

## 18. Status of Selected Freshwater Mussels [Unionidae] in Mississippi

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**Abstract.** Based on Mississippi Museum of Natural Science collections, published accounts and the authors personal experience, 34 of the 73 freshwater mussel species known from Mississippi are considered to be endangered, threatened or of special concern within the political boundaries of the state. Each is discussed in regard to known habitat, population status, total distribution and Mississippi distribution.

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The freshwater mussel fauna of Mississippi is declining. Mussel communities are being reduced, eliminated or negatively affected in all of the drainage systems of the state. The decline of these communities is a reflection of the fragmentation and destruction of Mississippi's lotic habitats. The Tombigbee River has been impounded and channelized and there are plans to alter most of its tributaries. The upland headwaters of the Mississippi delta streams are also impounded and channelized. Shells found in prehistoric shell middens in the delta suggest lotic habitats that have long since been destroyed by siltation. Gravel mining and channelization in the lower Mississippi River tributaries have caused severe erosion and the loss of a significant portion of the mussel fauna. All of the Gulf drainages between the Pearl and Pascagoula Rivers have been variously affected by channelization, impoundment, gravel mining, industrial and urban pollution, and siltation resulting from agricultural runoff and improper timber harvesting.

Mississippi's riverine systems are naturally precarious habitats for benthic organisms. Most of the geologic strata in the state was formed by ancient alluvial deposits or loess and are characteristically susceptible to erosion. Subjected to seasonal cycles of high rainfall, the benthos are dependent on watershed vegetation, stream meanders and natural obstacles to protect them from the scouring effects of frequent floods. Disruption of the system destroys mussels, their associated habitats and many other benthic species. Recognition of the importance of unionid mussels and other benthos as unique biological entities indicative of lotic community stability, coupled with proper management, can reduce the accelerating destruction of Mississippi's streams and rivers.

The mussels of Mississippi have received little attention from malacologists since the 19th century. Collections have been sporadic, and published accounts even rarer. In the past 10 years interest in the fauna has increased, and a number of collectors, both private individuals and public employees, have contributed to the Mississippi Museum of Natural Science (MMNS) Mussel Collection.

Based on the MMNS records, published accounts and personal experience, 34 of the 73 mussel species known from Mississippi are considered to be endangered, threatened or of special concern within the political boundaries of the state. Each of these is discussed in regard to known habitat, population status, total distribution and Mississippi distribution. The large portion of United States that is drained by the Mississippi River and its associated drainages is referred to in this manuscript as the Interior Basin. Nomenclature follows that suggested by Tugeon et al (in press). The species list presented in this paper has been assembled for review by persons knowledgeable and interested in the Mississippi mussel fauna. It represents the authors professional experience of the species status within the political boundaries of the state of Mississippi. Only five species have any official status recognition. All five are in the Tombigbee River drainage and are listed as endangered by the state of Mississippi and the U.S. Fish and Wildlife Service.

#### ENDANGERED

Species in danger of extinction within the state because of severe habitat loss or pollution.

*Quadrula stapes* (Lea, 1831). Stirrup shell.

State and federal endangered species status. The stirrup shell is endemic to the Tombigbee and Alabama Rivers. It was rare before channel modifications on the Tombigbee and Alabama rivers and little is known about it. The stirrup shell apparently prefers gravel substratum and moderate to swift currents in large to medium-sized rivers. The only post-impoundment collections have been a few fresh shells from the lower Sipsey River in Alabama.

*Pleurobema curtum* (Lea, 1859). Black club shell.

State and federal endangered species status. Perhaps the rarest of all mussel species in Mississippi, the black club shell is endemic to the Tombigbee River. It has not been collected in any tributaries and apparently requires stable sandy-gravel substratum exposed to moderate to swift currents in the main channel of the Tombigbee River. Live specimens have been collected from only two sites in recent times, one of which has been inundated by the Tenn-Tom Waterway.

*Pleurobema marshalli* (Frierson, 1927). Southern round pigtoe.

State and federal endangered species status. The southern round pigtoe is also endemic to the main channel of the Tombigbee River. Most known habitat of this species, gravel or sandy-gravel substratum in moderate to swift currents, has been flooded or otherwise affected by waterway impoundments.

Dead shells have been recently collected below Gainesville Bendway in Alabama, and habitat may still exist in this area.

*Pleurobema taitianum* (Lea, 1834). Southern pink pigtoe.

State and federal endangered species status. Endemic to the Tombigbee and Alabama River drainages, the southern pink pigtoe is found in medium to large rivers with gravel or sandy-gravel substratum in strong to moderate currents. The only remaining known habitat for this species in Mississippi is in the Buttahatchee River above impoundment influence, and the East Fork, Tombigbee River. In Alabama populations may still exist at the Gainesville Bendway and in the Sipsey and Cahaba rivers.

*Potamilus inflatus* (Lea, 1831). Alabama heelsplitter.

Endemic to gulf coast streams from the Amite River to the Alabama River, the Alabama heelsplitter has been reported from the Amite River by Stern (1976), the Pearl River by Frierson (1911), the Black Warrior River (Stansbery, 1976), the Tombigbee and Alabama Rivers (Simpson, 1914) and the Ohio State Museum of Zoology contains a single specimen from the Tangipahoa River in Mississippi. Recent surveys for this species have failed to locate it within the political boundaries of the state, however populations have been found in the Amite River near Denham Springs, LA and the Tombigbee River near Jackson, AL. This species has been collected in packed sand and moderate currents in small to large rivers.

*Epioblasma triquetra* (Rafinesque, 1820). Snuffbox.

Occurring in the central portion of the Interior Basin, the only collection record in Mississippi is from Bear Creek, Tishomingo County (Isom and Yokley, 1968). The snuffbox is known to inhabit stable sand, sandy gravel or gravel substratum in creeks and small rivers with moderate currents. Stansbery (1976) lists this species as endangered in the Tennessee River drainage in Alabama.

*Epioblasma brevidens* (Lea, 1831). Cumberland comb shell.

Endemic to the Tennessee and Cumberland river drainages, Isom and Yokley (1968) collected this species from Bear Creek near Mingo Community, Tishomingo County.

*Epioblasma penita* (Conrad, 1834). Southern comb shell.

State and federal endangered species status. The southern comb shell is endemic to the Tombigbee drainage. It has been collected in the Tombigbee River, East Fork Tombigbee, and Buttahatchee River from stable sandy-gravel or gravel substratum of shallow riffles and runs with moderate to strong currents. It is locally abundant in the lower reach of the Buttahatchee River that is unaffected by impoundment, and is occasionally found in the upper reaches. Dead shells are still occasionally collected at the Gainesville Bendway in Alabama.

## THREATENED ENDEMICIS

Species endemic to Gulf Coast drainages which may become endangered species in the state within the foreseeable future.

*Pleurobema decisum* (Lea, 1831). Southern club shell.

The southern club shell is restricted to Tombigbee River tributaries in Mississippi and to the Tombigbee and Alabama River drainages in Alabama. It is found in packed sand or gravel substrata in small to medium rivers and large creeks. Mississippi collection localities include Bull Mountain and Tibbee creeks, the East Fork Tombigbee, and the preimpounded Tombigbee River. It is locally abundant in the Buttahatchee River. Recent collections in Alabama have been made from the Sipsey River and Bogue Chitto Creek.

*Pleurobema perovatum* (Conrad, 1834). Ovate Club Shell.

Endemic to the Alabama and Tombigbee Rivers, the ovate club shell is usually found in packed sand or gravel in small rivers or large streams. It has been collected in Luxapalila Creek and the Buttahatchee and East Fork Tombigbee Rivers in Mississippi. Alabama records include the Tombigbee and Sipsey rivers. This is a very uncommon shell throughout its range even though habitat seems to be readily available.

*Lampsilis perovalis* (Conrad, 1834). Orange-nacred pocketbook.

This Tombigbee River system endemic is known to exist in only four of the larger tributaries of the upper Tombigbee River: the East Fork Tombigbee River, the Buttahatchee River, Bull Mountain Creek and the Sipsey Creek. The orange-nacred pocketbook is found in stable sandy-gravel substratum and moderate currents of large creeks and small rivers.

*Lampsilis straminea straminea* (Conrad, 1834). Rough fat mucket.

The total distribution of the rough fat mucket is recorded by Simpson (1914) as southern Alabama and southern Mississippi. All MMNS specimens are from small creeks in the Tombigbee drainage, including Chewawah, Tibbee and Bull Mountain Creeks. It is a very uncommon species.

## THREATENED PERIPHERALS

Species which may or may not be secure throughout most of their range, but are threatened in Mississippi.

*Strophitus undulatus* (Say, 1817). Squawfoot.

The squawfoot is widespread in the Interior Basin and the Atlantic drainage. The only recent collection in Mississippi is a single specimen from a gravel riffle in the upper portion of Bayou Pierre, Copiah County. It is found in small to large streams and prefers a gravel or gravel-mud substratum in flowing water (Oesch, 1984).

*Quadrula cylindrica cylindrica* (Say, 1817). Rabbit's foot.

In Mississippi, this mussel has been collected from a short stretch of the Big Black River between MS State Highway 27 and US Hwy 49. It is found in gravel riffles or substratum in moderate current. Fossil shells from indian middens in the Delta indicate that the rabbit's foot was once common in the Yazoo and Coldwater Rivers.

The rabbit's foot is distributed sporadically throughout the central portion of the Interior Basin.

*Quadrula metanevra* (Rafinesque, 1820). Monkeyface.

This widespread Interior Basin species prefers swift clear waters and stable gravel substratum. Its distribution in Mississippi is limited to the Tombigbee River and the lower Buttahatchee River. Unfortunately, impoundments have flooded most of the monkeyface's known habitat in Mississippi.

*Quadrula nodulata* (Rafinesque, 1820). Wartyback.

Another widespread Interior Basin species, in Mississippi shells of the wartyback have been found only in the Big Black River between MS Hwy 27 and I-55. It has been collected alive on a single gravel bar. The current was moderate to strong at this locality. Examinations of prehistoric shell middens along the Yazoo and Coldwater Rivers indicate that it was once widespread throughout the Mississippi delta.

*Pleurobema pyramidatum* (Lea, 1840). Pyramid pigtoe.

The pyramid pigtoe is historically known from the Ohio, Cumberland, Tennessee and Mississippi River systems. In 1980 it was collected in Mississippi in the Big Black River. Subsequent surveys have found dead shells along a 40 mile reach of the main channel. Live pyramid pigtoes have been collected in the Big Black from a single mussel bed in gravel substratum and strong to moderate currents. Samples of fossil shell middens indicate that this species was once abundant throughout the Mississippi delta.

*Truncilla truncata* (Rafinesque, 1820). Deertoe.

Widely distributed throughout the Mississippi and St. Lawrence drainages, the deertoe is known in Mississippi from the Big Black and Quiver Rivers. It is a generalized species throughout its range occurring in a variety of substratum and river sizes. In the Big Black river it is associated with gravel riffles in the main channel where there is moderate current. The deertoe has not been collected in the Quiver River since 1971, but prehistoric shell middens indicate that this species was once widespread in western Mississippi.

*Truncilla donaciformis* (Lea, 1828). Fawn's foot.

Also widespread in the Interior Basin and the Great Lakes, populations are known from only three locations in Mississippi, the Lower Pearl River, the East Fork Tombigbee River near Smithville, and the Buttahatchee River. Unfortunately, a recent collecting trip to the East Fork recovered a single speci-

men at a location where, in 1984, it was one of the most abundant species. Siltation appears to be severely reducing the mussel fauna at this site. A single individual of the fawn's foot was collected in 1986 from the Amite River in Louisiana north of Denham Springs. This mussel can live in a variety of substratum in medium to large rivers.

*Potamilus laevis* (Lea, 1829). Pink papershell.

Distributed throughout the Interior Basin, the only known collections of this species in the state are from the Big Black River and from the Mississippi River at Rosedale. It is found on a variety of substrata in moderate currents.

### SPECIAL CONCERN ENDEMICS

Mussels endemic to Gulf Coast drainages about which there is not enough information to determine specific status.

*Strophitus radiatus* (Conrad, 1834). Rayed creek mussel.

This mussel inhabits small to medium creeks and small rivers. It is usually collected in sand, but occasionally is found in gravel substratum. It is quite uncommon in Mississippi, usually found singly and rarely locally abundant in small streams.

Total distribution for this species is from the Apalachicola River, Florida to the Amite River, Louisiana. It is found in most of the Gulf of Mexico drainages in Mississippi including the Tombigbee, Amite, Tangipahoa, Pearl and Pascagoula River Systems. To my knowledge it has not been collected from the Wolf, Jourdan or Biloxi rivers.

*Strophitus subvexus* (Conrad, 1834). Southern creek mussel.

According to Burch (1976), the total distribution of this species is the Gulf drainage from the Pascagoula River to the Apalachicola River. In Mississippi it is found in the Tombigbee drainage in small to medium rivers with gravel substratum. No southern creek mussels have been collected from the Pascagoula system during recent collections and the author is unaware of any in the past. Southern creek mussels are uncommon, usually collected singly, occasionally locally abundant.

*Lasmigona complanata alabamensis* Clarke, 1985. White heelsplitter.

Arthur Clarke (1985) has recently described this subspecies of *Lasmigona complanata* (Barnes, 1823) based on shell corrugation and drainage. The parent form, *L. complanata complanata* is widespread in the Interior Basin and is not as sculptured as the Alabama River form.

Clarke included Pascagoula and Pearl River collections on his distribution map of the new subspecies but indicated in the text that they were aberrant specimens. Based on the MMNS collections, the Pearl River form is virtually indistinguishable from Interior Basin specimens. Pascagoula drainage specimens differ only in the total lack of corrugation on the smooth shell surface.

The new subspecies prefers soft substrata such as mud or sandy mud in medium to large rivers. The effect of the Tenn-Tom waterway on this mussel has yet to be determined.

*Quadrula asperata* (Lea, 1861). Alabama pimpleback.

Endemic to the Mobile River drainage, the Alabama pimpleback is found in the Tombigbee River and its tributaries in Mississippi. One of the most common mussels in this system before construction of the Tenn-Tom Waterway, populations are now in decline. Preferring stable sand or gravel substrata and moderate currents in medium to large rivers, it is still locally abundant in tributary streams.

*Pleurobema beadleanum* (Lea, 1861). Mississippi pigtoe.

Inhabiting gulf drainages from Mississippi to Eastern Texas, this species has been collected in the Pascagoula and Pearl River systems and the Amite and Tangipahoa Rivers. It is usually found in stable sand or gravel substratum and swift to moderate currents. It is occasionally locally abundant in small rivers or large streams, but is uncommon in the main channels of the larger rivers.

*Elliptio arca* (Conrad, 1843). Alabama spike.

Endemic to the Mobile River system, the Alabama spike is found in gravel or sandy gravel substrata and moderate to strong currents in small to medium rivers. It is locally abundant in the Buttahatchee River but uncommon in other tributary streams in Mississippi.

*Medionidus acutissimus* (Lea, 1831). Alabama moccasin.

The Alabama moccasin is endemic to the Mobile River system. In Mississippi it is found in the Buttahatchee River and Luxapalila Creek in gravel substratum and swift currents. It is uncommon in the Tombigbee River drainage, but because of its small size is easily overlooked.

*Lampsilis radiata hydiana* (Lea, 1838). Louisiana fat mucket.

Found in Gulf Coast and Mississippi drainages from eastern Texas to Alabama, the Louisiana fat mucket has been collected from Tibbee Creek in the Tombigbee River drainage and from the Big Sunflower River. This species is very uncommon in Mississippi although habitat, sluggish currents and mud or sand substratum, seems to be abundant.

### SPECIAL CONCERN PERIPHERALS

Widespread species that may be common throughout most of their range but are rare in Mississippi.

*Arcidens confragosus* (Say, 1829). Rock pocketbook.

A widespread Interior Basin species, the rock pocketbook mussel is uncommon in Mississippi. They are usually found in the main channels of our

largest rivers in sand and mud substratum. Rarely collected in the Tombigbee River, they are sure to have been impacted by the completion of the Tenn-Tom Waterway. They are also uncommon in the Buttahatchie, the lower Pearl and the Big Black Rivers.

*Elliptio arctata* (Conrad, 1834). Delicate spike.

The total distribution of this species is from the Pearl River system east and north to North Carolina, excluding peninsular Florida. The delicate spike is very uncommon in Mississippi and little is known about its habitat. It has been collected in the Pearl, Strong, Tombigbee and Buttahatchee Rivers.

*Uniomereus obesus* (Lea, 1831). Southern pondhorn.

Ranging from southern Virginia, south to Georgia, Alabama and Mississippi, the southern pondhorn's distribution within the State consists of small streams in the Tombigbee River drainage. Very uncommon and seldom collected, little is known about its ecological requirements.

*Ellipsaria lineolata* (Rafinesque, 1820). Butterfly.

Widespread and locally common in the Interior Basin drainages, the Butterfly is also known from the Tombigbee and Alabama river systems. It prefers gravel substratum and moderate to strong currents in larger streams and rivers. It was common in the preimpounded Tombigbee River in Mississippi, but rarely collected from Bull Mountain Creek and Buttahatchee River. Occasional collections have also been made from the Big Black River and from Bear Creek, Tishomingo County.

*Potamilus alatus* (Say, 1817). Pink heelsplitter.

Found throughout the central and northern portions of the Mississippi drainage, the southernmost distribution of this species is the Tennessee River drainage in Alabama and Mississippi. This confines the Pink heelsplitter to the extreme northeastern portion of the state. It is found in a variety of habitats, preferring larger bodies of water and relatively soft substrata, and may thrive in impounded waters. In Mississippi it has been collected in Bear Creek and Pickwick Lake in Tishomingo County. It has the potential to invade the Tombigbee drainage through the Tenn-Tom Waterway connection with the Tennessee River.

*Ligumia recta* (Lamarck, 1819). Black sand shell.

This species is widespread in the Canadian Interior Basin, the Mississippi River drainage and the gulf coast drainages from Texas to Florida. In Mississippi the black sand shell has been collected in the Tombigbee, Pearl and Strong Rivers. Habitat requirements include medium to large rivers with moderate to strong currents and stable sand or gravel substratum. The black sand shell is very uncommon in Mississippi.



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