
DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

**Endangered and Threatened Wildlife
and Plants; Proposed Threatened
Status for the Dismal Swamp
Southeastern Shrew**

AGENCY: Fish and Wildlife Service,
Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes to determine threatened status for the Dismal Swamp southeastern shrew, 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 causing direct adverse effects on the shrew, these habitat changes apparently are also 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 proposal, if made final, would implement protection provided by the Endangered Species Act of 1973, as amended, for the Dismal Swamp southeastern shrew. The Service seeks relevant data and comments from the public.

DATES: Comments from all interested parties must be received by September 16, 1985. Public hearing requests must be received by August 30, 1985.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Annapolis Field Office, U.S. Fish and Wildlife Service, 1825 Virginia Street, Annapolis, Maryland 21401. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

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

SUPPLEMENTARY INFORMATION:

Background

The Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) 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 the species *Sorex longirostris*, which is found over much of the southeastern United States, and now the former is usually referred to as *Sorex longirostris fisheri*. There is, however, still some question as to whether *fisheri* is a full species, because originally there was not evidence of intergradation between *fisheri* and *longirostris* (Judge and Hoffman 1981). A lack of intergradation in physical characters is generally considered an indication that two wild populations represent species, rather than subspecies. *Fisheri* is 15 to 25 percent larger than its upland relative *S. l. longirostris* and is generally duller in color. Most *S. l. fisheri* measure 95-100 millimeters in greatest length, while most *S. l. longirostris* measure 75-80 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). Prior to 1980, the subspecies was known from only 19 specimens collected within the Dismal Swamp (Handley 1979). Since 1980, at least 39 additional specimens have been collected in and adjacent to the Dismal Swamp, which can be identified as *Sorex longirostris fisheri* on the basis of body length (Rose 1983). The subspecies is found in a variety of habitats from lowland old fields to mature pine and deciduous forest areas, 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 its restricted habitat to be overrun by the more plentiful upland subspecies, *Sorex longirostris longirostris* (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 subspecies of small mammals, including *Sorex longirostris*. These subspecies show a feature typical of small mammals on islands, that is, individuals are larger than those from the nearby "mainland," in this case, members of upland subspecies. In the process of subspeciation, individuals in the swamp must have been at a competitive disadvantage when living outside the swamp, and the upland race must have been 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 race, in this case *S. l. longirostris*, over the swamp subspecies, *S. l. fisheri*.

In its Review of Vertebrate Wildlife in the Federal Register of December 30, 1982 (48 FR 58454-58460), the U.S. Fish and Wildlife Service placed *S. l. fisheri* in category 2, meaning that a proposal to list as endangered or threatened was possibly appropriate, but that substantial data were not then available to biologically 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,

show that a proposal to list the shrew as threatened is now warranted.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement the listing provisions of the Act (50 CFR Part 424) set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species 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. Around the turn of the century, this swamp was estimated to have occupied some 2,000 to 2,200 square miles (Oakes and Whitehead 1979). Even at that time, its size had been reduced by clearing and draining for agriculture. Today, approximately 328 square miles of the original swamp remain intact (U.S. Fish and Wildlife Service 1982), there having been a reduction of roughly 85 percent. According to Rose (1983), ditching has lowered the water table within the remaining swamp. Other human 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 forest is likely detrimental to the Dismal Swamp southeastern shrew. Rose's trapping data revealed that, of all habitats evaluated in the swamp, densities of *Sorex* were lowest in mature forests. Rose found the shrew to be abundant in cane stands and regenerating clearcuts, with the highest densities (= healthier populations) 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 if present trends continue.

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 large size and coloration while geographically or ecologically isolated from its smaller upland relative, *Sorex longirostris longirostris*, during the late Pleistocene (Handley 1980, Rose 1983). Changes in the Dismal Swamp (as described in "A" above) may have converted the swamp environment into habitat more suitable for the latter subspecies, causing an ingress of the latter into the swamp (Handley 1980, Rose 1983). The Dismal Swamp southeastern shrew is threatened primarily through contact and interbreeding with this smaller upland 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 *Sorex longirostris longirostris* into the entire Dismal Swamp shrew population. This would constitute extinction from 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 wolf populations. 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 range 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, however, it may now 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 propose this rule. 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 currently protected from taking or injury and 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, and may yet be reversed by proper conservation measures. 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. The species is not migratory and continuously occupies its known range. Moreover, a final determination of threatened status would be followed by continued development of Refuge management strategies designed to benefit the Dismal Swamp southeastern shrew. Thus, no benefits 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) of 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 cooperation provision of the Act are codified at 50 CFR Part 402, and are now under revision (see proposal at 48 FR 29990; June 29, 1983). Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species. If a species is listed subsequently, 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 such a 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) Selective burning and other logging practices that maintain a mosaic of forested plots of differing ages, and (b) increasing the height of the water table (Rose 1983).

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 available.

Public Comments Solicited

The Service intends that any final rule adopted will be accurate and as effective as possible in the conservation of endangered or threatened species. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposed rule are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to the Dismal Swamp southeastern shrew;

(2) The locations of any additional populations of the Dismal Swamp southeastern shrew and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range or distribution of this species; and

(4) Current or planned activities in the subject area and their possible impacts on the Dismal Swamp southeastern shrew.

Final promulgation of the regulation on the Dismal Swamp southeastern shrew will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Annapolis Field Office as shown in the above ADDRESSES section.

National Environmental Policy Act

The Fish and Wildlife 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).

References

- Hall, E.R. 1981. The mammals of North America. John Wiley and Sons, New York. 2 vols.
- Handley, C.O., Jr. 1979. Mammals of the Dismal Swamp: a historical account. In Kirk, P.W., Jr. (ed.), The Great Dismal Swamp. University Press of Virginia, Charlottesville, pp. 297-357.
- Handley, C.O., Jr. 1980. Mammals. In Linzey, D.W. (ed.), Endangered and threatened plants and animals of Virginia. Virginia Polytechnic Inst. and State Univ., Blacksburg, pp. 483-621.
- Jackson, H.H.T. 1928. A taxonomic review of

- the American long-tailed shrews. North American Fauna. no. 51, 238 pp.
- Junge, J.A., and R.S. Hoffmann. 1981. An annotated key to the long-tailed shrews (genus *Sorex*) of the United States and Canada, with notes on Middle American *Sorex*. Occas. Papers Mus. Nat. Hist. Univ. Kansas, no. 94, 48 pp.
- Merriam, C.H. 1895. Synopsis of the American shrews of the genus *Sorex*. North American Fauna. no. 10, pp. 57-125.
- Nowak, R.M. 1979. North American Quaternary *Canis*. Monogr. Mus. Nat. Hist. Univ. Kansas, no. 6, 154 pp.
- Oakes, R.Q., Jr., and D.R. Whitehead. 1979. Geologic setting and origin of the Dismal Swamp, southeastern Virginia and northeastern North Carolina. In Kirk, P.W., Jr. (ed.), The Great Dismal Swamp, University Press of Virginia, Charlottesville, pp. 1-21.
- Rose, R.K. 1983. A study of two rare mammals endemic to the Virginia/North Carolina Dismal Swamp. Final report under U.S. Fish and Wildlife Research Grant No. 14-16-0005-81-033, 135 pp.
- U.S. Fish and Wildlife Service. 1982. Synopsis of planning needs and issues: Dismal Swamp National Wildlife Refuge Master Plan. Manuscript.

Author

The primary author of this proposed rule is Ms. Martha Tacha, U.S. Fish and Wildlife Service, 1825 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).

Proposed Regulation Promulgation

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, 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. 375; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. It is proposed to 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.

* * * * *

(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)	Entire.....	T		NA	NA

Dated: June 27, 1985.

J. Craig Potter,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 85-16793 Filed 7-15-85; 8:45 am]

BILLING CODE 4310-55-M