known or are expected to affect this species.

The Act and its implementing regulations found at 50 CFR 17.71 set forth a series of general trade prohibitions and exceptions that apply to all threatened plants. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export any threatened plant, transport it in interstate or foreign commerce in the course of a commercial activity, sell or offer it for sale in interstate or foreign commerce, or remove it from areas under Federal jurisdiction and reduce it to possession. Certain exceptions can apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.72 also provide for the issuance of permits to carry out otherwise prohibited activities involving threatened species under certain circumstances. With respect to *Echinocereus chisoensis* var. *chisoensis*, it is anticipated that few trade permits would ever be sought or issued since the species is not common in cultivation or in the wild. Requests for copies of the regulations on plants and inquires regarding them may be addressed to the Permit Branch, Office of Management Authority, U.S. Fish and Wildlife Service, Washington, DC 20240 (703/343–4955).

Echinocereus chisoensis var. *chisoensis* is on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Species on Appendixc II require a permit from the country of origin prior to export. International trade in this species is minimal. The Service will not review this species to determine if it should be reclassified under CITES.

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

Benson, L. 1969. The cacti of the United States and Canada—New names and nomenclature combinations—I. Cactus and Succulent Journal (U.S.) 41:124–128.

Benson, L. 1982. The cacti of the United States and Canada. Stanford University Press, Stanford, CA. 1044 pp.

Evans, D.B. 1986. Survey of Chisos pitaya *Echinocereus reichenbachii* var. *chisoensis*]. U.S. National Park Service, Big Bend National Park, TX. 18 pp.

Heil, K.D., and E.F. Anderson. 1982. Status report on *Echinocereus chisoensis*. U.S. Fish and Wildlife Service, Office of Endangered Species, Albuquerque, NM. 19 pp.

Heil K.D., S. Brack, and J.M. Porter. 1985. The rare and sensitive cacti of Big Bend National Park. U.S. National Park Service, Big Bend National Park, TX. 41 pp.

Marshall, W.T. 1940. Echinocereus chisoensis sp. nov. Cactus and Succulent Journal (U.S.) 12:15.

Taylor, N.P. 1985. The genus *Echinocereus*. Timber Press, Portland, Oregon. 160 pp.

Author

The primary author of this final rule is Charles McDonald, Endangered Species Office, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103 (505/766–3972 or FTS 474–3972). Status information was provided by K.D. Heil, Navajo Community College, Shiprock, New Mexico, and E.F. Anderson, Whitman College, Walla Walla, Washington.

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

2. Amend § 17.12(h) by adding the following, in alphabetical order under the family Cactaceae, to the List of Endangered and Threatened Plants:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
Cactaceae—Cactus family:						
*	*	*	*	*		
Echinocereus chisoensis var. *chisoensis* (=E. chisoensis=E. reichenbachii var. *chisosensis*).	Chisos Mountain hedgehog cactus	U.S.A. (TX)	T	335	NA	NA
*	*	*	*	*		

Dated: September 22, 1988.

Susan Recce,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 88–22329 Filed 9–29–88; 8:45 am]

BILLING CODE 4310–55–M

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Two Long-Nosed Bats

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Service determines endangered status for the Mexican long-nosed bat (*Leptonycteris nivalis*) and Sanborn's long-nosed bat (*L. sanborni*), which are found in the southwestern U.S., Mexico, and Central America. They depend largely on caves for roosting and on the flowers of agaves and cacti for food. Both species evidently have declined in recent years, and remaining populations are jeopardized by disturbance of roosting sites, loss of food sources, and direct killing by humans. This rule implements the protection of the Endangered Species Act of 1973, as amended, to these animals.

EFFECTIVE DATE: October 31, 1988.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Service's Regional Office of Endangered Species, 500 Gold Avenue SW., Room 4000, Albuquerque, New Mexico.

FOR FURTHER INFORMATION CONTACT: Chief, Office of Endangered Species, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103 (505/766–3972 or FTS 474–3972).

SUPPLEMENTARY INFORMATION:

Background

The genus *Leptonycteris* differs strikingly from most other bats that occur in the United States, in having an elongated muzzle with a small nose leaf at the tip. Its long tongue, an adaptation for feeding, measures up to 3 inches (76 millimeters). Head and body length is 2¾ to 3¾ inches (70 to 90 millimeters), the tail is very small, and weight is ½ to 1 ounce (18 to 30 grams). Coloration is usually yellowish brown or grayish above and cinnamon brown below (Wilson 1985a, 1985b).

Leptonycteris contains three species, of which one (*L. curasoae*) is known only from the northern coast of South America and some adjacent islands (Nowak and Paradiso 1983). The other two species, which occur in the southwestern U.S., Mexico, and Central America, are *L. nivalis* (Saussure), the Mexican or "big" long-nosed bat, and *L. sanborni* Hoffmeister, Sanborn's or "little" long-nosed bat. These bats have a rather confusing nomenclatural history, and *L. sanborni* is sometimes called *L. yerbabuenae*. Although there is general agreement that *L. nivalis* and *L. sanborni* are distinct species, and while the two can be separated by cranial and dental characters, they are sometimes difficult to distinguish in the field (there is actually little size difference). The most useful external identification characters are the shorter, denser pelage of *L. sanborni*, and the longer, finer hair extending above and beyond the tail membrane of *L. nivalis* (Wilson 1985a, 1985b).

These bats are adapted for life in arid country, and are found mainly in desert scrub habitat in the U.S. parts of their range. Farther south, they sometimes occur at high elevations on wooded mountains. For day roosting sites, they depend almost entirely on caves and abandoned mines and tunnels. Populations in the U.S. and northern Mexico apparently migrate southward in the fall and return in the spring, with groups occupying the same caves, year after year. Thousands of individuals may roost together at a single site, though large aggregations now seem much rarer than in the past (Wilson 1985a, 1985b).

The bats emerge at night to feed on nectar and pollen, especially of the flowers of paniculate agaves (century plants) and large cacti. An intimate mutual relationship seems to be involved, with the bats depending on the plants for food, and the plants requiring the bats as pollinators. In recent decades, human exploitation of agaves may have contributed substantially to a drastic reduction in populations of *Leptonycteris*, which in turn caused a serious decline in the reproductive rate of certain agaves (Howell 1974, 1976, pers. comm.; Howell and Roth 1981). Fruit, particularly soft and juicy kinds, is also eaten by these bats, especially in the southern parts of their range (Wilson, pers. comm.).

In its Review of Vertebrate Wildlife in the **Federal Register** of December 30, 1982 (47 FR 58454–58460), the Service included *L. nivalis* in category 2, meaning that information then available indicated that a proposal to determine endangered or threatened status was possibly appropriate, but was not yet sufficiently substantial to biologically support such a proposal. In a revised Review of Vertebrate Wildlife in the **Federal Register** of September 18, 1985 (50 FR 37958–37967), both *L. nivalis* and *L. sanborni* were placed in category 2. Shortly thereafter, the Service received completed reports (Wilson 1985a, 1985b) of status surveys, which it had initially funded in 1983. These reports, and other information provided to the Service, indicate that the two long-nosed bats have declined, that their remaining populations are jeopardized by several factors, and that they now warrant addition to the List of Endangered and Threatened Wildlife. In the **Federal Register** of July 6, 1987 (52 FR 25271–25275), the Service published a proposed rule to determine endangered status for these two bats.

Summary of Comments and Recommendations

In the July 6, 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. Newspaper notices were published in *The Star* (Tucson, AZ) and the *Alpine Avalanche* (Alpine, TX) on July 30, 1987, which invited general public comment. Six comments were received and are discussed below.

Five letters of support were received (Arizona Game and Fish Department, Texas Parks and Wildlife Department, Arizona Department of Commerce, the Director of the Oklahoma Museum of Natural History, and a Ph.D. candidate from the University of Arizona), and one letter of opposition (New Mexico Game and Fish Department) was received.

The Ph.D. candidate sent additional location information on Sanborn's long-nosed bat. While important, this information does not change the major conclusions about the status of the bat. The information was incorporated into this final rule.

The New Mexico Game and Fish Department questioned the validity of listing these species based on present evidence. They believe the data base is limited—especially for the ranges south of the United States. Their criticism focused on what they believed to be inadequacies in the 1985 status report of *L. sanborni*. Although the decision to list these two species of *Leptonycteris* was based in part on the status reports by Wilson (1985a, 1985b), the Service did consider information from other sources in making this decision. In addition, although additional survey work should be conducted to aid in the recovery of these bats, the Service believes that the status reports and information from other sources does contain sufficient information to support listing. (See "A" under "Summary of Factors Affecting the Species"). Section 4 of the Endangered Species Act requires that listing determination be made on the basis of the best available scientific information.

Summary of Factors Affecting the Species

After a thorough review and consideration of all available information, the Service has determined that the Mexican long-nosed bat (*Leptonycteris nivalis*) and Sanborn's long-nosed bat (*L. sanborni*) should be classified as endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act of 1973, as amended (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 Mexican long-nosed bat (*Leptonycteris nivalis*) and Sanborn's long-nosed bat (*L. sanborni*) are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

The species *L. nivalis* originally occurred from southwestern Texas and perhaps southwestern New Mexico, through much of Mexico, to Guatemala. The reported presence in New Mexico is based solely on two specimens collected in 1963 and 1967 in Hidalgo County. The only roosting site in the United States, currently known to be in use, is a cave in Big Bend National Park, Texas. The population there was estimated at 10,650 individuals in 1967 and about 1,000 in 1983 (Wilson 1985a). *L. nivalis* still occurs in Mexico, but there is evidence of a severe decline. The recent Service-funded survey covered nearly all sites in that country, where the species had been reported in the past, and located live individuals at 15 localities, but only in relatively small numbers. An abandoned mine in Nuevo Leon, which had an estimated population of 10,000 *L. nivalis* in 1938, had no sign of the species in 1983. Another mine in that State, which had a ceiling covered with newborn young in 1967, contained only a single bat in 1983. A cave in Morelos that supported large numbers in the 1950's and 1960's had only 30–50 individuals in 1984, and that was about the largest group found in Mexico (Wilson 1985a). Reported occurrence in Guatemala is based entirely on two specimens collected over 100 years ago (Jones 1966).

The species *L. sanborni* originally occurred from central Arizona and southwestern New Mexico, through much of Mexico, to El Salvador (Hall 1981). It evidently was once more common in the U.S. than was *L. nivalis*, but a deterioration in status was noted some years ago. Hayward and Cockrum (1971) reported that populations of many colonies in Arizona and northwestern Mexico had greatly declined and some had completely disappeared. A 1974 survey of all localities in the U.S., from which the species had been reported, found only 135 individuals (Howell and Roth 1981). Until the 1950's, a single roosting colony, at Colossal Cave in Pima County, Arizona, contained as many as 20,000 *L. sanborni*, but that colony has now vanished. The recent Service-funded survey covered every previously known site of occurrence in the U.S., but found the species only in one place, a cave on private property in Santa Cruz County, Arizona, that held about 500 individuals. However, based on reported sightings of bats visiting artificial hummingbird feeders, two additional populations of *L. sanborni* are thought to survive in or near Cochise County, Arizona, one containing perhaps 300 individuals.

The Service-funded survey also covered nearly all sites in Mexico, from which *L. sanborni* had been reported. Live individuals were found in only three places, and very few in two of those. The third site, a cave on the coast of Jalisco, may have supported 15,000 *L. sanborni* (Wilson 1985b). To the south of Mexico, the species is known only by a single specimen, collected in El Salvador in 1972 (Jones and Bleier 1974).

Since the proposed rule was published, the Service has received several other reports of *L. sanborni*. Most of these, however, appear to be small colonies (less than 50 bats) or a single bat. One unconfirmed report of 2,000–3,000 *L. sanborni* in the Patagonia or Santa Rita Mountains during the fall of 1987 has been received. This area is close to the site where the largest colony was found in 1985 during the status survey. Another report of 800–1000 in a cave in Sonora, Mexico during May, 1986 was received. Both of these colonies were found in different years than the status survey; therefore, they may represent bats counted in the status survey.

The reasons for the evident decline of the two long-nosed bats are not entirely clear, but are probably associated, at least in part, with habitat disruption. The two most important aspects of the bats' habitat involve roosting sites and food sources. A limited number of caves and mines provide a proper roosting environment. While there are no precisely documented cases of roosts being made unusable, such sites are becoming increasingly subject to human destruction and disturbance, particularly in Mexico. The currently known U.S. roosts are thought to be well protected, but because there are so few, the loss of one could be devastating (Wilson 1985a, 1985b). These bats are easily disturbed and readily take flight when approached (Wilson *et al.* 1985).

As mentioned above, the long-nosed bats feed to a considerable extent on nectar and pollen of the flowers of agaves and cacti, especially in that portion of their ranges in the United States and northern Mexico. Their muzzles and tongues, both in length and surface structure, are highly adapted for deep insertion into flowers and collection of pollen particles (Greenbaum and Phillips 1974, Howell and Hodgkin 1986). Paniculate agaves (century plants), which produce showy, easily accessible, night-blooming flowers, the pollen of which is rich in protein, seem to be especially important to the bats. The annual migrations of the bats are associated to some degree with flowering of agaves in various areas. For example, the June arrival of *L. nivalis* in Big Ben National Park, Texas, coincides with the onset of agave flowering (Wilson 1985a). Unfortunately, the survival of many species and varieties of agaves is in doubt, especially in Mexico, because of human exploitation (for food, fiber, and alcoholic beverages), the spread of agriculture, wood cutting, and livestock grazing (Reichenbacher 1985).

Considerable evidence exists for the interdependence of *Leptonycteris* and certain agaves and cacti (a phenomenon known as chiropterophily) and for the simultaneous decline of the bats and agaves (Howell 1974, 1976, pers. comm.; Howell and Roth 1981). In location, structure, odor, and time of blooming, the flowers of the plants facilitate use by the bats. And in morphology and physiology of their noses, tongues, and dentition, the bats are adapted for feeding on the plants. When a bat visits a flower, it not only laps up some of the nectar and pollen on the spot, but picks up a considerable amount of pollen on its fur for later consumption. Some of this material is transferred to the next flower visited by the bat, and hence the plant is pollinated and reproduction can occur. *Leptonycteris* is thought to be the most important pollinator of some paniculate agaves and of the giant saguaro and organ pipe cacti. When the bats move northward in the late spring and summer, they are largely dependent on these plants. When they turn back south, and are conentrated in northern Mexico, the only blooming plants available to them are agaves. These agaves, however, are being intensively harvested by "moonshiners" for tequila production.

Excess harvest, and other factors resulting in elimination of agaves, may have contributed substantially to the drastic decline in long-nosed bat populations. In turn, the drop in bat numbers over the past several decades has coincided with a decline in the reproductive rate of agaves. For example, herbarium specimens of *Agave palmeri* from the Rincon Mountains of Arizona indicate pollination success of 80–100 percent in 1938–1941, when the area supported the huge Colossal Cave colony of *L. sanborni*. In 1976, after this colony had practically disappeared, the fecundity of *A. palmeri* was 0–10 percent. Other agaves, as well as the saguaro and organ pipe cacti, may also be affected, and there is concern for the future of entire southwest desert ecosystems.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Leptonycteris is not known to be taken for commercial purposes, and scientific collecting is not thought to be a problem. However, these bats are killed for fun by vandals. In Mexico, the general public often considers all bats to be vampire bats (which sometimes spread disease to people and livestock), and thus destructive control operations kill all bats in a cave (Wilson 1985a, 1985b).

C. Disease or Predation

Bats are susceptible to various diseases, though none are now known to be seriously affecting populations of *Leptonycteris*. However, if human agency reduces a species to only a few colonies, the vulnerability of that species to natural problems increases.

D. The Inadequacy of Existing Regulatory Mechanisms

In Mexico, there are no regulations protecting bats, other than restrictions on scientific collecting, and thus *Leptonycteris* is killed along with other kinds of bats in the course of control operations (Wilson 1985a, 1985b).

E. Other Natural or Manmade Factors Affecting its Continued Existence

During the recent Service-funded status survey, investigation of a cave in Guerrero, Mexico, revealed the skeletal remains of numerous *L. nivalis*, but no live members of that species. A cave in Sonora contained a recently dead *L. sanborni*, but no live individuals. In contrast, both caves were inhabited by several other kinds of bats, some of them in large numbers. These situations suggest the existence of some unknown agent that is causing a specific die-off of the long-nosed bats (Wilson 1985a, 1985b).

The Service has carefully assessed the best available scientific information regarding past, present, and probable future problems for the species. Based on this evaluation, the preferred action is to list the Mexican long-nosed bat and Sanborn's long-nosed bat as endangered. A decision to take no action would exclude these bats from protection provided by the Endangered Species Act. A decision to propose only threatened status would not adequately reflect the evident drastic decline of these species, the near or total disappearance of most of their known large colonies, and the apparent environmental problems that may lead to further deterioration of their status and that of the ecosystems on which they depend. For the reasons given below, critical habitat is not being designated.

Critical Habitat

Section 4(a)(3) of the Endangered Species Act, as amended, requires that "critical habitat" be designated "to the maximum extent prudent and determinable," concurrent with the determination that a species is endangered or threatened. The Service finds that designation of critical habitat for the Mexican and Sanborn's long-nosed bats is not prudent at this time. As noted in factors "A" and "B" in the above "Summary of Factors Affecting the Species," both species are easily disturbed, subject to killing by vandals, and reduced to only a few roosting colonies in the United States, the loss of which would be disastrous. Publication of precise descriptions and location maps of these colonies, such as would be involved in a critical habitat determination, could increase the vulnerability of the sites to vandals and could lead to disturbance by well-meaning tourists. The bats' survival could thus be placed in further jeopardy. Critical habitat designation is not applicable to species in areas outside of U.S. jurisdiction.

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 at the earliest opportunity. Potential management actions are limited, but the use of artificial feeders and the protection of roost sites may warrant investigation. 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 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 affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. With respect to the listing of the Mexican and Sanborn's long-nosed bats, there would be no known substantial effects on Federal activities within the United States. An opinion of August 31, 1981, from the Office of the Solicitor, U.S. Department of the Interior, indicates that the jeopardy prohibition of section 7(a)(2) does not apply in foreign countries.

Section 8(a) of the Act authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered species in foreign countries. Sections 8(b) and 8(c) of the Act authorize the Secretary to encourage conservation programs for foreign endangered species, and to provide assistance for such programs, in the form of personnel and the training of personnel.

Section 9 of 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 time to relieve undue economic hardship that would be suffered if such relief were not available.

National Environmental Policy Act

The 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).

Reference Cited

Greenbaum, I.F., and C.J. Phillips. 1974. Comparative anatomy and general histology of tongues of long-nosed bats (*Leptonycteris sanborni* and *L. nivalis*) with reference to infestation of oral mites. J. Mamm. 55:489–504.

Hall, E.R. 1981. The mammals of North America. John Wiley & Sons, New York, 2 vols.

Hayward, B.J., and E.L. Cockrum. 1971. The natural history of the western long-nosed bat *Leptonycteris sanborni*. Western New Mexico Univ. Res. Sci. 1:75–123.

Howell, D.J. 1974. Bats and pollen: physiological aspects of the syndrome of chiropterophily. Comp. Biochem. Physiol. 48A:263–276.

Howell, D.J. 1976. Plant-loving bats, bat-loving plants. Nat. Hist. 85(2):52–57.

Howell, D.J., and N. Hodgkin. 1976. Feeding adaptations in the hairs and tongues of nectar-feeding bats. J. Morphol. 148:329–336.

Howell, D.J., and B.S. Roth. 1981. Sexual reproduction in agaves: the benefits of bats: the cost of semelparous advertising. Ecology 62:1–7.

Jones, J.K., Jr. 1966. Bats from Guatemala. Univ. Kansas Publ. Mus. Nat. Hist. 16:439–472.

Jones, J.K., Jr., and W.J. Bleier. 1974. Sanborn's long-tongued bat, *Leptonyctyeris sanborni*, in El Salvador. Mammalia 38:144–145.

Nowak, R.M., and J.L. Paradiso. 1983. Walker's mammals of the world. Johns Hopkins Univ. Press, Baltimore, 2 vols.

Reichenbacher, F.W. 1985. Conservation of southwestern agaves. Desert Plants 7:103–107.

Wilson, D.E. 1985a. Status report: *Leptonycteris nivalis* (Saussure). Mexican long-nosed bat. Rept. to U.S. Fish and Wildl. Serv., Albuquerque, 33 pp.

Wilson, D.E. 1985b. Status report: *Leptonycteris sanborni* Hoffmeister. Sanborn's long-nosed bat. Rept. to U.S. Fish and Wildl. Serv., Albuquerque, 35 pp.

Wilson, D.E., D.V. Lanning, and R.A. Medellin. 1985. Bats from northeastern Mexico, with a checklist of species. U.S. Fish and Wildl. Serv., Museum Section, Washington, D.C., 30 pp.

Author

The primary author of this final rule is Alisa M. Shull, Endangered Species Biologist, Ecological Service Field Office, Fritz Lanham Building, Room 9A33, 819 Taylor St., Fort Worth, Texas 76102 (817/334–2961 or FTS 334–2961).

List of Subjects in 50 CFR Part 17

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

Regulations 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 (16 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 "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							
*	*	*	*	*			
Bat, Mexican long-nosed	*Leptonycteris nivalis*	U.S.A. (NM, TX), Mexico, Central America.	Entire	E	336	NA	NA
*	*	*	*	*			
Bat, Sanborn's long-nosed	*Leptonycteris sanborni* (=*L. yerbabuenae*).	U.S.A. (AZ, NM), Mexico, Central America.	Entire	E	336	NA	NA
*	*	*	*	*			

Dated: September 22, 1988.

Susan Recce,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 88–22330 Filed 9–29–88; 8:45 am]

BILLING CODE 4310–55–M

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Shasta Crayfish

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) determines the Shasta (placid) crayfish (*Pacifastacus fortis*) to be an endangered species. This species occurs only in Shasta County, California, within the Pit River drainage system including tributaries of the Hat Creek and Fall River subdrainages. This crayfish is a slow-maturing, relatively long-lived, passive species with low fecundity. Its preferred habitat is spring-fed lakes and slowly to moderately flowing cool rivers and streams. These waters typically have low turbidity, few suspended particles, excellent water quality, little vegetation, and adequate rubble substrate. The Shasta crayfish is uncommon and the overall population

could number fewer than 3,000 individuals located in the Fall River and Hat Creek subdrainages. A survey conducted in 1985 by the California Department of Fish and Game (CDFG) showed that the Shasta crayfish has been extirpated from approximately one-half of its known range since 1978. Throughout the approximate remaining 2,000 acres of habitat, the Shasta crayfish is endangered by: competition for food and space with two aggressive, adaptive, exotic crayfish species; agricultural development; increased residential development; and aquatic habitat loss because of water diversion and impoundment projects. Continued habitat loss and degradation present substantial threats to the existence of this crayfish. This rule implements the protection provided under the Endangered Species Act of 1973, as amended (Act), for the Shasta crayfish.

EFFECTIVE DATE: October 31, 1988.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Endangered Species Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E–1823, Sacramento, California 98525.

FOR FURTHER INFORMATION CONTACT: Mr. Gail C. Kobetich, Field Supervisor, Endangered Species Office, at the above address (916/978–4866 or FTS 460–4866).

SUPPLEMENTARY INFORMATION:

Background

The Shasta crayfish [*Pacifastacus fortis* (Faxon)] is a decapod crustacean of the family Astacidae. William Faxon (1914) originally described this crayfish as *Astacus nigrescens fortis* from specimens taken from Fall River and Hat Creek near Cassel in 1898. Bott (1950) revised the subfamily Astacinae, creating the new genus *Pacifastacus*, which contained most of the western North American species of the subfamily. Bott (1950) limited the members of the genus *Astacus* to the Eurasian species. Bouchard (1977a) subdivided the genus *Pacifastacus* into two subgenera, *Pacifastacus* and *Hobbsastacus*. *Pacifastacus fortis*, which Hobbs (1972) elevated to a species, belongs to the subgenus *Hobbsastacus*.

Adult Shasta crayfish are small- to medium-sized crayfish which may reach 25 to 50 millimeters (1–2 inches) total length of the carapace (shell covering the back over the walking legs). The color is variable and may range from dark brownish-green to dark brown on the topside and bright orange on the underside. Occasional blue-green to light blue individuals are found in isolated populations (McGriff, personal communication 1986). These blue crayfish have a light salmon color on their undersides. Members of the Fall River population are dark orange-brown on the topside and bright red on the underside, especially on the chelae (pinchers) (Eng and Daniels 1982). These colors (except the blue) provide camouflage for the crayfish among the volcanic rubble substrates of its habitat.

The adults of *P. fortis* are sexually dimorphic and can easily be distinguished because the males have narrower abdomens and larger chelae than the females. The first two pair of swimmerets (tiny swimming legs) of the males are hard and modified for sperm transfer to the female during mating. These notable sexual characteristics can be seen in young larvae that are less than 11 millimeters (.4 inches) in total carapace length (Eng and Daniels 1982).

Pacifastacus fortis is found only in Shasta County, California, in the Pit River drainage and two tributary systems, Fall River and Hat Creek subdrainages. In the Hat Creek subdrainage, populations have been found in Lost Creek and in Crystal, Baum, and Rising River Lakes. In the Fall River subdrainage, populations occur in the following bodies of water: Fall River; Big Lake (Horr Pond); Bit Tule River; Spring, Mallard, Squaw, and Lava Creeks; and in Crystal, Thousand, and Rainbow Springs. An additional population was extirpated in Sucker Spring Creek, a tributary of the Pit River at Powerhouse I, which lies between the two subdrainages (Bouchard 1978, Eng and Daniels 1982). The populations in Lake Britton, and in Burney, Clark, Kosk, Goose, Lost, and Rock Creeks were extirpated prior to 1974 (Bouchard 1977b). Since 1978, the Shasta crayfish has been extirpated from Baum Lake and Spring Creek near its confluence with the Pit River (Darlene McGriff CDFG, personal communication 1986).

Daniels (1980) reported the relative density of *P. fortis* in Crystal Lake as 6.89 crayfish per square meter verses 0.09 crayfish per square meter for Baum Lake in 1978. He also reported an average density of 3.81 crayfish per square meter for the introduced signal crayfish (*Pacifastacus leniusculus*) in Baum Lake. Although Daniels observed one gravid signal crayfish in Crystal Lake, this exotic was not considered established at that time, and a density estimate was not calculated for it at this site. The signal crayfish is a known competitor of the Shasta crayfish and seemingly was responsible for the low density of the native crayfish in Baum Lake. Recent surveys (1986) by CDFG confirmed the loss of the Shasta crayfish population in Baum Lake and a large decline in numbers in Crystal Lake, and attributed these changes to the establishment of exotic crayfish.

During 1985 and 1986, surveys revealed that most Shasta crayfish were found in the Fall River subdrainage (McGriff, personal communication 1986). At the Spring Creek confluence with the Pit River, *P. leniusculus* and a second exotic crayfish species, *Orconectes virilis* were present, but there were no *P. fortis* in 1985 (McGriff, personal communication 1986). In a few locations, the Shasta crayfish occurs sympatrically with both exotic species; however, it is much less common at these sites. It is not known if the Shasta crayfish and the two exotic crayfish species can coexist permanently. Cases of apparent sympatry may be the result of Shasta crayfish having washed down from upstream populations and may not reflect coexisting breeding populations. All distributional information indicates that these two exotic species can outcompete native species (Bouchard 1977, Riegel 1959, Schwartz *et al.* 1963).

Shasta crayfish occur in cool, clear, spring-fed lakes, rivers, and streams, usually at or near a spring inflow source, where waters show relatively little annual fluctuation in temperature and remain cool during the summer. Most are found in lentic and slowly to moderately flowing waters. Although Shasta crayfish have been observed in groups under large rocks situated on clean, firm sand or gravel substrates (Bouchard 1978, Eng and Daniels 1982), they also have been observed on a fine, probably organic, material 1–3 centemeters (.4 to ½ inches) thick on the bottom of Crystal Lake. *Pacifastacus fortis* is most abundant where plants are absent. Another important habitat requirement appears to be the presence of adequate volcanic rock rubble to provide escape cover from predators.

Although the food habits of the Shasta crayfish are not well known, the morphology of the mouthparts suggests that the species relies primarily on predation, browsing on encrusting organisms, and grazing on detritus to obtain food. Aquatic invertebrates and dead fish probably provide food for the crayfish, although its main food source is unknown. Unlike most crayfish that feed during the day, the Shasta crayfish probably feeds mainly at night (Eng and Daniels 1982).

P. fortis, like most crayfish, is solitary, but may tolerate the proximity of other crayfish if space is limited or during courtship and mating. Similar to its congeners in its mating habits, the Shasta crayfish mates in late September

and October after the final molt (loss of previous skin and the growth of a new larger skin) of the season. Reproductive maturity of the Shasta crayfish occurs in the fifth year of life, while in the two exotic crayfish species that occur within the range, reproductive maturity occurs in the second year. Eggs of the Shasta crayfish are laid during the fall, and hatching occurs in the following spring when the water temperature increases slightly. Each newly mature mated female lays 10–70 eggs, with an average of 40 per female. The two exotic crayfish, *Orconectes virilis* and *Pacifiastacus leniusculus*, average 110 and 150 eggs, respectively, per female. In general, crayfish fecundity increases with the age of the female; older *P. fortis* females produce an average of 60 eggs per female, whereas the exotic species produce up to 200–300 eggs per female. Therefore, the introduced crayfish species have a reproductive advantage over the Shasta crayfish (Eng and Daniels 1982).

Because of its placid behavior, low fecundity, slow maturity, restricted distribution, and specialized habitat requirements, the Shasta crayfish is particularly vulnerable to habitat loss or modification (e.g., changes in the substrates (from rubble to mud bottoms) resulting from siltation caused by increased erosion of its habitat, changes in water quality parameters (increase in temperature, turbidity, hydrogen ions, and nutrients)), water pollution, and displacement by exotic crayfish species. Other threats to the survival of this species include habitat loss through modifications from diking, dredging, water diversion projects, hydroelectric projects, agricultural development, water impoundments, and increased residential development. All these habitat modifications seem to favor the two exotic species which, as discussed above, have a great reproductive advantage over the Shasta Crayfish. A more subtle threat to the Shasta crayfish is the overall increase in human use of the area for outdoor recreational purposes. For example, off-road vehicle trails that cross creeks can cause bank erosion and siltation that degrade the habitat. Fishing with exotic crayfish bait may result in introductions of additional exotic competitors.

Most of the land in the range of the Shasta crayfish is in private ownership. The U.S. Forest Service and the Bureau of Land Management administer less than 10 acres each of the Shasta crayfish habitat. The State owns the 5,890 acre Ahjumawi Lava Springs State Park that includes about 10 acres of Shasta crayfish habitat in the Fall River drainage.

The Shasta crayfish (under the common name of "placid crayfish") was proposed as a threatened species on January 12, 1977, in the **Federal Register** (42 FR 2507). Comments expressing support for the proposal were received from the CDFG and two private organizations. That proposal was withdrawn on December 10, 1979 (44 FR 70796), under a provision of the 1978 amendments to the Act that required withdrawal of all pending proposals that were not made within 2 years of the date of the proposal.

The Shasta crayfish was included in category 1 of the Service's Review of Invertebrate Wildlife for Listing and Endangered or Threatened Species (49 FR 21666; May 22, 1984). Category 1 comprises taxa for which the Service has substantial evidence to support the biological appropriateness of proposing endangered or threatend status. In that notice, the Service, following the suggestion of Eng and Daniels (1982), used the common name Shasta crayfish rather than placid crayfish, the name used in the earlier proposal of threatened status.

In the summer of 1978, the CDFG and the U.S. Forest Service initiated studies to further determine the distributon of *P. fortis* and gather biological and ecological information necessary for its conservation (see Eng and Daniels 1982). The maps of the distribution of the Shasta crayfish generated in 1979 by CDFG were amended from information gained during a 1985 survey of the distribution and population status of the crayfish. These updated maps and additional data constitute significant new information on which to make a determination of endangered status for the Shasta crayfish.

In the **Federal Register** of July 10, 1987 (52 FR 26036), the Service proposed the Shasta crayfish as an endangered species. A notification extending the comment period beyond September 8, 1987, to November 8, 1987, was published in the **Federal Register** (52 FR 22979) on September 9, 1987.

Summary of Comments and Recommendations

In the July 10, 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 *Record Searchlight* (September 3, 1987) and the *News* (September 3, 1987), both of which invited general public comment.

During the comment period, totalling approximately 4 months, eight comments on the listing were received. Two additional comments were received after the close of the comment period and are noted as ex parte communications. Of the 10 letters of comment, 5 supported listing (two state agencies, one conservation organization, and two private citizens) and 2 did not (two private citizens); 3 offered no substantive information (two Federal agencies and one private citizen).

Support for the listing proposal was expressed by a conservation organization and two other interested parties. Ex parte comments from the CDFG and California Department of Parks and Recreation supported the listing and presented additional status information on the crayfish. Opposing comments and other comments questioning the rule can be placed in a number of general groups. These categories of comments and the Service's response to each are listed below.

Comment 1: Two questions from private citizens were raised pertaining to the available biological information on the crayfish. Have there been recent studies to determine that the species is continuing to decline? A request was made to conduct more studies on the species to determine if the crayfish is really endangered. One commenter stated that crayfish are abundant in irrigation canals. A commenter stated that the Shasta crayfish has made a comeback in the last 3 years. Concern was expressed about the possibility of a premature listing.

Service response: The Service finds that surveys conducted between the 1960's and 1987 by qualified biologists familiar with the Shasta crayfish and its habitats provide adequate information on the distribution, habitat requirements, and most importantly, threats to the species to warrant the present action for the Shasta crayfish (See discussion under Factor A). Further studies on the distribution and actual numbers would consume additional time during which the crayfish would not be Federally protected. Pertinent studies on the habitat requirements of the crayfish are listed in the References Cited section of the proposed rule and the final rule. In some cases, the data were supplied by personal communications with field biologists and are noted in the text. The State of California, recognizing the decline in the Shasta crayfish, listed it as rare in 1980, and reclassified it as

endangered in 1987. The species continues to lose habitat and decline in distribution and population size. Therefore, based on the available information regarding the status of the Shasta crayfish, the Service believes immediate listing is warranted.

The numerous "crawdads" observed by one private citizen in the rice field drainage ditches and other degraded habitats, are not likely to be the Shasta crayfish but rather one or both species of exotic competitors. The Shasta crayfish cannot tolerate pollutants such as those that would be expected in agricultural drainage canals. In contrast, the competitors appear to thrive in nutrient enriched habitats. In the Background and Factors Affecting the Species sections, the biological and habitat requirements of the Shasta crayfish are described more fully.

Comment 2: One commenter (a private landowner) stated his belief that the Shasta crayfish was proposed for listing only to enable the CDFG to gain control of the Fall River and its tributaries.

Service response: The decision to list the species must be based on the best available biological information on the status of the Shasta crayfish. A species must qualify under at least one of the five factors specified in the Endangered Species Act to be listed. Furthermore, the Shasta crayfish was proposed for listing only because the Service believed the species met the requirements for endangered status as specified by the Act, and for no other reason.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Shasta crayfish (*Pacifastacus fortis*) should be classified as an endangered species. Procedures found at section 4(a)(1) of the 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 Shasta crayfish (*Pacifastacus fortis*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* The total population of Shasta crayfish, when sampled in 1978 by Daniels (1980), was estimated to be fewer than 6,000 individuals. With the recent confirmed loss of the population in Baum Lake and the large decline in Crystal Lake of the Hat Creek subdrainage, the total population probably numbers fewer than 3,000 individuals. It has also been extirpated from a site in the Fall River subdrainage near its connection to the Pit River. At the present rate of extirpation, with at least three out of 15 sites being lost since 1978 and possibly only one site remaining in the Hat Creek subdrainage, it is conceivable that very shortly the Shasta crayfish may become restricted only to the Fall River subdrainage.

Water diversion and impoundment projects have adversely affected the Shasta crayfish by modifying the habitat into large quiet lakes with silt and mud bottoms and an increase in aquatic vegetation. These modifications have made the habitat more suitable for the two exotic crayfish species than the Shasta crayfish. The exotic species have done very well in these areas, and have displaced the Shasta crayfish. Lake Britton, and Baum and Crystal Lakes are examples of areas where these types of habitat modifications have led to the displacement of the Shasta crayfish in recent times.

Numerous hydroelectric projects have been constructed on Hat Creek and the Pit River since the early part of the century. Lake Britton and Baum Lake are manmade reservoirs used for hydroelectric power production, water impoundment, and recreation. These installations have adversely affected the Shasta crayfish by blocking access and egress to refugia in the remaining spring pools. These refugia formerly served as sources of immigrant individuals for re-establishing populations that had become locally extirpated from suitable habitat as the result of natural events (i.e., flooding, landslides, and log or debris jams). These manmade dam installations isolate and separate Shasta crayfish populations to such an extent that when habitats become available, they are unable to recolonize them.

Agricultural development and more recently residential development within the range of the Shasta crayfish have increased demands on the water resources, thus lowering the water table and causing seasonal interruptions of spring flow. This has occurred on some of the small unnamed tributaries of Fall River and Hat Creek (R. Brown, CDFG, personal communication, 1986). Increased residential development on Fall River, including the headwater spring areas at Lava Creek, is resulting in increased human use of the area and associated pollution that may adversely affect the crayfish (CDFG, letter dated November 23, 1987). In conjunction with the increase in water usage, an extensive, diverse agricultural industry has caused an increase in the use of pesticides in the area. These pesticides, when washed into the waterways, can kill aquatic invertebrates directly or over a period of time by bioaccumulation.

Livestock grazing near watercourses also leads to increased turbidity in some of the streams. Turbidity inhibits the penetration of sunlight to lower depths of the spring pools, where it promotes the growth of encrusting organisms on which the crayfish feeds. This increase in murkiness of the water also causes an increase in predation because the Shasta crayfish is unable to detect predators. Pasture runoff increases the nutrients in the streams, thus increasing planktonic (free-floating) algal and aquatic macrophyte growth. Because Shasta crayfish prefer areas with sparse plant growth, these areas become less suitable for the crayfish. Further, such conditions encourage invasion by the two exotic crayfish species that outcompete the Shasta crayfish.

B. *Overutilization for commercial, recreational, scientific, or educational purpose.* The incidental capture of Shasta crayfish for human consumption may occur. Although the Shasta crayfish is not the target of the catch, it is extremely vulnerable to such pressures because of its placid behavior. Its low fecundity, and long maturation period will result in low recruitment.

C. *Disease or predation.* Not applicable.

D. *The inadequacy of existing regulatory mechanisms.* In 1980, the California State Fish and Game Commission listed the Shasta crayfish as a rare species under State law. It was reclassified as endangered in 1987, thus offering protection from take, possession, or sale within the State of California. Other State regulations prohibit the take, possession, or use for bait of any crayfish species at any time of year within the range of *P. fortis*. These regulations were enacted to protect the Shasta crayfish and prevent the spread of exotic crayfish by unintentional introductions. Because of the large size and remoteness of the area, these regulations are difficult to enforce.

E. *Other natural or manmade factors affecting its continued existence.* The spread of the two exotic crayfish species, *Pacifastacus leniusculus* and *Orconectes virilis*, into the range of the Shasta crayfish continues at an alarming rate. Both species are recent introductions to the Pit River drainage (Daniels 1980). These species compete for food, space, and other resources with the Shasta crayfish. Because they are more fecund and mature much faster

than the Shasta crayfish, and have less specific habitat requirements, the exotic crayfish have been successful in colonizing the modified habitat and in displacing the Shasta crayfish. Since *O. virilis* is probably able to move overland under conditions of high humidity, it may invade the Fall River as it has Hat Creek. Both exotic species have displaced native species in other regions (Bouchard 1977a,b; Riegel 1959; Schwartz *et al.* 1963). If the habitat of *P. fortis* continues to be degraded and becomes better suited for the exotic species, the Shasta crayfish may be displaced from its remaining habitat in the near future. With the introduction of the exotic crayfish, the populations of Shasta crayfish in Crystal and Baum Lakes, Lake Britton, Clark, Rock, Goose, Kosk, Lost, and Spring Creeks have been lost, thus significantly reducing the limited range of the native crayfish. These extirpations occurred in less than 10 years.

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 Shasta crayfish as endangered. Its significantly reduced distribution, competition from exotic crayfish species, loss of habitat, and substantial potential for continued habitat modification or loss indicate that the species warrants endangered rather than threatened status. Critical habitat is not being designated for the species at this time for the reasons discussed below.

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 the Shasta crayfish at this time. As discussed under Factors D and E in the "Summary of Factors Affecting the Species," State laws to protect the Shasta crayfish from taking and from introductions of exotic crayfish species are difficult to enforce. Publication of critical habitat descriptions and maps in the **Federal Register** would make this species and its habitats more vulnerable to possible taking and vandalism and would increase enforcement problems. All involved parties and landowners will be notified of the locations and importance of protecting this species' habitat. Protection of the habitat of the Shasta crayfish will be addressed through the recovery and Section 7 consultation processes. Therefore, it would not be prudent to determine critical habitat for the Shasta crayfish at this time.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the 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 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 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) of the Act 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 destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Some Federal involvement with the U.S. Army Corps of Engineers and the Federal Energy Regulatory Commission (FERC) permitting processes for hydroelectric facilities is anticipated. Federal involvement with the Soil Conservation Service bank protection and repair projects addressing damage caused by cattle grazing is expected.

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 or foreign 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 would 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 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, 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

Bott, R. 1950. Die flusskrebse Europas (Decapoda, Astacidae). Abhandlungen Senckenbergischen Naturforschenden Gesellshalt 483: 1–36.

Bouchard, R.W. 1977a. Distribution, systematic status, and ecological notes on five poorly known species of crayfish in western North America (Decapoda: Astacidae and Cambaridae). Freshwater Crayfish 3:409–423.

Bouchard, R.W. 1977b. Morphology of the mandible in Holarctic crayfishes (Decapoda: Astacidae and Cambaridae): Ecological and phylogenetic implications. Freshwater Crayfish 3:425–452.

Bouchard, R.W. 1978. Taxonomy, distribution, and general ecology of the genera of North America crayfishes. Fisheries 3:11–19.

Daniels, R.A. 1980. Distribution and status of crayfishes in the Pit River drainage, California. Crustaceana 38:131–138.

Eng, L.L., and Daniels, R.A. 1982. Life history, distribution, and status of *Pacifastacus fortis* (Decapoda: Astacidae). California Fish and Game 68:197–212.

Faxon, W. 1914. Notes on the crayfishes in the United States National Museum and the Museum of Comparative Zoology with descriptions of new species and subspecies to which is appended a catalogue of the known species and subspecies. Memoirs of the Museum of Comparative Zoology. (Harvard) 40: 351–427.

Hobbs, H.H. 1972. Crayfishes (Astacidae) of North and Middle America. Identification Manual No. 9 in Biota of Freshwater Ecosystems. U.S. Environmental Protection Agency, Water Pollution Control Research Series. 18050, ELDO5/72. 173 pp.

Riegel, J.A. 1959. The systematics and distribution of crayfishes in California. California Fish and Game 45:29–50.
Schwartz, F.J., R. Rubelmann, and J. Allison. 1963. Ecological population expansion of the introduced crayfish, *Orconectes virilis*. Ohio Journal of Science. 63:266–273.

Author

The primary author of this rule is Dr. Jeurel Singleton, Sacramento Endangered Species Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E–1823, Sacramento, California (916/978–4866 or FTS 460–4866).

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.*); 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.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
CRUSTACEANS							
*	*	*	*	*	*	*	*
Crayfish, Shasta (=placid)	Pacifastacus fortis	U.S.A. (CA)	NA	E	337	NA	NA
*	*	*	*	*	*	*	*

Dated: September 22, 1988.

Susan Recce,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 88–22399 Filed 9–29–88; 8:45 am]

BILLING CODE 4310–53–M

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50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Stephens' Kangaroo Rat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Fish and Wildlife Service (Service) determines the Stephens' kangaroo rat (*Dipodomys stephensi*), a small mammal found in southern California, to be an endangered species. The species has suffered widespread habitat loss and degradation, resulting in small isolated populations. This rule implements the protection provided by the Endangered Species Act of 1973, as amended (Act), for the Stephens' kangaroo rat.

DATE: The effective date of this rule is October 31, 1988.

ADDRESS: The complete file for this rule is available for inspection, by appointment, during normal business hours at U.S. Fish and Wildlife Service, 24000 Avila Road, Laguna Niguel, California 92656.

FOR FURTHER INFORMATION CONTACT: Ms. Nancy M. Kaufman, field supervisor, at the above address (714/643–4270 or FTS 796–4270).

SUPPLEMENTARY INFORMATION:

Background

The Stephens' kangaroo rat (*Dipodomys stephensi*) is a small mammal of the rodent family Heteromyidae. Like other kangaroo rats, it has a large head, external cheek pouches, elongated rear legs used for jumping, and relatively small front legs. The front feet are frequently used to hold seeds that the animal eats. There are five toes on the hind foot and the tail is 1.45 times the length of the head and body. The Stephens' kangaroo rat is distinguished from the sympatric agile kangaroo rat (*Dipodomys agilis*) by a lateral white tail band that is one half or less (rather than one half or more) times the width of the dorsal tail stripe, dusky (rather than dark) soles on the hind feet, a more grizzled appearance to the dorsal tail stripe due to many white hairs, a darker tail tuft due to fewer white hairs, a smaller ear (averaging 0.5 inch [15 millimeters] in length), and a relatively broad head. The average adult Stephens' kangaroo rat is 11 to 12 inches (277 to 300 millimeters) in length and weighs 2.3 ounces (67 grams) (Bleich 1977).

The Stephens' kangaroo rat was first described by Merriam (1907) as *Perodipus stephensi*. The type locality is the San Jacinto Valley, a little west of the town of Winchester, Riverside County. Grinnell (1921) placed the species in the genus *Dipodomys*. Huey (1962) described a kangaroo rat from the San Luis Rey River valley as *Dipodomys cascus*. However, Lackey later (1967a) determined *D. cascus* to be a synonym of *D. stephensi*.

The Stephens' kangaroo rat is endemic to the Perris and San Jacinto Valleys in western Riverside County and the San Luis Rey and Temecula Valleys in northern San Diego County (Grinnell 1922, Lackey 1967a, O'Farrell and Uptain 1986, Thomas 1973). Occupied habitats are usually described as sparse, slightly disturbed coastal sage scrub or annual grassland. The actual distribution of suitable habitat is normally mixed with other habitat types in a natural mosaic. The populations with the highest densities have been found in areas where the herbaceous layer still contains California native annuals, and where perennial cover is less than 30 percent (Hogan 1981). The Stephens' kangaroo rat is most commonly associated with *Artemisia californica* and *Eriogonum fasciculatum* because these shrubs are often the most obvious elements of the habitat. The animal is actually using the herbaceous layer which is often dominated by filaree (*Erodium cicutarium*). Many areas supporting the species are shrubless (O'Farrell, 1988 pers. comm.). The Stephens' kangaroo rat occurs on level or low rolling terrain; it is not found on extremely hard or sandy soils (Lackey 1967a). Bleich (1977) noted that gravel is a common component of soils where the animal is found.

All of the occupied sites found by Thomas (1973) had been previously disturbed, usually by plowing. Remnant