

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Dismal Swamp Southeastern Shrew**AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: The Service determines threatened status for the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*), a small mammal restricted primarily to the Dismal Swamp of southeastern Virginia and adjacent North Carolina. This swamp has undergone extensive environmental changes in the recent past, as a result of human activities. In addition to having direct adverse effects on the shrew, these habitat changes are apparently enabling a neighboring upland subspecies of southeastern shrew to invade the swamp. The Dismal Swamp southeastern shrew may be vulnerable to genetic extinction through continued interbreeding with the more widespread upland subspecies. This rule implements the full protection of the Endangered Species Act of 1973, as amended, for the Dismal Swamp southeastern shrew.

EFFECTIVE DATE: October 27, 1986.

ADDRESS: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Annapolis Field Office, U.S. Fish and Wildlife Service, 1825B Virginia Street, Annapolis, Maryland 21401.

FOR FURTHER INFORMATION CONTACT: Ms. Judy Jacobs at the above address (301/269-6324 or FTS 922-4197).

SUPPLEMENTARY INFORMATION:**Background**

The Dismal Swamp southeastern shrew is a small, long-tailed shrew with a brown back, slightly paler underparts, buffy feet, and a relatively short, broad nose (Handley 1980). It was first described as a species, *Sorex fisheri*, by C. H. Merriam in 1895, based on four specimens trapped that same year in the Dismal Swamp by A. K. Fisher. Jackson (1928) reduced *S. fisheri* to a subspecies of *Sorex longirostris*, which is found over much of the southeastern United States. *S. l. fisheri* generally has a duller pelage than *S. l. longirostris* and is 15 to 25 percent larger. Most *S. l. fisheri* measure about 4 inches (95-102 millimeters) in total length, while most *S. l. longirostris* measure about 3 inches (75-85 millimeters) (Rose 1983).

The Dismal Swamp southeastern shrew is essentially restricted to the Great Dismal Swamp National Wildlife Refuge in southeastern Virginia (cities of Suffolk and Chesapeake, formerly Nansemond and Norfolk Counties) and adjacent portions of the swamp in North Carolina (Camden, Gates, Pasquotank, and Perquimans Counties) (Handley 1980, Hall 1981, Rose 1983). A single specimen of *fisheri* was recently collected in Currituck County, North Carolina (Clark *et al.* 1985), within the historical extent of the swamp. Prior to 1980, the subspecies was known only from 19 specimens collected near the heart of the Dismal Swamp (Handley 1979). Since 1980, at least 40 additional specimens have been collected in and adjacent to the Dismal Swamp, which can be identified as *S. l. fisheri* on the basis of total length (Rose 1983). The subspecies is found in a variety of habitats, from lowland old fields to mature pine and deciduous forests, but

is most abundant in mesic successional habitats such as cane stands, regenerating clearcuts, and 10 to 15-year old forested plots (Rose 1983).

The Dismal Swamp southeastern shrew is considered threatened due to its very limited distribution and to recent, human-induced habitat changes in the swamp. In addition to affecting this lowland shrew directly, these changes may be allowing restricted habitat to be overrun by the more plentiful *Sorex longirostris longirostri* (Handley 1980, Rose 1983).

In order to understand this situation more clearly, it is necessary to consider the dynamics of the evolutionary process within the swamp. The Dismal Swamp has apparently acted like an island for several species of small mammals, including *Sorex longirostris*. The subspecies that evolved in the swamp show a feature typical of small mammals on islands; that is, individuals are larger than those from the nearby "mainland," or in this case, upland subspecies (Carlquist 1974). In the process of subspeciation, individuals in the swamp would be at a competitive disadvantage when living outside the swamp, and the upland race would be equally handicapped in the swamp. It follows that any action which detracts from the distinctive nature of the swamp (e.g., draining) will favor the upland taxon, in this case *S. l. longirostris*, over the swamp subspecies, *S. fisheri*.

In its Review of Vertebrate Wildlife in the Federal Register of December 30, 1982 (48 FR 58454-58460), the Service Placed *S. l. fisheri* in category 2, meaning that a proposal to list as endangered or threatened was possibly appropriate, but that substantial biological data were not then available to support such a proposal. Subsequently, the Service received a report from Dr. Robert K. Rose (1983), who had been contracted to investigate the status of the shrew. The data in Dr.

Rose's report, along with other new information assembled by the Service, showed that a proposal to list the shrew as threatened was warranted. In the Federal Register of July 16, 1985 (FR 28821), the Service proposed *S. l. fisheri* as a threatened species.

Summary of Comments and Recommendations

In the July 16 proposed rule (50 FR 28821) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations and other interested parties were contacted and requested to comment. A newspaper notice, inviting general public comment, was published in the *Virginia Pilot and Ledger-Star* on July 28, 1985.

Only two comments were received. One was from the Virginia Department of Game and Inland Fisheries, which expressed full support of the proposal to list *S. l. fisheri* as threatened. The other comment, from the City Manager, City of Suffolk, Virginia, neither supported nor opposed the rule; it addressed potential positive impacts to the shrew of a proposed highway by-pass around the city. The effects, positive or negative, of this by-pass on the shrew may now be addressed through the Section 7 consultation process. No new biological data were received during the comment period, and no public hearings were requested.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Dismal Swamp southeastern shrew should be classified as a threatened species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Handley (1980) noted that the Dismal Swamp southeastern shrew is essentially confined to the Dismal Swamp. Oakes and Whitehead (1979) estimated that

around the turn of the century this swamp, more accurately described as a timbered peat bog, occupied some 2,000 to 2,200 square miles (5,200 to 5,700 square kilometers). Even at that time, its size had been reduced and its character altered by clearing, draining for agriculture, and the construction in the early 19th century of the Dismal Swamp Canal. Today, only about 328 square miles (853 square kilometers) of the original swamp remain, there having been a reduction of roughly 85 percent since the turn of the century (U.S. Fish and Wildlife Service 1982).

The character of the remaining swamp has been altered by ditching, beginning in the late 1700's, which has lowered the water table. Furthermore, naturally occurring burns, and human-related activities, such as burning, grazing, and logging, which once maintained portions of the swamp in various stages of succession, were curtailed or eliminated with the establishment of the Great Dismal Swamp National Wildlife Refuge in 1973. As a consequence, the former Dismal Swamp, a heterogeneous mosaic of large tracts of bald cypress, Atlantic white cedar, and cane, has been replaced by a more homogeneous, mesic swamp dominated by a rapidly maturing red maple and black gum forest. This progression toward homogeneous mature hardwood forest is likely detrimental to the Dismal Swamp southeastern shrew. Rose's (1983) trapping data revealed that, of all habitats evaluated in the swamp, densities of *Sorex* were lowest in mature forests. Conversely, shrews were most abundant in cane stands and regenerating clearcuts, with the highest densities in 10- to 15-year old, mid-successional forested areas with grassy or shrubby understories. These habitats are now rare within the Dismal Swamp and will essentially disappear without active management to maintain them.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Not known to be a problem.

C. *Disease or predation.* Not known to be a problem.

D. *The inadequacy of existing regulatory mechanisms.* As a faunal component of the Great Dismal Swamp National Wildlife Refuge, the subspecies is protected within Refuge boundaries from direct disturbance violations (to kill, possess, disturb, injure, damage, etc., without special permit) by 50 CFR 27.51. The main problem of the shrew, however, is not direct disturbance or taking, but alteration of habitat (see "A") and consequent vulnerability to genetic swamping (see "E").

E. *Other natural or manmade factors affecting its continued existence.* The

Dismal Swamp southeastern shrew probably developed its distinctive size and coloration while geographically or ecologically isolated from its smaller upland relative, *Sorex longirostris longirostris*, during the late Pleistocene. Recent rapid changes in the Dismal Swamp (as described in "A" above) may have converted the swamp environment into habitat more suitable for the latter subspecies, apparently causing an ingress of *S. l. longirostris* into the swamp. The Dismal Swamp southeastern shrew is threatened through contact and interbreeding with this smaller subspecies (Handley 1980, Rose 1983). Rose (1983) found evidence of interbreeding between the two subspecies along the east and west periphery of the swamp. Evidence of contact and interbreeding is further reinforced by Rose's observation of a clear trend in size, from large to small shrews, as one moves peripherally from the Dismal Swamp. Because of the restricted distribution of the larger Dismal Swamp shrew, it is probable that the continued interbreeding of the two subspecies will eventually result in an infusion of genes of *S. l. longirostris* into the entire Dismal Swamp shrew population. This would constitute extinction for the Dismal Swamp southeastern shrew.

The hybridization process now jeopardizing the Dismal Swamp southeastern shrew is comparable to that which has nearly destroyed another mammal, the red wolf (*Canis rufus*), which is federally classified as endangered. According to Nowak (1979), the red wolf originally occupied a range and habitat in the forested southeastern United States, largely separate from that occupied by its smaller relative, the coyote (*Canis latrans*) of the western prairies. Human activities reduced red wolf numbers, disrupted its habitat, and allowed the coyote to invade its range. The latter species then began to interbreed with surviving red wolves. As a result, by the early 20th century zones of hybridization were evident in central Texas and the Ozark region. At that time there was a clear progression in size, ranging from the small coyote in the north and west, through intermediate-sized *Canis* in central Texas and the Ozarks, to the large red wolf in eastern Texas, Louisiana, and some adjacent areas. This situation was much the same as we see today in the *Sorex* of the Dismal Swamp region. No conservation measures were initiated for the red wolf until the 1960's, and by then the hybridization process had engulfed almost all of the species. The red wolf, in the pure form, has now

nearly or entirely disappeared from the wild. By catching the same process at an earlier stage, it may yet be possible to save the Dismal Swamp southeastern shrew.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the Dismal Swamp southeastern shrew as threatened. The Act defines a threatened species as one which "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." This status seems most appropriate for *Sorex longirostris fisheri* at this time. As stated above, the subspecies is jeopardized primarily by its limited distribution and the possibility of genetic swamping if present trends continue. These trends have not yet progressed so far that extinction appears imminent; they may be reversed by proper conservation measures. obtain data necessary for proper management, the interactions and ecology of the two shrew subspecies must be further studied. Such study involves trapping and, therefore, taking of shrews. Paradoxically, in this particular instance, such taking may be necessary to the survival of the threatened subspecies. For the reasons given below, no critical habitat is being designated.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate any habitat of a species which is considered to be critical habitat at the time the species is determined to be endangered or threatened. Implementing regulations at 50 CFR 424.12(a)(1) state: "A designation of critical habitat is not prudent when one or both of the following situations exist: (i) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species, or (ii) such designation of critical habitat would not be beneficial to the species." In the case of the Dismal Swamp southeastern shrew, the Service finds that a determination of critical habitat is not prudent. Such a determination would result in no known benefit to the species. Nearly all of the known habitat of this species lies within the Great Dismal Swamp National Wildlife Refuge, which is managed by the Service. The Refuge managers and

all other involved parties are already aware of the occupied range of this species. Moreover, this final determination of threatened status will be followed by continued development of Refuge management strategies designed to benefit the Dismal Swamp southeastern shrew. Thus, no benefit would accrue from designation of critical habitat.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened. Regulations implementing this interagency cooperative provision of the Act are codified at 50 CFR 402 (see revision at 51 FR 19926; June 3, 1986). Section 7(a)(2) requires agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species. If a Federal action may affect a listed species, the responsible Federal agency must enter into formal consultation with the Service.

An overall management plan is currently being developed for the Great Dismal Swamp National Wildlife Refuge. This plan will be designed, in part, to consider the needs of *Sorex longirostris fisheri*. Land use practices likely to benefit this shrew would include: (a) increasing the height of the water table and (b) selective burning and other logging practices that maintain a mosaic of forested plots of differing ages in areas where *S. 1. fisheri* is now predominant (Rose 1983). Intra-Service consultation on this master plan will be required as a result of this listing. The proposed highway by-pass mentioned in the Comments section above will also require formal consultation (by the Federal Highway Administration) as a result of this rule.

Finally, the U.S. Army Corps of Engineers is considering closing the Dismal Swamp Canal. This action will also require consultation, to ensure that the closure is done in a manner consistent with the well-being of *S. 1. fisheri*.

The Act and implementing regulations found at 50 CFR 17.21 and 17.31 set forth a series of general prohibitions and exceptions that apply to all threatened wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that was illegally taken. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving threatened wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22, 17.23, and 17.32. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. For threatened species, there are also permits for zoological exhibition, educational purposes, or special purposes consistent with the purposes of the Act. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not otherwise available.

National Environmental Policy Act

The Service has determined that an Environmental Assessment, as defined by the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended.

A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

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Author

The primary author of this final rule is Ms. Judy Jacobs, U.S. Fish and Wildlife Service, 1825B Virginia Street, Annapolis, Maryland 21401 (301/269-6324 or FTS 922-4197).

List of Subjects in 50 CFR Part 17

Endangered and Threatened Wildlife, Fish, Marine Mammals, Plants (agriculture).

Regulation Promulgation

PART 17—[AMENDED]

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. Amend § 17.11(h) by adding the following, in alphabetical order under "Mammals," to the list of endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

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(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
Shrew, Dismal Swamp southeastern	<i>Sorex longirostris fisheri</i>	U.S.A. (VA, NC)	Entre	T	246	NA	NA

Dated: September 12, 1986.

Susan Recce,
Deputy Assistant Secretary for Fish and Wildlife and Parks.
 [FR Doc. 86-21757 Filed 9-25-86; 8:45 am]
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