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STATUS OF ENDANGERED FLUVIATILE MOLLUSKS
IN CENTRAL NORTH AMERICA

PEGIAS FABULA (LEA, 1838)

May, 1976

U. S. Department of the Interior
Fish & Wildlife Service
Bureau of Sport Fisheries & Wildlife
Washington, D.C. 20240

Contract No. 14-16-0008-755



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PEGIAS FABULA (LEA, 1838)

by

David H. Stansbery
The Ohio State University Museum of Zoology
May, 1976

for

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PEGIAS FABULA (LEA, 1838).

Synonymy

Margaritana fabula Lea, 1836. Nomen Nudem: A Synopsis of the Family of Naiades, p. 46 (no description or locality given).

Margaritana fabula Lea, 1838. Original Description: Trans. Amer. Philos. Soc. 6:44, pl. 13, fig. 39. Further Description: Obsv. Genus Unio 2, 1838:44, pl. 13, fig. 39. Type Locality: "Hab. Cumberland River, Ten. Professor Troost." (Lea, 1838:44). Holotype: "Figured holotype USNM 86325." (Johnson 1974:55).

Margaritana curreyana Lea, 1840. Original Description: Proc. Acad. Nat. Sci. Phila. 1:288. Further Description: Trans. Amer. Philos. Soc. 8, 1842:223, pl. 18, fig. 40; Obsv. Genus Unio 3, 1842:61, pl. 18, fig. 40. Type Locality: "Hab. Stone's River, Tenn. Dr. Curry of Nashville." (Lea, 1840:288). Holotype: "Known only from the figured holotype USNM 86227." (Johnson, 1974:41).

Unio fabula (Lea, 1838). Hanley, Sylvanus, 1842-1856, An illustrated and descriptive catalogue of recent bivalve shells, p. 213:pl.22, fig. 45.

Unio curreyanus (Lea, 1840). Hanley, Sylvanus, 1842-1856, An illustrated and descriptive catalogue of recent bivalve shells, p. 386: pl. 24, fig. 10.

Micromya fabula (Lea, 1838). Agassiz, Louis, 1852, Arch. für Nat. 1:47.

Micromya curreyana (Lea, 1840). Agassiz, Louis, 1852, Arch. für Nat. 1:47.

Strophitus fabula (Lea, 1838). Conrad, Timothy, 1853, Proc. Acad. Nat. Sci. Phila. 6:263.

Baphia fabula (Lea, 1838). Adams, H. & A., 1857, The genera of recent mollusca; arranged according to their organization, p. 499.

Baphia curreyana (Lea, 1840). Adams, H. & A., 1857, The genera of recent mollusca; arranged according to their organization, p. 499.

Margaritana correyana (Lea, 1840). Paetel, 1890, Conchylien-Sammlung 3:173.

Pegias fabula (Lea, 1838). Simpson, 1900, Proc. United States National Museum 22:661

Alasmidonta fabula (Lea, 1838). Ortmann, 1913, Proc. Amer. Philos. Soc. 52:311.

Taxonomic Status

The characters of the glochidium, mantle and marsupial gills place this species in the Subfamily Anodontinae of the Family Unionidae. The hinge of the shell is alasmidontine and the species is currently placed in the Genus or Subgenus Pegias of that group since it has a number of characters peculiar to no other unionid (Simpson, 1900:661; Ortmann, 1914:44-45).

The figure of M. curreyiana Lea (1840, pl. 18, fig. 40) is the figure of the female and M. fabula Lea (1838, pl. 13, fig. 39) is the male. The sexual dimorphism in the shell of this species appears to be unique in the Anodontinae.

The placement of this species in the Genus Pegias by Simpson (1900:472) appears justified since all other alasmidontines lack sexual dimorphism in the shell and form several natural groups distinct from Pegias.

Diagnostic Characteristics

This species may be recognized by its small size, relatively heavy shell, typically eroded periostracum, alasmidontine hinge and heavy umbonal sculpturing of subconcentric ridges which are most prominent and persistent on the posterior ridge.

Former Distribution

This rare species has never been known outside the Tennessee and Cumberland Rivers of the Ohio River System (Simpson, 1914:473). Within this system it appears, in historic times at least, to have been restricted to the relatively small, cool, high gradient tributaries where it is occasionally found (Ortmann, 1918:562). It has been suggested that its rarity may be due to its being overlooked because of its small size (op.cit.). However, I have searched especially for this species on numerous occasions, and in what appeared to be prime habitat where specimens had been found, with less than modest success. In fact, the eroded shell of living specimens lying on or partially imbedded within the relatively dark substrate of a riffle made a number of those specimens which were found quite obvious. Previous records supported by museum specimens are restricted to the river systems mentioned above in the states of Virginia, Kentucky, Tennessee and Alabama. Its former distribution is known to have extended in the downstream direction as far as the West Fork Red River, Todd County, Kentucky, in the Cumberland System (OSUM 7393) and downstream to Bluewater Creek, Lauderdale County, Alabama, in the Tennessee System (Ortmann, 1925:345).

Present Distribution

Small, high-gradient tributary streams are quite numerous in the Cumberlandian Region. Many of these have yet to be greatly altered by man

and much of what may be favorable, though unexplored, habitat of this species appears to be little changed. Exceptions to the above include the Powell River in western Virginia where the molluscan fauna has been eliminated or greatly reduced from above Big Stone Gap, Wise County, downstream to below Jonesville in Lee County and the Rockcastle River in western Kentucky, where the mollusk fauna downstream to below Livingston, in Rockcastle County, is presently on the decline. The North Fork Holston River naiad fauna was extirpated from the village of Saltville, Smyth County, Virginia, to its mouth at Rotherwood in Hawkins County, Tennessee. All of the above streams were known to have had populations of Pegias fabula in historic times, some as recently as within the past decade.

There is no evidence to indicate that this species was ever common within historic times or before and it appears to be an even rarer species today.

Recent records are as follows:

Mississippi River

Ohio River

Cumberland River

Caney Fork River

Cane Creek 1967(OSUM 18191)

Buck Creek 1974(OSUM NC)

Rockcastle River 1963(OSUM 9309), 1964(OSUM 12857), 1967(OSUM 20507).

Horse Lick Creek (Blankenship 1971).

Tennessee River

* Clinch River 1968(OSUM 20656) (subfossil specimen)

Holston River

North Fork Holston River 1971(OSUM 33310, 33361, 33447)

Middle Fork Holston River 1968(OSUM 24313), 1974(OSUM NC)

Note: "NC" = Not Catalogued.

Possible Reasons For Current Status

The disappearance of this species from parts of its former range as noted above has been associated, in most instances, with major environmental modifications wrought by man. While experimentally validated direct cause and effect evidence is lacking in nearly every instance, the circumstantial evidence is abundant and repetitive. In the case of P. fabula the known hiatuses in the range are associated with the following environmental changes:

<u>SITE</u>	<u>CHANGE</u>
Rockcastle River at Livingston, Ky. (Williamson, 1905:309)	Acid Mine Drainage Siltation Lumbering
Powell River above Jonesville, Va. (Ortmann, 1918:562)	Acid Mine Drainage

SITE cont'd.

CHANGE cont'd.

Clinch River below Tazewell, Va.
(Stansbery, 1973:21)

Sewage Treatment Plant at
Tazewell, Va.

North Fork Holston River below
Saltville, Va. (Stansbery, 1972:45)

Industrial outfall of Olin
Chemical Corp.

South Fork Holston River,
Pactolus, Tenn. (Ortmann, 1918:562)

South Holston impoundment

Bluewater Creek
(Ortmann, 1924:345)

Wilson impoundment

Elk River, Estill Springs
(Ortmann, 1924:345)

Tims Ford impoundment

Living specimens of P. fabula from Cane Creek, Buck Creek, Horse Lick Creek, North Fork Holston River and Middle Fork Holston River have been found during the past decade (see Site-Change information above). These apparently represent small isolated populations which still persist in environments scarcely modified by man. No data exists which would reveal any change in the status of these specific populations over the years. Although a rare species everywhere today, it may have been so for some time. The present distribution pattern, however, indicates a headwater Cumberlandian species being eliminated in all but the very headwaters.

Potential Threats

Pegias fabula appears to be a rare Cumberlandian species characteristic of stream conditions near, but not quite in, the uppermost headwaters. Its disappearance from several sites which still retain populations of other species indicates a form highly sensitive to current changes.

Increased or continued mining or coal-washing in the Rockcastle River may reduce or eliminate the populations there. Any increase in stream organics in this area (such as results from clear-cutting lumbering operations) could be deleterious. Impoundments and large quantities of certain industrial outfalls have proven fatal in every case on record and could do so again.

Selected References

Blankenship, Shaw

1971. Notes on Alasmidonta fabula (Lea) in Kentucky (Unionidae).
Nautilus 85(2):60-61, 1 fig.

The continued existence of the species in the Rockcastle River system in eastern Kentucky is noted.

Lea, Isaac

1838. Description of new freshwater and land shells.
Trans. Amer. Philos. Soc. 6, N.S.:1-154, pls. 1-24, colored.
This paper contains the original description of M. fabula.
"printed and ready...June 15, 1838" (Scudder, 1885:16).
1838. Observations on the Genus Unio together with descriptions of new genera and species in the families Naiades, Colimacea, Lymnaeana, Melaniana and Peristomiana. 2:1-152, pls. 1-29, colored.
Privately published, Philadelphia, Pa.
This volume contains a reprint of the original description of M. fabula. "Issued in June, 1838" (Scudder, 1885:22).
1840. Descriptions of new fresh water and land shells.
Proc. Amer. Philos. Soc. 1:284-289.
This paper contains the original description of M. curreyana.
"Copy presented to the meeting...November 6, 1840."
(Scudder, 1885:24).
1842. Observations on the Genus Unio, together with descriptions of new species in the families Naiades, Colimacea, Lymnaeana, Melaniana and Peristomiana. 3:1-88, pls. 5-27, figs. 1-65.
Privately published, Philadelphia, Pa.
This volume contains a reprint of the original description of M. curreyana.

Ortmann, Arnold E.

- 1913-14. Studies in najades.
Nautilus 27(8):88-91, 28(2):20-22, 28(3):28-34, 28(4):41-47, 28(5):65-69, 28(9):106-108.
This serial paper describes Ortmann's concept of the position of the Subgenus Pegias within the Genus Alasmidonta (44-46) [He later came to agree with Simpson that Pegias should have generic rank.] The anatomy of the soft parts of specimens from the North Fork Holston River are described along with the unique glochidia.
1918. The nayades (freshwater mussels) of the upper Tennessee drainage. With notes on synonymy and distribution.
Proc. Amer. Philos. Soc. 57(6):521-626, 1 map.
The range in the upper Tennessee system is described on the basis of collection records. Ortmann recognizes Pegias as of generic rank "on account of the very peculiar glochidia..."
1921. The anatomy of certain mussels from the upper Tennessee.
Nautilus 34(3):81-91.
September records of gravid specimens, eggs and glochidia are here recorded.
1925. The naiad fauna of the Tennessee River system below Walden Gorge.
Amer. Midl. Nat. 9(8):321-373, 1 map.
The range of P. fabula in the lower Tennessee system is given

in addition to several locales for the Cumberland River system. Its apparent absence from the Duck River is noted here as well as elsewhere (Ortmann, 1924:43).

Simpson, Charles T.

1900. Synopsis of the naiades, or pearly freshwater mussels. Proc. U.S. Nat. Mus. 22:501-1044, pl. 18 [No. 1205].
This paper contains the original description of the Genus Pegias (p. 660). Both shell and soft parts are described and a synonymy is given.

1914. A descriptive catalogue of the naiades, or pearly freshwater mussels, 3 parts, i-xii, 1-1540.

Privately published by Bryant Walker, Detroit, Michigan.

This paper contains generic and species descriptions of the shell and a generic description of the soft parts. A synonymy, the gross dimensions of 3 specimens, range and type locality are included in addition to a discussion of characteristic features.

Stansbery, David H., and William J. Clench

1974. The Pleuroceridae and Unionidae of the North Fork Holston River above Saltville, Virginia.

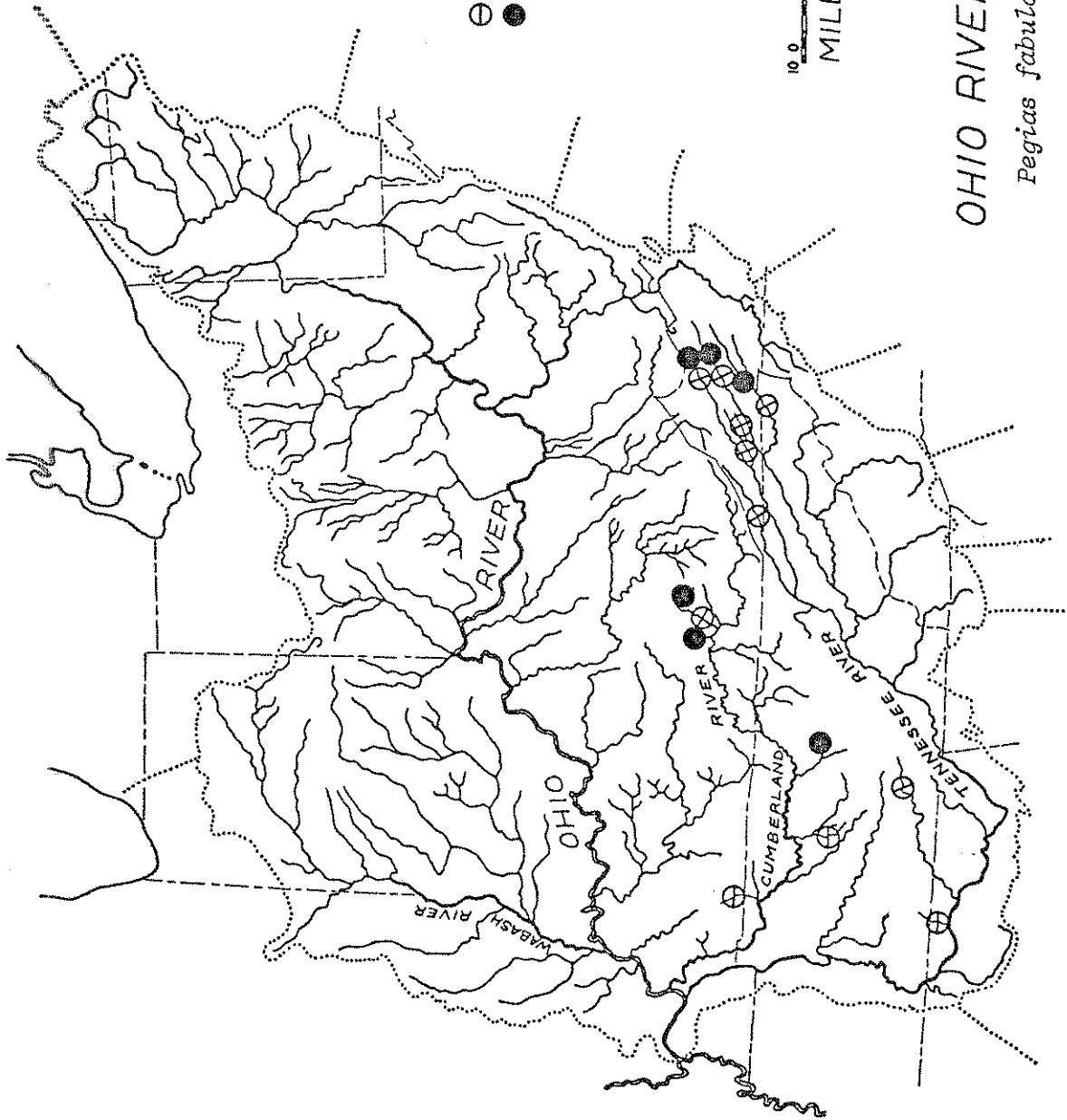
Bull. Amer. Malacol. Union, 1973:33-36, 1 map, 1 table.

Pegias fabula is recorded from three sites on the North Fork Holston River.

1975. The Pleuroceridae and Unionidae of the Middle Fork Holston River in Virginia.

Bull. Amer. Malacol. Union, 1974:51-54, 1 map, 1 table.

Pegias fabula is recorded from two sites on the Middle Fork Holston River.



○ = before 1960
 ● = 1960-1976

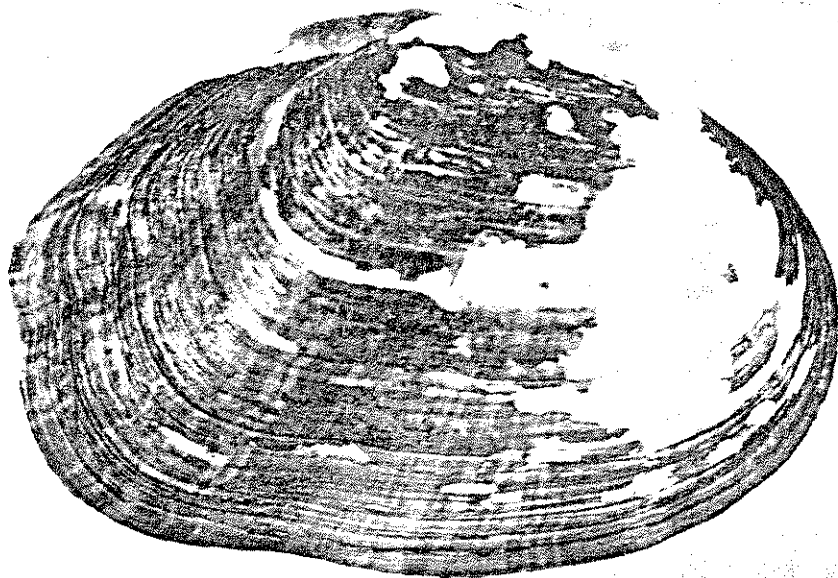


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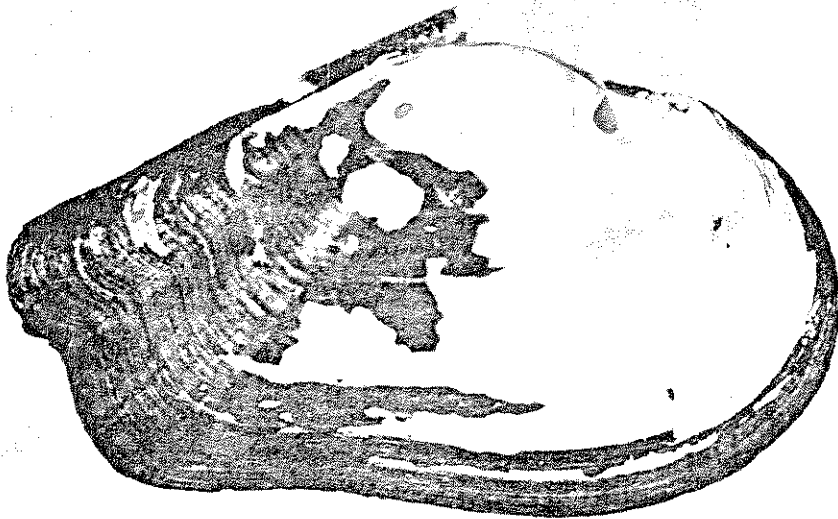
Pegias fabula (Lea, 1838).

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Pegias fabula (Lea, 1838).

OSUM 12857, male, Rockcastle River 2.8 mi.
below Livingston, Rockcastle Co., Kentucky.
25-26 Oct. 1964. L=25, H=16, W=13 mm.



Pegias fabula (Lea, 1838).

OSUM 20507, female, Rockcastle River at
Livingston Ford, Rockcastle Co., Kentucky.
22 Oct. 1967. L=28, H=15, W=14 mm.