johns National Wildlife Refuge, this bird may soon be part of an intense breeding project geared to recovering its dwindling numbers. (See our separate "Special Report.") *Human efforts may involve dusky semen preservation and artificial insemination, with experimentation soon to be underway on surrogate sparrows at the Patuxent Wildlife Research Center.*

See Story Page 4



REGIONAL BRIEFS

Endangered Species Program regional staffers have reported the following activities for the month of February.

Region. 1. The Antioch Dunes Recovery Plan (covering Lange's metalmark butterfly *(Apodemia mormo langei),* Contra Costa wallflower *(Erysimum capitatum* var. *angustatum),* and Antioch Dunes evening-primrose *(Oenothera deltoides* ssp. *howellii)* was submitted to Washington for final approval. The April 1980 BULLETIN will feature a report on the Service's recent acquisition of this unsettled ecosystem.

The Portland Chapter of the Audubon Society, along with the Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and National Wildlife Federation, sponsored a bald eagle workshop in Klamath Falls, Oregon. About 200 people attended, including representatives from six western States. Workshop participants went to the Klamath Basin, which has the largest wintering concentration of bald eagles *(Haliaeetus leucocephalus)* in the lower 48 States.

Region 2. The San Bernadino Ranch Renovation and Management Plan was initiated by eliminating exotic mosquito fish *(Gambusia affinis)* to protect native Endangered Gila topminnow *(Poeciliopsis occidentalis)* from competition or hybridization. Staff members met with the Arizona Bureau of Geology and Mineral Technology regarding potential impacts of the renovation plan on their projects, and geothermal exploration north of the ranch (which is located in southeastern Arizona, near the Mexican border).

Jack Woody served as U.S. representative and panel member at the Mexican Symposium on Wildlife Management Programs in Desert Environments.

An interagency cooperative agreement was reached on studying nesting bald eagles on the Salt and Verde Rivers in Arizona. Participants in the agreement are our Service, Salt River Project, Arizona Water Commission, Rocky Mountain Range and Forest Experiment Station of the Forest Service, the Maricopa Audubon Society, Water and Power Resources Service, and Arizona State University, which will be doing the actual work.

Region 4. Regional and other Service personnel participated in a public meeting at Gadsden, Alabama, on February 7 to discuss listing of the green pitcher plant *(Sarracenia oreophila)* as Endangered (effective April 7, 1980). There were nearly 200 people in attendence at the meeting, where time was devoted to the presentation of formal statements for the record as well as to question and answer sessions. While a number of concerns were expressed over the listing, most were prompted by misconceptions of the Service action. (For example, no Critical Habitat has been designated.) A number of people questioned the basis for the listing, but no new biological or other data was presented. (A report of the public meeting is contained in the March 24, 1980, *Federal Register.)*

U.S. Fish and Wildlife Service
Washington, D.C. 20240

Lynn A. Greenwalt, *Director*
(202-343-4717)
Ronald E. Lambertson
Associate Director and
Endangered Species Program Manager
(202-343-4646)
Harold J. O'Connor
Deputy Associate Director
(202-343-4646)
John Spinks, *Chief,*
Office of Endangered Species
(703/235-2771)
Richard Parsons, *Chief,*
Federal Wildlife Permit Office
(703/235-1937)
Clark R. Bavin, *Chief,*
Division of Law Enforcement
(202-343-9242)

TECHNICAL BULLETIN STAFF
Dona Finnley, *Editor*
Morey Norkin, *Editorial Asst.*
(703/235-2407)

Regional Offices

Region 1, Suite 1692, Lloyd 500 Bldg., 500 N.E. Multnomah St., Portland, OR 97232 (503-231-6118): R. Kahler Martinson, *Regional Director;* Edward B. Chamberlain, *Assistant Regional Director;* David B. Marshall, *Endangered Species Specialist.*

Region 2, P.O. Box 1306, Albuquerque, NM 87103 (505-766-2321): W. O. Nelson, *Regional Director,* Robert F. Stephens, *Assistant Regional Director,* Jack B. Woody, *Endangered Species Specialist.*

Region 3, Federal Bldg., Fort Snelling, Twin Cities, MN 55111 (612-725-3500): Harvey Nelson, *Regional Director,* Daniel H. Bumgarner, *Assistant Regional Director,* James M. Engel, *Endangered Species Specialist.*

Region 4, Richard B. Russell Federal Bldg., 75 Spring St., S.W., Atlanta, GA 30303 (404-221-3583): Kenneth E. Black, *Regional Director;* Harold W. Benson, *Assistant Regional Director;* Alex B. Montgomery, *Endangered Species Specialist.*

Region 5, Suite 700, One Gateway Center, Newton Corner, MA 02158 (617-965-5100): Howard Larsen, *Regional Director;* Gordon T. Nightingale, *Assistant Regional Director;* Paul Nickerson, *Endangered Species Specialist.*

Region 6, P.O. Box 25486, Denver Federal Center, Denver, CO 80225 (303-234-2209): Don W. Minnich, *Regional Director;* Charles E. Lane, *Assistant Regional Director,* Don Rodgers, *Endangered Species Specialist.*

Alaska Area, 1101 E Tudor Rd., Anchorage, AK 99503 (907-276-3800, ext. 495): Keith M. Schreiner, *Area Director;* Jon Nelson, *Ass't Area Director;* Dan Benfield, *Endangered Species Specialist.*

U.S. Fish and Wildlife Service Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, and Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands. **Region 5:** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. **Region 6:** Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Alaska Area:** Alaska.

The ENDANGERED SPECIES TECHNICAL BULLETIN is published monthly by the U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

On February 5, 61 snail darters *(Percina tanasi)* out of 106 being held at Tennessee's Eagle Bend Fish Hatchery died of apparent gas bubble disease. The survivors were moved to Morristown State Hatchery where other darters were placed after being removed from the Little Tennessee River prior to the closure of Tellico Dam (see the October 1979 BULLETIN).

Region 6. A meeting held in Billings, Montana, on threatened and endangered plants resulted in the formation of an Endangered Species Committee aimed at improving communication between botanists and providing direction and impetus for the State's endangered and threatened plant program. The committee consists of Federal, State, and university personnel.

SERVICES ADOPT NEW LISTING REGULATIONS

continued from page 1
throughout all or a significant portion of its range.

Of interest, however, are several new or revised definitions:

Critical Habitat: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) which may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Director that such areas are essential for the conservation of the species.

Species*: Any species or subspecies of fish or wildlife or plant, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. (Excluded are those species of the Class Insecta determined by the Director to constitute a pest whose protection under the provisions of the Act would present an overwhelming and overriding risk to man.)

Public hearing: An informal hearing to provide the public with the opportunity to give their comments on a proposal to designate Critical Habitat and, if appropriate, the accompanying proposal to list a species.

Public meeting: An informal meeting between Service representatives and the public that permits an exchange of information on a proposed rule.

Special management considerations or protection: Any methods or procedures useful in protecting physical and biological features for the conservation of listed species.

* In determining whether a particular taxon is a population or species for the purposes of the Act, the Services will rely on standard taxonomic distinctions and the biological expertise of the Service and the scientific community concerned with that group of taxa.

Conservation: To use and the use of all methods and procedures which are necessary to bring any Endangered species or Threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Listing Criteria

Under slightly revised criteria, a species may be listed on the basis of the best scientific and commercial data available (after a review of the species' status) because of any one or more of these factors:

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;

(2) Utilization for commercial, sporting, scientific, or educational purposes at levels that detrimentally affect it;

(3) Disease or predation;

(4) Absence of regulatory mechanisms adequate to prevent the decline of a species or degradation of its habitat; and

(5) Other natural or manmade factors affecting its continued existence.

(The fact that a species is listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora or similar international agreements may also constitute evidence that a species should be considered for listing as Endangered or Threatened.)

A species may be removed from the U.S. List based on the best available data indicating either its (1) extinction, (2) recovery, or (3) a finding that original data for classification were in error.

Critical Habitat Determination

As provided under 1978 Amendments to the Act, Critical Habitat shall be designated, *to the maximum extent prudent,* at the time a species is listed. Under the new regulations, proposed Critical Habitat areas shall be specified at the time a species is proposed for listing *unless* (1) identification of Critical Habitat areas would be expected to increase the degree of threat to the species or (2) such designation would not be beneficial to the species.

Under the regulations, all physiological, behavioral, ecological, and evolutionary requirements essential to the conservation of the species and which may require "special management considerations or protection" will be considered in determining Critical Habitat. These requirements may include:

1) Space for individual and population growth and for normal behavior;

2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

3) Cover or shelter;

4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally,

5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of listed species.

In considering the Critical Habitat designation, the Services will focus on the biological or physical constituent elements within the defined area which are essential to the conservation of the species, and will identify known primary constituent elements (such as roost or feeding sites, vegetation types, etc.) along with any Critical Habitat designation.

All significant activities which would either affect an area considered for designation as Critical Habitat or

continued on page 8

EXTINCTION OR SURVIVAL?

SEMEN PRESERVATION AND ARTIFICIAL INSEMINATION COULD MAKE THE DIFFERENCE

Thirty-nine years ago, when the total population of whooping cranes *(Grus americana)* in existence dropped to a critical low of 21 birds, no one ever dreamed that our human efforts would put this species back on the road to recovery. But, thanks to specialists bent on halting its decline, 119 of these majestic birds survive in North America—some in their original migratory range, others as part of a second experimental flock, and still another 24 in captivity as part of a Service incentive to boost the crane's dwindling breeding success.

Captive propagation was initiated in 1967 to bolster the wild whooper population—still vulnerable despite intense habitat management on its behalf. Cranes in residence at the Patuxent Wildlife Research Center in Maryland were not producing fertile eggs when Dr. George Gee started as research physiologist for the Service one year later. While semen production appeared normal, most of the birds simply were not copulating—a behavioral rather than physiological problem.

Without artificial insemination—begun at that time as a necessity to maintain crane propagation—our captive breeding efforts would have bordered on failure.

Techniques Improving Fertility

Used as a successful propagation tool since 1969, artificial insemination is now increasing the fertility of whooping cranes, Mississippi sandhill cranes *(Grus canadensis pulla),* Aleutian Canada geese *(Branta canadensis leucopareia),* and other Endangered wildlife under the Service's Endangered Wildlife Research Program.

Working primarily with birds, Gee and his co-workers have perfected a variety of techniques for collecting semen—including massage, electromechanical stimulation, artificial vaginas, and even natural mating attempts using teaser animals or (for imprinted animals) humans. The semen is then inseminated using one of two principal methods: everting the oviduct, with the sperm inserted into the vagina, or (without eversion of the oviduct) depositing semen directly into the middle chamber of the cloaca.

Through their methods, all reproductive whoopers and Mississippi sandhills in captivity at Patuxent have been artificially inseminated. Fertility rates of 85 percent with fresh, uncontaminated semen have been consistently achieved with formerly infertile pairs.

Pioneers in "Cryobiology"

With the captive breeding program well underway, Gee soon recognized the need to preserve a stockpile of crane semen—not only to supplement quantities produced by captive males, but also to insure the maintenance of natural genetic diversity which can be lost through inbreeding.

Working with Dr. Tom Sexton of the Department of Agriculture's Beltsville Agricultural Research Center, Gee was able to apply Sexton's methods—developed in 1976 for the cryogenic preservation (storage in the frozen state) of poultry semen—in his own work with cranes. Within two years, using greater sandhill cranes *(Grus canadensis tabida)* as surrogates, Gee and Sexton were able to unlock the magic formula. In 1978, artificial insemination of greater sandhills with semen frozen for nearly two months resulted in fertile eggs (6 out of 27 laid) and the production of three healthy chicks.

Using semen collected prior to and during egg production at Patuxent, Gee has since perfected techniques for freezing the genetic material of whoopers and Mississippi sandhill cranes, and the results have shown promise. While fertility rates have not been as high as those achieved using fresh semen, he has attained 30 percent fertility (with five birds) using frozen-thawed semen.

Gee is not satisfied with these lower success rates, however, striving for 60 percent fertility as the minimum acceptable level for propagation purposes. "There really isn't any theoretical reason for the frozen-thawed rates to be any different from the fresh. The obvious solution may be to increase sperm numbers per insemination." Gee thinks they may have dropped below the "critical fertile level" (likely between 50,000 and 100,000 sperm for whoopers and sandhills). Not all sperm survive freezing, however, so they hope to boost fertility this year by increasing the dose and improving insemination techniques. With estimates of 35 to 60 percent sperm survival rates, the researchers will be inseminating both whoopers and sandhills using a full tube of semen (containing three ejaculations) to insure adequate sperm levels.

Genetic Diversity: Key to Survival

As we now know, the adaptability—if not the survival—of an animal population inevitably depends upon the maintenance of a diverse gene pool. Although captive propagation may insure the survival of a species for many generations, it leads eventually to loss of the genetic diversity that has proven essential to survival of the species throughout its evolution.

The maintenance of all alleles [those genetic components of the chromosome carrying inheritable information] or "heterogenicity," in some balance similar to that which occurred before the populations declined can be vital. Although they may be represented in small numbers, a major change in the environment could suddenly favor certain alleles—and the natural evolutionary process would then select for the expansion of this small proportion. In captivity, when you have selected certain individuals from a population, this normal distribution disappears and some genetic variation will be lost. Although this can be caused by inbreeding, loss in variation of captive populations also results simply because the

U.S. Fish and Wildlife Service Photo

Artificial insemination proved indispensible to the captive propagation of whooping cranes at Patuxent, where eggs laid by captive whoopers without insemination were infertile. Here, Gee and Glen Smart (formerly with Patuxent's Endangered Wildlife Research Program, now based in Washington) inseminate one of the first whoopers to produce fertile eggs at Patuxent, with semen from her mate. (Semen is collected and the females inseminated three times a week, using frozen semen only when the fresh is not available.)

environment can no longer "select" for adaptive alleles.

The ideal way to maintain diversity in captive flocks is through reintroducing wild animals—or, if not the animals themselves, then their genetic material. "When we see a population in rapid decline, we should go out and get as much semen as possible and preserve it." Then, Gee says, "we could go back to our captive flock and reintroduce that semen, which is still representative of that original population that was much larger only a short time ago." Once collection and freezing methodologies are worked out, sperm taken from just a few different individuals each year would allow reintroduction of a broad genetic base back into a population—diversity that could later mean the difference between extinction or survival.

Hope for the Dusky

Gee hopes to work this year to perfect methods for the collection, insemination, and preservation of sea-

continued on page 6

SEMEN PRESERVATION AND ARTIFICIAL INSEMINATION

continued from page 5

side sparrow semen (using the Scott's seaside sparrow, *Ammospiza maritima peninsulae,* as a surrogate) for eventual application with the dusky seaside sparrow *(A. m. nigrescens).* Possibly the first Endangered passerine bird to become part of a captive breeding project (see our April 1980 "Special Report"), the dusky's fate may depend largely on success with these techniques, should female adults or nestlings be found this year.

While the semen volume for individual sparrows would be small (.01 to .05 ml), Gee believes samples can be prepared for frozen storage and that the bird's physiology could even work to his advantage. "Because of their small body size, they have apparently become adapted to accumulate large doses of semen right where they need it." The male duskies have a cloacal protuberance, where the vas deferens is looped around the dorsal lip of the cloaca. Semen may be easily taken by massage from the swollen protuberance during the breeding season—a practice already accomplished in the field.

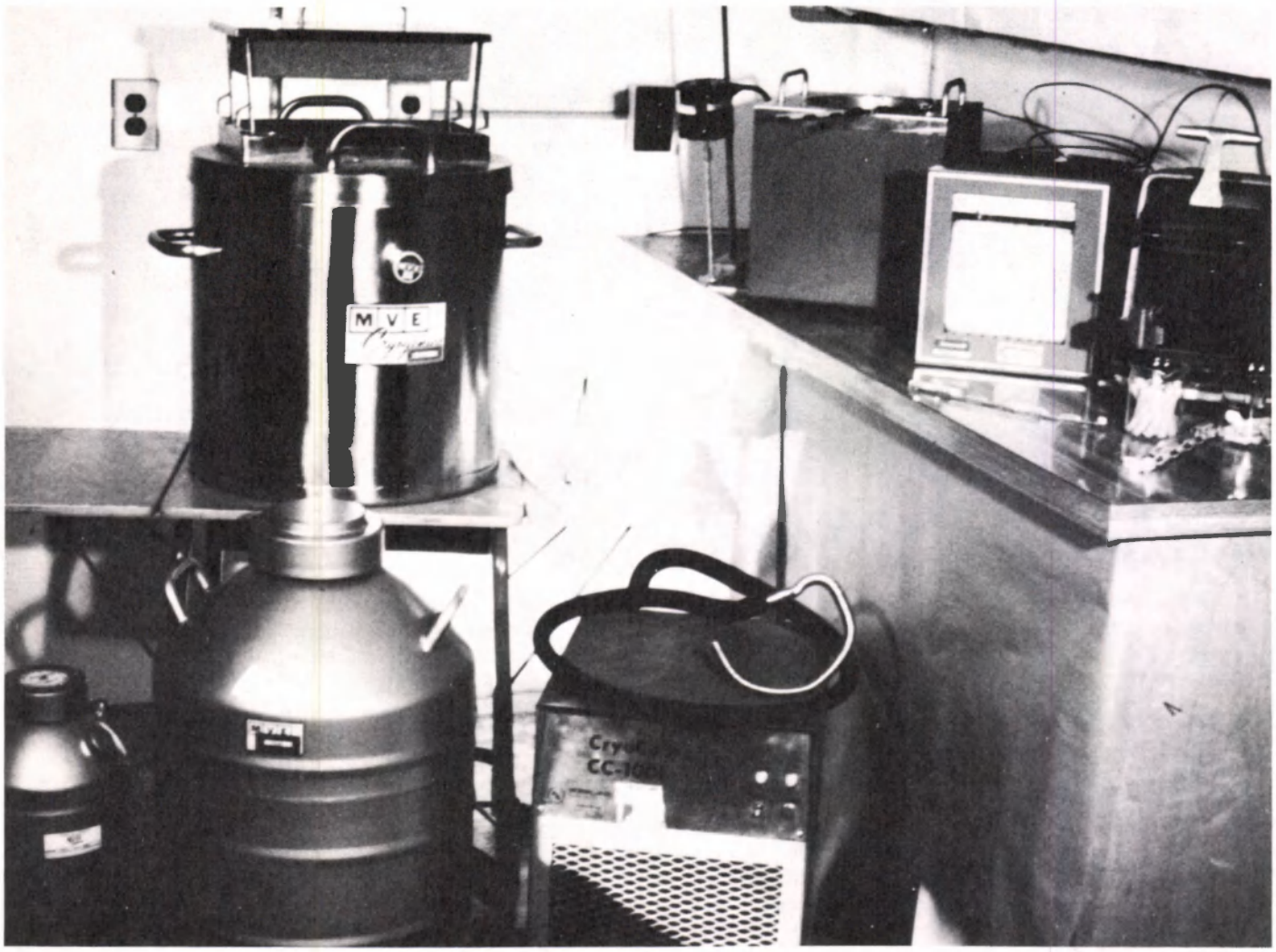
Although longevity should not be a problem (one dusky has lived for 9 years), Gee fears it could take 3 or more years to learn how to successfully freeze dusky semen. He hopes to accelerate the process, perhaps cutting the time in half by bringing his surrogate seasides into production more frequently through day-length and temperature manipulations.

If all goes well, freezing techniques could then be more readily developed for other Endangered passerines like the Cape Sable seaside sparrow (A.m. *mirabilis),* the dusky's cousin from the Florida Everglades.

Sperm Bank: The Best Investment

For the dusky, the California condor *(Gymnogyps californianus),* and many other critically Endangered species, time is indeed the prime obstacle to recovery. But Gee and others like him believe we can buy time—through little investment and effort—by storing the

The equipment necessary to freeze and store semen from whoopers and other birds requires little space in Gee's laboratory at the Patuxent Center. Freezing vessels, equilibrators, freezing units, and storage tanks are relatively inexpensive, and much of the equipment necessary for semen collection and freezing may be carried in the back of a station wagon.



U.S. Fish and Wildlife Service Photo

genetic material so critical to a species' survival.

Many types of cryogenic tissue storage have been developed in the last 40 years, with most designed for practical use in human and domestic animals. Viable sperm have been recovered from frozen semen in man, cattle, dogs, cats, elephants, bison, horses, trout, pigs, sheep, goats, chickens, turkeys, camels, moose, deer, llama, yak, monkeys, chinchilla, and bears.

Tissues can be preserved with little or no loss of vigor for decades, even centuries, according to Gee who says there should not be any decrease in sperm viability as long as its organic constitutents remain frozen in place—generally at −196°C.

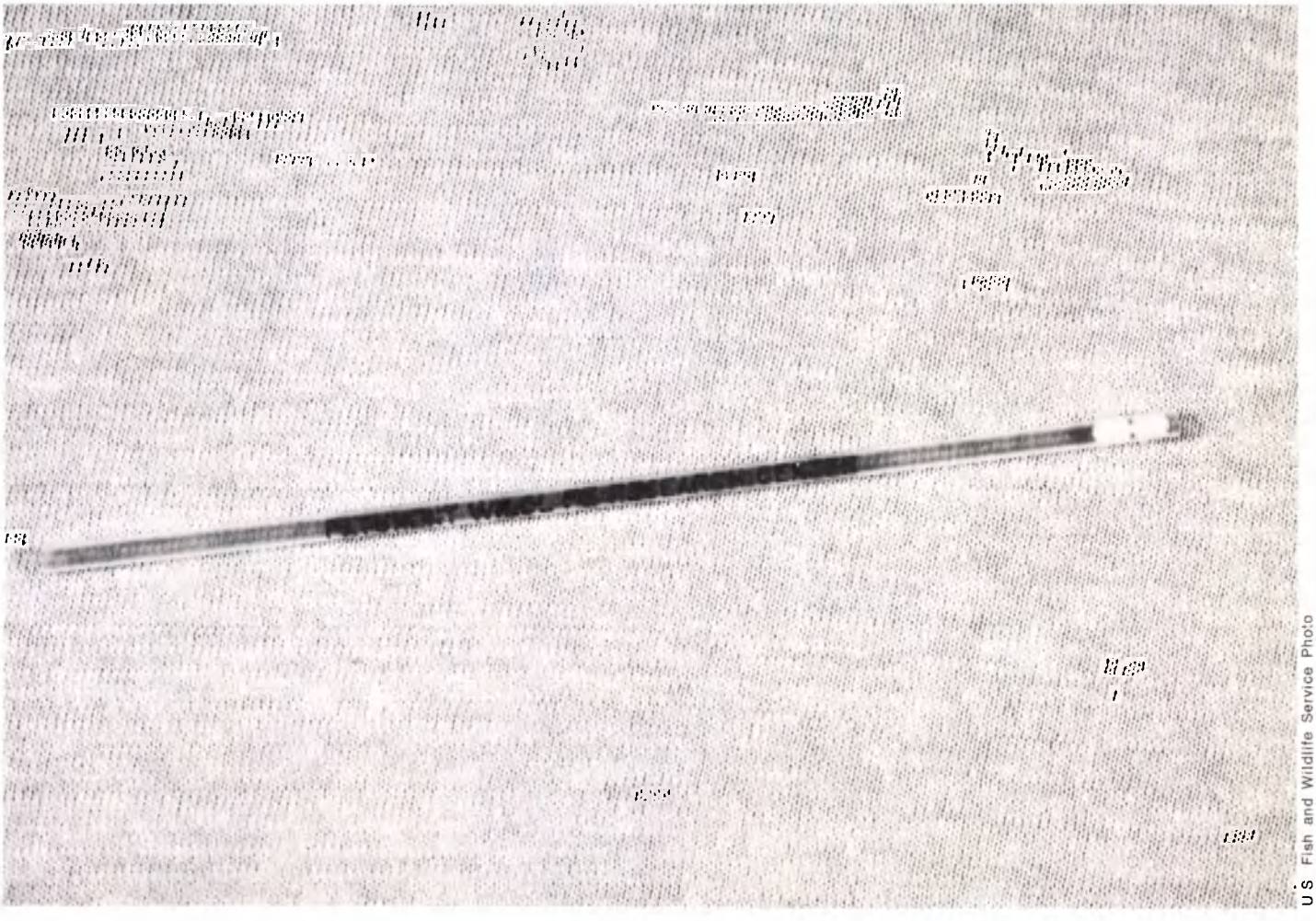
Of all the techniques used in endangered species conservation, a semen bank would be the least damaging to a wild population and perhaps the best safeguard. Preservation of an endangered population could, after all, depend on our ability to help it along by maintaining its genetic diversity in times of environmental stress. "In our particular situation, in working with Endangered species," Gee says "we should consider all the possibilities and think about how we can make use of developing technologies." For example, he advises the frozen storage of tissues from the duskies for use later, should we ever learn to clone them [i.e., reproduction of duplicate organisms by tissue culture].

A universal storehouse of semen from declining species could be one of our best investments toward the long-term conservation of Endangered populations. While techniques for obtaining, handling, and preserving semen would have to be worked out for each species, Gee feels the time for establishing a centralized Endangered species sperm bank has arrived. "How thankful we may be to have stockpiled that essential source of diversity—perhaps our last hope for restoring a population as an adaptable part of a rehabilitated environment."

Without it, we might some day look back on future failures as we have with the passenger pigeon—a species apparently ideally suited for captive propagation. While the passenger pigeon has been lost to mankind, it is not too late to know the importance of maintaining these irreplaceable gene pools—materials that could later be used when the techniques are there.

As Gee points out, "If you had it, and it did happen, wouldn't you feel good."

Great care must be exercised in the handling of semen as freezing rates are critical to viability. Once collected and diluted, semen is cooled to near freezing for up to 4 hours, then is further diluted with cryoprotectants and siphoned into a plastic straw (like the one above) labelled for each donor bird. After a brief equilibration period, the 50°C sample is cooled to −20°C at the rate of 1°C per minute, then to −80°C at 50°C per minute, and finally to −196°C as rapidly as possible, where it is stored in liquid nitrogen. (The samples are gradually thawed before insemination.)



U.S. Fish and Wildlife Service Photo

SERVICES ADOPT NEW LISTING REGULATIONS

continued from page 3

which are likely to be affected by such a designation will be identified in any Critical Habitat proposal. The "reasonably probable economic and other impacts" of such a designation shall also be considered, and the Services may exclude affected areas from the designation upon a determination that "the benefits of such exclusion outweigh the benefits of specifying the area as part of the Critical Habitat" (so long as failure to include such an area will not result in the extinction of the species—based on the best available data).

Critical Habitats will be defined using reference points and lines found on standard topographic maps, with the names of State(s), county(ies), or other local governmental units within which the designated area is located (although such political references shall not be construed to constitute the boundaries of the area). When a number of suitable habitats are located in close proximity, an inclusive area may be designated as Critical Habitat.

Critical Habitat shall be designated outside the geographical area presently occupied by the species only when determined necessary to ensure the conservation of the species.

Petitions, Data Sources, and Status Reviews

The Services shall review the status of a species prior to proposing a rule to list or remove a species, in consultation as appropriate with affected States, Federal agencies, interested organizations, persons, and country-(ies).

Any interested person may petition the Services to review the status of a species with a view toward listing (or delisting or reclassification) under the Act. Petitions must be in writing and contain the date submitted, the name, signature, address, and telephone number, and the association, institution, or business (if any) represented by the petitioner.

The Services must acknowledge receipt of the petition within 30 days, and then determine whether substantial evidence has been presented in support of the measure recommended by the petitioner. In making such a determination, the Director shall consider whether the petition:

(1) Clearly indicates the administrative measures recommended, the scientific and any common name of the species involved, and if appropriate, the precise area recommended as Critical Habitat:

(2) Contains detailed narrative justification for the recommended measure, describing, based on available information, the past and present numbers and distribution of the involved species, the particular threats confronting the species, and the features and importance of any recommended Critical Habitat;

(3) Indicates any beneficial or adverse effect on the species of designating Critical Habitat;

(4) Provides information on the status of the species over a significant portion of its range; and

(5) Is accompanied by appropriate supporting documentation such as a list of bibliographic references, reprints of pertinent publications, copies of written reports or letters from authorities, and maps, as appropriate.

If adequate evidence has not been presented, the petition shall be denied with explanation within 90 days. If, however, the Director finds that substantial evidence has been presented, he will: (1) promptly announce such a determination in the *Federal Register*, and (2) conduct (and publish in the *Federal Register*) within 90 days of receipt of the petition a status review of the species, indicating how the Service expects to proceed with the action. If the petition pertains only to Critical Habitat or a special rule for the conservation of a species, the Service will promptly conduct a review to determine the appropriateness of the requested action.

If the Director finds that the action requested by a petitioner appears warranted, but that available evidence is not definitive enough to justify a proposal, then he may publish a Notice of Review soliciting comments and additional data to determine if indeed such a proposal is warranted.

Proposals

When sufficient information is available, the Services will publish a proposed rule in the *Federal Register* summarizing the action under consideration as well as data on which the proposal is based and, if appropriate, factors affecting the species and likely effects of the rulemaking.

For proposals to list, reclassify, remove, or to designate Critical Habitat, a minimum of 60 days will be allowed for public comment, while a minimum of 30 days will be allowed for public comment on all other proposed rules.

The Governors of all affected States and the governments of foreign countries in which the species occurs (or whose citizens harvest such species from the high seas) will be notified of the proposal and allowed 90 days to submit comments.

For all rules proposing listing, reclassification, delisting, or the designation of Critical Habitat, the Services shall offer the substance of the proposal for publication in appropriate scientific journals or newsletters.

For proposals to list, remove, or reclassify species (where no Critical Habitat is proposed), a public meeting shall be held within or adjacent to the affected area if requested within 45 days after date of publication in the *Federal Register.* (The specifics of such a meeting would then be published as a notice in the *Federal Register.)*

Any proposal specifying Critical Habitat must also contain a map of the proposed area and, to the maximum extent practicable, a brief description of activities that might occur in the area that may adversely modify such habitat or may be affected by such a designation.

A public meeting shall be held on all Critical Habitat proposals within, or immediately adjacent to, the proposed area within each affected State. (Notice of such meetings will be published in the *Federal Register.)* A public hearing is to be held after the public meeting in each affected State, if requested in writing no later than 15 days after the public meeting. The hearing would then be held promptly, but usually not sooner than 15 days after notice of the hearing is published in the *Federal Register.*

For all proposals involving Critical Habitat, the Director will (1) notify Federal agencies with jurisdiction in the area; (2) publish a summary of the proposal in a general circulation newspaper within or adjacent to the habitat within 30 days; and (3) give notice of the rule and related impact analyses to local governments in the area within 30 days.

Finally, the Services shall gather (and may solicit through a Notice of Review) all economic and other appropriate information on impacts associated with any Critical Habitat designation on significant activities in the area. A draft impact analysis will be prepared addressing the beneficial or

continued on page 10

CONDOR RECOVERY PLAN REVISED

Continuing its conservation efforts on behalf of the critically Endangered California condor *(Gymnogyps californianus),* the Service has approved a revised recovery plan for the species. The revised document updates the original California Condor Recovery Plan, approved in 1975, by incorporating a contingency plan for captive propagation and release to bolster exising condor populations and to establish new ones. The prime objective of the plan is to reach a minimum of 100 birds in the wild, with production equalling or exceeding mortality. Current wild population estimates are at 25 to 30 birds.

Historically, the California condor occurred along the Pacific coast from British Columbia to northern Baja California, Mexico. Although never abundant within historic times, the condor was widespread and regularly seen in the Nineteenth and early Twentieth Centuries. No population estimates are available prior to the 1940's, when the total was thought to be about 60 (apparently an underestimate since the population was figured at 50–60 condors in 1970—apparently representing a significant decrease from the 1950's).

Today, the condors occupy a wishbone-shaped area in the mountains of central California from Santa Clara and Fresno Counties south to Ventura and Los Angeles Counties.

Steady human encroachment has crowded the condor out of portions of its range. As human presence increased, so did habitat destruction, shooting, and egg and specimen collecting. (Environmental contamination may have also contributed to the species' decline.) A minimum of 288 condors and 71 eggs were taken between 1792 and 1976, with as many as 111 condors and 49 eggs taken between 1881 and 1910 alone. This high mortality far exceeded the normally low productivity of the condor (with a single egg produced every other breeding season).

The road to recovery for the California condor will be a long one. According to the recovery team, condor populations are so low that the only hope for the species is through captive propagation and release, with attempts at reestablishment as much as 20 years away. The plan calls for capture and marking and possible retention of a numbers of condors for captive propagation between September 1980 and March 1983. A chief criticism of this procedure, the team notes, is the uncertain success in releasing captive-raised condors into the wild. However, studies with turkey and black vultures have demonstrated possible procedures for releasing California condors. This spring, a number of captive-reared Andean condors *(Vultur gryphus)* will be released in Peru. The recovery plan calls for continued management of the captive flock of Andeans until propagation and release techniques are perfected.

To help insure the success of future releases, the recovery plan calls for identification and protection of present condor habitat and possible release sites. Other recommended actions include:

(1) prohibiting motorized (including aircraft) activity and blasting in the vicinity of condor nest sites. (All recently used nests are in the Los Padres National Forest.)

(2) restricting all human use within 0.5 miles of condor nest sites;

(3) developing management plans for condor nesting, roosting, and feeding habitats;

(4) encouraging open-space preservation and a continuing livestock economy through the condor range;

(5) encouraging land managers to leave dead livestock on the range where it is available to condors (which only eat dead animals);

(6) researching the effects of environmental contaminants on condor survival and reproduction;

(7) monitoring the condor population; and

(8) conducting a public information program.

For more information on California condor recovery, see the January 1980 BULLETIN and our May 1979 *Special Report,* "Last-ditch Contingency Plan Seen as Only Hope for California Condor."

SERVICES ADOPT NEW LISTING REGULATIONS

continued from page 8

detrimental economic and other impacts of the Critical Habitat designation, and will be available to the public upon publication of the proposal.

Final Rules

After consideration of all data and comments received, the Director will publish either a final rule or a notice of withdrawal of the proposal in the *Federal Register*.

Final rulemaking documents will summarize all comments received on the proposal as well as all data upon which the rule is based and likely effects of the ruling. For listing, delisting, reclassification, and Critical Habitat rulings, a summary of factors affecting the species will also be included. Critical Habitat determinations will contain descriptions of the boundaries of designated areas and appropriate maps, and will briefly describe activities that might adversely modify the habitat or be impacted by such a designation.

Prior to finalizing Critical Habitat, a final impact analysis shall be prepared (incorporating all information and comments received) to analyze and discuss beneficial and detrimental economic and other impacts of possible Critical Habitat designations on significant activities in the area. This analysis will then form the basis for the Director's decision as to whether to exclude any area from the Critical Habitat—if determined that the benefits of excluding such an area outweigh the benefits of designating the area as Critical Habitat.

A final regulation adding a species to the U.S. List must be published not later than 2 years after such a rule was proposed. Otherwise, the proposal must be withdrawn (with notification in the *Federal Register* not later than 30 days after expiration of the period). Another proposal to add a species to the list which had been the subject of a withdrawn proposal may only be published when the Services determine that "sufficient new information"* has been received to warrant a new proposal.

The Director will review each listed species at least once every 5 years to determine whether its classification remains warranted.

Emergency Rules

The Director may by emergency regulation take any action provided under Section 4 of the Act (that is listing, Critical Habitat designation, or special rule) if such a measure is warranted by the development of a significant risk to the well being of a species. Emergency rules shall become effective immediately upon their publication in the *Federal Register,* although the Governor of any affected State must be notified in advance. Such rules will remain effective for 240 days unless the Director determines that substantial evidence does not exist to warrant the regulation, in which case it shall be withdrawn.

New Format for Lists

Both U.S. Lists (for wildlife and plants) have been restructured to indicate whether or not Critical Habitat has been designated for the species. A column entitled "Historic Range" has been added to both animal and plant lists, to indicate (for informational purposes) the general known distribution of the species or subspecies as reported in the scientific literature. This column replaces the "Known Distribution" column on the current U.S. List (and does *not* imply any limitation on applications of the Act's prohibitions). A new column entitled "Vertebrate Population where Endangered or Threatened" has been added to the U.S. List for wildlife only (as populations of invertebrates and plants may not be listed under the Act). (The lists will be republished in the *Federal Register* later this spring.)

* Sufficient new information—The Department of the Interior Solicitor has determined with respect to withdrawn proposed listings, that "new information" applies to additional information received subsequent to the date of the withdrawal. While the amount and quality of "sufficient new information" would be expected to vary from species to species, this standard should not imply any modification in the biological listing criteria now imposed under Section 4, in the opinion of the Solicitor. While the "sufficiency" of new information would be directly related to the factors which contributed to failure to complete the original listing proposal within the 2-year deadline, either (1) an analysis of data verifying a species' precarious biological status (or newly collected data) *or* (2) economic analysis and related data as required under 1978 amendments would essentially meet the "sufficient new information" standard.

SEA TURTLE STAMPS ISSUED

The General Post Office of the Republic of Maldives, a group of coral islands in the Indian Ocean, has issued a series of stamps depicting seven species of sea turtles found in their waters. Of the seven species, six are on the U.S. List of Endangered and Threatened Wildlife and Plants. They are: leatherback sea turtle *(Dermochelys coriacea),* hawksbill sea turtle *(Eretmochelys imbricata),* loggerhead sea turtle *(Caretta caretta),* Olive Ridley sea turtle *(Lepidochelys olivacea),* Kemp's Ridley sea turtle *(Lepidochelys kempii),* and green sea turtle *(Chelonia mydas).* The flatback sea turtle *(Chelonia depressa),* which is not on the U.S. List, but is protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), also appears on a stamp.

Designed by Maxim Shamir and printed by the House of Questa, England, the stamps cost 10/93 rupees per set and 4/00 rupees for a souvenir sheet. A first-day cover envelope was issued along with this set and is available for 1.00 rupees. (Exchange rate: $1.00=3.93 Rs.)

Orders for stamps and first-day covers should be sent with full payment by bank draft or International Money Order to Postmaster, General Post Office, Malé, Republic of Maldives.

BERTRAND TO HEAD MASSACHUSETTS AUDUBON

Dr. Gerard A. Bertrand, Chief of the Service's International Affairs division, will leave his post in mid-April to serve as President and Chief Executive Officer of the Massachusetts Audubon Society.

Bertrand, 36, served as science advisor to the President's Council on Environmental Quality before coming to the Service in 1977. Under his leadership, the U.S. role in international wildlife conservation has been greatly expanded, with major accomplishments in the implementation of protective wildlife treaties (notably the Western Hemisphere Convention) and in the conservation of migratory birds. Bertrand and his staff have initiated wildlife conservation programs with more than a dozen countries, including significant endangered species projects in India, Egypt, and Pakistan under the Service's excess foreign currency program.

Selected from over 150 candidates, Bertrand looks forward to guiding Mass. Audubon's wildlife and natural areas preservation programs and to active involvement in the Society's environmental education effort.

Rulemaking Actions

February 1980

BELL'S VIREO UNDER REVIEW

The Service has published a notice of review requesting information which may lead to a proposed listing of two subspecies of Bell's vireo *(Vireo bellii)* as Endangered or Threatened species (F.R. 2/6/80).

A petition to consider listing *Vireo bellii pusillus* and *Vireo bellii arizonae* in California, Nevada, Utah, Arizona, and northwestern Mexico—submitted by Mr. J. M. Greaves of Goleta, California, has attributed the decline of both subspecies to loss of habitat and reproductive losses from parasitism by the brown-headed cowbird *(Molothrus ater)*. This vireo nests in the early successional stages (primarily willows) of riparian woodlands which are rapidly being lost. The cowbird population has increased in the American Southwest and has apparently only recently invaded the vireo's riparian habitat.

Some, but not all, of the information required by the Service before the Director can determine the appropriateness of a listing proposal are: complete distribution and numbers still extant in southwestern U.S. and northwestern Mexico, specific habitats that may be proposed as critical, economic and other impacts of designating such areas as Critical Habitats, and the documented impacts of cowbird and habitat loss on the vireo. Persons having information on the vireo's past or present distribution or rate of cowbird parasitism are urged to send their information to the Service. This, and any other relevant information, should be sent to the Director (OES), U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, on or before October 3, 1980.

DATA REQUESTED FOR FRITILLARY BUTTERFLY

The status of the Uncompahgre fritillary butterfly (*Boloria* sp.) is being reviewed by the Service to determine if it should be added to the U.S. List of Endangered and Threatened Wildlife and Plants (F.R. 2/6/80).

Known only from a restricted area on Mount Uncompahgre, Hinsdale County, Colorado, this butterfly may be Endangered or Threatened because of overcollecting and the inadequacy of existing regulatory mechanisms. Since rare species of the fritillary butterfly genus *Boloria* are valued highly by collectors, a high demand for this species is expected to occur when it is described scientifically. Excessive collecting activity may also damage the butterfly's fragile high altitude habitat.

The Service is seeking the views of the Governor of Colorado and soliciting from him information on the butterfly's status. Other interested parties are requested to submit any factual information (especially publications and written reports germane to the status review) to the Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240, on or before May 6, 1980.

Reference Note

All Service notices and proposed and final rulemakings are published in the *Federal Register* in full detail. The parenthetical references given in the BULLETIN—e.g., (F.R. 1/17/80)—identify the month, day, and year on which the relevant notice or rulemaking was published in the *Federal Register.*

ENDANGERED SPECIES CONFERENCES PLANNED

A Northeast Endangered Species Conference is scheduled for May 9-11 in Provincetown, Massachusetts. Organized by the Center for Action on Endangered Species, Monitor International, and the Provincetown Center for Coastal Studies, the conference will focus on the status of rare, endangered—and threatened species, preservation efforts, and the role of government agencies and the scientific community in conserving endangered species in the Northeast States from Virginia to Maine. Featured during the 3-day session will be lectures, slide shows, films, exhibits, and a whale watching expedition in Cape Cod Bay. Advance registration fee is $25 (with an additional $10 for the whale-watch.) Contact Phoebe Wray, (617) 772-0445, Center for Action on Endangered Species, 175 West Main Street, Ayer, Massachusetts 01432.

The 1980 American Association of Zoological Parks and Aquariums (AAZPA) Great Lakes Regional Conference will be held April 27-29 at the Cincinnati Zoo. The thrust of this conference will be endangered species, with topics such as "Computer Aid for Endangered Species," "Interpretation and Education Programs," and an "Endangered Species Tour" included on the agenda. Registration fees are $30 for members and their spouses, and $40 for nonmembers. For further information contact Barry Wakeman at the Cincinnati Zoo, (513) 281-3700.

BOX SCORE OF SPECIES LISTINGS

Category	Number of Endangered Species			Number of Threatened Species		
	U.S.	Foreign	Total	U.S.	Foreign	Total
Mammals	35	251	286	3	21	24
Birds	67	145	212	3		3
Reptiles	11	50	61	10		10
Amphibians	5	9	14	2		2
Fishes	29	11	40	12		12
Snails	2	1	3	5		5
Clams	23	2	25			
Crustaceans	1		1			
Insects	6		6	2		2
Plants	49		49	7	2	9
Total	228	469	697	44	23	67

Number of species currently proposed: 35 animals (no plants)
Number of Critical Habitats listed: 35
Number of Recovery Teams appointed: 66
Number of Recovery Plans approved: 31
Number of Cooperative Agreements signed with States: 34 (fish & wildlife) 3 (plants)

February 29, 1980

NEW PUBLICATIONS

State Reports on Rare, Threatened, and Endangered Plants for *Maryland, Delaware, Pennsylvania, New York,* and *Virginia,* are available from the Service's Boston Regional Office.

The Endangered Species: A Symposium, Great Basin Naturalist Memoirs, No. 3, may be purchased from the Life Science Museum, Brigham Young University, Provo, Utah 84602, for $6.00 per copy.

The Oregon Natural Area Preserves Advisory Committee has published *Rare, Threatened and Endangered Vascular Plants in Oregon—An Interim Report.* This publication will be used in the development of a Natural Heritage Plan for the State. Copies are available from the Division of State Lands, 1445 State Street, Salem, Oregon 97310.

ENDANGERED SPECIES TECHNICAL BULLETIN

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

U.S. MAIL

POSTAGE AND FEES PAID
U S DEPARTMENT OF THE INTERIOR
Int 423

March 1980, Vol. V, No. 3