

CL-01

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 17****RIN 1018-AB75****Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Northern Riffleshell Mussel (*Epioblasma torulosa rangiana*) and the Clubshell Mussel (*Pleurobema clava*)****AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: The Service determines the mussels, the northern riffleshell (*Epioblasma torulosa rangiana*) and the clubshell (*Pleurobema clava*) to be endangered species. The northern riffleshell is known historically from the tributaries of the Ohio River, western Lake Erie, and the St. Clair and Detroit Rivers. It occurs today in relatively short reaches of six streams in Kentucky, Michigan, Ohio, and Pennsylvania. The clubshell historically was widespread in the Ohio River basin and tributaries of western Lake Erie in nine states; today it is known from relatively short reaches of 12 streams in Indiana, Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia.

Both of these species have experienced greater than a 95 percent range reduction. In over half of the stream reaches where the mussels are presumed extant, biologists have located only a few dead shells in the last five years. Causes of the drastically reduced ranges of these two species include: channelization, streambank clearing, agriculture, and chemical and wastewater runoff. This rule implements the protection provided by the Endangered Species Act of 1973, as amended, for *Epioblasma torulosa rangiana* and *Pleurobema clava*.

EFFECTIVE DATE: February 22, 1993.

ADDRESSES: The complete files for these species are available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Post Office Box 1278, Elkins, West Virginia 26241.

FOR FURTHER INFORMATION CONTACT: William A. Tolin at the above address or by telephone (304/636-6586).

SUPPLEMENTARY INFORMATION:

Background

The northern riffleshell (*Epioblasma torulosa rangiana*) was described by Lea in 1839. This freshwater mussel occurs in a wide variety of streams, large and small, preferring runs with a bottom composed of firmly packed sand and fine to coarse gravel (Stansbery *et al.* 1982).

The northern riffleshell is a small to medium size mussel, up to three inches (7.6 cm) long. The species expresses sexual dimorphism. The male is irregular ovate in outline, with a wide shallow sulcus just anterior to the posterior ridge. The female is obovate in outline, greatly expanded postventrally. This post-ventral expansion is very broadly rounded. The shell exterior is brownish yellow to yellowish green with fine green rays. The inside of the shell is normally white, rarely pink (Stansbery *et al.* 1982).

The clubshell (*Pleurobema clava*) was described by Lamarck in 1819. The species occurs in clean swept sand and gravel in medium to small rivers and streams (Stansbery *et al.* 1982). Thomas Watters (Ecological Specialists Inc., pers. comm., 1991) has found the clubshell to bury in clean loose sand to a depth of two to four inches.

The clubshell is also small to medium size, up to three inches (7.6 cm) long. The outline of the shell is wedge-shaped and solid. The umbos are pointed and fairly high. The exterior of the shell is bright yellow to brown with bright green blotchy rays. The inside of the shell is white (Stansbery, *et al.* 1982).

Like other freshwater mussels, the northern riffleshell and the clubshell feed and respire by filtering macroscopic food particles and oxygen from the water column. Their complicated reproductive cycle includes one or more species of fish where a larval form of the mussel, known as a glochidium, attaches to the gills, fins, or skin of the fish and is nourished for a short time period. This relationship is generally species-specific. Many aspects of the life history of these mussels are not known.

The historic ranges of the northern riffleshell and the clubshell mussels overlapped, but the clubshell was more widely distributed. Both species were known from Illinois, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia. The range of the clubshell extended farther south in Tennessee and Alabama in the Tennessee River Basin while the northern riffleshell extended north into western Ontario. Both were widespread in the Ohio River basin in rivers such as the Ohio, Allegheny, Scioto, Kanawha, Little Kanawha, Licking, Kentucky, Wabash, White, Vermillion, Mississinewa, Tippecanoe, Tennessee, Green, and Salt Rivers. They were also located in the Maumee River basin and tributaries of western Lake Erie such as the Huron River and the River Raisin. The northern riffleshell also occurred in southern Michigan and western Ontario in streams such as the St. Clair, Black, Ausable, and Sydenham Rivers (Stansbery *et al.* 1982).

Presently, the two species co-occur in portions of four streams in two states. They are found in the Green River, Edmonson and Hart Counties, Kentucky. In Pennsylvania, they occur in French Creek, Crawford, Venango, and Mercer Counties; LeBoeuf Creek, Erie County, and the Allegheny River, Warren and Forest Counties.

The northern riffleshell is also found in the upper 2.0 miles of the Detroit River from Lake St. Clair to Belle Isle, Wayne County, Michigan and in Big Darby Creek, Pickaway County, Ohio. Of the six total locations for this species, only two, those in the Detroit River (Michigan) and French Creek (Pennsylvania) show evidence of recent reproduction.

The clubshell retains a wider distribution than the northern riffleshell. However, this species was also historically wider spread and locally very abundant. The clubshell presently occurs in 12 streams: the Tippecanoe River, Kosciusko, Fulton, Pulaskia, and Tippecanoe Counties, Indiana; Fish Creek of the St. Josephs River, Williams County, Ohio, and

DeKalb County, Indiana; West Branch of the St. Josephs River, Williams County, Ohio, and Hillsdale County, Michigan; Walhonding River, Coshocton County, Ohio; East Fork of the West Branch of the St. Josephs River, Hillsdale County, Michigan; Little Darby Creek, Madison County, Ohio; Conneautee Creek of French Creek, Crawford County, Pennsylvania; and Elk River, Braxton and Clay Counties, West Virginia.

The clubshell was first recognized by the Service in the May 22, 1984 **Federal Register** (49 FR 21664). That notice, which covered invertebrate wildlife under consideration for endangered or threatened status, included the clubshell as a Category 2 species. Category 2 includes those taxa for which proposing to list as endangered or threatened is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently available to support proposed rules. In the **Federal Register** Animal Notice of Review published on January 6, 1989 (54 FR 554), the clubshell was retained as a Category 2 species and the northern riffleshell was added in the same category.

During 1989 and early 1990, the Service sent more than 80 requests for information about these two species to State and Federal resource agencies, private organizations, and knowledgeable individuals. On the basis of responses received, the Service moved both species to Category 1 in the Animal Notice of Review published in the November 21, 1991 **Federal Register** (56 FR 58804). Category 1 includes species for which the Service now possesses sufficient information to support a listing as threatened or endangered. In the June 18, 1992 **Federal Register**, the Service published a proposed rule to list *Epioblasma torulosa rangiana* and *Pleurobema clava* as endangered species.

Summary of Comments and Recommendations

In the June 18, 1992, proposed rule and associated notifications, all interested parties were requested to submit factual information that might contribute to the development of a final rule. Appropriate State resource agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Twenty-seven notices inviting public comment were published in newspapers of general circulation in each area where *Epioblasma torulosa rangiana* and *Pleurobema clava* are known to occur. Nine written comments were received; all supported the proposed listing and

none recommended changes in the data presented in the proposed rule.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the northern riffleshell and the clubshell are as follows:

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

The northern riffleshell and the clubshell mussels were once widespread through the Ohio River watershed with the highest concentrations occurring in the northern portion of the basin and western Lake Erie drainages. Communication with knowledgeable experts (Ronald Cicerello, Kentucky Nature Preserves Commission, 1991; Steven Ahlstedt, Tennessee Valley Authority, 1991; Thomas Watters, Ecological Specialists, Inc., 1991; Charles Bier, Western Pennsylvania Chapter of The Nature Conservancy, 1990; Arthur Bogan, Philadelphia Academy of Natural Science, 1990; David Stansbery, Ohio State University, 1991; Arthur Clarke, Ecosearch, Inc., 1991; Kevin Cummings, Illinois Natural History Survey, 1990; Thomas Frietag, U.S. Army Corps of Engineers, 1991; Randy Hoeh, University of Michigan, 1990; Leni Wilsman, Michigan Natural Features Inventory, 1990; Richard Trdan, Saginaw Valley State College, 1991; Bill Kovalak, Detroit Edison, 1991; Mike Hoggarth, Ohio Department of Transportation, 1991; and Bob Anderson, Indiana Department of Natural Resources) and a review of the current literature (Cicerello and Hannan 1990, Watters 1986 and 1988, Cummings et al. 1987) reveal that both the northern riffleshell and the clubshell have undergone a greater than 95 percent range reduction.

Since mussels are sedentary, they are extremely susceptible to environmental degradation. The range reductions of both these mussels are attributed to physical loss of habitat and degraded water quality related primarily to water impoundments, channelization, streambank clearing, and agriculture. Impacts associated with run-off from human waste, chemical outfalls, and

coal mining have also affected many tributaries. Increased turbidity and suspended sediments can result in increased water temperature, decreased oxygen levels, and siltation. Smothering from siltation, in turn, decreases or eliminates the mussels' ability to breathe, feed, and reproduce. Impacts to the fish species composition can also affect reproduction since a fish host is an integral component of the mussel's reproduction cycle. These factors continue to threaten the remaining habitats and populations of these species.

The northern riffleshell has been extirpated from Illinois, Indiana, West Virginia, and Ontario. Most recent population losses include the Black River, Sanilac County, Michigan, as a result of channelization and draining for agriculture, which occurred in 1989 (Kovalak, pers. comm., 1991). In 1991, the Service became aware that the Sydenham River northern riffleshell population had been extirpated because of siltation, most likely a result of intense farming (Clarke, pers. comm., 1991). Loss, probably due to siltation, of a riffleshell population in Fish Creek of the St. Josephs River was also documented in 1991 (Kovalak, pers. comm., 1991). Surveys conducted during 1991 failed to find the riffleshell in its former locations in the Elk River, West Virginia (J. Clayton, West Virginia Division of Natural Resources, pers. comm., 1991), and the Tippecanoe River, Indiana (Watters, pers. comm., 1991).

The clubshell has been extirpated from Alabama, Illinois, and Tennessee, and is no longer found in many streams elsewhere in its former range. Domestic and industrial waste and navigation developments have eliminated or reduced populations of the clubshell on the upper Ohio and Wabash River watersheds (Watters, pers. comm., 1991). The newly rediscovered Elk River population of the clubshell in West Virginia could be affected by plans for deep coal mining in the watershed, which might create sedimentation, heavy metal leaching, and acidification of the water.

B. Over-utilization for Commercial, Recreational, Scientific, or Educational Purposes

Neither of these species are commercially valuable. However, small size and number of remaining populations increase their vulnerability to over-zealous scientific collecting or educational programs. Federal protection would help control the take of individuals by requiring Federal endangered species collecting permits.

C. Disease or Predation

Predation on mussels is a natural occurrence. Predators, such as freshwater drum, river otter, and muskrats, are known to feed on mussels. In a time when these mussels were widespread and abundant, the impact of this predation was insignificant. However, at the present time, their greatly reduced distribution and populations have made them susceptible to predators, especially muskrats (Neves, pers. comm., 1991). Watters (pers. comm., 1991) stated that during a 1988 survey of the French Creek, Pennsylvania population, he observed at least 200 northern riffleshells that had been harvested by muskrats. Watters also noted that the clubshell is less susceptible to mammalian predators because of its burying behavior.

Although extensive, unexplained, die-offs have occurred in the past in the Mississippi River drainage, these were for the most part restricted to large rivers. The rivers and streams preferred by the clubshell are medium to small rivers and streams, and disease has not been documented as a factor affecting its population dynamics. A portion of the northern riffleshell's historic range included large rivers, and die-offs may have played a role in the species' decline.

D. The Inadequacy of Existing Regulatory Mechanisms

All States throughout the range of the northern riffleshell and the clubshell prohibit taking fish and wildlife, including freshwater mussels, for scientific purposes without a State collecting permit. Ohio, Michigan, and Indiana have endangered species legislation, which protects the clubshell and northern riffleshell from other types of unauthorized take. The Michigan Endangered Species Act of 1974 also regulates take that may occur as a result of development and construction projects; however, this State law did not avert the recent loss of the northern riffleshell population in the Black River. Ohio and Indiana endangered species laws do not provide protection to species from habitat loss or degradation, although the Indiana Flood Control law allows that State to "remove or eliminate any structure, obstruction, deposit, or excavation in any floodway which, * * * is unreasonably detrimental to fish, wildlife, or botanical resources (Indiana 13-2-22-13)." Except for requiring a permit for scientific collecting, Pennsylvania, West Virginia, and Kentucky provide no protection to these species or their

habitats. Federal listing will provide additional protection under the Endangered Species Act by requiring Federal permits to take the clubshell and the northern riffleshell for any purpose throughout their range and by requiring Federal agencies to consult with the Service when projects they fund, authorize, or carry out may affect these species.

E. Other Natural or Man-Made Factors Affecting its Continued Existence.

The exotic, prolific zebra mussel (*Dreissena polymorpha*), accidentally introduced to North America in the mid-1980's, poses a severe threat to all native mussel fauna through the competition for space, food, and survival of glochidia. Presently, the zebra mussel, which was conveyed to the area through ship ballast water from interior European ports, is abundant in the lower Great Lakes. During the fall of 1992, biologists determined that zebra mussel infestation posed such a severe threat to the northern riffleshell in the Detroit River that they initiated efforts to salvage as many of the native species as possible and move them to captivity. The zebra mussel also poses an immediate threat to the populations of the northern riffleshell in the St. Clair River and to populations of both these rare species in the Maumee and Black River drainages. As it continues its rapid range expansion, the zebra mussel may threaten the continued existence of all native freshwater mussels in the Mississippi and Great Lakes drainages.

The high potential of a toxic chemical spill from a ship or factory in the Detroit and St. Clair Rivers threaten the northern riffleshell populations in these rivers. A number of toxic spills have occurred in the "Chemical Valley" near Sarnia, Ontario.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in adopting this final rule. Based on this evaluation, the preferred action is to list the northern riffleshell mussel and the clubshell mussel as endangered. Historically, these species were widely distributed throughout the Ohio River and western Lake Erie drainages. The radically reduced distribution of these species and their continued vulnerability to loss of habitat and water quality deterioration constitute severe threats to their continued existence, and therefore, endangered status appears to be the most appropriate classification.

Critical Habitat

Section 4(a)(3) of the Act as amended, requires that, to the maximum extent

prudent and determinable, the Secretary propose critical habitat at the time a species is proposed for listing as endangered or threatened. Section 3 of the Act defines critical habitat 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 determination that such areas are essential for the conservation of the species." Designation of critical habitat is prudent unless: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species (50 CFR 424.12(a)(1)). Designation of critical habitat is determinable unless: (1) Information sufficient to perform the required analyses of the impacts of the designation is lacking, or (2) the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat (50 CFR 424.12(a)(2)).

The Service finds that designation of critical habitat for these two mussels is not prudent. Because of their sedentary nature and susceptibility to a wide variety of changes in water quality, mussels are highly vulnerable to vandalism. Due to the low number of reproducing populations of these species, even a single such incident could be catastrophic. The publication of critical habitat maps could increase this risk.

The Service also finds that designation of critical habitat for the northern riffleshell and the clubshell mussels is not presently determinable. Most existing populations of these mussels are located in widely scattered streams of declining suitability. The number and location of stream habitats required to provide for the long-term survival of existing populations have not been identified. In addition, information needed to analyze the impacts of critical habitat designation is unavailable at this time.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions

against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The 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 requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) requires Federal agencies to insure 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 formal consultation with the Service.

The Service has notified Federal agencies having programs that may affect the northern riffleshell and the clubshell mussels. Federal activities that could occur and impact the species, either directly through funding and development, or through issuance of permits or licenses, include dredge and fill, flood protection, water impoundments and channelization, hydroelectric projects, powerline and highway construction, railroads, industrial and domestic wastewater discharge projects, commercial and recreational development, and mining. For example, the recently rediscovered populations of the clubshell in the Elk River in West Virginia is threatened by the acceleration of coal mining in the watershed; potential Federal involvement in such coal mining operations includes permitting by the Office of Surface Mining and the U.S. Army Corps of Engineers. In addition, reconstruction and operation of a railroad along the Elk River to carry coal will require approvals from the Interstate Commerce Commission.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any subject to the jurisdiction of the United States to take any listed species, import or export it, ship it in interstate commerce in the

course of commercial activity, or sell it or offer it for sale in interstate or foreign commerce. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions would apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for propagation or survival of the species and/or for incidental take in connection with otherwise lawful activities.

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

Cicerello, R.R., and R.R. Hannan. 1990. Survey of the freshwater unionids (mussels)

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Cummings, K.S., C.A. Mayer, L.M. Page, and J.M.K. Berlocher. 1987. Survey of the freshwater mussels (Mollusca: Unionidae) of the Wabash River drainage, Phase I: lower Wabash and Tippecanoe River. Unpublished. Prepared for Indiana Department of Natural Resources. 167 pp.

Lea, Isaac. 1838. Description of new freshwater and land shells. Trans. Amer. Phil. Soc. 6 (N.S.): 1-154, pl. 1-24. [*Unio rangianus*, p. 95-96, pl. 18, fig. 45].

Lamarck, Jean Baptiste. 1819. Les Nuyades. Vol. 6, pp. 67-89 in: Histoire naturelle des animaux sans vertebres. . . . Paris, 6 volumes. [*Unio ciava*, p. 74].

Stansbery, D. H., K. C. Borrer, and K. E. Newman. 1982. Biological abstracts of selected species of Unionid mollusks recovered from Ohio. Unpublished. Prepared for the Ohio Heritage Foundation. Ohio Department of Natural Resources.

Watters, G.T. 1986. The distribution and relative abundance of the Unionid mollusks of the Big Darby Creek system in Ohio. Unpublished. Prepared for the Ohio Chapter of the Natural Conservancy. 158 pp.

Watters, G.T. 1988. A survey of the freshwater mussels of the St. Josephs River system with emphasis on the federally endangered white cat's paw pearly mussel. Unpublished. Indiana Department of Natural Resources. 127 pp.

Author

The primary author of this rule is William A. Tolin, U.S. Fish and Wildlife

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List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

PART 17—(AMENDED)

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

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

Authority: 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.

§ 17.11 [Amended]

2. Amend 17.11(h) by adding the following, in alphabetical order under CLAMS, to the List of Endangered and Threatened Wildlife.

§ 17.11 Endangered and threatened wildlife.

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Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Claims							
Riffleshell, Northern	<i>Epioblasma torulosa rangiana</i>	U.S.A. (IL, IN, KY, MI, OH, PA, WV, Canada (Ont.))	NA	E	488	NA	NA
Clubshell	<i>Pleurobema cava</i>	U.S.A. (AL, IL, IN, KY, MI, OH, PA, TN, WV)	NA	E	488	NA	NA

Dated: December 31, 1992.
Richard N. Smith,
 Acting Director, Fish and Wildlife Service.
 [FR Doc. 93-1372 Filed 1-21-93; 8:45 am]
BILLING CODE 4310-55-M