Code for reading third column: Emerg.—Emergency; Reg.—Regular; Susp.—Suspension.

Dated: September 28, 2001.

Robert F. Shea,

Acting Administrator, Federal Insurance and Mitigation Administration.

[FR Doc. 01–25242 Filed 10–5–01; 8:45 am]

BILLING CODE 6718–05–P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 01–2205; MM Docket No. 00–169; RM–9953]

Radio Broadcasting Services; Oswego and Granby, NY

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In response to a *Notice of Proposed Rule Making,* 65 FR 57800 (September 26, 2000) this document reallots Channel 288A from Oswego to Granby, New York and provides Granby with its first local aural transmission service. The coordinates for Channel 288A at Granby are 43–17–44 North Latitude and 76–26–16 West Longitude.

DATES: Effective November 5, 2001.

FOR FURTHER INFORMATION CONTACT: R. Barthen Gorman, Mass Media Bureau, (202) 418–2180.

SUPPLEMENTARY INFORMATION: This is a synopsis of the Commission's Report and Order, MM Docket No. 00–169, adopted September 12, 2001, and released September 21, 2001. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC's Reference Information Center at Portals II, CY–A257, 445 12th Street, SW., Washington, DC. The complete text of this decision may also be purchased from the Commission's copy contractor: Qualex International, Portals II, 445 12th Street, SW, Room CY–B402, Washington, D.C. 20554.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

Part 73 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for Part 73 reads as follows:

Authority: 47 U.S.C. 154, 303, 334, and 336.

§ 73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under New York, is amended by adding Granby, Channel 288A, and removing Channel 288A from Oswego.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 01–25116 Filed 10–5–01; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AF57

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Scaleshell Mussel

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine the scaleshell mussel (*Leptodea leptodon*) to be an endangered species under the Endangered Species Act of 1973, as amended (Act). The scaleshell mussel historically occurred in 55 rivers in 13 states in the eastern United States. Currently, the species is known to exist in 14 rivers (and may occur in 6 others) within the Mississippi River Basin in Missouri, Oklahoma, and Arkansas. Its abundance and distribution have decreased markedly due to habitat loss and adverse effects associated with water quality degradation, sedimentation, channelization, sand and gravel mining, dredging, and reservoir construction.

DATES: This final rule is effective on November 8, 2001.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Columbia Field Office, U.S. Fish and Wildlife Service, 608 East Cherry Street, Room 200, Columbia, Missouri 65201.

FOR FURTHER INFORMATION CONTACT: Andy Roberts (at the above address or telephone 573–876–1911, ext. 110; fax 573–876–1914). TTY users may contact us through the Federal Relay Service at 1–800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Buchanan (1980), Cummings and Mayer (1992), Oesch (1995), and Watters (1995) provide descriptions of the scaleshell mussel. The shell grows to approximately three to ten centimeters (one to four inches) in length. The shells are elongate, very thin, and compressed. The anterior (front) end is rounded. In males, the posterior (rear) end is bluntly pointed. In females, the periostracum (the outside layer or covering of the shell) forms a wavy, fluted extension of the posterior end of the shell. The dorsal (top) margin is straight and the ventral (bottom) margin is gently rounded. Beaks (the raised or domed part of the dorsal margin of the shell) are small and low, and nearly even with the hinge line. The beak sculpture is inconspicuously compressed and consists of four or five double-looped ridges. The periostracum is smooth, yellowish green or brown, with numerous faint green rays. The pseudocardinal teeth (the triangular, often serrated, teeth located on the upper part of the shell) are reduced to a small thickened ridge. The lateral teeth (the elongated teeth along the hinge line of the shell) are moderately long with two indistinct teeth occurring in the left valve (shell) and one fine tooth in the right. The beak cavity (a cavity located inside the shell that extends into the beak) is very shallow. The nacre (the interior layer of the shell) is pinkish white or light purple and highly iridescent.

Life History

The biology of the scaleshell mussel is similar to the biology of other bivalved mollusks belonging to the family Unionidae. Adult unionids are filter-feeders, spending their entire lives partially or completely buried in the stream bottom (Murray and Leonard 1962). The posterior margin of the shell is usually exposed and the siphons extended to facilitate feeding. During periods of activity, movement is accomplished by extending and contracting a single muscular foot between the valves. Extension of the foot also enables the mussel to wedge itself into the river bottom. Their food includes detritus (disintegrated organic material), plankton, and other microorganisms (Fuller 1974). Some freshwater mussel species are long-lived. Individuals of many species live more than 10 years and some have been reported to live over 100 years (Cummings and Mayer 1992).

Unionids have an unusual and complex mode of reproduction, which includes a brief, obligatory parasitic

stage on fish. Males release sperm into the water column in the spring, summer, or early fall, and females using the incurrent water flow draw in the sperm. Fertilization takes place in the shell of the female. Fertilized eggs develop into microscopic larvae (glochidia) and are brooded within special gill chambers of the female. Once the glochidia are mature, they are expelled into the water where they must quickly attach to the gills or the fins of an appropriate fish host to complete development. Following proper host infestation, glochidia transform into juveniles and excyst (drop off). Juveniles must drop off into suitable habitat to survive. Host fish specificity varies among unionids. Some mussel species appear to require a single host species, while others can transform their glochidia into juvenile mussels on several fish species. For further information on the life history of freshwater mussels, see Gordon and Layzer (1989) and Watters (1995).

Mussel biologists know relatively little about the specific life history requirements of the scaleshell mussel. Baker (1928) surmised that the scaleshell mussel is a long-term brooder (spawns in fall months and females brood the larvae in their gills until the following spring or summer). Glochidia found in the gill chambers in September, October, November, and March support that conclusion (Gordon 1991). The scaleshell mussel uses the freshwater drum (*Aplodinotus grunniens*) as the fish host for its larvae (Chris Barnhart, Southwest Missouri State University, pers. comm. 1998). Other species in the genus *Leptodea* and a closely related genus *Potamilus* are also known to use freshwater drum exclusively as a host (Watters 1994).

Little is known about the life expectancy of the scaleshell mussel. However, recent collections from Missouri indicate that it is relatively short-lived compared to other species. A sample of 33 dead specimens and 2 living individuals collected in 2000 from a Gasconade River site did not contain any individuals exceeding seven years old (Chris Barnhart, pers. comm. 2000). Likewise, no individuals over six years old were observed out of 44 living individuals collected in 1997 from the Meramec Basin (Roberts and Bruenderman 2000). Based on these collections, it appears that the life expectancy of the scaleshell mussel may be less than 10 years. In addition, the sex ratio of the above collections are significantly different from a 50/50 ratio (Chi-Square Test, $P < 0.05$). The Gasconade collection only contained eight females (including one living) out of 35 individuals, and the Meramec Basin collection only contained 15 females out of 44 living individuals. The reason females appear to be less common than males in the Gasconade River and Meramec Basin is unknown.

Habitat Characteristics

The scaleshell mussel occurs in medium to large rivers with low to moderate gradients in a variety of stream habitats. Buchanan (1980, 1994) and Gordon (1991) reported the scaleshell mussel from riffle areas with substrate consisting of gravel, cobble, boulder, and occasionally mud or sand. Oesch (1995) considered the scaleshell mussel a typical riffle species, occurring only in clear, unpolluted water with good current. Conversely, Call (1900), Goodrich and Van der Schalie (1944), and Cummings and Mayer (1992) reported collections from muddy bottoms of medium-sized and large rivers. Roberts and Bruenderman (2000) collected the scaleshell mussel primarily from mussel beds (areas with a high concentration of mussels that contain more than one species) with stable, gravel substrates. The characteristic common to these sites appears to be a stable stream bed and good water quality. These habitat observations are consistent with the current distribution of the scaleshell mussel. The scaleshell mussel is restricted to rivers that have maintained relatively good water quality (Oesch 1995) and to river stretches with stable channels (Buchanan 1980, Harris 1992). The scaleshell mussel is also usually collected in mussel beds in association with a high diversity of other mussel species.

Distribution and Abundance

The scaleshell mussel historically occurred in 13 states in the eastern United States. While the scaleshell mussel had a broad distribution, it appears that it was a rare species locally (Gordon 1991, Oesch 1995, Call 1900). Williams *et al.* (1993) reported the historical range as Alabama, Arkansas, Illinois, Indiana, Iowa, Kentucky, Missouri, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin. Historical records also exist for the Minnesota River, Minnesota (Clarke 1996). Williams *et al.* (1993) also listed Michigan and Mississippi as part of the scaleshell mussel's range, but no valid records exist in these states. Therefore, its presence cannot be confirmed (Bob Jones, Mississippi Wildlife Fisheries and Parks, Museum of Natural Science, pers. comm. 2000; Szymanski 1998). Gordon (1991) included a portion of the St. Lawrence drainage in describing the distribution of the scaleshell mussel. However, the specimens that were the source of the St. Lawrence River record were later identified as wingless examples of *Leptodea fragilis* (fragile papershell), which are often seen in New York (David Strayer, Institute of Ecosystem Studies, New York, *in litt.* 1995). Given this and that no other authentic specimens have been found (David Stansbery, Ohio State Museum, *in litt.* 1995), the historical occurrence of the species in St. Lawrence Basin is doubtful.

Within the last 50 years the scaleshell mussel has become increasingly rare and its range greatly restricted. Historically, the scaleshell mussel occurred in 55 rivers. Today, the species is known from only 14 rivers including the Meramec, Bourbeuse, Big, Gasconade, and Osage Rivers in Missouri; Frog Bayou and the St. Francis, Spring, South Fork Spring, South Fourche LaFave, and White Rivers in Arkansas; and the Little, Mountain Fork, and Kiamichi Rivers in Oklahoma. An additional six rivers (Cossatot, Little Missouri, Saline, and Strawberry Rivers, and Myatt and Gates Creeks) in Arkansas and Oklahoma may support the scaleshell mussel, but the existence of the species in these rivers is uncertain. With the exception of the Meramec, Bourbeuse, and Gasconade Rivers, all rivers listed as supporting the scaleshell mussel are based on the collection of a few or a single individual specimen.

Assessment of the Presumed Health of Individual Populations

For the purposes of this rule, the term ''population'' is used in a geographical sense and, unless otherwise indicated, is defined as all individuals living in one river or stream. By using this term we do not imply that a scaleshell mussel population is currently reproducing or that it is a distinct genetic unit. Using the term in this way allows the status, trends, and threats to be discussed separately for each river where the scaleshell mussel occurs, improving the clarity of the discussion.

Due to the low densities of current scaleshell mussel populations, ascertaining status (an assessment of the current existence of a population) and trends (an assessment of change in a population's numbers and its probable future condition) is difficult. To facilitate population comparisons, a single classification system was devised to evaluate the probable current health of individual populations. The indicators of (or criteria for) the presumed health of scaleshell mussel populations are as follows. The

presumed health of a population is considered ''stable'' if (1) there is no evidence of significant habitat loss or degradation, *and* (2) there has been post-1980 collection of live or fresh dead mussels and, if surveys were thorough, evidence of recruitment was found. The presumed health of a population is considered ''declining'' if (1) habitat is limiting due to its small size, or a significant decrease in habitat quality or quantity has occurred, (2) there is no evidence of recruitment despite one or more thorough surveys, *or* (3) a significant decline in number of individual mussels has occurred. The presumed health of a population is considered ''extirpated'' if (1) despite one or more thorough post-1980 surveys, no scaleshell mussels, or only old dead shells, have been found, *or* (2) all known suitable habitat has been destroyed. The presumed health of a population is considered ''unknown'' if the available information is inadequate to place the population in one of the above categories. In a few cases, additional biological information not listed above was used to categorize a population that otherwise would have been called ''unknown'' or which appeared to fit into multiple categories.

Based on the above criteria, 14 scaleshell mussel populations are considered extant. Of these populations, the presumed health of 1 is thought to be stable and 13 are believed to be declining. Six other populations may also be extant, but their health is unknown due to lack of recent collections or surveys. The 14 extant populations and 6 potentially extant populations are listed in Table 1 and included in the discussions below.

TABLE 1.—PRESUMED POPULATION HEALTH OF EXTANT AND POTENTIALLY EXTANT SCALESHELL MUSSEL POPULATIONS. S = STABLE, D = DECLINING, UK = UNKNOWN

Population	Presumed health
Big (MO)	D
Bourbeuse (MO)	D
Cossatot (AR)	UK
Frog Bayou (AR)	D
Gates Creek (OK)	UK
Gasconade (MO)	D
Kiamichi (OK)	D
Little Missouri (AR)	UK
Little (OK)	D
Meramec (MO)	D
Mountain Fork (OK)	D
Myatt Creek (AR)	UK
Osage River (MO)	D
St. Francis (AR)	D
Saline (AR)	UK
South Fork Spring (AR)	S
South Fourche LaFave (AR)	D
Spring River (AR)	D
Strawberry (AR)	UK
White River (AR)	D

River Basin Specific Discussion of the Scaleshell Mussel Status

Upper Mississippi River Basin

The scaleshell mussel formerly occurred in eight rivers and tributaries within the upper Mississippi River Basin, including the Mississippi River in Illinois, Iowa, and Wisconsin; the Minnesota River in Minnesota; Burdett's Slough in Iowa; the Iowa and Cedar Rivers in Iowa; and the Illinois, Sangamon, and Pecatonica Rivers in Illinois. However, the scaleshell mussel has not been found for more than 50 years in the upper Mississippi River Basin and is believed extirpated from that basin (Kevin Cummings, Illinois Natural History Survey, *in litt.* 1994).

Middle Mississippi River Basin

Historically, the scaleshell mussel occurred in 26 rivers and tributaries within the middle Mississippi River Basin including the Kaskaskia River in Illinois; the mainstem Ohio River in Kentucky and Ohio; the Wabash River in Illinois and Indiana; the White River and Sugar Creek in Indiana; the Green and Licking Rivers in Kentucky; the Scioto, St. Mary's, and East Fork Little Miami Rivers in Ohio; the Cumberland River in Kentucky and Tennessee; Beaver Creek in Kentucky; Caney Fork in Tennessee; the Tennessee River in Alabama and Tennessee; the Clinch, Holston, and Duck Rivers in Tennessee; Auxvasse Creek in Missouri; the Meramec, Bourbeuse, South Grand, Gasconade, Big, Osage, and Big Piney Rivers in Missouri; and the mainstem Missouri River in South Dakota and Missouri. The scaleshell mussel has been extirpated from most of the middle Mississippi River Basin. Currently, the scaleshell mussel is extant in five rivers within the Meramec River basin and tributaries of the Missouri River drainages in Missouri.

Ohio River Drainage—The scaleshell mussel has been extirpated from the entire Ohio River system. The most recent collection date from the Ohio River Basin is 1964 from the Greene River (Wayne Davis, Kentucky Department of Fish and Wildlife, *in litt.* 1994). All other records are pre-1950 (Kevin Cummings, *in litt.* 1994; Catherine Gremillion-Smith, Indiana Department of Natural Resources, *in litt.* 1994; Ron Cicerello, Kentucky Department of Fish and Wildlife, *in litt.,* 1994; Paul Parmelee, University of Tennessee, pers. comm. 1995).

Meramec River Basin (Missouri)—In 1979, Buchanan surveyed for mussels at 198 sites within the Meramec River Basin (Buchanan 1980). Of these sites, 14 had evidence of live or dead scaleshell mussels. Seven of the 14 sites were in the lower 180 kilometers (km) (112 miles (mi)) of the Meramec River, five in the lower 87 km (54 mi) of the Bourbeuse River, and two in the lower 16 km (10 mi) of the Big River. Buchanan found that the species comprised less than 0.1 percent of the 20,589 living mussels he examined in the basin. He collected live scaleshell mussels at only four sites, three in the Meramec and one in the Bourbeuse. Although the lower 174 km (108 mi) of the Meramec River had suitable habitat for many rare species, live scaleshell mussels were found only in the lower 64 km (40 mi) (Buchanan 1980). Both the Bourbeuse and Big Rivers had lower species diversity and less suitable habitat than the Meramec River. Suitable habitat occurs only in the lower 87 km (54 mi) of the Bourbeuse River and lower 16 km (10 mi) of the Big River (Buchanan 1980).

The Missouri Department of Conservation (MDC) sampled 78 sites in an intensive resurvey of the Meramec River basin in 1997 (Roberts and Bruenderman 2000). Similar to Buchanan's findings (1980), scaleshell mussels represented only 0.4 percent of the living mussels. Live specimens were collected from the mainstem Meramec River (34 specimens from 9 sites), the Bourbeuse River (10 specimens from 5 sites), and the Big River (2 specimens from 1 site). In addition to the nine sites surveyed by Buchanan (1979), new sites were included in the 1997 survey. Living or dead scaleshell mussels were found at four of the five sites in the Meramec River and two of the four sites in the Bourbeuse River. The three sites where the presence of scaleshell mussels was not reconfirmed no longer support suitable mussel habitat due to stream bed degradation. Other species that were found in mussel beds at those sites in the earlier surveys were no longer present in 1997. Although portions of the Meramec River basin continue to provide suitable habitat, mussel species diversity and abundance have declined noticeably since 1980 and

significant losses of mussel habitat have occurred (Roberts and Bruenderman 2000).

The number of scaleshell mussel specimens the MDC collected in 1997 is greater than that reported by Buchanan's study (Buchanan 1980); however, the small number of specimens collected, especially from the Bourbeuse and Big Rivers, indicates that the long-term viability of these populations is tenuous. Moreover, the long-term persistence of populations in the Meramec Basin is in question because of the limited availability of mussel habitat and the loss of mussel beds since 1980 from bank and channel degradation, sedimentation, and eutrophication (excessive fertilization caused by pollution of plant nutrients) (Roberts and Bruenderman 2000; Alan Buchanan, MDC, *in litt.* 1997; Sue Bruenderman, MDC, pers. comm. 1998).

Missouri River drainage (South Dakota and Missouri)—Within the Missouri River drainage, Buchanan (1980, 1994) and Oesch (1995) reported scaleshell mussels from the Missouri, Gasconade, Big Piney, South Grand, Osage Rivers, and Auxvasse Creek. The last collection of scaleshell mussels from Auxvasse Creek was in the late 1960s (Alan Buchanan, *in litt.* 1997). Similarly, the last known collection date for the South Grand is the early 1970s. This collection site is now inundated by Truman Lake and is unsuitable for the scaleshell mussel (Alan Buchanan, *in litt.* 1997). A single, fresh dead specimen was collected from Big Piney River in 1981 (Sue Bruenderman, *in litt.* 1998). However, the scaleshell mussel has not been found in recent surveys of this river. Between 1994 and 1996, 70 sites were sampled in the Big Piney River from the mouth to the headwaters. While 3,331 mussels of 26 species were collected, no evidence of scaleshell mussels were found (Janet Sternberg, MDC, pers. comm. 2000). Another survey was conducted in 1998, in which 10 sites were sampled between river miles 53.6 and 96.0. Over 1,000 living mussels were collected representing 15 species, but no living or dead scaleshell mussels were found (Sue Bruenderman, pers. comm. 2000).

Only two records (both single dead shells) of scaleshell mussels exist for the mainstem of the Missouri River. In 1981 and 1982, the Missouri River was surveyed from Santee to Omaha, Nebraska (Hoke 1983). A single fresh dead shell was found during this study just below Gavin's Point Dam, South Dakota. This occurrence represents the westernmost record of the scaleshell mussel in North America. However, this species has not been found in subsequent surveys on the Missouri River just below Gavin's Point dam. In 1995, Clarke (1996) found no evidence of scaleshell mussels in a survey conducted from Gavin's Point Dam to 48 river km (30 mi) downstream. However, high water conditions limited Clark's search efforts, and only 10 individual mussels were found. In 1999, the Omaha District of the U.S. Army Corps of Engineers (Corps) funded a mussel survey between Gavin's Point Dam and Ponca, Nebraska, a distance of 96 river km (60 mi). In all, 355 live and 1,709 dead individual mussels were collected representing 16 species, but no living or dead scaleshell mussels were found (Candace M. Gordon, Corps, Omaha District, *in litt.* 2000). The second scaleshell mussel record from the mainstem of the Missouri River is a single fresh dead individual that was collected in 1990 from Gasconade County, Missouri. This specimen was found during an extensive survey conducted from Gavin's Point Dam to St. Louis (Hoke 2000). However, the site of this collection was subsequently destroyed.

Since no living scaleshell mussel has been found in the Missouri River, its habitat cannot be determined. However, both dead shells were collected from areas shielded from the main flow of the river in relatively stable, sandy bottoms with moderate current (Hoke 2000). Hoke (2000) described scaleshell mussel as ''extremely rare'' and its habitat ''very uncommon * * * and existing in only widely separated locals'' in the Missouri River. Based on the criteria used to assign presumed health to scaleshell mussel populations (Table 1), we consider this potential population to be extirpated at this time. Of the two known Missouri River records for scaleshell mussel, one locality has been destroyed and recent surveys have not found any evidence of this species at or in the vicinity of the other site. Further, no other scaleshell mussel specimens were found during Hoke's survey from Gavin's Point Dam to St. Louis. More information is needed on the existence of the scaleshell mussel and its habitat in the Missouri River. Furthermore, more information is needed on the location of sampling sites, distribution and habitat use of mussels, etc. from Hoke's survey work on the Missouri River, which is unavailable at this time.

Buchanan (1994) surveyed the lower 137 km (85 mi) of the Gasconade River, and documented 36 species of freshwater mussels. He collected scaleshell mussel specimens at eight sites between river miles 6.0 and 57.7. Buchanan found only dead shells at two sites and eight live specimens from the remaining six sites. Overall, scaleshell mussels comprised less than 0.1 percent of the mussels collected. In 1998–99, the Gasconade River was surveyed at 46 sites from mile 92.0 to 256.0. At sites where scaleshell mussels were collected, living individuals represented less than 0.5 percent of the total number of mussels found. A total of 12 living scaleshell mussels were found at 9 sites, and dead shells were found at an additional 10 sites between river miles 92.0 and 230.3 (Sue Bruenderman, pers. comm. 2000).

A scaleshell mussel has recently been discovered in the lower Osage River in Osage County, Missouri. On July 16, 2001, one live male specimen was found at river mile 20 (Heidi Dunn, pers. comm.). This individual was found during a mussel survey that is currently underway in the lower 80 miles of the Osage River and its tributaries. To date, 33 sites have been surveyed including 24 in the mainstem. A total of 3,904 living mussels have been found representing 29 living species. No other evidence of scaleshell mussels were found during the survey, but more intensive sampling is planned for these same sites in the near future.

Until this recent discovery, the scaleshell mussel had never been reported from the Osage system in past surveys. Utterback (1917) found 34 species in the basin. No other information is available because his notes and collections have since been lost. Oesch (1995) collected mussels in the 1970s at a number of sites in the basin and reported 39 species. In 1980, a detailed study of mussel distribution was conducted by Grace and Buchanan (1981) of the Lower 80 miles of the Osage River and two tributaries below Bagnell Dam. A total of 43 sites were surveyed and 21,593 living mussels were found representing 36 species. No evidence of scaleshell mussels was found in any of these surveys.

This new record of the scaleshell mussel does not significantly increase its range or lessen its risk of extinction. Similar to other records for the species, the one individual found indicates that a small population is present. No other evidence of the species was found during the 2001 survey. If a significant population of scaleshell mussels existed in the Osage River, dead shells would have been found. This is because dead shells accumulate over time, which makes them easier to detect than live specimens. Additionally, there are significant threats to scaleshell mussel in the Osage River from the operation of Bagnell Dam and instream gravel mining. Due to these habitat conditions, we categorized the Osage River

scaleshell mussel population's presumed health as declining.

Middle Mississippi River Basin summary—Of the 26 rivers and tributaries in the middle Mississippi River Basin that historically supported scaleshell mussels, the species is still present in 5 including the Meramec, Bourbeuse, Big, Osage, and Gasconade Rivers. The presumed health of all of these populations is thought to be declining.

Lower Mississippi River Basin

The scaleshell mussel historically occupied 21 rivers and tributaries in the lower Mississippi River Basin. These include the St. Francis, White, James, Spring, Little Missouri, Middle Fork Little Red, Saline (of the Ouachita River), Ouachita, Cossatot, Saline (of the Little River), South Fourche LaFave, Mulberry, and Strawberry Rivers in Arkansas; South Fork Spring, Frog Bayou, and Myatt Creek in Arkansas; Poteau, Little, and Kiamichi Rivers in Oklahoma; and Gates Creek and Mountain Fork in Oklahoma. These rivers are organized and discussed below according to drainage (St. Francis, White, Arkansas, and Red River drainages).

St. Francis River drainage (Arkansas)—Bates and Dennis (1983), Clarke (1985), and Ahlstedt and Jenkinson (1987) conducted mussel surveys on the St. Francis River in Arkansas and Missouri. Of these surveys, scaleshell mussels were only documented from two sites, both of which are single-specimen records (Clarke 1985). Records of dead shells of various species indicate that at one time freshwater mussels occurred throughout the river (Bates and Dennis 1983). Bates and Dennis (1983) determined that of the 54 sites sampled, 15 were productive, 10 marginal, and 29 had either no shells or dead specimens only; scaleshell mussels were not documented at any of the 54 sites. They identified 77 km (48 mi.) of habitat generally suitable for mussels: Wappapello Dam to Mingo Ditch, Missouri; Parkin to Madison, Arkansas; and Marianna to the confluence with the Mississippi River at Helena, Arkansas. They indicated that the remaining portions of the river were no longer suitable for mussels. If the scaleshell mussel is extant in the St. Francis River, it is restricted to the few patches of suitable habitat.

White River drainage (Arkansas)—Clarke (1996) noted a 1902 collection of a single specimen from the White River near Garfield, Arkansas. A late 1970s survey of the White River between Beaver Reservoir and its headwaters failed to relocate live or dead scaleshell mussel individuals. However, in 1999, a single live specimen was collected from the White River near Newport by John Harris (John Harris, Arkansas Department of Transportation, pers. comm. 2000). Navigation maintenance activities have relegated the mussel fauna to a few refugial sites (Bates and Dennis 1983). Specimens have not been collected from the James River, a tributary of the White River, since before 1950 (Clarke 1996).

An eight-mile section of the Spring River in Arkansas supports a diverse assemblage of freshwater mussels (Gordon *et al.* 1984, Arkansas Highway and Transportation Dept 1984, Miller and Hartfield 1986). The collections from this river total eight scaleshell mussel specimens (Kevin Cummings, *in litt.* 1994; Clarke 1996, Arkansas State Highway and Transportation Department, 1984). Gordon *et al.* (1984) surveyed the river and reported suitable mussel habitat between river miles 3.2 and 11.0, although species richness below river mile 9 had declined markedly compared to past surveys. Gordon *et al.* (1984), as well as Miller and Hartfield (1986), reported that the lower 5.0 km (3.0 mi) of river were completely depleted of mussels and contained no suitable habitat. Harris did not find scaleshell mussels in a 1993 survey of the Spring River (John Harris, *in litt.* 1997).

Scaleshell mussels were collected from the South Fork of the Spring River in 1983 and 1990. During the 1983 survey, Harris (*in litt.* 1997) collected four specimens near Saddle, Arkansas, and one specimen and one valve north of Hunt, Arkansas. During a subsequent visit in 1990, Harris collected young adults (Harris, pers. comm. 1995). Although juveniles were not found, the presence of young adults suggests that reproduction recently occurred.

Records of scaleshell mussels from the Strawberry River and the Myatt Creek are based on single specimen collections, both made in 1996 (John Harris, *in litt.* 1997). Harris collected a live specimen from the Strawberry River near the confluence with Clayton Creek in Lawrence County. He also collected a single relict (a weathered shell that has been dead a long period of time) specimen from Myatt Creek in Fulton County (John Harris, *in litt.* 1997). Comprehensive surveys have not been conducted in these rivers since 1996.

The historical locality (near Shirley, Van Buren County, Arkansas) where a single scaleshell mussel specimen was collected from the Middle Fork of the Little Red River no longer provides mussel habitat. Clarke (1987) stated that suitable mussel habitat was restricted to a 9.6 km (6.0 mi) stretch from the confluence of Tick Creek upstream to the mouth of Meadow Creek.

Arkansas River drainage (Oklahoma and Arkansas)—The scaleshell mussel has been collected from the following streams from the Arkansas River drainage: Poteau River in Oklahoma (Gordon 1991), Frog Bayou in Arkansas (Harris and Gordon 1987), and the South Fourche LaFave and Mulberry Rivers in Arkansas (Gordon 1991; Harris 1992). A single scaleshell mussel specimen was collected in the Poteau River (Gordon 1980). However, it has not been documented in subsequent surveys of this river (Branson 1984; Harris 1994). The existence of scaleshell mussels in Poteau River is doubtful.

Gordon (1980) collected two scaleshell mussel specimens from Frog Bayou. Beaver Reservoir now inundates one of the Frog Bayou collection sites. The most recent collection was a fresh dead individual during a 1979 survey (Gordon 1980). Gordon noted that stream bank bulldozing upstream recently disturbed this site and other nearby sites. He also reported in-stream gravel mining activities at several sites. Within Frog Bayou, potential habitat is restricted to the area between Rudy and the confluence of the Arkansas River. Above Rudy, two reservoirs impact the river; one near Maddux Spring and the other at Mountainburg. Live mussels have not been found at the confluence of the Arkansas River, likely due to dredging activities (Gordon 1980). Although the current status of the scaleshell mussel in Frog Bayou is uncertain, any remaining individuals are in potential jeopardy due to limited habitat and in-stream mining activities.

The only scaleshell mussel record from the South Fourche LaFave River is based on a single live specimen found in 1991 (Harris 1992). An 86-acre reservoir is approved for construction on Bear Creek approximately six miles upstream from this site. However, the effect of this impoundment on scaleshell mussels is uncertain. The potential for discovering additional scaleshell mussel sites in this river is unlikely due to the limited availability of suitable substrate. Similarly, other major tributaries of the South Fourche LaFave River provide little mussel habitat. Like Frog Bayou, the persistence of scaleshell mussels in this river is in doubt.

Although Gordon (1991) reported scaleshell mussels from the Mulberry River, documentation is lacking. Recent surveys did not find the species in the Mulberry River (Craig Hilborne, U.S. Forest Service, pers. comm. 1995;

Stoeckel *et al.* 1995). The existence of scaleshell mussels in the Mulberry River is unlikely.

Red River drainage (Oklahoma and Arkansas)—The scaleshell mussel has been documented from the following streams in the Red River drainage: the Kiamichi River, Gates Creek, Little River, Mountain Fork; and the Cossatot, Ouachita, Little Missouri, and Saline Rivers. Isley (1925) first collected scaleshell mussels from the Kiamichi River in 1925. Based on his account, the Kiamichi River historically supported a diverse and abundant mussel fauna. He collected 36 scaleshell mussel specimens at one of 22 stations visited. A single specimen was also collected from Gates Creek, a tributary of the Kiamichi River, by Valentine and Stansbery (1971). As recently as 1987, Clarke described the Kiamichi River as ''in remarkably good condition'' and a ''faunal treasure'' (Clarke 1987). However, despite extensive searches of the Kiamichi River over the last 11 years, only a single fresh dead shell of scaleshell mussel (in 1987) has been collected (Caryn Vaughn, Oklahoma Biological Survey, pers. comm. 1997; Charles Mather, University of Science and Arts of Oklahoma, *in litt.* 1984 and 1995). Vaughn (pers. comm. 1997) failed to find even a dead shell during three years (1993–1996) of surveys in the Red River Basin. However, the mussel habitat in the Kiamichi River is in relatively good condition above the Hugo Reservoir (Clarke 1987) and may still support a remnant population of scaleshell mussels.

Although there is no evidence of scaleshell mussels persisting in the Little River, healthy mussel beds exist above the Pine Creek Reservoir (Caryn Vaughn, *in litt.* 1997). Below Pine Creek Reservoir, the mussel fauna is severely depleted but recovers with increasing distance from the impoundment (Caryn Vaughn, *in litt.* 1997). Although scaleshell mussels have not been documented during extensive surveys throughout the length of the Little River, suitable habitat remains and the species may persist (Caryn Vaughn, *in litt.* 1997). However, the discharge of reservoir water from Pine Creek and periodic discharge of pollution from Rolling Fork Creek may seriously impact any remaining viable scaleshell mussel populations and prohibit any future recolonization (Clarke 1987). Valentine and Stansbery (1971) reported a single specimen from Mountain Fork. Clarke (1987) hypothesized that, based on the presence of mussels at the confluence of Mountain Fork and beyond the Arkansas border, damage to Mountain Fork from the Broken Bow Reservoir has not occurred. However, Vaughn (*in litt.* 1997) indicated that these areas have been severely depleted with most no longer containing live mussels.

If scaleshell mussels still occur in the Red River drainage in Oklahoma, extant populations are probably small and are likely restricted to isolated areas of suitable habitat in the Kiamichi and Mountain Fork Rivers. Given the extensive survey effort over the last decade, long-term survival of the scaleshell mussel in Oklahoma is doubtful.

Harris collected single scaleshell mussel specimens from the Cossatot and Saline Rivers in Arkansas in 1983 (John Harris, *in litt.* 1997) and 1987 (John Harris, pers. comm. 1995), respectively. No other information is available for either river.

The existence of scaleshell mussels in the Ouachita River and its two tributaries, the Saline River and Little Missouri River, is questionable as well. Both the Little Missouri and Saline Rivers records are based on single specimens. The Saline River specimen was collected in 1964 (Clarke 1996), and the Little Missouri River collection record is from 1995 (John Harris, *in litt.* 1997). Four undated museum specimens of scaleshell mussels from the Ouachita River in Arkadelphia, Clark County, Arkansas are listed in Clarke (1996), but details are unavailable. Based on the few collections and the limited habitat available, the long-term persistence of scaleshell mussel in Cossatot, Saline, Little Missouri, and Ouachita Rivers appears precarious.

Lower Mississippi River Basin summary—Of these 21 rivers and tributaries in the lower Mississippi River Basin that historically supported scaleshell mussels, nine, and possibly an additional six, support the species today. Of these populations, the South Fork Spring River could possibly be stable; the St. Francis River, Kiamichi River, Little River, Mountain Fork, Spring River, Frog Bayou, South Fourche LaFave River, and White River are presumed to be declining; and the status of the Myatt and Gates Creeks and the Strawberry, Cossatot, Saline, and Little Missouri Rivers populations are unknown.

Previous Federal Action

We had identified the scaleshell mussel as a Category 2 candidate species in a notice of review published in the **Federal Register** on May 22, 1984 (49 FR 21664). The scaleshell mussel remained a Category 2 candidate species in subsequent notices including January 6, 1989 (54 FR 554), November 21, 1991 (56 FR 58804), and November 15, 1994 (59 FR 58982). Prior to 1996, a Category 2 candidate species was one that we were considering for possible addition to the Federal List of Endangered and Threatened Wildlife, but for which conclusive data on biological vulnerability and threats were not available to support a proposed rule. We discontinued designating Category 2 species in the February 28, 1996, Notice of Review (61 FR 7596). We now define a candidate species as a species for which we have on file sufficient information on biological vulnerability and threats to support issuance of a proposed rule. We designated the scaleshell mussel as a candidate species on October 16, 1998.

On August 13, 1999 (64 FR 44171), we published a proposal to list the scaleshell mussel as an endangered species and opened a 60-day comment period on the proposal. On November 29, 1999 (64 FR 66600), we reopened the comment period for 39 days in order to hold a public hearing. The hearing was held in Jefferson City, Missouri, on December 8, 1999.

Summary of Comments and Recommendations

In the August 13, 1999, proposed rule, and through associated notifications, we requested all interested parties to submit factual reports or information that might contribute to the development of a final rule. We contacted appropriate Federal and State agencies, County governments, scientific organizations, and interested parties and requested their comments. We published notices inviting public comment in the following newspapers in 1999: The Chicago Sun Times, The Chicago Tribune, The Peoria Journal Star, State Journal-Register, The Journal Gazette Co., The Indianapolis Star, The Columbia Daily Tribune, The Kansas City Star, The St. Louis Post-Dispatch, The South Bend Tribune, The Cedar Rapids Gazette, Quad City Times, The Des Moines Register, The Cincinnati Post, The Cleveland Plain Dealer, The Columbus Dispatch, Cuba Free Press, Steelville Star-Crawford Mirror, Jefferson County Journal, Jefferson County Leader, Jefferson County News Democrat Journal, Meramec Journal, Jefferson County Watchman, TriCounty Journal, County Star Journal West, Chesterfield Journal, Clayton-St. Louis County Watchman, North County Journal-West, Florissant Valley Reporter, North County Journal-East, North Side Journal, County Star Journal-East, Concord Call, Mid-County Journal, Oakville Call, Oakville/Mehlville Journal, St. Louis Countian, South

County Journal, South County Times, Southwest County Journal, Webster-Kirkwood Times, West County Journal, Citizen Journal, Webster/Kirkwood Journal, South County News-Times, Press Journal, New Haven Leader, St. Clair Missourian, Sullivan Independent-News, Franklin County Watchman, Union Missourian, Washington Missourian, Bland Courier, Advertiser-Courier, Gasconade County Republican, Unterrified Democrat, Dixon Pilot, The Richland Mirror, Fort Leonard Wood Essayons, and The Daily Guide.

The Service hosted a public hearing (December 8, 1999, in Jefferson City, Missouri) at the request of Two Rivers Levee and Drainage Association, Law Offices of John C. Franken, Howard/Cooper County Regional Port Authority, and 180 private citizens. To accommodate this request, we reopened the comment period from November 29, 1999, to January 7, 2000, to allow for consideration of, and to provide an opportunity for, further comments. A notice of the hearing and reopening of the comment period was published in the **Federal Register** on November 29, 1999 (64 FR 66600), and in legal notices in the newspapers listed above.

We received 26 letters providing comments and information during the comment periods. Additionally, six individuals provided oral statements at the public hearing. We have updated this rule to reflect any changes in information concerning distribution, status, and threats since the publication of the proposed rule. All pertinent comments have been considered in the formulation of this final rule. Written comments received during the comment periods and written comments and oral statements presented at the public hearings are addressed in the following summary. Comments of a similar nature or point are grouped together (referred to as ''Issues'' for the purpose of this summary) below, along with the Service's response to each.

Issue 1: One respondent was unsure of what this listing would accomplish beyond the recovery efforts of other mussel species already federally listed in Missouri.

Response: This action will extend the Act's protection to this species. Federal listing results in an increased awareness of this species' status and its need for conservation attention. It also provides for opportunities for funding research, management activities, and conservation actions specifically targeted for this species. In addition to better funding opportunities, Federal endangered status encourages scientists and natural resource managers to focus research and conservation actions specifically for the scaleshell mussel.

There are currently four federally listed mussel species in Missouri (Missouri Natural Heritage Database 1999). These are the pink mucket (*Lampsilis abrupta*), Curtis pearlymussel (*Epioblasma florentina curtisi*), Higgins' eye (*Lampsilis higginsii*), and fat pocketbook (*Potamilus capax*). We agree that where overlap of listed mussels occurs, the prohibitions of the Act will provide little additional protection of habitat. However, the current range of scaleshell mussel extends to areas where there are no federally listed species. The Act will provide protection from further habitat loss and degradation in these areas.

Issue 2: One respondent was concerned that the public will not know what impacts this listing will have on activities on private property until after the recovery plan is completed. The respondent was referring to potential impacts of recovery actions on private land in particular.

Response: While recovery plans are not developed until after a species is listed, there is opportunity for public input in the recovery planning stage. The purpose of the recovery plan is to set recovery objectives (goals) and identify the tasks needed to meet those objectives before a species can be downlisted or delisted. As the draft recovery plan is announced in the **Federal Register**, we will solicit comment from species experts, natural resource managers, and other interested parties. To ensure broad participation in the review of the recovery plan, we will notify all interested parties that were identified during the listing process (for example, those that provided comments or requested to be on our mailing list).

Although actions that could be affected by the listing were identified in the proposed rule, we acknowledge that impact upon private actions cannot be fully assessed until a recovery plan is developed. However, in ascertaining whether a species warrants Federal protection under the Act, we may consider only biological factors. In accordance with 16 U.S.C. sec. 1533(b)(1)(A) and 50 CFR 424.11, listing decisions are made solely on the basis of the best scientific and commercial data available. The legislative history of the 1982 Act amendments states: ''The addition of the word ''solely'' is intended to remove from the process of the listing or delisting of species any factor not related to the biological status of the species. The Committee strongly believes that economic considerations have no relevance to determinations regarding the status of the species. * * *'' H.R. Rep. No. 567, Part I, 97th Congress, 2nd Session 20 (1982). Thus, the impact of listing on private activities, although of great interest and importance to the public, is not a factor we may consider in our listing determination.

Issue 3: One respondent questioned whether the range of the scaleshell mussel, particularly in the Missouri River, is based on records that were identified correctly. Scaleshell mussels can be easily confused with the fragile papershell (*Leptodea fragilis*) or the pink papershell (*Potamilus ohioensis*), which are more common and widespread.

Response: We acknowledge that scaleshell mussels may be confused with other species by the casual observer. Freshwater mussels are often difficult to identify by shell shape alone. However, to malacologists (a person who studies mollusks) and other properly trained biologists, there are no ambiguities in distinguishing scaleshell mussels from other species. Female scaleshell mussels are unique and unlikely to be mistaken with any other species. Females are small, very elongated, and the posterior edge is ruffled. Male scaleshell mussels can possibly be confused with other species, particularly the fragile papershell. However, several external characteristics distinguish male scaleshell mussels from the fragile papershell, the pink papershell, and other species. These characteristics include the presence of green rays, light brown periostracum, pointed posterior end, absence of dorsal wings, elongated shell, straight dorsal margin, and rounded ventral margin (Parmalee and Bogan 1998, Oesch 1995, Watters 1995).

While it is possible that a small number of scaleshell mussel specimens have been misidentified, we are confident that the range of this species is based on valid specimens because many records are represented by voucher specimens that are housed in museums. The identification of these specimens has been verified by expert malacologists. In particular, the records of scaleshell mussel from the Missouri River were identified by Dr. David H. Stansbery, who is a leading authority in North America on freshwater mussel identification at the Ohio State Museum located at Ohio State University in Columbus, Ohio.

Issue 4: The proposed rule states that gravel mining has recently become a more serious threat for scaleshell mussel range-wide because the Corps' authority to regulate instream gravel mining has been reduced. One respondent stated that this issue will probably not be

overlooked by the State agencies. In other words, gravel mining will probably be regulated by State agencies now that the Corps has less authority to regulate this activity.

Response: Section 404 of the Clean Water Act of 1972 (CWA) provides regulations for discharge of dredged and fill materials in surface waters, including a permit program to ensure that such discharges comply with other State and Federal environmental regulations. The Corps is the Federal agency responsible for implementing this section of the CWA. Until 1997, instream mining was more strictly regulated, because incidental fallback of material during a dredging action was considered fill in surface waters, and thus triggered section 404 compliance. Due to a 1997 Federal court decision, however, incidental fallback of material is no longer considered fill. Consequently, only activities that result in discharge of fill material greater than incidental fallback are regulated under section 404 (see factors A and D under the ''Summary of Factors Affecting the Species'' section for further information on this issue).

As discussed in Issue 1, federally listed species frequently coexist with scaleshell mussels. Section 7 of the Act requires all Federal agencies, including the Corps, to consult with the Service regarding any action that may adversely affect listed species. Through this consultation process, the Service identifies conservation measures, which minimize adverse impacts to listed species. With incidental fallback no longer requiring a Corps section 404 permit, the section 7 consultation process is no longer applicable for many instream gravel mining activities.

Some State agencies have authority to regulate gravel mining within their state. In Arkansas, instream gravel mining is regulated by the Arkansas Open-Cut Mining and Land Reclamation Code, which contains guidelines to reduce impacts (Roell 1999). The Missouri Department of Natural Resources (MDNR) also has the authority to regulate gravel mining in Missouri under the Land Reclamation Act. However, their regulatory authority is limited. First, only commercial operators are required to obtain a permit to remove gravel from streams and rivers. City, county, and state operators using their own equipment and private operations are not required to obtain a permit from MDNR. Also, these operators are not obligated to comply with permit conditions that are crucial in avoiding adverse impacts to the stream environment. Second, MDNR's conditions for gravel mining permits are less stringent than those required previously by the Corps (Mike Larson, Missouri Department of Natural Resources, pers. comm. 2000). For example, the MDNR permit does not prohibit the modification of water conveyance, limit excavation to unconsolidated areas, require bank and water buffer strips, or minimize the removal of aquatic and terrestrial vegetation. All of these factors could adversely affect the scaleshell mussel and its habitat.

Issue 5: Several respondents are concerned that this listing will impact activities on private property. One respondent was concerned that impoundments will be more difficult to construct after the listing.

Response: This listing will protect scaleshell mussels from take under section 9 (Prohibited Acts) of the Act. Take is defined by the Act as ''harass, harm, pursue, hunt, shoot, wound, capture, collect, or attempt to engage in any such conduct.'' Take is further defined by regulation to include ''significant habitat modification or degradation that actually kills or injures wildlife,'' (50 CFR 17.3 ''*Harm*''). Non-Federal property owners, such as private landowners, corporations, or State or local governments, wishing to conduct activities on their land that might result in the incidental take of scaleshell mussels can obtain an incidental take permit from the U.S. Fish and Wildlife Service. Section 10 of the Act provides for the issuance of permits to conduct otherwise prohibited activities. Through section 10, there is an opportunity to provide species protection and habitat conservation for non-Federal development and land use activities that may result in incidental take of a listed species. For landowners and local governments, these incidental take permits, and their associated habitat conservation plans (HCP), provide long-term assurances that their activities will be in compliance with the requirements of the Act. Biologically, they provide the Service with a tool to offset the incidental take of listed species by reconciling species conservation with economic development. The HCP process allows private development to proceed while promoting listed species conservation.

The No Surprises policy provides assurances to non-Federal landowners participating in HCP efforts through the section 10(a)(1)(B) process. Essentially, landowners are assured that if ''unforeseen circumstances'' arise, the Services will not require, without the consent of the permittee, the commitment of additional land, water or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed to in the HCP. The government will honor these assurances as long as a permittee is implementing the terms and conditions of the HCP, permit, and other associated documents in good faith. In effect, this regulation states that the government will honor its commitment as long as HCP permittees honor theirs.

An activity on private land could also possibly be affected by this listing if that project (1) would need to be authorized, permitted, or funded by the Federal government, (2) would be located in habitat occupied by the scaleshell mussel or in designated critical habitat for the species, and (3) would have a direct or indirect effect on the species or its designated critical habitat. Federal programs and activities of this nature would usually require consultation with the Service under section 7 of the Act to evaluate the nature and extent of the adverse impacts and determine if project modification is necessary to reduce those impacts. Proposed impoundments within currently occupied streams and rivers are one type of activity that will require consultation. See the ''Available Conservation Measures'' section for additional examples of activities that will and will not require consultation.

While certain activities may require consultation, projects are rarely terminated due to the presence of a federally listed species, and private landowners are usually not affected. The consultation process is the responsibility of the Federal agencies involved. The majority of section 7 consultations are resolved informally. For example, consultation is ended at an early stage if the potential impacts of a proposed project are expected to be discountable, insignificant, or beneficial to the species. Even if a significant adverse effect is expected, the consultation can usually be concluded by developing minor modifications to project plans or designs that avoid those impacts. If potential impacts are of such nature that a federally listed species is likely to be adversely affected and such effects cannot be removed, formal consultation would be required. However, section 7(b)(4) of the Act allows incidental take of the listed species resulting from Federal actions if such take is not likely to jeopardize the continued existence of the species and if reasonable and prudent measures are implemented to minimize the adverse impacts of such take. A General Accounting Office audit (1992), which found that 99.9 percent of all projects reviewed between 1988 and 1992 went

forward unchanged or with only minor modifications as a result of the section 7 consultation, attests to the regulatory flexibility afforded by the Act.

Issue 6: One commenter stated that the same threats (*i.e.,* water pollution, sedimentation, channelization, and impoundments) listed as impacting scaleshell mussel in the past (prior to 1950) are stated for present and future populations. The commenter stated that these conditions have improved. In Missouri, most of the channelization was established before the 1930s. Since 1950 land management practices have also evolved to more effectively control erosion and runoff, and the impacts of water pollution and sedimentation have been reduced.

Response: The Service recognizes that some of these factors have improved, particularly land management practices to reduce erosion and runoff. In fact, the reason scaleshell mussels continue to persist could possibly be due to these improvements. However, the same threats that contributed to scaleshell mussels' decline before 1950, are still being observed and continue to impact scaleshell mussels. Channelization and new impoundments are currently proposed within the range of the scaleshell mussel, and water quality degradation and siltation has recently been documented as a serious threat in areas still occupied by scaleshell mussels. These threats are ongoing and qualify the scaleshell mussel for listing (See factor A in the ''Summary of Factors Affecting the Species'' section). The small number and low density of the remaining populations exacerbate threats and adverse effects of chance events on the species.

Issue 7: The data cited in the notice of proposed listing provide inadequate support for listing the scaleshell mussel as an endangered species. The decline of the scaleshell mussel is not serious enough to warrant listing. The six potential additional populations (status unknown), which would increase the current number of populations by almost 50 percent, merit further investigation before the listing decision is made.

Response: Under section 4(b)(1)(A) of the Act, a listing determination must be based solely on the best scientific and commercial data available regarding the species' biological status and threats to its existence. Endangered status is assigned to species which are in danger of extinction throughout all or significant portion of their range. 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) of the Act. These factors include (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence.

The scaleshell mussel has undergone one of the most extensive range reductions of all the federally listed freshwater mussel species. It is considered extirpated from ten states and from 39 of the 55 rivers within its historical range. Although 14 populations, and possibly six others, persist, the long-term viability of these populations is threatened by a variety of ongoing threats (see ''Summary of Factors Affecting the Species'' discussion). Given the extent of range reduction that has occurred and the persistence of threats to the remaining populations, we believe the scaleshell mussel is in danger of extinction throughout a significant portion of its range.

Issue 8: Detecting population changes by using available data for a rare species is speculative. Specifically, the proposed rule states that the long-term viability of scaleshell mussel populations in the Meramec basin is tenuous. In a recent survey on the Meramec River, more scaleshell mussels were found than in a past survey. The respondent did not understand how those data could support a conclusion that the species is declining.

Response: The Service acknowledges that rare species are difficult to census, and thus, deriving population trends based on counts of individuals is difficult and sometimes impossible. It is a common problem in rare species conservation that, as numbers of a rare species continue to decline, it becomes increasingly difficult to find and count the individuals in order to ''prove'' the decline is continuing. However, reliable inferences on the status and long-term viability of individual populations, as well as for a species as a whole, can be made based on ecological principles, small population biology theory, and observations of threats and habitat loss from field investigations. For example, population stability implies that recruitment exceeds mortality. For freshwater mussels, the presence of juveniles serves as the best evidence for recruitment. Thus, failure to collect juvenile specimens suggests that the population is declining. Similarly, small populations are more susceptible to extinction due to chance events, such as disease, drought, accidental spills of contaminants, or other fluctuations in local environmental conditions. Thus, even without multiple years of survey data, we know that low density mussel populations are vulnerable. Small populations must also rely on movement of individuals among populations to remain genetically viable. Thus, mussel populations that are isolated are threatened. In addition to these biological factors, the presence of threats, regardless of population size, can substantially influence the conservation status of a population. Using these factors, the health of individual populations and the species can be determined.

To ensure consistency and objectivity, Szymanski (1998) developed criteria based on the aforementioned factors to assign status and trend categories to each scaleshell mussel population. These criteria were utilized in the proposed rule. However, a discussion of status and trends using the same set of limited data was confusing and redundant to readers. Therefore, in this final rule, we devised a single classification system (*i.e.,* combined status and trend categories) to assess population health (Table 1). The revised classification system differs only in the presentation of the data and the results of its application are similar to those derived from the Szymanski (1998) methodology. As a result of additional information that was obtained during the public comment period, the status or trends reported in the proposed rule for a few populations differs from those reported herein. For example, the status of the White River population changed from extirpated to presumed declining as new information documented a 1999 live scaleshell mussel collection from this river. A discussion of the criteria used for this classification system is provided in the ''Distribution and Abundance'' section.

With respect to the recent survey work in the Meramec River, the greater number of scaleshell mussels found in the 1997 survey was likely due to two aspects of the survey, and not a result of a population increase (Roberts and Brunderman 2000). First, a special effort was made to collect this species (*i.e.,* raking the top layer of the substrate by hand) because it often lies buried in the substrate. This method likely increased the probability of finding the species compared to past surveys. Second, lower water levels from drought conditions exposed a mussel bed at one site, causing scaleshell mussels to actively crawl on top of the substrate. The collection of only 19 scaleshell mussels, when viewed in light of the modified survey techniques and the

high visibility of individual mussels at one mussel bed, is strong evidence of the extreme rarity of this species.

When attempting to monitor rare species, for which surveys usually locate only one or several surviving individuals, it is not uncommon for variations in survey methodology, weather conditions, and even time of day to affect the results of the survey. For species of extreme rarity, the effects of these factors can easily obscure the true population trend for the species. For this reason, we usually use criteria, in addition to population or density estimates, to evaluate the health of individual populations and the species as a whole.

Based on the criteria described earlier, the three scaleshell mussel populations in the Meramec Basin (the Meramec, Bourbeuse, and Big Rivers) are believed to be declining at the present time. The long-term persistence of these populations is considered questionable because of marked habitat loss and other existing threats. Furthermore, the small number of individuals and low density of these populations exacerbate the magnitude and adverse impacts of threats (see ''Summary of Factors Affecting the Species''). Thus, despite the fact that more scaleshell mussels were collected from the Meramec River in a recent survey than in the past, other factors indicate that these populations are threatened and are declining.

Issue 9: One respondent requested clarification of references to historical and existing distribution and abundance of scaleshell mussels. The respondent asked if the terms ''populations'' and ''occurrences'' are equivalent and if populations are equal in size and other qualities.

Response: A ''historical record'' is any site where the scaleshell mussel has been documented regardless of when it was collected. The Service believes that recently discovered sites do not represent areas that have been colonized recently, but rather, they are sites that have existed historically (*i.e.,* in historical times) and have not been previously known or sampled by collectors. A description of the historical range of the scaleshell mussel includes all known records. In contrast, a description of the existing distribution of the scaleshell mussel would include only its extant (that is, currently existing) range.

An ''occurrence'' refers to a site where a scaleshell mussel specimen has been collected. An occurrence, which may be represented by one or more specimens, usually indicates the species is present or once existed in that area, depending on whether the specimen(s) is living or dead.

In the context of this rule, the term ''population'' refers to all the current and historical occurrences of scaleshell mussels within a single river.

It is impossible to determine if past and present scaleshell mussel populations are equal in size (in terms of number of individuals or length of stream inhabited), because many surveys conducted near the turn of the century were not thorough. However, it is believed that scaleshell mussels historically have always been rare relative to many other mussel species. Inferences regarding population trend can be made from existing data (*e.g.,* age-structure, historical vs. current collections, habitat availability and condition, and threats). For example, scaleshell mussels were locally abundant in the Kiamichi River in the past (with 36 specimens collected from one sampling station). Today, however, no living scaleshell mussel specimens and only 1 fresh dead specimen were found during exhaustive survey efforts. It is apparent that scaleshell mussels, although always rare, occur today at lower densities than in the past in the Kiamichi River (see Issue 8 for further discussion regarding assessing conservation status). Within this final rule, populations that were assigned to the same conservation status do not necessarily have similar population size (although all populations persist at very low densities) or habitat quality.

Issue 10: The proposed rule states that scaleshell mussels have not been found in the Upper Mississippi River basin in over 50 years. One respondent asked how often sampling has been conducted in the Upper Mississippi River basin, and what is the likelihood of detecting a locally rare species.

Response: The historical range of the scaleshell mussel in the Upper Mississippi River basin includes the states of Illinois, Iowa, Minnesota, and Wisconsin. Natural resource agencies in these states are confident enough to consider the scaleshell mussel extirpated since it has not been collected in over 50 years despite a considerable number of surveys. Rivers with documented scaleshell mussel occurrences in the Upper Mississippi River basin include the Mississippi, Minnesota, Iowa, Cedar, Illinois, Sangamon, and Pecatonica Rivers, and Burdett's Slough of the Mississippi River (see ''Distribution and Abundance''). All of these rivers have been surveyed in the last 10–15 years. Surveys considered here are formal mussel surveys published in technical reports and scientific journals. Numerous other surveys, which are not discussed here, also have been conducted in these streams at selected sites for various Federal projects (*e.g.,* proposed bridges, pipelines, channelization, etc.). Surveys have been conducted on the Minnesota River in 1977 and 1999 (Marian Havlik, Malacological Consultants, *in litt.* 2000; Tim Yager, Corps, St. Paul District, in litt. 2000). The Mississippi River mainstem, in particular, has been surveyed extensively since 1950. The Illinois, Sanagamon, and Pecatonica Rivers have also been surveyed extensively in the last 15 years (Kevin Cummings, pers. comm. 2000).

The likelihood of detecting a locally rare species depends on the amount of time spent searching and the search methods employed. The most common method used for surveys is timed searches, which produce a measurement of the number of mussels collected per unit of time spent searching. Timed searches produce the most complete list of species (including rare species) at a given site (Strayer *et al.* 1997, Vaughn *et al.* 1997).

Furthermore, the deficiency of suitable mussel habitat, both in quality and quantity, remaining in this drainage also suggest that scaleshell mussel persistence is highly unlikely. This is not to say individuals may not persist in the Upper Mississippi River drainage, but that the best available scientific information indicates that population viability is doubtful.

Issue 11: One respondent believes that water turbulence produced by jet boat motors may be adversely affecting scaleshell mussels and other freshwater mussels in the Meramec River in Missouri.

Response: The Service recognizes that jet boats, which can produce powerful water turbulence, could potentially have adverse affects on freshwater mussels including scaleshell mussels. Jet wash from motors may contribute to substrate destabilization and/or could dislodge adult and juvenile mussels from suitable habitat, particularly from shallow riffles where mussels typically occur. The magnitude and extent to which this factor may threaten populations, however, is unknown.

Peer Review

In accordance with our July 1, 1994, Interagency Policy on Peer Review (59 FR 34270) we requested the expert opinions of independent specialists regarding pertinent scientific or commercial data and assumptions relating to the supportive biological and ecological information in the proposed rule. The purpose of such review is to

ensure that the listing decision is based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists.

We requested a formal scientific peer review from four malacologists who possess expertise on the scaleshell mussel. We received a written response and comments from two of these experts within the open comment periods. These experts strongly supported the listing proposal and agreed with the Service that this species is in need of Federal protection as an endangered species. One reviewer stated that the Service was thorough in reviewing this species and that the status and threats are accurately described. This reviewer felt that the threats posed by the zebra mussel to the scaleshell mussel, as discussed in the proposed rule, should not be underestimated. Additionally, more information was provided in one response regarding the extant distribution of the scaleshell mussel and threats to its existence. That information is incorporated into this final rule.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, we determine that the scaleshell mussel should be classified as an endangered species. We followed the procedures found at section 4(a)(1) of the Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) implementing the listing provisions of the Act. We may determine a species 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 scaleshell mussel (*Leptodea leptodon*) are as follows:

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

Arguably, the scaleshell mussel has suffered a greater range reduction than any other unionid. The range of this species was once expansive, spanning the Mississippi River Basin in at least 55 rivers in 13 states (Szymanski 1998). Today, the range is significantly reduced with known extant populations persisting in only 14, potentially 20, rivers in three states. The scaleshell mussel has been eliminated from the entire upper and most of the middle Mississippi River drainages. Although much of the decline occurred before 1950, population declines continue in most portions of the species' range, and numerous threats are impacting the few remaining extant populations. Water pollution, sedimentation, channelization, sand and gravel mining, dredging, and impoundments contribute to the decline of the scaleshell mussel throughout its range and continue to affect existing populations. A general description of how these factors affect mussels is given below, followed by specific examples of how these threats are affecting scaleshell mussels in its extant range. Refer to Szymanski (1998) for a more detailed discussion of threats to freshwater mussels.

Mussel biologists generally agree that contaminants are partially responsible for the decline of mussels (Havlik and Marking 1987, Williams *et al.* 1993, Biggins *et al.* 1996). Mussels are sedentary filter feeders and are vulnerable to contaminants that are dissolved in water, associated with suspended particles, or deposited in bottom sediments (Naimo *et al.* 1992).

Contaminants enter streams from point and nonpoint sources. Point source pollution is the entry of material from a discrete, identifiable source such as industrial effluents, sewage treatment plants, and solid waste disposal sites. Freshwater mussel mortality from toxic spills and polluted water is well documented (Ortmann 1909, Baker 1928, Cairns *et al.* 1971, Goudreau *et al.* 1988). Decline and elimination of populations may be due to acute and chronic toxic effects that result in direct mortality, reduced reproductive success, or compromised health of the animal or host fish.

Nonpoint source pollution is the entry of material into the environment from a diffuse source such as runoff from cultivated fields, pastures, private wastewater effluents, agricultural feed-lots and poultry houses, active and abandoned mines, construction, and highway and road drainage. Stream discharge from these sources may accelerate eutrophication (*i.e.,* organic enrichment), decrease oxygen concentration, increase acidity and conductivity, and cause other changes in water chemistry that are detrimental to the survival of most mussel species and may impact host fishes (Goudreau *et al.* 1988, Dance 1981, Fuller 1974).

Sediment is material that is suspended in the water, and is being transported, or has been moved, as the result of erosion (USSCS 1988). Although sedimentation is a natural process, agricultural encroachment, channelization, impoundments, timber harvesting within riparian zones, heavy recreational use, urbanization, and other land use activities can accelerate erosion (Waters 1995, Myers *et al.* 1985, Chesters and Schierow 1985). The water quality impacts caused by sedimentation are numerous. Generally, it affects aquatic biota by altering the substratum and by altering the chemical and physical composition of the water (Ellis 1936, Myers *et al.* 1985, USSCS 1988). Sedimentation directly affects freshwater mussel survival by interfering with respiration and feeding. Due to their difficulty in escaping smothering conditions (Imlay 1972, Aldridge *et al.* 1987), a sudden or slow blanketing of stream bottom with sediment can suffocate freshwater mussels (Ellis 1936). Sediment particles may carry contaminants toxic to mussels (Naimo *et al.* 1992). Increased sediment levels may also reduce feeding efficiency (Ellis 1936), which can lead to decreased growth and survival (Bayne *et al.* 1981).

Channelization, sand and gravel mining, and dredging operations physically remove mussels from the water and may also bury or crush mussels (Watters 1995). Other effects of these activities extend upstream and downstream of the excavated area. Headcutting, the upstream progression of stream bed destabilization and accelerated bank erosion, can affect an area much larger than the dredging site (Hartfield 1993). In severe cases, this erosional process can extend for several miles upstream. As relatively immobile bottom-dwelling invertebrates, mussels are particularly vulnerable to channel degradation (Hartfield 1993). Accelerated erosion also releases sediment and pollutants, and in some instances, diminishes mussel diversity and habitat as documented in the Yellow and Kankakee Rivers in Indiana, the Big Vermillion River in Illinois, and the Ohio River (Fuller 1974).

Gravel mining has recently become a more serious threat for scaleshell mussels range-wide. In 1997, a court ruling changed the interpretation of the CWA as it applies to the regulation of gravel mining (Roell 1999). Previously, gravel mining was more strictly regulated because ''incidental fallback'' (the incidental soil movement from excavation, such as the soil that is disturbed when dirt is shoveled, or back-spill that comes off a bucket and falls into the same place from which it was removed) was considered fill in surface waters, thus triggering section 404 of the CWA and the permitting process of the Corps. Prior to the 1997 ruling, gravel mining operators were required to obtain a Corps section 404 permit and follow several conditions outlined on the permit. Except in very small tributaries, the Corps required all operators to establish a streamside and riparian buffer and prohibited removing gravel from flowing water (*i.e.,* no in-stream mining) or from below the water

table (Danny McKlendon, Corps, St. Louis District, pers. comm. 1998). These requirements avoided most adverse effects to mussels including headcutting, channel modification, and the physical crushing or removal of mussels. Furthermore, the Corps' permit process included consultation with the Service concerning the presence of federally listed species at each proposed mining site. However, the 1997 ruling eliminated the Corps authority to regulate most instream gravel mining activities, thereby eliminating the section 404 permit and the conditions that protected mussel beds. Therefore, the scaleshell mussel has lost much of its protection from gravel mining. Only activities resulting in discharge of fill material greater than incidental fallback (such as instream gravel stockpiling, stream crossings, and select removal methods) are regulated. However, many gravel mining operations may not fall under this category.

Impoundments negatively affect mussels both upstream and downstream by inducing scouring, changing water temperature regimes, and altering habitat, food, and fish host availability (Caryn Vaughn, *in litt.* 1997). Impoundments permanently flood stream channels and eliminate flowing water that is essential habitat for most unionids, including scaleshell mussels (Fuller 1974, Oesch 1995). Scouring is a major cause of mussel mortality below dams (Layzer *et al.* 1993). Most detrimental, however, is the disruption of reproductive processes. Impoundments interfere with movement of host fishes, alter fish host assemblages, and isolate mussel beds from each other and from host fishes (Stansbery 1973, Fuller 1974, Vaughn 1993, Williams *et al.* 1993). The result is diminished recruitment (Layzer *et al.* 1993). Dams are effective barriers to fish host movement and migration that unionids depend on for dispersal. Mussels living upstream from the dam can become reproductively isolated from those living downstream causing a decrease in genetic diversity. Even small, lowhead dams can hinder fish movement and isolate mussel beds from fish hosts and from each other. For example, Watters (1996) determined that the upstream distribution of two mussel species, the fragile papershell (*Leptodea fragilis*) and pink heelsplitter (*Potamilus alatus*) stopped at lowhead dams. These species, like the scaleshell mussel, are believed to use the freshwater drum as a sole host.

The same threats that caused the extirpation of historical populations of scaleshell mussel still exist and continue to threaten extant populations. This species appears to be especially susceptible to contamination and sedimentation. Historically, the species was widespread and occurred in diverse habitats. Today, scaleshell mussels no longer occur at disturbed sites that still support other endangered unionids (Szymanski 1998). This suggests that scaleshell mussels are especially sensitive to degraded water quality. Given the pervasiveness of the sources of pollution and sedimentation, it is apparent that these threats continue to be problematic for the remaining scaleshell mussel populations.

Upper Mississippi River Basin

The scaleshell mussel formerly occurred in eight rivers and tributaries within the Upper Mississippi Basin. However, this species has not been found in more than 50 years and is believed extirpated from this region (Kevin Cummings, *in litt.* 1994). We believe the same factors that have caused declines and extirpations of other mussel species including impoundments, pollution, sedimentation, and channelization and dredging activities, have caused the disappearance of scaleshell mussels from the Upper Mississippi River Basin.

Middle Mississippi River Basin

Similar to the Upper Mississippi River Basin, impoundments, pollution, sedimentation, and channelization and dredging activities are believed to have led to the extirpation of the scaleshell mussel from the entire Ohio River Basin. These same threats continue to adversely affect extant populations in the middle Mississippi River Basin. Scaleshell mussel habitat in the Meramec River Basin has been reduced in recent years. In 1979, Buchanan found living or dead scaleshell mussels in the lower 180 km (112 mi) of the Meramec River (Buchanan 1980). In 1997, living or dead scaleshell mussels were collected only in the lower 96 km (60 mi) of the river (Roberts and Bruenderman 2000). While portions of the lower reach continue to provide suitable habitat, mussel species diversity and abundance above mile 60 have declined noticeably in the last 20 years and 9 mussel beds are no longer present between river mile 21.5 and 145.7. Roberts and Bruenderman (2000) attributed this decline primarily to the loss of channel stability. Within the Meramec Basin, the Bourbeuse River has undergone the greatest change with respect to mussel populations. In particular, mussel populations have declined in the lower river. Whereas Buchanan (1980) found this section of the Bourbeuse River to have the greatest mussel diversity, this stretch was nearly devoid of mussels when resurveyed in 1997. Additionally, five mussel beds are no longer present between miles 0.4 and 137. Buchanan (*in litt.* 1997) and Roberts and Bruenderman (2000) attributed this decline to habitat loss from sedimentation, eutrophication, and substrate destabilization.

The Big River has the lowest species diversity and abundance in the Meramec River Basin. Buchanan (1980) attributed this to the effects of lead and barite mining. While most mining operations have ceased, 45 dams retaining mine waste and numerous waste piles remain in the Big River Basin. Most of those dams were improperly constructed or maintained. The Corps found that only one of the 45 dams was safe and 27 received the worst possible rating and could fail during a flood. The poor condition of the dams has led to large influxes of mine waste into the Big River from dam collapse (MDC 1997). For example, since 1978, a ruptured tailings dam has discharged 63,000 cubic meters (81,000 cubic yards) of mine tailings into the Big River covering 40 km (25 mi) of stream bottom and negatively impacting the lower 129 km (80 mi) of the river (Alan Buchanan, *in litt.* 1995), making it less suitable for mussels.

While no major impoundments exist in the Meramec River Basin, several old mill dams (low-head dams) affect the mainstem of the Big and Bourbeuse Rivers. Five dams are still in place along the lower 48 km (30 mi) of the Big River, and one dam exists in the lower Bourbeuse River. These structures are barriers to host fish movement during normal flows (MDC 1997) and thus, continue to depress reproductive rates of scaleshell and other mussels.

Gravel mining poses an imminent threat to scaleshell mussel populations in the Meramec River Basin due to the high, and increasing, level of interest in gravel mining in the basin (Roberts and Brunderman 2000). For example, between 1994 and 1998, the Corps issued permits for 230 sites. Additional sites were mined without a permit, but the number of these unauthorized operations is unknown. (Danny McKlendon, Corps, St. Louis District, *in litt.* 1998).

In 1994, several areas of the Gasconade River channel were highly unstable, possibly a result of riparian vegetation removal in conjunction with the 1993 flood. These areas had high cut mud banks with trees fallen into the river, unstable substrate, and contained very few mussels. Buchanan (1994) predicted that habitat degradation on this river would continue and

postulated that the mussel fauna would be further impacted with some species possibly disappearing. He noted that below river mile 6, only one stable gravel bar contained a diverse mussel fauna. High silt deposition from the Missouri River prohibits the formation of mussel habitat below this area.

The majority of the Osage River system has been impounded and is no longer suitable for freshwater mussels. The majority of remaining mussel habitat occurs below Bagnell dam in the lower 80 miles of the Osage River proper. This river reach is affected by the operation of Bagnell dam, which alters flow and temperature regimes, lowers dissolved oxygen levels, and causes channel scouring and accelerated bank erosion. Several instream gravel mining operations currently exist in the Osage River that physically remove mussels from the water and cause headcutting and siltation.

Lower Mississippi River Basin

Channelization, levee construction, diversion ditches, control structures, and floodways have drastically altered much of the St. Francis River from the mouth above Helena, Arkansas, to Wappapello Dam, Missouri (Ahlstedt and Jenkinson 1987, Bates and Dennis 1983). Bates and Dennis (1983) determined that of the 54 sites sampled, 15 were productive, 10 were marginal, and 29 had either no shells or dead specimens only. They identified 77 km (48 mi) that may still provide suitable mussel habitat, but did not collect scaleshell mussels. All the remaining river miles are unsuitable for mussels.

The White River between Beaver Reservoir and its headwaters, due to municipal pollution, gravel dredging, and dam construction, is no longer suitable for mussels (Gordon 1980). Navigational maintenance activities continue to destroy habitat from Newport to the confluence of the Mississippi River (Bates and Dennis 1983). This habitat destruction has relegated mussel species to a few refugial sites.

Species richness in the Spring River below river mile nine has declined markedly from past surveys, with the lower 5.0 km (3.0 mi) of river completely depleted of mussels and no longer supporting suitable habitat (Miller and Hartfield 1986, Gordon *et al.* 1984). Sand and gravel dredging; the destruction of stream banks, disturbance of mussel beds, and the deposition of wastes from livestock movements; siltation; and surface run-off of pesticide and fertilizer appear to be contributing factors in the degradation of this river reach (Gordon *et al.* 1984).

Within Frog Bayou, potential habitat is restricted to the area between Rudy and the confluence of the Arkansas River. Within this area, streambank modifications and in-stream gravel mining are degrading scaleshell mussel habitat. Two reservoirs, one near Maddux Spring and the other at Mountainburg, impact the river above Rudy. Below the confluence of the Arkansas River, Gordon (1980) did not find live mussels, likely due to dredging activities (Gordon 1980).

The proposed Tuskahoma Reservoir (located above Hugo Reservoir) is a potential threat to mussels in the Kiamichi River. Although the Corps has authorized construction, the lack of a local sponsor has rendered the project ''inactive'' (David Martinez, Service, Tulsa, pers. comm. 1997). If constructed, the adverse effects associated with reservoirs (including permanent flooding of the channel and disruption of reproduction) are likely to destroy the mussel fauna both above and below the proposed dam site.

Sewage pollution, gravel dredging, and reservoirs continue to impact the Little River. Pine Creek Reservoir impounds the mainstem of the river. Further downstream, Broken Bow Reservoir impounds a major tributary to the Little River, the Mountain Fork River. Below Pine Creek Lake, the mussel fauna is severely depleted but recovers with increasing distance from the impoundment (Caryn Vaughn, *in litt.* 1997). However, the discharge of reservoir water from Pine Creek and periodic discharge of pollution from Rolling Fork Creek seriously impact any remaining scaleshell mussels and prohibit any future recolonization (Clarke 1987).

Hydroelectric dams and artificial lakes have impacted the Ouachita River. The ''Old River'' (an oxbow system off the mainstem), is now essentially a series of muddy, stagnant pools, with water quality problems resulting from surrounding dumps (Clarke 1987).

In summary, many of the same threats that caused the extirpation of historical populations of scaleshell mussels still exist and continue to threaten extant populations. Nonpoint and point source pollution is currently affecting the Spring River in Arkansas (Gordon *et al.* 1984, Miller and Hartfield 1986) and the Little River in Oklahoma (Clarke 1987, Vaughn 1994). Loss of stable substrates and sedimentation is causing deleterious effects in the Meramec and Bourbeuse Rivers, Missouri (Sue Bruenderman, pers. comm. 1998); Gasconade River, Missouri (Buchanan 1994); Frog Bayou, Arkansas (Gordon 1980); and Spring River, Arkansas (Gordon *et al.* 1984). Unregulated sand and gravel mining are eliminating important pool habitat (for both scaleshell mussels and potential fish hosts) in the Meramec, Bourbeuse, Big, and Gasconade Rivers in Missouri (Bruenderman, MDC, pers. comm. 1998). Impoundments, channelization, and other dredging activities (*e.g.,* sand and gravel mining) are destroying mussel beds and impairing water quality in Frog Bayou, Arkansas (Gordon 1980); St. Francis River, Arkansas (Ahlstedt and Jenkinson 1987); White River, Arkansas (Bates and Dennis 1983); Spring River, Arkansas (Gordon *et al.* 1984); and Ouachita River, Arkansas (Clarke 1987). The proposed Kiamichi River Reservoir, if constructed, will have adverse impacts on any remaining populations in Oklahoma. Nearly all scaleshell mussel populations are now restricted to small stretches of rivers with little, if any, potential for expansion or recolonization to other areas. For example, sewage pollution, gravel dredging, and reservoir construction have degraded the Little River in Oklahoma to the extent that only a few small stretches are able to support mussels.

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

It is unlikely that commercial mussel collectors ever purposefully collected scaleshell mussels because of their small size and thin shell. It is probable, however, that over-harvesting activities that removed entire mussel beds impacted scaleshell mussel populations. For example, according to local fishermen, during a period of extended drought, mussel harvesters severely over-collected mussel beds in the Spring and Black Rivers and completely destroyed most beds (Gordon *et al.* 1984). Thus, scaleshell mussel populations may have been impacted by habitat destruction (*i.e.,* disturbance of stream bottom), trampling, and removal of individuals from the stream. Individuals dislodged from the stream bottom could be washed away into unsuitable habitat. Even for mussels returned to the stream, mortality can still occur (Williams *et al.* 1993). Today, intensive mussel collecting activity will have severe adverse affects on existing populations, because scaleshell mussels now occur in very small, isolated areas. The destruction of only a few individuals could be a contributing factor in the extirpation of some populations.

As scaleshell mussels become more uncommon, the interest of scientific and

shell collectors will increase. Scaleshell mussel occurrences are generally localized, easily accessible, and exposed during low flow periods, and, therefore, are also vulnerable to take for fish bait, curiosity, or vandalism. Up to five freshwater mussels per day, including scaleshell, may be legally collected in Missouri and used for fishing bait (Sue Bruenderman, pers. comm. 1998). However, the low density of scaleshell mussels minimizes the likelihood of a scaleshell being collected.

C. Disease or Predation

Although natural predation is usually not a factor for stable, healthy mussel populations, small mammal predation could pose a problem for scaleshell mussel populations (Gordon 1991). While the large size or thick shells of some species afford protection from small mammal predators, the small size and fragile shell of the scaleshell mussel makes it an easy and desirable prey species. Small mammals, such as muskrats and racoons, may be common predators of scaleshell mussels throughout their range, particularly during periods of low water. For example, fresh scaleshell mussel shells were found among other species at several active raccoon middens (feeding areas) during a freshwater mussel survey of the Meramec and Bourbeuse Rivers (Roberts and Bruenderman 2000). These mammals are so effective at finding and eating freshwater mussels that malacologists consider collecting dead shells from middens a good way to determine the presence of rare species. Extant scaleshell mussel populations in Arkansas and Oklahoma are small, isolated, and have very limited recolonization potential. Thus, the removal of even a small number of individuals could significantly affect these populations. Small populations are less resilient to these natural predators, and therefore, are much more threatened by them. Consequently, predation could exacerbate ongoing population declines of scaleshell mussels.

Bacteria and protozoans persist at unnaturally high concentrations in streams with high sediment load or in water bodies affected by point source pollution, such as sewage treatment plants (Goudreau *et al.* 1988). At such concentrations, mussel ova and glochidia are more subject to infection (Ellis 1929). Disease and parasites may have caused major die-offs of freshwater mussels in the late 1970s throughout the eastern United States (Neves 1986). For example, significant die-offs of freshwater mussels occurred in 1977 and 1978 in the Meramec and Bourbeuse Rivers. Large numbers of mussels of all species, including scaleshell, were lost. Buchanan (1986) presumed an epizootic or other disease caused the die-off since no environmental impact was reported or could be found.

D. The Inadequacy of Existing Regulatory Mechanisms

The passage of the CWA resulted in many positive consequences for freshwater ecosystems (including a decrease in lead and fecal coliform bacteria), and set the stage for the regulations and the water standards that exist today. Goals of the CWA include the protection and enhancement of fish, shellfish, and wildlife; providing conditions suitable for recreation in surface waters; and eliminating the discharge of pollutants into U.S. waters. However, despite the implementation of the CWA, degraded water quality still presents problems for sensitive aquatic organisms such as freshwater mussels. Specifically, nationwide stream and lake sampling has indicated continuing increases in nitrate, chloride, arsenic, and cadmium concentrations (Neves 1993). Nonpoint pollution sources appear to be the cause of increases in nitrogen. Many of the impacts discussed above occurred in the past as unintended consequences of human development. Improved understanding of these consequences has led to regulatory (*e.g.,* CWA) and voluntary measures (*e.g.,* best management practices for agriculture and silviculture) and improved land use practices that are generally compatible with the continued existence of the scaleshell mussel. Nonetheless, the scaleshell mussel is highly restricted in numbers and distribution and shows little evidence of recovering from historical habitat degradation and losses.

As discussed previously (see Factor A under ''Summary of Factors Affecting the Species'' and Issue 4), a 1997 court ruling reduced the Corps' authority to regulate instream gravel mining. The MDNR is currently responsible for regulating gravel mining in Missouri, but has limited regulatory authority, and several conditions that were previously required by the Corps are no longer in place. These guidelines avoided many adverse effects to mussels including headcutting, channel modification, and the physical removal of mussels. Further, city, county, and State operators using their own equipment and private operations are not required to obtain a MDNR permit for instream gravel mining. In Arkansas, instream gravel mining will still be controlled by the Arkansas Open-Cut Mining and Land Reclamation Code, which contains required conditions to reduce impacts (Roell 1999).

Additionally, since MDNR is not a Federal agency, section 7 of the Act, which required the Corps to consult with the Service regarding the presence of federally listed species at proposed gravel mining sites, is no longer applicable. Without the section 7 consultation process, mussel beds containing federally listed species could be adversely affected by gravel mining operations.

The Corps will still retain oversight authority and require a permit for gravel mining activities that deposit fill into streams under section 404 of the CWA. Additionally, a Corps permit would be required under section 10 of the Rivers and Harbors Act for navigable waterways including the lower 80 km (50 mi) of the Meramec River. However, many gravel mining operations do not fall under these two categories.

Although recognized by species experts as threatened in Arkansas, the scaleshell mussel is not afforded state protection. Missouri and Oklahoma list the scaleshell mussel as a species of conservation concern (Sue Bruenderman, *in litt.* 1998; Caryn Vaughn, pers. comm. 1995). However, these designations are primarily used for planning and communication purposes and do not afford any significant State protection from direct take and habitat destruction (David Martinez, pers. comm. 1997; Paul McKenzie, Service, Columbia, MO, pers. comm. 1997). Therefore, scaleshell mussels may be collected, harmed, or killed in Missouri and Oklahoma without a permit. Without additional regulations providing habitat protection, as well as protection from direct and indirect take, populations of scaleshell mussels will continue to decline and disappear.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

As a consequence of the above factors, the inherent biological traits of freshwater mussels increase their vulnerability to extinction (Neves 1993). For example, the larval stage (glochidium) of most mussels is dependent on a few or one specific host fish (Neves 1993). The scaleshell mussel is believed to use the freshwater drum as its sole host fish species. This trait greatly reduces the likelihood of contact between glochidia and suitable hosts. Watters (1995) postulated that the glochidia must acquire suitable hosts within 24 hours to survive. Therefore, a reduction or loss of host fish

populations will lead to reduced glochidial survival and a decline in reproductive success, which will inevitably adversely impact scaleshell mussel populations.

Once a larva successfully transforms on a host, it is further challenged with dropping off onto suitable habitat. Watters (1995) reported that estimated chances of successful glochidial transformation and excystment (detachment) range between 0.0001 percent (Jansen and Hanson 1991) and 0.000001 percent (Young and Williams 1984). As a result of fish host-specificity and the difficulty of locating suitable habitat, even under optimal conditions, freshwater mussel population growth occurs very slowly. Furthermore, the sedentary nature of mussels limits their dispersal capability. This trait, coupled with low recruitment success, translates into the need for decades of immigration and recruitment for re-establishment of self-sustaining populations.

The small number and low density of the remaining scaleshell mussel populations exacerbate the threats to its survival posed by the above factors. Although the scaleshell mussel was always locally rare though broadly distributed, the widespread loss of populations and the limited number of collections in recent years indicates that the current population densities are much lower (due to the previously identified threats) than historical levels. Despite any evolutionary adaptations for rarity, habitat loss and degradation increase a species' vulnerability to extinction (Noss and Cooperrider 1994). Numerous studies have shown that with decreasing habitat availability, the probability of extinction increases. Similarly, as the number of occupied sites decreases, and the distances between them increases, the likelihood of extinction increases (Vaughn 1993). This increased vulnerability is the result of chance events. Environmental variation, random or predictable, naturally causes fluctuations in populations. However, small and low density populations are more likely to fluctuate below the minimum viable population (*i.e.,* the minimum number of individuals needed in a population to persist). If population levels stay below this minimum size, an inevitable, and often irreversible, slide toward extinction will occur. Further, the shorter life span of the scaleshell mussel may render it less able to tolerate periods of poor recruitment or increased mortality than are longer-lived mussel species (Chris Barnhart, *in litt.* 1999).

Small populations are also more susceptible to inbreeding depression and genetic drift. Populations subjected to either of these problems usually have low genetic diversity, which reduces fertility, survivorship, and the ability to adapt to environmental changes. Also, chance variation in age and sex ratios can affect birth and deaths rates. Skewing of these ratios may lead to death rates exceeding the birth rates, and when this occurs in small populations there is a higher risk of extinction.

Similarly, the fertilization success of mussels may be related to population density, with a threshold density required for any reproductive success to occur (Downing *et al.* 1993). Small mussel populations may have individuals too scattered to reproduce effectively. Many of the remaining scaleshell mussel populations may be at or below this threshold density. These populations will be, if the aforementioned threats go unabated, forced below or forced to remain below the minimum threshold. As a result, reproduction is diminished or ceases, and the current decline to extinction will be accelerated.

Furthermore, species that occur in low numbers must rely on dispersal and immigration for long-term persistence. In order to retain genetic viability and guard against chance extinction, movement between populations must occur. Although the scaleshell mussel naturally occurs in patches within a river and necessarily possesses mechanisms to adapt to such a discontinuous distribution, anthropogenic (man-made) influences have fragmented and further lengthened the distance between patches. Empirical studies have shown that with increasing isolation, immigration and colonization rates decrease. Also, as previously explained, natural recolonization of mussels occurs at a very low rate (Vaughn 1993). Therefore, preservation of a population (including all partially isolated patches in a river) structure is imperative for long-term freshwater mussel survival. Unfortunately, many of the extant scaleshell mussel populations now occur as single, isolated sites. These highly isolated populations are very susceptible to chance events and local extirpation with no chance of recolonization.

Lastly, the recent invasion of the exotic zebra mussel (*Dreissena polymorpha*) poses a substantial threat to native unionids (Herbert *et al.* 1989). The introduction of *Dreissena* into North America probably resulted from an ocean-crossing vessel that discharged freshwater ballast from Europe containing free-swimming larvae of the zebra mussel (Griffiths *et al.* 1991). Since its introduction in 1985, this prolific species has spread throughout the Mississippi River and many of its tributaries including the Illinois and Ohio basins and the Arkansas and Tennessee rivers. Zebra mussels starve and suffocate native mussels by attaching to their shells in large numbers. The spread of this prolific species has caused severe declines of native freshwater mussel species in many areas (Tucker *et al.* 1993; Kent Kroonemeyer, Service *in litt.* 1994; Illinois Natural History Survey, *in litt.* 1995; Corps, *in litt.* 2000).

Given that recreational and commercial vessels greatly facilitate the spread of zebra mussels, and because of the proliferation and spread that has already occurred, invasion of the zebra mussel into portions of the middle and lower Mississippi Basin is likely (Alan Buchanan, pers. comm. 1995). If zebra mussels successfully colonize rivers occupied by scaleshell mussels, its continued survival will be further jeopardized. The zebra mussel has been found recently within the scaleshell mussels' extant range in the middle Mississippi Basin. In the summer of 1999, a live zebra mussel was collected in the Lower Meramec River at river mile 6.9 (Chris Barnhart, *in litt.* 1999). The Meramec Basin appears to support the largest remaining populations of scaleshell mussels. Zebra mussels are likely to successfully colonize the Meramec River, because it appears to be similar in most ways to other tributaries of the Mississippi River that already have established populations of zebra mussels. Another live zebra mussel was collected in 1999 from the Missouri River near Sioux City, Iowa (John LaRandeau, *in litt.* 1999). If zebra mussels have successfully colonized the Missouri River, it is likely that they will spread into the Gasconade River, which has perhaps the largest population of scaleshell mussels next to those in the Meramec Basin.

Conclusion

Significant habitat loss, range restriction, and population fragmentation and size reduction have rendered the scaleshell mussel vulnerable to extinction. The scaleshell mussel has disappeared from the entire upper and most of the middle Mississippi River drainages. Of the 55 known historical populations, 14 and possibly 20, remain. Although much of the decline occurred before 1950, population declines continue in most of the species' range, and numerous threats, including water quality degradation, loss of stable substrates, sedimentation, channelization, gravel mining, dredging, and impoundments,

are impacting the few remaining viable extant populations. The small number and low density of the remaining scaleshell mussel populations exacerbate the threats and adverse effects of chance events to scaleshell mussels. Only one of the remaining populations is believed to be stable.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the scaleshell mussel in determining this rule final. The present distribution and abundance of the scaleshell mussel are at risk given the potential for these impacts to continue. Therefore, based on this evaluation, it is appropriate that the scaleshell mussel be listed as an endangered species. The Act defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. Endangered status is appropriate for the scaleshell mussel given the extent and magnitude of habitat loss, range restriction, and population fragmentation that has occurred, and the continued vulnerability of this species to such threats. These threats are ongoing, and there is clear evidence that some of them, such as sand and gravel mining in the core of the species' current range, have actually increased their adverse impacts on mussel habitat in the last several years.

Critical Habitat

Critical habitat is defined in section 3 of the Act as: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Conservation means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Section 4(b)(2) of the Act requires us to consider economic and other relevant impacts of designating a particular area as critical habitat on the basis of the best scientific data available. The Secretary may exclude any area from critical habitat if she/he determines that the benefits of such exclusion outweigh the benefits of its inclusion, unless to do so would result in the extinction of the species. Our regulations (50 CFR 424.12(a)) state that 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 activity and the identification of critical habitat can be expected to increase the degree of threat to the species or (ii) such designation of critical habitat would not be beneficial to the species.

In the proposed rule, we indicated that designation of critical habitat was not prudent because of a concern that publication of precise maps and descriptions of critical habitat in the **Federal Register** could increase the vulnerability of this species to incidents of collection and vandalism. We also indicated that designation of critical habitat was not prudent because we believed it would not provide any additional benefit beyond that provided by the listing as endangered.

In the last few years, a series of court decisions have overturned Service determinations regarding a variety of species that designation of critical habitat would not be prudent (e.g., *Natural Resources Defense Council* v. *U.S. Department of the Interior* 113 F. 3d 1121 (9th Cir. 1997); *Conservation Council for Hawaii* v. *Babbitt,* 2 F. Supp. 2d 1280 (D. Hawaii 1998)). Based on the standards applied in those judicial opinions, we have reexamined the question of whether critical habitat for the scaleshell mussel would be prudent.

Due to small population size, the scaleshell mussel is vulnerable to unrestricted collection, vandalism, or other disturbance. We remain concerned that these threats might be exacerbated by the publication of critical habitat maps and further dissemination of locational information. However, we have examined the evidence available for the scaleshell mussel and have not found specific evidence of taking, vandalism, collection, or trade of these species or any similarly situated species. Consequently, consistent with applicable regulations (50 CFR 424.12(a)(1)(i)) and recent case law, at this time we do not expect that the identification of critical habitat will increase the degree of threat to this species of taking or other human activity.

In the absence of a finding that critical habitat would increase threats to a species, if any benefits would result from a critical habitat designation, then a prudent finding is warranted. In the case of scaleshell mussel, designation of critical habitat may provide some benefits.

In general, critical habitat identifies areas that may require special management considerations or protection, and its designation may provide protection to areas where significant threats to a species have been identified. Critical habitat receives protection from destruction or adverse modification through required consultation under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires conferences on Federal actions that are likely to result in the adverse modification or destruction of proposed critical habitat. Aside from the protection that may be provided under section 7, the Act does not provide any other forms of protection to lands designated as critical habitat.

Section 7(a)(2) of the Act requires Federal agencies to consult with the Service to ensure that any action they carry out, authorize, or fund does not jeopardize the continued existence of a federally listed species or destroy or adversely modify designated critical habitat. A critical habitat designation for habitat currently occupied by a species would usually result in the same outcome under section 7 consultation as would occur if the critical habitat had not been designated, because an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy for the species. However, there may be instances where section 7 consultation, and subsequent protection, would be triggered only if critical habitat is designated, such as areas where a species is not believed to currently exist, but where reestablishment is needed to conserve the species. In the case of the scaleshell mussel, the species' low numbers and highly fragmented distribution will likely require the establishment of additional populations beyond the 14 known extant populations. Critical habitat designation of areas most suitable for future establishment of scaleshell mussel populations would provide habitat protection by triggering section 7 consultations for Federal agency actions.

Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features essential for the conservation of

that species, regardless of whether the areas are currently used by the species. Designation of critical habitat alerts the public as well as land-managing agencies to the importance of these areas.

We find that critical habitat designation is prudent for the scaleshell mussel due to the probable benefits to the species described above. We find that these benefits are not outweighed by potential increased threats from designating critical habitat.

However, our budget for listing activities is currently insufficient to allow us to immediately complete all of the listing actions required by the Act. Listing the scaleshell mussel without designation of critical habitat will allow us to concentrate our limited resources on other listing actions that must be addressed, while allowing us to invoke protections needed for the conservation of this species without further delay. This is consistent with section 4(b)(6)(C)(i) of the Act, which states that final listing decisions may be issued without critical habitat designations when it is essential that such determinations be promptly published. The legislative history of the 1982 Act amendments also emphasized this point: ''The Committee feels strongly, however, that, where biology relating to the status of the species is clear, it should not be denied the protection of the Act because of the inability of the Secretary to complete the work necessary to designate critical habitat. * * * The committee expects the agencies to make the strongest attempt possible to determine critical habitat within the time period designated for listing, but stresses that the listing of species is not to be delayed in any instance past the time period allocated for such listing if the biological data is clear but the habitat designation process is not complete'' (H.R. Rep. No. 97–567 at 20 (1982)). We will prepare a critical habitat designation in the future as soon as there are resources available and other listing duties under the Act will allow.

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 local agencies, private organizations, 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. 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 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 such a 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 consultation with us.

Federal activities that could occur and impact the scaleshell mussel, include, but are not limited to, issuance of permits for reservoir construction, stream alterations, waste-water facility development, water withdrawal projects, pesticide registration, agricultural assistance programs, mining, road and bridge construction, Federal loan programs, water allocation, and hydropower licensing or relicensing. In our experience, nearly all section 7 consultations result in protecting the species while still meeting the project's objectives.

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. The prohibitions in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), 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 endangered 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 our agents and agents of State conservation agencies.

Our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), is to identify, to the maximum extent practicable, those activities that would or would not likely constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness as to the potential effects of this final listing on future and ongoing activities within a species' range. We believe that the following activities are unlikely to result in a violation of section 9:

(1) Existing discharges into waters supporting these species, provided these activities are carried out in accordance with existing regulations and permit requirements (*e.g.*, activities subject to sections 402, 404, and 405 of the CWA and discharges regulated under the National Pollutant Discharge Elimination System).

(2) Actions that may affect the scaleshell mussel and are authorized, funded or carried out by a Federal agency when the action is conducted in accordance with any reasonable and prudent measures we have specified in accordance with section 7 of the Act.

(3) Development and construction activities designed and implemented pursuant to Federal, State, and local water quality regulations and implemented using approved best management practices.

(4) Existing recreational activities such as swimming, wading, canoeing, and fishing, that are in accordance with State and local regulations, provided if a scaleshell mussel is collected it is immediately released, unharmed.

Activities that we believe could potentially result in take of scaleshell mussels include but are not limited to:

(1) Illegal collection or capture of the species;

(2) Unlawful destruction or alteration of the species' occupied habitat (*e.g.*, unpermitted instream dredging, channelization, or discharge of fill material);

(3) Violation of any discharge or water withdrawal permit within the species' occupied range; and

(4) Illegal discharge or dumping of toxic chemicals or other pollutants into waters supporting scaleshell mussels.

We will review other activities not identified above on a case-by-case basis to determine whether they are likely to result in a violation of section 9 of the Act. We do not consider these lists to be exhaustive and provide them as information to the public.

You should direct questions regarding whether specific activities may constitute a future violation of section 9 to the Field Supervisor of the Service's Columbia, Missouri Field office (see **ADDRESSES**). You may request copies of the regulations regarding listed wildlife from, and address questions about prohibitions and permits to, the U.S. Fish and Wildlife Service, Ecological Services Division, Whipple Federal Building, 1 Federal Drive, Fort Snelling, MN 55111 (Phone 612/713–5350; Fax 612/713–5292).

National Environmental Policy Act

We have determined that we do not need to prepare an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act, as amended. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget control number 1018–0094. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information, unless it displays a currently valid control number. For additional information concerning permit and associated requirements for endangered species, see 50 CFR 17.22.

References Cited

A complete list of all references cited herein, as well as others, is available upon request from the Field Supervisor (see **ADDRESSES**).

Authors

The primary authors of this final rule are Mr. Andy Roberts (see **FOR FURTHER INFORMATION CONTACT**) and Ms. Jennifer Szymanski (U.S. Fish and Wildlife Service, Whipple Federal Building, 1 Federal Drive, Fort Snelling, MN 55111–4056).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record keeping requirements, Transportation.

Regulation Promulgation

Accordingly, we hereby amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

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

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Section 17.11(h) is amended by adding the following, in alphabetical order, under Clams to the List of Endangered and Threatened Wildlife to read as follows:

§ 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						
*	*	*	*	*	*	*	
CLAMS							
*	*	*	*	*	*	*	
Mussel, scaleshell ...	*Leptodea leptodon* ..	U.S.A. (AL, AR, IA, IL, IN, KY, MN, MO, OH, OK, SD, TN, WI).	NA	E	714	NA	NA
*	*	*	*	*	*	*	

Dated: September 28, 2001.

Marshall P. Jones, Jr.

Acting Director, Fish and Wildlife Service.

[FR Doc. 01–24804 Filed 10–5–01; 8:45 am]

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