

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Endangered Status for the Alabama Cave Shrimp, *Palaemonias alabamiae*

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Service determines the Alabama cave shrimp, *Palaemonias alabamiae*, to be an endangered species under the authority contained in the Endangered Species Act of 1973, as amended (Act). This obligate cave dweller has been found in only two caves, Shelta and Bobcat, in Madison County, Alabama. Groundwater contamination, low population levels, and collecting represent major threats to this small shrimp. The shrimp was not observed in Shelta Cave during the biweekly surveys of aquatic cave life over a twelve month period. In Bobcat Cave, only two or three shrimp have been observed on any single visit. This determination implements the protection of the Act for the Alabama cave shrimp.

EFFECTIVE DATE: October 7, 1988.

ADDRESS: The complete file for this rule is available for inspection by appointment during normal business hours at the Jackson, Mississippi, Field Office, U.S. Fish and Wildlife Service, Jackson Mall Office Center, Suite 316, 300 Woodrow Wilson Avenue, Jackson, Mississippi 39213.

FOR FURTHER INFORMATION CONTACT: Mr. James H. Stewart at the above address (601/965-4900, FTS 490-4900).

SUPPLEMENTARY INFORMATION:**Background**

The Alabama cave shrimp, *Palaemonias alabamiae*, is an albinistic cave shrimp known from only two caves in Madison County, Alabama. (J.E. Cooper, pers. comm.). This obligate cave shrimp was first collected in 1958 by Dr. Thomas Poulson and described in 1961 by A.E. Smalley from a series of 20 shrimp collected in Shelta Cave (Cooper 1975). The Alabama cave shrimp is colorless and largely transparent with a total length of up to 20 mm (0.8 in.) (Cooper 1975; Smalley 1961). The only other species of *Palaemonias* is the endangered Kentucky cave shrimp, *P. ganteri*, known only from Mammoth Cave, Kentucky. *Palaemonias alabamiae* is very similar to *P. ganteri*, but is smaller in size, has a shorter rostrum, generally lacks ventral rostral spines

and has fewer dorsal rostral spines (Smalley 1961).

A search of over 200 caves in north Alabama has failed to find the Alabama cave shrimp anywhere but at the two localities (J.E. Cooper, pers. comm.). The type locality, Shelta Cave, lies within the northwest limits of Huntsville, Alabama. It is located in Warsaw limestone of Mississippian age in the Interior Low Plateau (Cooper 1975). Shelta Cave consists of three large rooms with smaller alcoves. Water is present in all of the cave areas during wet periods of the year. Water levels fluctuate several feet during the year and some areas of the cave become seasonally dry. The two pit entrances to Shelta Cave are owned by the National Speleological Society and are gated to control activity in the cave. The only other known population is in Bobcat Cave, located on Redstone Arsenal, under the control of the U.S. Army.

The available information indicates the population in Shelta Cave has declined and may be extirpated. Over an 11-year period, Cooper and others collected or observed from one to 25 shrimp on each of 19 visits (Cooper 1975). On two of these visits the shrimp were not counted, but described as plentiful. During the period from December 1985 to April 1986, biologists made monthly trips to observe aquatic life in Shelta Cave but did not find any shrimp. In April 1986, a study to observe aquatic life in Shelta Cave twice a month for one year was initiated. No cave shrimp were observed in Shelta Cave during this period.

Threatened status was proposed for the Alabama cave shrimp on January 12, 1977 (42 FR 2507). That proposal was withdrawn on December 10, 1979 (44 FR 70796), for administrative reasons stemming from new listing requirements of the 1978 amendments to the Act. This species was proposed for endangered status on November 19, 1987 (52 FR 44578-44580).

Summary of Comments and Recommendations

In the November 19, 1987, proposed rule 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 was published in The Birmingham News and in The Huntsville Times on December 13, 1987, and in The Huntsville News on December 14, 1987, which invited general public comment.

Four comments were received. One Federal agency saw no impact to their program by the proposal. The proposal was supported by the other three commenters, including a Federal agency, the national conservation organization that owns Shelta Cave, and by a professional biologist. Two of these commenters provided additional data.

After a thorough review and consideration of all information available, the Service has determined that the Alabama cave shrimp (*Palaemonias alabamiae*) should be classified as an endangered 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 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 Alabama cave shrimp (*Palaemonias alabamiae*) are as follows:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. The only known populations of Alabama cave shrimp occur in Shelta and Bobcat Caves. The only population trend data is discussed in the "Background" section. Groundwater contamination represents a major threat to this cave-dwelling species. Both caves are within the Huntsville Spring Branch and Indian Creek drainages, known areas of DDT contamination (Environmental Protection Agency 1986). They are not known to be in the direct path of the contaminated flow at the present time. In any area where sinkholes occur, however, surface pollutants can easily and rapidly enter the sub-surface aquifer.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Apparent low reproductive abilities, confined habitat, and inability to elude captors make the Alabama cave shrimp very susceptible to collecting. Cooper (1975) found only eight attached eggs on Alabama cave shrimp and indicated this species produced only one-third to one-half as many eggs as females of the endangered Kentucky cave shrimp. Other cave species are known to have extremely low reproductive rates compared to closely related surface species (Poulson 1961; Cooper 1975). As a result, any collection of adults can significantly affect population levels. There are few known collections of the Alabama cave shrimp, and these were made when the

species was apparently more common (see Background).

C. Disease and Predation. The Alabama cave shrimp occurs with the southern cavefish, *Typhlichthys subterraneus*, the cave salamander, *Gyrinophilus pallescens*, and the cave crayfish, *Aviticambarus jonesi* in one or both caves (Cooper 1975). It is probable that all three prey upon young cave shrimp (Barr and Kuehne 1971; Cooper 1975).

D. The inadequacy of existing regulatory mechanisms. The Alabama Department of Conservation and Natural Resources recognizes the Alabama cave shrimp as a "species of special concern" but does not provide any legal protection (Bouchard 1976). Shelta Cave is owned by the National Speleological Society and is currently gated to exclude unauthorized visitors. Bobcat Cave is owned by Redstone Arsenal and admittance is controlled. While admittance to the caves is restricted by the owners, adequate regulations do not exist to discourage collection of the species by those who are able to gain entrance to the caves.

E. Other natural or manmade factors affecting its continued existence. Its very small population levels and low reproductive capabilities are natural limitations to the ability of this species to recover from any adversity. Only two populations are known, and no shrimp have been observed in Shelta Cave despite twice monthly observations of the aquatic fauna for almost a year.

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 Alabama cave shrimp as an endangered species. Endangered status was chosen because the species has only been found in two caves and is in obvious decline in one of these caves. Therefore, the species requires the greatest possible protection under the Act. The reason critical habitat is not designated is discussed in the next section.

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. The Service finds that designation of critical habitat is not prudent for this species at this time. As discussed under Factor B in the "Summary of Factors Affecting the Species", the Alabama cave shrimp is

endangered by taking, an activity difficult to prevent. Publication of critical habitat descriptions would make this species even more vulnerable and increase enforcement problems. All involved parties and land owners have been notified of the location and importance of protecting this species' habitat. Protection of this species' habitat will be addressed through the recovery process and through the section 7 jeopardy standard. Therefore, it would not be prudent to determine critical habitat for the Alabama cave shrimp at this time.

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. Examples of recovery actions that might be implemented include management agreements with Redstone Arsenal and cooperation with the National Speleological Society to protect existing populations of this shrimp, studies to understand the groundwater recharge patterns, and attempts to develop safeguards against potentially damaging contamination of groundwater entering the caves. 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 for threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may adversely affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal involvement with this species is expected to be minimal. The continuing development of this region could lead to sub-surface water degradation that may involve the Environmental Protection Agency or other agencies with jurisdiction over groundwater. The Federal Housing Authority may be required to consult with the Service on Federal loans for housing development within the cave's recharge area. Development on Redstone Arsenal may require consultation with the U.S. Army.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered 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 also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. 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. 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.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of 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 Cited

- Barr, T.C., Jr., and R.A. Kuehne. 1971. Ecological studies in the Mammoth Cave System of Kentucky II. The ecosystem. *International Journal of Speleology* 26(1):47-96.
- Bouchard, R.W. 1976. Crayfishes and shrimps. pp. 14-20. *In*: H. Boschung (ed.).

Endangered and Threatened Plants and Animals of Alabama. Alabama Museum of Natural History Bulletin No. 2, 92 pp.

Cooper, J.E. 1975. Ecological and behavioral studies in Shelta Cave, Alabama, with emphasis on decapod crustaceans. Ph.D. Dissertation University of Michigan. University Microfilm International, Ann Arbor, Michigan 364 pp.

Environmental Protection Agency. 1986. Report on the remedial action to isolate DDT from people and the environment in the Huntsville Spring Branch-Indian Creek System Wheeler Reservoir, Alabama. EPA, Region IV, Atlanta, Georgia. 38 pp + appendices.

Poulson, T.L. 1961. Cave adaptations in Amblyopsid fishes. Ph.D. Dissertation University of Michigan. University Microfilm International, Ann Arbor, Michigan. 185 pp.

Smalley, A.E. 1961. A new cave shrimp from Southeastern United States (Decapod, Atyidae). Crustaceana III(2):127-130.

Author

The primary author of this final rule is James H. Stewart (see **ADDRESS** section) (601/965-4900, FTS 490-4900).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Regulation Promulgation

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

PART 17—[AMENDED]

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 (18 U.S.C. 1531 *et seq.*); Pub. L. 99-625, 100 Stat. 3500 (1986), unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under "CRUSTACEANS", 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						
CRUSTACEANS							
Shrimp, Alabama cave	<i>Palaeomonias alabamae</i>	U.S.A. (AL)	NA	E	323	NA	NA

Dated: August 11, 1988.
 Susan Recce,
 Assistant Secretary for Fish and Wildlife and Parks.
 [FR Doc. 88-20297 Filed 9-6-88; 8:45 am]
 BILLING CODE 4310-55-M