

*Alasmidonta marginata*

## Elktoe

Class: Bivalvia

Order: Unionoida

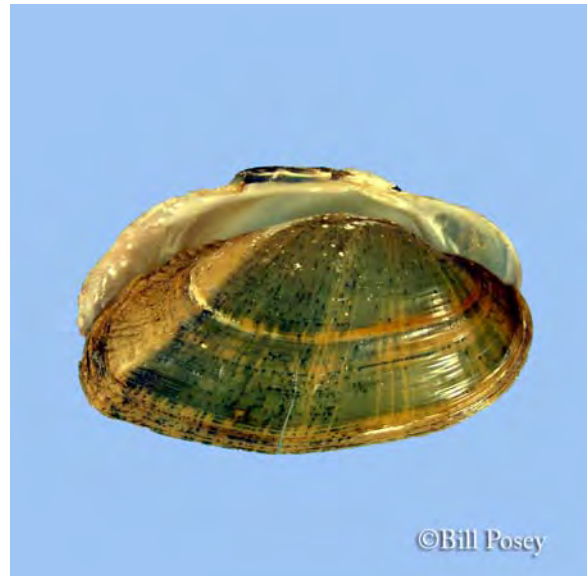
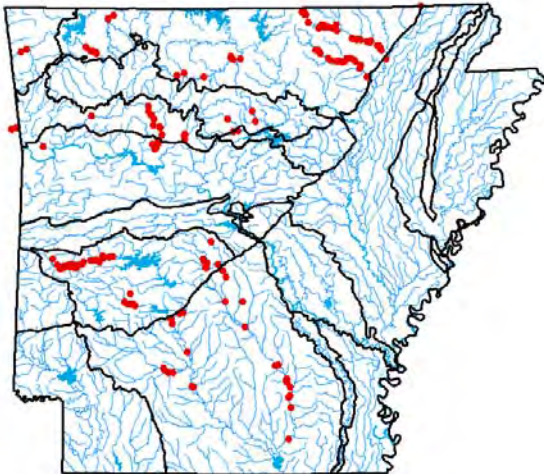
Family: Unionidae

Priority Score: **19** out of 100

Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/cobble**Description**

Shell elongate, triangular, inflated, and relatively thin. Anterior end rounded, posterior end sharply angled, ending in a blunt, squared point. Posterior ridge sharply angled and prominent, posterior

slope broad, flat, and covered with fine ridges. Ventral margin straight to slightly curved. Umbos large, located near the center of the shell, and elevated above the hinge line. Beak sculpture of three or four heavy, double-looped ridges. Shell smooth and dull. Periostracum yellowish green or bright green with numerous rays and dark green spots present. Posterior slope often lighter than rest of shell. Length to four inches (10.2cm). Pseudocardinal teeth thin and elongate; one in right, occasionally two in the left. Lateral teeth reduced to a thickened swelling along the hinge line. Beak cavity moderately deep. Nacre bluish white, occasionally with salmon near the beaks.

**Host Fish**

Rockbass, White Sucker, Northern Hogsucker, Warmouth, Shorthead Redhorse,

**Ecobasins**

Arkansas Valley - Arkansas River

Boston Mountains - Arkansas River

Boston Mountains - White River

Mississippi River Alluvial Plain - White River

Ouachita Mountains - Ouachita River

Ozark Highlands - Arkansas River

Ozark Highlands - White River

South Central Plains - Ouachita River

**Habitats**

**Weight**

Natural Glide: Headwater

Suitable

Natural Pool: Headwater

Marginal

Natural Run: Headwater - Medium - Large

Optimal

## Problems Faced

Threat: Habitat destruction  
Source: Forestry activities

---

Threat: Habitat destruction  
Source: Resource extraction

---

Threat: Habitat destruction  
Source: Urban development

---

Threat: Nutrient loading  
Source: Confined animal operations

---

Threat: Nutrient loading  
Source: Grazing/Browsing

---

Threat: Nutrient loading  
Source: Urban development

---

Threat: Sedimentation  
Source: Channel alteration

---

Threat: Sedimentation  
Source: Grazing/Browsing

---

Threat: Sedimentation  
Source: Road construction

---

## Data Gaps/Research Needs

Conduct status survey.

---

## Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Restore or enhance riparian buffers.	High	Habitat Protection

---

## Monitoring Strategies

Monitor occurrence in ongoing river surveys.

---

## Comments

Widespread but rare. Rangewide population status of the elktoe mussel is not known. (AFMC 2004a, AFMC 2004b, AFMC 2004c, AFMC 2005, AGFC 2003, AGFC 1991-1999, AHTD 1984, AHTD 1994, ANHI 2003, Bates and Dennis 1983, Branson 1983, Burns and McDonnell 1992a, Clark 1987, Crump 2003, Cummings and Mayer 1992, Davidson and others 2000, Gordon 1980, 1980a, 1985, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1992a, 1996, 1997b, 1999, 1999a, Harris and Doster 1992, Harris and Gordon 1985, 1990, Harris and Milam 2002, Johnson 1980, Meek and Clark 1912, Oesch 1995, ONHI 2003, Rust 1993, Stoeckel and others 1996, 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Alasmidonta viridis*

## Slippershell Mussel

Class: Bivalvia

Order: Unionoida

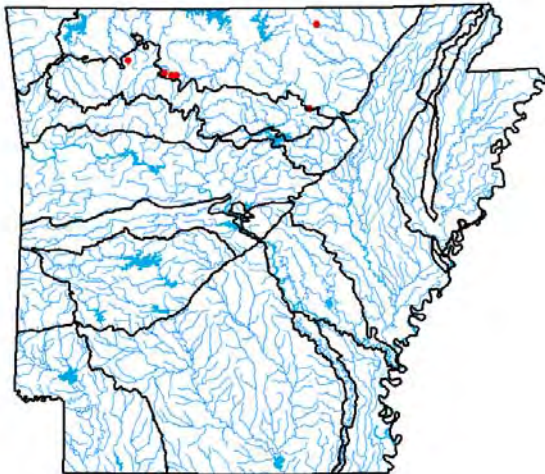
Family: Unionidae

Priority Score: **31** out of 100

Population Trend: Decreasing

Global Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel**Description**

Shell small (usually about an inch), somewhat inflated, thin in young individuals to moderately thick in adults. Anterior end rounded, posterior end squared or truncated. Posterior ridge high and rounded,

posterior slope flattened. Ventral margin straight or slightly arched. Umbos full and elevated above the hinge line. Beak sculpture of three or four elevated ridges or loops. Shell smooth to rough and yellowish green with numerous wavy green rays, particularly on the posterior half of the shell. Length to 1.5 inches (3.8 cm). Pseudocardinal teeth triangular; two in the left valve, one in the right. Lateral teeth poorly developed, generally appearing as a slight swelling along the hinge line. Beak cavity moderately deep. Nacre white, iridescent on the posterior third of the shell.

### Host Fish

Mottled Sculpin, Banded Sculpin, Johnny Darter

### Ecobasins

Ozark Highlands - White River

### Habitats

Natural Riffle: Headwater

### Weight

Suitable

Natural Run: Headwater

Optimal

### Problems Faced

Threat: Habitat destruction

Source: Grazing/Browsing

Threat: Habitat destruction

Source: Recreation

Threat: Habitat destruction

Source: Road construction

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing/Browsing

Threat: Sedimentation

Source: Forestry activities

Threat: Sedimentation

Source: Grazing/Browsing

Threat: Sedimentation

Source: Recreation

Threat: Sedimentation

Source: Road construction

### Data Gaps/Research Needs

Conduct additional population surveys.

Conduct life history study.

Determine habitat preferences and availability.

Determine host fish suitability and availability.

**Conservation Actions**

	<b>Importance</b>	<b>Category</b>
Augment populations in suitable habitat.	Low	Population Management
Establish populations in suitable habitat.	High	Population Management
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Restore or enhance riparian buffers.	Medium	Habitat Protection

**Monitoring Strategies**

Additional information is needed before a monitoring strategy can be determined.

**Comments**

Ristricted range and extremely rare. Since 1996, few specimens have been recorded (AFMC 2004a, 2004b, 2004c, 2005, Harris 1996).

**Taxa Association Team and Peer Reviewers**

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Arcidens wheeleri*

## Ouachita Rock Pocketbook

Class: Bivalvia

Order: Unionoida

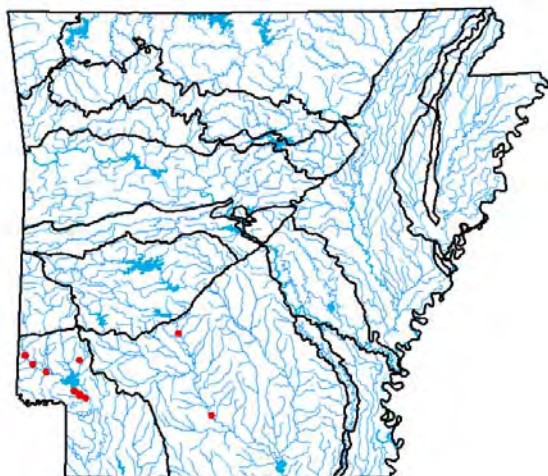
Family: Unionidae

Priority Score: **80** out of 100

Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/cobble/sand**Description**

Shell subcircular to subovate to subquadrate in profile, truncated posteriorly, moderately inflated, up to 4.4 inches long, 3.4 inches high, and 2.4 inches wide, moderately heavy, somewhat thickened

anteriorly, up 0.24 inches thick, and half as thick posteriorly. Outer shell layer is chestnut-brown to black with a silky luster, and appears to slightly iridescent when wet. Umbo is prominent. Posterior half of shell is sculptured by irregular, oblique ridges that are sometimes crossed by smaller ridges or sometimes indistinct. Beak sculpturing is very restricted, rarely intact. Nacre is usually salmon-colored above the pallial line, white to light blue below. Hinge teeth well developed.

**Host Fish**

Green Sunfish, Bluegill, Smallmouth Bass, Bleeding Shiner, River Carpsucker, Longear Sunfish, Largemouth Bass, White Crappie, Black Crappie, Emerald Shiner, Warmouth

**Ecobasins**

South Central Plains - Ouachita River

South Central Plains - Red River

**Habitats**

**Weight**

Natural Oxbow - connected: - Medium - Large	Optimal
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

**Problems Faced**

Threat: Habitat destruction  
Source: Channel alteration

Threat: Habitat destruction  
Source: Dam

Threat: Hydrological alteration  
Source: Dam

Threat: Hydrological alteration  
Source: Water diversion

Threat: Sedimentation  
Source: Channel alteration

Threat: Sedimentation  
Source: Dam

**Data Gaps/Research Needs**

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and habitat availability.

Determine sustainable flow below dams to improve habitat.

Survey streams and rivers for unknown populations, particularly in Ouachita River sided channels and backwater habitats.



Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Implement habitat conservation plan.	High	Habitat Protection
Manage the Ouachita River watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	High	Population Management

### Monitoring Strategies

Monitor in accordance with U.S. Fish and Wildlife Service recovery plan.

### Comments

Federally-listed endangered species. Populations occur in the Kiamichi and Glover rivers in Oklahoma, and the Little River system in Oklahoma and Arkansas. The only known reproducing population, based on juveniles and gravid females, occurs in the Little River in Arkansas. This species should be considered for reintroduction to the Ouachita River as part of recovery efforts. The generic name for this species has been changed to *Arcidens*, based on genetic studies when compared to its closest relative, also an *Arcidens* species. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Bouldin and others, 2013, Branson 1983, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Farris and Seagraves 2003, Gordon 1980a, Gordon and Harris 1983, Gordon and Kraemer 1984, Harris 1999, 1999a, Harris and Gordon 1987, 1990, Harris and others 1997, Inuoe and others 2014, Johnson 1980, Mehlhop-Cifelli and Miller 1989, Posey 1997, Posey and others 1996, Stansbery 1970, Turgeon and others 1988, 1998, USDA FS 1999, USDI FWS 1994, Vaughn and others 1993, 1996, 1997, Wheeler 1918, Williams & others 1993).

### Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Cumberlandia monodonta*

## Spectaclecase

Class: Bivalvia

Order: Unionoida

Family: Margaritiferidae

Priority Score: **38** out of 100

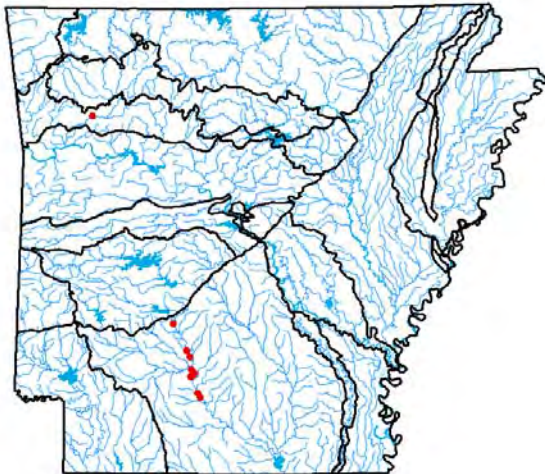
Population Trend: Decreasing

Global Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

**Distribution**

## Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

Suitable Substrate gravel

**Description**

Shell oblong, elongate, and compressed. Anterior and posterior ends rounded. Ventral margin usually arched or pinched, occasionally straight. Shell thin in young, becoming thicker in older

individuals. Umbos only slightly elevated above the hinge line. Beak sculpture, when visible, of three or four heavy ridges. Surface of shell smooth to somewhat rough, brown in young shells, becoming dark brown to black and rayless with age. Length to eight inches. Pseudocardinal teeth small, tubercular; one in each valve in young individuals. Lateral teeth poorly developed or absent. Beak cavity moderately shallow. Nacre white, iridescent in young individuals and on the posterior fourth of shell in adults

**Host Fish**

Unknown

**Ecobasins**

Boston Mountains - Arkansas River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

**Habitats**

**Weight**

Natural Pool: Headwater - Medium - Large

Optimal

Natural Run: - Medium - Large

Optimal

Natural Shoal: - Medium - Large

Suitable

**Problems Faced**

Threat: Habitat destruction

Source: Channel alteration

Threat: Habitat destruction

Source: Channel maintenance

Threat: Habitat destruction

Source: Municipal/Industrial point source

Threat: Hydrological alteration

Source: Dam

Threat: Hydrological alteration

Source: Water diversion

**Data Gaps/Research Needs**

Conduct life history study.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and availability.

Determine host fish suitability and host fish availability.

Determine viability of species in the Ouachita River in Arkansas.

Survey streams for additional populations.

Conservation Actions	Importance	Category
Develop an outreach/education program.	Low	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Partner with other agencies to prevent loss of suitable habitat.	High	Habitat Protection
Propagate, augment and reintroduce species where appropriate.	Medium	Population Management

### Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

### Comments

Federally-listed candidate species. Extremely rare, on periphery of range. Known from one relic above Lake Ouachita but known to occur downstream of Remmel Dam (Malvern, Ark.) in the Ouachita River mainstem. Surveys from 2012-2014 have detected reproducing populations in the Ouachita River below Remmel Dam. One record reported from the Mulberry River. Additional surveys in the Mulberry River have not detected additional animals. A difficult species to detect since it utilizes habitat that is not generally used by other bivalve species. Habitat preference includes sand/gravel/silt beneath overhanging boulders. Three host fish trials have not determined the host fish. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Gordon 1980a, Gordon and Harris 1983, Gordon and others 1980, Harris 1999, 1999a, Harris and Gordon 1987, 1990, Harris and others 1997, K. Inuoe, pers. Comm., Johnson 1980, ORVET 2003, Posey and others 1996, Stoeckel and others 1996, Turgeon and others 1988, 1998, USDA FS 1999, USFWS 2004, Wheeler 1918, Williams & others 1993).

### Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Cyprogenia aberti*

## Western Fanshell

Class: Bivalvia

Order: Unionoida

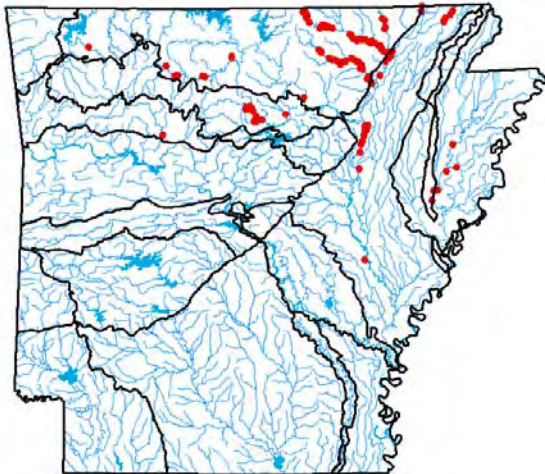
Family: Unionidae

Priority Score: **43** out of 100

Population Trend: Decreasing

Global Rank: G2G3Q — Imperiled (uncertain rank) questionable taxonomy

State Rank: S3 — Vulnerable in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/sand**Description**

Shell rounded, solid, and moderately inflated. Anterior margin rounded, posterior margin bluntly rounded or truncated. Ventral margin broadly rounded. Umbos not elevated above the hinge line.

Beak sculpture, if visible, of a few weak ridges. Growth lines appear as distinct elevated ridges. Numerous pustules usually concentrated in the center but occasionally covering the entire surface of the shell. Periostracum usually greenish yellow, with a pattern of dark green rays made up of numerous smaller broken lines or dots. Length to three inches (7.6 cm). Pseudocardinal teeth relatively large and serrated; two in the left valve, one in the right. Lateral teeth roughened, straight to slightly curved, heavy and very short. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.

**Host Fish**

Fantail Darter, Logperch, Slenderhead Darter

**Ecobasins**

Boston Mountains - Arkansas River

Boston Mountains - White River

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

**Habitats**

**Weight**

Natural Glide: Headwater	Optimal
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

**Problems Faced**

Threat: Habitat destruction  
Source: Dam

Threat: Habitat destruction  
Source: Grazing/Browsing

Threat: Habitat destruction  
Source: Resource extraction

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Forestry activities

Threat: Sedimentation  
Source: Road construction

## Data Gaps/Research Needs

Conduct life history study.

Continue genetic studies to determine taxonomy of the different groups.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

## Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

## Comments

Ongoing taxonomic work indicates that this complex may be comprised of more than one species, possibly up to three. Widespread, rare to locally common. The western fanshell may be declining across its range (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1987, 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1984, Burns and McDonnell 1992a, Call 1895, Christian 1995, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson 1997, Davidson and Gosse 2001, Davidson and others 2000, Eckert 2003, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and Harris 1983, Gordon and others 1980, Harris 1987, 1996, 1999, 1999a, Harris and Gordon 1985, 1988, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Mather 1990, Meek and Clark 1912, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Roe and Chong 2014, Rust 1993, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Stoeckel and others 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Cyprogenia sp. cf aberti*

"Ouachita" Fanshell

Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **19** out of 100

Population Trend: Decreasing

Global Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/sand**Description**

Shell rounded, solid, and moderately inflated. Anterior margin rounded, posterior margin bluntly rounded or truncated. Ventral margin broadly rounded. Umbos not elevated above the hinge line.



Beak sculpture, if visible, of a few weak ridges. Growth lines appear as distinct elevated ridges. Numerous pustules usually concentrated in the center but occasionally covering the entire surface of the shell. Periostracum usually greenish yellow, with a pattern of dark green rays made up of numerous smaller broken lines or dots. Length to three inches (7.6 cm). Pseudocardinal teeth relatively large and serrated; two in the left valve, one in the right. Lateral teeth roughened, straight to slightly curved, heavy and very short. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.

### Host Fish

Logperch, Orangebelly Darter

### Ecobasins

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

### Habitats

Habitats	Weight
Natural Glide: Headwater	Optimal
Natural Pool: Headwater - Medium	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

### Problems Faced

Threat: Habitat destruction  
Source: Dam

Threat: Habitat destruction  
Source: Grazing/Browsing

Threat: Habitat destruction  
Source: Resource extraction

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Forestry activities

Threat: Sedimentation  
Source: Road construction

### Conservation Actions

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

### Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

## Comments

Ongoing taxonomic work indicates that this complex may be comprised of more than one species, possibly up to three. Widespread, rare to locally common. The western fanshell may be declining across its range (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1987, 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1984, Burns and McDonnell 1992a, Call 1895, Christian 1995, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson 1997, Davidson and Gosse 2001, Davidson and others 2000, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and Harris 1983, Gordon and others 1980, Harris 1987, 1996, 1999, 1999a, Harris and Gordon 1985, 1988, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Mather 1990, Meek and Clark 1912, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Stoeckel and others 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

---

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Epioblasma florentina curtisii*

## Curtis Pearlymussel

Class: Bivalvia

Order: Unionoida

Family: Unionidae

Priority Score: **100** out of 100

Population Trend: Decreasing

Global Rank: G1T1 — Critically imperiled subspecies

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate**    gravel**Description**

Shell small (less than 1.5 inches), yellowish brown to brown, sometimes with fine evenly spaced rays over most of its length. Beak broad and low and beak sculpture usually eroded away. Males oval in

shape, with the anterior end smoothly rounded, and the posterior end bluntly pointed and biangular. Female smoothly rounded anteriorly and broadly rounded and inflated posteriorly, posterior edge serrated. Nacre white to whitish-blue, hinge line broadly curved. Cardinal teeth high, triangular and divergent.

### Host Fish

Rainbow Darter

## Ecobasins

Ozark Highlands - White River

### Habitats

Natural Riffle: Headwater

### Weight

Suitable

Natural Run: Headwater

Optimal

### Problems Faced

Threat: Habitat destruction

Source: Grazing/Browsing

Threat: Habitat destruction

Source: Recreation

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing/Browsing

Threat: Nutrient loading

Source: Urban development

### Data Gaps/Research Needs

Continue searching for species using eDNA technology.

### Conservation Actions

Develop an outreach program.

### Importance Category

Medium

Public Relations/Education

Find females and propagate juveniles for release.

High

Population Management

Protect habitat from recreational uses.

Medium

Habitat Protection

Protect host fish and associated habitat.

High

Habitat Protection

Protect or enhance riparian buffer.

High

Habitat Restoration/Improvement

### Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

## Comments

Historically known from the Spring Rivers in Arkansas. Reported from South Fork Spring River in early 1980s. A 2007 Status Assessment conducted throughout its range yielded no live or dead individuals. The last live specimen was found in the Little Black River in Missouri in 1993. (AFMC 2004a, 2004b, 2004c, 2005, Bruendeman and others 2001, Harris and others 2007)

---

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Epioblasma triquetra*

## Snuffbox

Class: Bivalvia  
 Order: Unionoida  
 Family: Unionidae

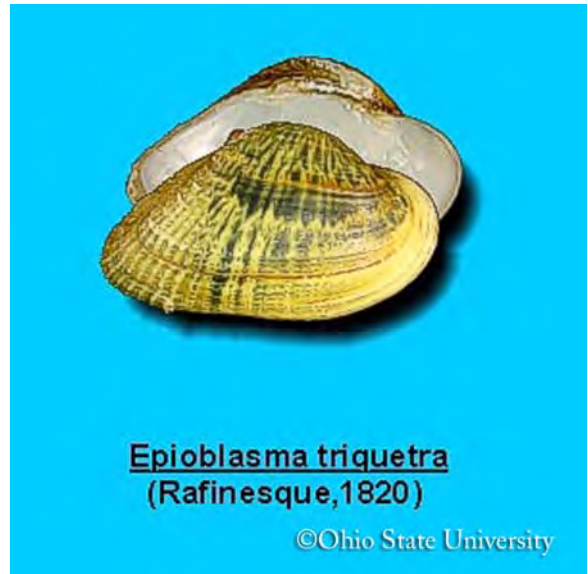
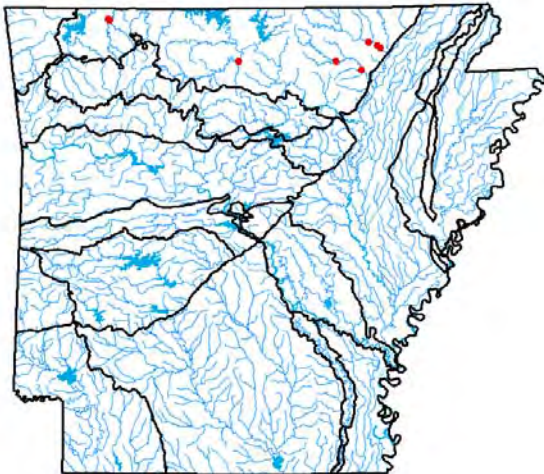
Priority Score: **43** out of 100



Population Trend: Decreasing

Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where  
 the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel

**Description**

Shell small, fairly solid, triangular (males) to somewhat elongate (females) and inflated (particularly in females). Anterior end rounded, posterior end truncated in males, expanded in females. Dorsal and

ventral margins straight to slightly curved. Posterior ridge sharply angled, posterior slope wide, expanded, and ribbed (especially in females). Umbos swollen and slightly elevated above the hinge line. Beak sculpture of three or four faint, double-looped bars. Periostracum yellow or yellowish green, with numerous dark green rays, blotches or chevron-shaped markings. Length to 2.5 inches (6.4 cm). Pseudocardinal teeth elevated, roughened, relatively thin and compressed; two in the left valve, two in the right, with the front one being thinner and much smaller. Lateral teeth very short, slightly curved, serrated, and elevated. Beak cavity fairly deep. Nacre pearly white, iridescent posteriorly.

### Host Fish

Banded Sculpin, Logperch

### Ecobasins

Ozark Highlands - White River

#### Habitats

Natural Riffle: Headwater - Small - Medium

Natural Run: Headwater - Small - Medium

#### Weight

Suitable

Optimal

### Problems Faced

Threat: Habitat destruction

Source: Grazing/Browsing

Threat: Habitat destruction

Source: Recreation

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing/Browsing

Threat: Nutrient loading

Source: Urban development

### Data Gaps/Research Needs

Conduct genetic research to address taxonomic questions.

Conduct status survey.

Conduct survey for additional populations.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

<b>Conservation Actions</b>	<b>Importance</b>	<b>Category</b>
Develop an outreach program.	Medium	Public Relations/Education
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect habitat from recreational uses.	Medium	Habitat Protection
Protect host fish and associated habitat.	High	Habitat Restoration/Improvement
Protect or enhance riparian buffer.	High	Habitat Restoration/Improvement

### **Monitoring Strategies**

Additional information is needed before a monitoring strategy can be developed.

### **Comments**

Appears to be a viable population in the Spring River, and one live individual has been found in the Buffalo River. Relict shells have been found in the Kings and Strawberry rivers. Widespread distribution in North America but declining rangewide and is thought to exist in 40 percent of its former range (AFMC 2004a, 2004b, 2004c, 2005, Matthews 2007, Roe 2002).

### **Taxa Association Team and Peer Reviewers**

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing



*Epioblasma turgidula*

## Turgid Blossom

Class: Bivalvia

Order: Unionoida

Family: Unionidae

Priority Score: **100** out of 100

Population Trend: Decreasing

Global Rank: GX — Presumed extinct

State Rank: SX — Presumed extinct

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel**Description**

Shell small, elliptical, ovate, or obovate in shape (maximum length 40 mm). Anterior end of shell rounded; posterior end of male shells pointed, while females are broadly rounded. Shell yellowish

green covered with numerous fine green rays evenly distributed over the shell surface. Nacre bluish-white.

**Host Fish**

Unknown

**Ecobasins**

Ozark Highlands - White River

**Habitats**

Natural Riffle: Headwater

Natural Run: Headwater

**Weight**

Data Gap

Data Gap

**Problems Faced**

Threat: Habitat destruction  
Source: Grazing/Browsing

Threat: Habitat destruction  
Source: Recreation

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Nutrient loading  
Source: Recreation

**Data Gaps/Research Needs**

Continue searching for species using eDNA technology.

**Conservation Actions**

Develop an outreach program.

Develop and implement habitat conservation plan.

Propagate, augment and reintroduce species where appropriate.

Protect habitat from recreational uses.

Protect or enhance riparian buffer.

**Importance**

Medium

Medium

Medium

Medium

Medium

**Category**

Public Relations/Education

Habitat Restoration/Improvement

Population Management

Habitat Protection

Habitat Protection

**Monitoring Strategies**

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

## Comments

Possibly extinct, but exhaustive surveys have not been conducted in Arkansas (AFMC 2004a, 2004b, 2004c, 2005, USFW 1985).

---

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Fusconaia ozarkensis*

## Ozark Pigtoe

Class: Bivalvia

Order: Unionoida

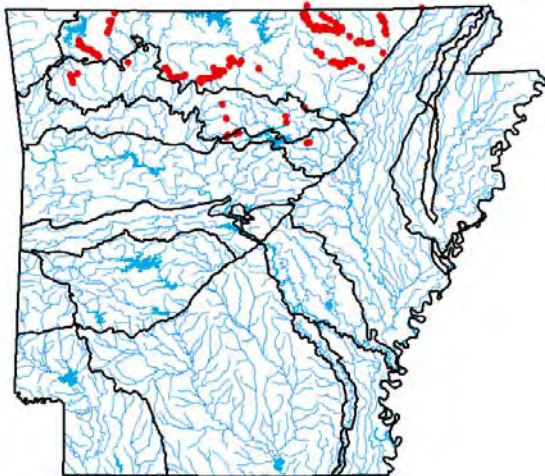
Family: Unionidae

Priority Score: **23** out of 100

Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/cobble**Description**

Shell quadrate; dorsal margin straight or slightly curved; ventral margin gently convex to straight but may be concave; anterior end uniformly rounded; posterior margin with two angles. Shells thick, not

inflated, posterior ridge not prominent. Shell color tan with faint green rays in young individuals, becoming red-brown to black in older individuals. Left valve with two erect, triangular, striated pseudocardinals; lateral teeth nearly straight, relatively short and striated; right valve has one erect, stout, striated pseudocardinal; single lateral tooth is heavy, broad, striated; nacre white to blue-white, often tinged with pink.

**Host Fish**

Unknown

**Ecobasins**

Ozark Highlands - White River

**Habitats**

**Weight**

Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

**Problems Faced**

Threat: Habitat destruction  
Source: Channel alteration

Threat: Habitat destruction  
Source: Channel maintenance

Threat: Habitat destruction  
Source: Dam

Threat: Hydrological alteration  
Source: Dam

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

**Data Gaps/Research Needs**

Conduct genetic and life history studies to determine the taxonomic relationships of *Fusconaia* and *Pleurobema*.

Conduct status survey.

Conduct survey for additional populations.

**Conservation Actions**

**Importance Category**

More data are needed to determine conservation actions.	Medium	Data Gap
---	--------	----------

### Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

---

### Comments

Recognized form is widespread across Ozark Mountains in Arkansas and Missouri. Genetic uncertainty has resulted in uncertain distributional information. Genetic analysis will help determine phylogeography of species in Arkansas (AFMC 2004a, 2004b, 2004c, 2005).

---

### Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Fusconaia sp. cf. flava*

## "Elongate" Pigtoe

Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **29** out of 100

Population Trend: Decreasing

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate**    gravel**Description**

Valves thin to moderately thick, strong; shell thin to moderately inflated, outline quadrate to elongate; beaks low, turned forward. Posterior ridge indistinct; sulcus absent on disc. Periostracum has a

satiny or cloth-like sheen; fine green rays may be present, especially in young specimens. Pseudocardinal and lateral teeth well developed and solid; narrow interdentum; beak cavity moderately deep to deep. Nacre usually white. The species is most closely related to *Fusconaia flava*; however, it most closely resembles the Ozark pigtoe (*Fusconaia ozarkensis*) and is thought to occur only in Arkansas River tributaries in Arkansas, Kansas, Missouri and Oklahoma.

**Host Fish**

Unknown

**Ecobasins**

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

**Habitats**

**Weight**

Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

**Problems Faced**

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Nutrient loading  
Source: Municipal/Industrial point source

Threat: Nutrient loading  
Source: Urban development

Threat: Sedimentation  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Road construction

Threat: Sedimentation  
Source: Urban development



## Data Gaps/Research Needs

Conduct genetic research to determine phylogenetic relationships.

Conduct life history study.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and availability.

Determine host fish availability.

## Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Low	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection
Reduce cattle access to the Illinois River.	Medium	Habitat Protection

## Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

## Comments

This species was recognized by Hayes (2010) from the Illinois River based on genetic sampling. However, more samples are needed before a formal taxonomic change can be recommended.

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis abrupta*

## Pink Mucket

Class: Bivalvia

Order: Unionoida

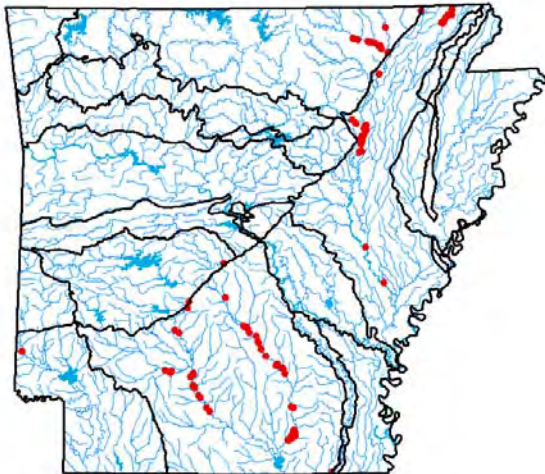
Family: Unionidae

Priority Score: **46** out of 100

Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

**Distribution****Occurrence Records**

## Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** sand/gravel**Description**

Shell round to elliptical, solid, and inflated. Anterior end rounded, posterior end bluntly pointed in males, truncated in females. Dorsal margin straight, ventral margin straight to slightly curved. Umbos

turned forward and elevated above the hinge line. Beak sculpture, if visible, of three or four double-looped ridges. Shell smooth, yellow or yellowish green and rayless or with faint green rays. Length to four inches (10.2 cm). Pseudocardinal teeth triangular, thick, divergent; two in the left valve, one in the right, occasionally with a smaller tubercular tooth in front. Lateral teeth short, heavy, and relatively thick. Beak cavity deep. Nacre pink or white, iridescent posteriorly.

**Host Fish**

Smallmouth Bass, Largemouth Bass, Spotted Bass

**Ecobasins**

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

**Habitats**

**Weight**

Natural Pool: - Medium - Large

Suitable

Natural Run: - Medium - Large

Optimal

Natural Shoal: - Medium - Large

Suitable

**Problems Faced**

Threat: Habitat destruction

Source: Channel alteration

Threat: Habitat destruction

Source: Channel maintenance

Threat: Habitat destruction

Source: Dam

Threat: Hydrological alteration

Source: Dam

Threat: Hydrological alteration

Source: Water diversion

Threat: Sedimentation

Source: Agricultural practices

Threat: Sedimentation

Source: Channel alteration

Threat: Sedimentation

Source: Channel maintenance

Threat: Sedimentation

Source: Dam

Threat: Sedimentation

Source: Forestry activities

Threat: Sedimentation

Source: Road construction

## Data Gaps/Research Needs

Conduct genetic testing to determine species in Arkansas.

Conduct status survey.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine host fish.

## Conservation Actions

Conservation Actions	Importance	Category
Avoid dredging White and Ouachita river beds and channel.	High	Habitat Protection
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Medium	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection

## Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

## Comments

Federally-listed endangered species. Taxonomic concerns are due to similarity of appearance with another species. May also be two separate species in Arkansas. Historically widespread but rarely common. The lack of recruitment and the difficulty with which it is found makes the species difficult to determine its status in Arkansas. In 2014, the USFWS and AGFC released 1,000 two-year old Pink mucket mussels into the Saline River in Ashley County. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, ANHI 2003, Bates and Dennis 1983, Christian 1995, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Gordon 1980a, 1982, Gordon and Harris 1983, Gordon and others 1980, Harris 1989d, 1990c, 1995, 1997c, 1999, 1999a, 2002, Harris and Gordon 1987, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Johnson 1980, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis ornata*

## Southern Pocketbook

Class: Bivalvia

Order: Unionoida

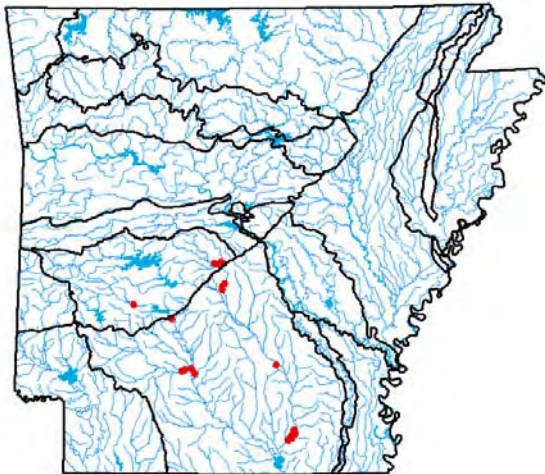
Family: Unionidae

Priority Score: **19** out of 100

Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel**Description**

Shell inflated, subsolid, the male irregularly ovate or rhomboid, the female obovate, with a high, decided posterior ridge; beaks high and full. Shell tawny or greenish-yellow, showing a few greenish

rays. Two pseudocardinals in left valve, and two small remote laterals; right valve with two subcompressed, triangular pseudocardinals, and one high lateral truncated behind; nacre white.

**Host Fish**

Largemouth Bass

**Ecobasins**

Ouachita Mountains - Ouachita River

**Habitats**

**Weight**

Natural Oxbow - connected: - Medium - Large	Marginal
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

**Problems Faced**

Threat: Nutrient loading  
Source:

Threat: Nutrient loading  
Source:

Threat: Nutrient loading  
Source:

**Data Gaps/Research Needs**

Conduct distribution surveys.

Conduct genetic study to determine extent of population in Arkansas.

Determine habitat preferences and availability.

Determine host fish suitability and availability.

**Conservation Actions**

**Importance Category**

Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
--	--------	------------------

**Monitoring Strategies**

Additional information is needed before a monitoring strategy can be developed.

## Comments

Peripheral. Scattered distribution. Low density in the Ouachita Mountain portion of its range. The Southern Pocketbook has only been confirmed from the Saline River in Arkansas. Although this species is not considered to be very threatened rangewide, the small number of occurrences known from Arkansas seems to indicate that this species is rare (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, ANHI 2003, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Gordon and Harris 1983, Harris 1999, Harris and Gordon 1987, Harris and others 1997, Johnson 1980, Turgeon and others 1988, 1998, USDA FS 1999, Williams & others 1993).

---

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis powellii*

## Arkansas Fatmucket

Class: Bivalvia

Order: Unionoida

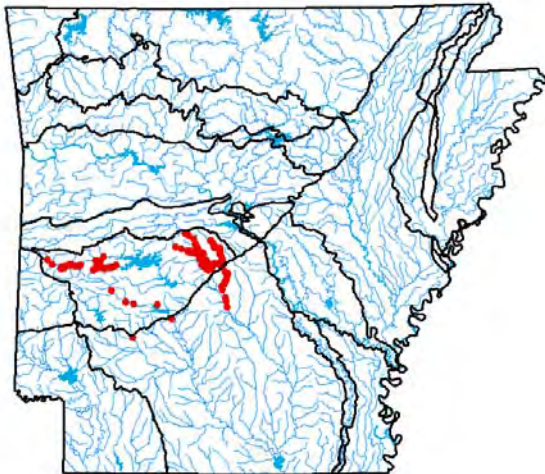
Family: Unionidae

Priority Score: **57** out of 100

Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/sand**Description**

Shell oblong to quadrate and slightly to moderately inflated, with thin to moderately thick valves. Shell color is yellow to tan and color rays are always absent. Nacre and both pseudocardinal and lateral



teeth are thin but well developed. Maximum length is about six inches.

**Host Fish**

Spotted Bass, Largemouth Bass

**Ecobasins**

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

**Habitats**

**Weight**

Natural Pool: Headwater - Medium - Large

Suitable

Natural Riffle: Headwater

Marginal

Natural Run: Headwater - Medium - Large

Suitable

Natural Shoal: - Medium - Large

Marginal

Natural Side channel: - Medium - Large

Optimal

**Problems Faced**

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing/Browsing

Threat: Nutrient loading

Source: Recreation

Threat: Nutrient loading

Source: Urban development

Threat: Sedimentation

Source: Grazing/Browsing

Threat: Sedimentation

Source: Road construction

Threat: Sedimentation

Source: Urban development

**Data Gaps/Research Needs**

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and availability.

Determine host fish availability.

<b>Conservation Actions</b>	<b>Importance</b>	<b>Category</b>
Develop an outreach program.	Medium	Public Relations/Education
Implement a Safe Harbor agreement.	High	Habitat Protection
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life with emphasis in the Saline and Ouachita Rivers.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection

### **Monitoring Strategies**

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

### **Comments**

Federally-listed threatened species. Ouachita River drainage endemic. Main populations are in the Forks of the Saline, South Fork Ouachita and upper Ouachita rivers. Restricted distribution and relatively common in preferred habitat, its population sizes appear small; however, its frequency of capture may be decreasing. Host fish availability was conducted in 2004. Propagating and releasing juveniles is a high priority in the Ouachita and Caddo rivers where the species has become difficult to locate. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1989, 1994, ANHI 2003, Branson 1984, Brown and Brown 1989, Burns and McDonnell 1992, 1992a, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson and Gosse 2001, Gordon and Harris 1983, 1985, Harris 1989c, 1991a, 1994a, 1999, 1999a, Harris and Gordon 1987, 1988, 1990, Harris and others 1992, 1997, Johnson 1980, Scott 2004, Turgeon and others 1988, 1998, Turner and others 2000, USDA FS 1999, USDI FWS 1990, 1992, Williams & others 1993).

### **Taxa Association Team and Peer Reviewers**

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

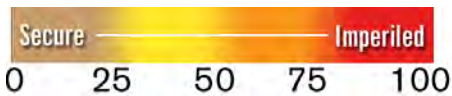
*Lampsilis rafinesqueana*

## Neosho Mucket

Class: Bivalvia

Order: Unionoida

Family: Unionidae

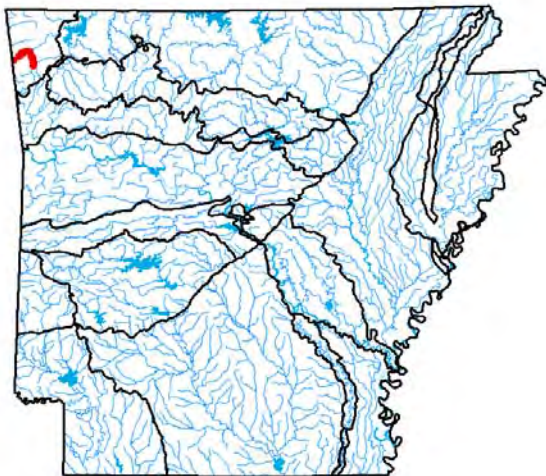
Priority Score: **62** out of 100

©Bill Posey

Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel**Description**

Shell oblong, dorsal line gently rounded, ventral line straight to gently curved; anterior end uniformly rounded, posterior end truncated above and at the posterior ridge which usually gives it a biangulate

*Lampsilis rafinesqueana*  
Neosho Mucket

appearance; compressed; relatively strong although thin; beaks low; shell light brown and has a dull, waxy luster; green rays cover surface; left valve has two stout, divergent, striated, triangular pseudocardinal teeth; the two lateral teeth are short, stout and slightly curved; right valve has a tall, triangular to columnar, striated pseudocardinal, a low, lamellar tooth can be seen anteriorly; right lateral tooth is short, stout and slightly curved. Nacre is bluish-white to white, slightly iridescent posteriorly.

**Host Fish**

Largemouth Bass, Smallmouth Bass

**Ecobasins**

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

**Habitats**

**Weight**

Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

**Problems Faced**

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Nutrient loading  
Source: Municipal/Industrial point source

Threat: Nutrient loading  
Source: Urban development

Threat: Sedimentation  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Road construction

Threat: Sedimentation  
Source: Urban development

## Data Gaps/Research Needs

Conduct life history study.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine genetic structure among extant populations across the range.

Determine habitat preferences and availability,

Determine host fish availability.

## Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Low	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection
Reduce cattle access to the Illinois River.	High	Habitat Protection

## Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

## Comments

Federally-listed endangered species. Endemic to Arkansas River drainage streams in Arkansas, Oklahoma, Kansas and Missouri. Most imperiled in Kansas streams where it has been lost in several stream segments. Propagation and augmentation efforts are showing signs of success in Kansas streams. Genetic research to determine phylogenetic relationships was completed in 2004 and confirmed the Neosho Mucket as a valid species. (AFMC 2004a, 2004b, 2004c, 2005, Chris Barnhart, personal communication 2005, USFWS 2013).

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis sp. A cf hydiana*

"Arkoma" Fatmucket

Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **15** out of 100

Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** unknown**Description**

Currently undescribed.

**Host Fish**

*Lampsilis sp. A cf hydiana*  
"Arkoma" Fatmucket

Unknown

---

## Ecobasins

Arkansas Valley - Arkansas River

---

Ouachita Mountains - Arkansas River

---

## Habitats

Natural Pool: - Small - Medium

## Weight

Data Gap

Natural Riffle: - Small - Medium

Data Gap

Natural Run: - Small - Medium

Data Gap

## Problems Faced

Threat: Sedimentation

Source: Resource extraction

---

## Data Gaps/Research Needs

Conduct life history study.

---

Describe species and determine distribution.

---

Determine habitat preferences.

---

Determine host fish suitability and availability.

---

Identify threats and sources of threats.

---

## Conservation Actions

More data are needed to determine conservation actions.

## Importance Category

Medium Data Gap

---

## Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

---

## Comments

This is an undescribed species that was historically treated as *Lampsilis hydiana*. Future work will develop global and state rankings and needs for this species (AFMC 2004a, 2004b, 2004c, 2005, Harris and others 2004).

---

## Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis sp. B cf hydiana*

"Red River" Mucket

Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **19** out of 100

Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** unknown**Description**

Currently undescribed.

**Host Fish**

*Lampsilis sp. B cf hydiana*  
"Red River" Mucket



Unknown

**Ecobasins**

South Central Plains - Red River

<b>Habitats</b>	<b>Weight</b>
Natural Pool: - Medium	Suitable
Natural Riffle:	Data Gap
Natural Run:	Data Gap

**Problems Faced**

Threat:

Source:

**Data Gaps/Research Needs**

Conduct life history study.

Determine distribution.

Determine habitat preferences.

Determine host fish suitability and availability.

Identify threats and sources of threats.

<b>Conservation Actions</b>	<b>Importance</b>	<b>Category</b>
More data are needed to determine conservation actions.	Medium	Data Gap

**Monitoring Strategies**

Additional information is needed before a monitoring strategy can be developed.

**Comments**

This is an undescribed species that was historically treated as *Lampsilis hydiana*. Future work will develop global rankings. State ranks have been developed. (AFMC 2004a, 2004b, 2004c, 2005, Harris and others 2004; Harris and others 2015).

**Taxa Association Team and Peer Reviewers**

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Lampsilis streckeri*

## Speckled Pocketbook

Class: Bivalvia

Order: Unionoida

Family: Unionidae

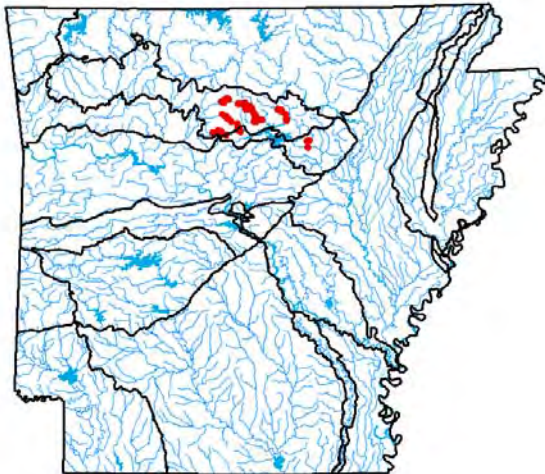
Priority Score: **80** out of 100

©Bill Posey

Population Trend: Stable

Global Rank: G1Q — Critically imperiled (questionable taxonomy)

State Rank: S1 — Critically imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel**Description**

Shell oblong to quadrate, moderately inflated with thin to moderately thick valves. Pseudocardinal and lateral teeth are thin but well developed. Shell color ranges from yellow to green to tan, with

numerous thin, broken rays and flecks extending from the umbo to the posterior margin. Nacre grayish to iridescent, and maximum length is about four inches.

**Host Fish**

Green Sunfish, Bluegill, Longear Sunfish, Redear Sunfish, Spotted Sunfish, Smallmouth Bass, Spotted Bass, Largemouth Bass

**Ecobasins**

Boston Mountains - White River

**Habitats**

**Weight**

Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

**Problems Faced**

Threat: Habitat destruction  
Source: Dam

Threat: Habitat destruction  
Source: Grazing/Browsing

Threat: Habitat destruction  
Source: Resource extraction

Threat: Nutrient loading  
Source: Confined animal operations

Threat: Nutrient loading  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Forestry activities

Threat: Sedimentation  
Source: Grazing/Browsing

Threat: Sedimentation  
Source: Resource extraction

Threat: Sedimentation  
Source: Road construction

**Data Gaps/Research Needs**

Conduct status survey.

Survey for additional populations.

<b>Conservation Actions</b>	<b>Importance</b>	<b>Category</b>
Develop an outreach program.	Medium	Public Relations/Education
Implement Safe Harbor Agreement.	High	Habitat Restoration/Improvement
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life in the Little Red River basin.	High	Threat Abatement
Propagate, augment or reintroduce species where appropriate.	Low	Population Management
Protect and enhance riparian buffers.	High	Habitat Protection
Protect host fish and associated habitat.	Medium	Habitat Protection

### **Monitoring Strategies**

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

### **Comments**

Federally-listed endangered species. Endemic to Little Red River. Previously thought to only remain in Middle Fork Little Red River, but recent surveys found small populations in all forks (AFMC 2004a, 2004b, 2004c, 2005). Genetic research has confirmed the validity of this species (Harris and others 2004). The species has also been discovered in Big Creek, a tributary occurring downstream of Greers Ferry Dam.

### **Taxa Association Team and Peer Reviewers**

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

*Leptodea leptodon*

## Scaleshell

Class: Bivalvia

Order: Unionoida

Family: Unionidae

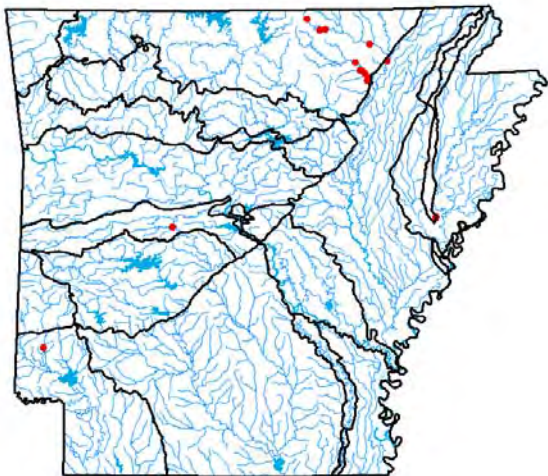
Priority Score: **76** out of 100

©Bill Posey

Population Trend: Decreasing

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

**Distribution****Occurrence Records**

Ecoregions where the species occurs:

- Ozark Highlands
- Boston Mountains
- Arkansas Valley
- Ouachita Mountains
- South Central Plains
- Mississippi Alluvial Plain
- Mississippi Valley Loess Plains

**Suitable Substrate** gravel/sand**Description**

Shell relatively small, elongate, thin, and compressed. Anterior end rounded, posterior end pointed. Dorsal margin straight, ventral margin straight to broadly curved. Umbos small and low, about even

with the hinge line. Beak sculpture, if visible, of four or five double-looped ridges. Shell smooth, yellowish green or brown, with numerous faint green rays. Length to 4 inches (10.2 cm). Pseudocardinal teeth reduced to a small thickened ridge. Lateral teeth moderately long; two low, indistinct lateral teeth in left valve, one fine tooth in the right. Beak cavity very shallow or absent. Nacre pinkish white or light purple and highly iridescent.

### Host Fish

Freshwater Drum

### Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Ouachita Mountains - Arkansas River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

### Habitats

### Weight

Natural Glide: Headwater

Optimal

Natural Riffle: Headwater

Optimal

Natural Run: Headwater - Medium - Large

Optimal

Natural Shoal: - Medium - Large

Suitable

### Problems Faced

Threat: Habitat destruction

Source: Dam

Threat: Habitat destruction

Source: Grazing/Browsing

Threat: Habitat destruction

Source: Resource extraction

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing/Browsing

Threat: Sedimentation

Source: Forestry activities

Threat: Sedimentation

Source: Road construction

### Data Gaps/Research Needs

Conduct status surveys.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Develop and implement a habitat conservation plan.	High	Habitat Restoration/Improvement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	High	Habitat Restoration/Improvement

### Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

### Comments

Federally-listed endangered species. Poorly known, difficult to detect and extremely rare. Occurs in Arkansas, but distribution and densities not well understood. Scaleshell is found with increasing difficulty. Those found have been so rare that they do not appear to be members of viable populations. There has been no evidence of recent reproduction (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, ANHI 2003, Bates and Dennis 1983, Branson 1984, Clark 1985, 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson and others 1997, Gordon 1980, 1980a, 1985, Gordon and others 1980, Harris 1992b, 1999, 1999a, 2002, Harris and Gordon 1987, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, Johnson 1980, Mehlhop-Cifelli and Miller 1989, Oesch 1995, ONHI 2003, Stansbery 1970, Stoeckel and Mole 2002, Szymanski 1998, Turgeon and others 1988, 1998, USDA FS 1999, USDI FWS 1998, Vaughn 1996, Vaughn and Spooner 2000, Vaughn and others 1996, Wheeler 1918, Williams & others 1993).

A life history study was conducted by Barnhart and others in 1998, and a status assessment was completed in 2013 (Bouldin and others).

### Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing