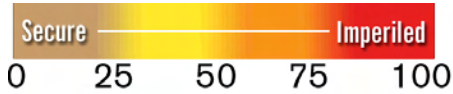


Alasmidonta marginata

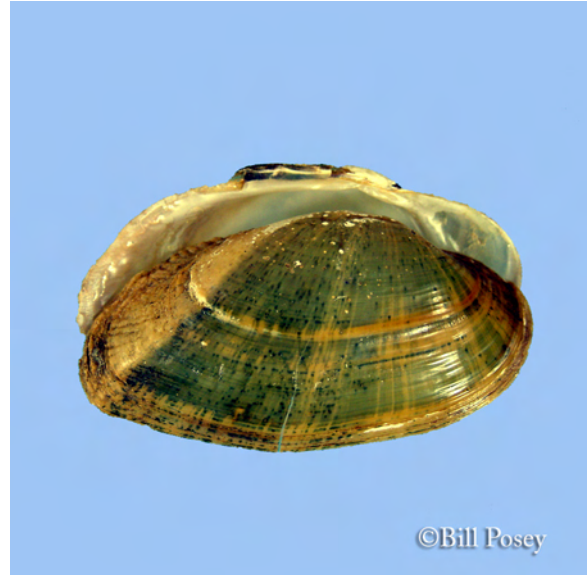
Elktoe

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **19 out of 100**



Population Trend: Unknown

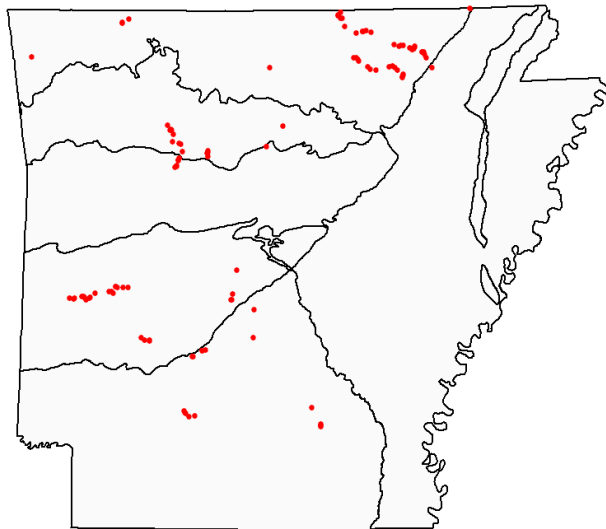


©Bill Posey

G Rank: G4 – Apparently secure species

S Rank: S3 – Vulnerable in Arkansas

Distribution



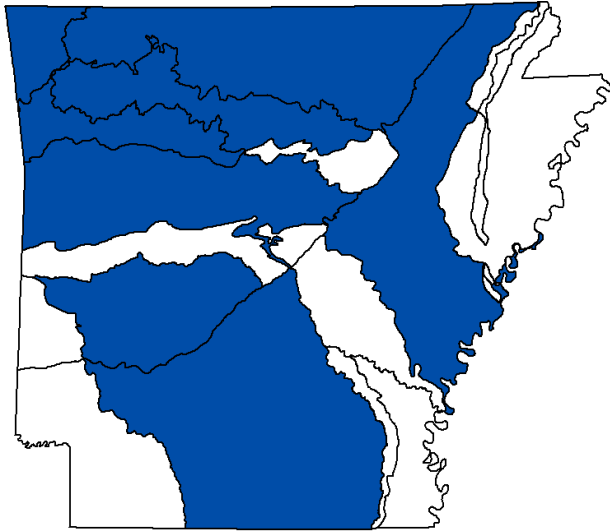
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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.

Substrate

gravel/cobble

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

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

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Grazing

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

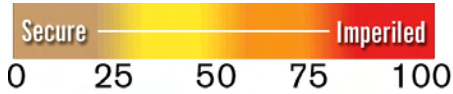
Widespread but rare. Rangewide population status of the elktoe mussel is not known. (AFMC 2004a, AFMC 2004b, AFMC 2004c, AFMC 2005, AGFC 2003, AGFC 1991-1999, AHTD 1984, AHTD 1994, ANHI 2003, Bates and Dennis 1983, Branson 1983, Burns and McDonnell 1992a, Clark 1987, Crump 2003, Cummings and Mayer 1992, 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).

Alasmidonta viridis

Slippershell Mussel

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **31 out of 100**



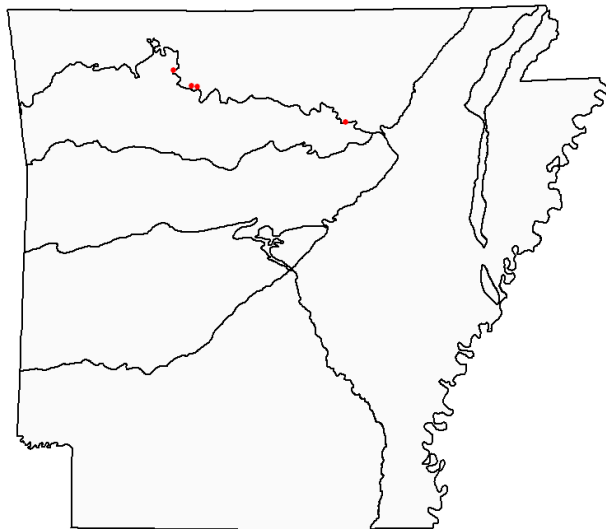
Population Trend: Decreasing



G Rank: G4G5 – Apparently secure (uncertain rank)

S Rank: S1 – Critically imperiled in Arkansas

Distribution



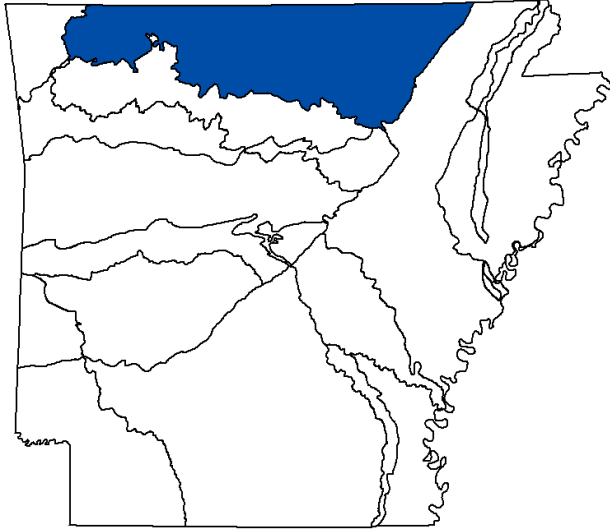
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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.

Substrate

gravel

Host Fish

mottled sculpin, banded sculpin, johnny darter

Ecobasins

Ozark Highlands - White River

Habitats

Natural Riffle: Headwater
 Natural Run: Headwater

Weight

Suitable
 Optimal

Problems Faced

Threat: Habitat destruction
Source: Grazing

Threat: Habitat destruction
Source: Recreation

Threat: Habitat destruction
Source: Road construction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing

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

	Importance	Category
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

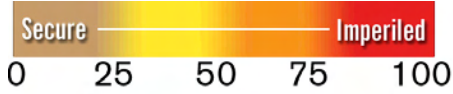
Ristricted range and extremely rare. Since 1996, few specimens have been recorded (AFMC 2004a, 2004b, 2004c, 2005, Harris 1996).

Anodonta suborbiculata

Flat Floater

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **15 out of 100**



Population Trend: Unknown

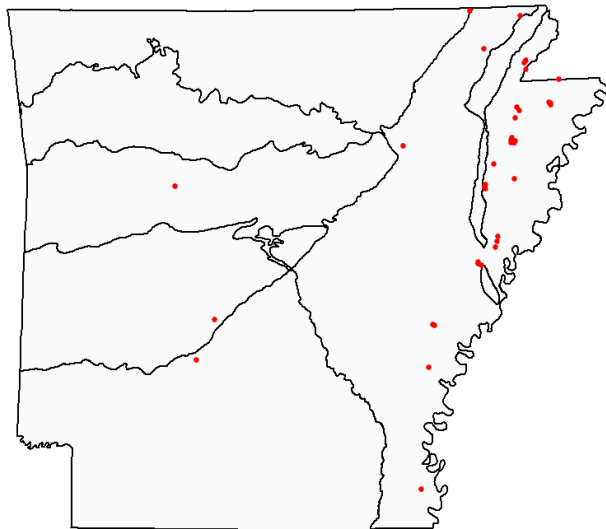


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G Rank: G5 – Secure

S Rank: S3 – Vulnerable in Arkansas

Distribution



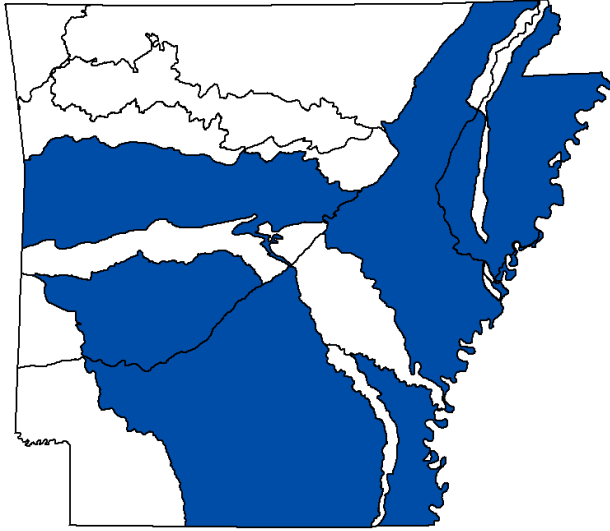
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

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Ecobasins where the species occurs

Substrate

silt/clay

Description

Shell large, thin, nearly circular, and compressed to slightly inflated in some individuals. Anterior and ventral margins broadly rounded, posterior end bluntly pointed. Dorsal margin flattened and nearly straight. Umbos low, flattened, not raised above the hinge line. Beak sculpture of three or four irregular or broken double-looped ridges. A small wing occasionally present behind the umbo. Shell smooth, shiny, yellow or yellowish green to dark brown, with fine green rays in some individuals. Length to seven inches (17.8 cm). Both valves without teeth, hinge line only slightly thickened. Beak cavity large and very shallow. Nacre white or pinkish white and iridescent

Host Fish

Channel catfish, green sunfish, warmouth, longear sunfish, largemouth bass, golden shiner, white crappie

Ecobasins

Arkansas Valley - Arkansas River

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Mississippi River Alluvial Plain (Lake Chicot) -
Mississippi River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats

	Weight
Man-made Littoral: - Small	Optimal
Man-made Pelagic: - Small	Marginal
Natural Littoral: - Large	Optimal
Natural Other: - Medium - Large	Marginal
Natural Oxbow - connected: - Medium - Large	Optimal
Natural Oxbow - disconnected:	Suitable
Natural Pelagic: - Large	Marginal
Natural Side channel: - Medium - Large	Optimal
Natural Slough: - Medium - Large	Suitable

Problems Faced

Threat: Biological alteration
Source: Exotic species

Threat: Biological alteration
Source: Predation

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Crop production practices

Threat: Hydrological alteration
Source: Commercial/industrial development

Threat: Hydrological alteration
Source: Water diversion

Data Gaps/Research Needs

Conduct life history study.

Conduct status survey.

Determine habitat preferences.

Survey for additional populations.

Conservation Actions

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

Importance	Category
Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

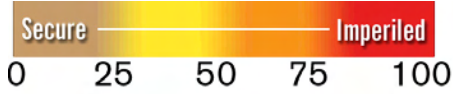
Widespread, rare to locally abundant. The fact that it is declining in other states within its range may imply that it is either not doing well or it is not detected during general mussel surveys since it is typically found in backwater areas that are susceptible to dewatering or in heavily silted areas. (AFMC 2004a, AFMC 2004b, AFMC 2004c, AFMC 2005, AGFC 2003, AHTD 1984, AHTD 1994, Ahlstedt and Jenkinson 1987, 1991, ANHI 2003, Bates and Dennis 1983, Clark 1985, 1987, Coker 1919, Crump 2003, Cummins and Mayer 1992, Davidson 1997, Davidson and others 2000, Ecological Consultants 1984, Foti and Bukenhofer 1998, Gordon 1980a, 1982, Gordon and Brown 1980, Harris 1989b, 1991c, 1997a, 1999, 1999a, 2001, Harris and Gordon 1987, 1990, Harris and Milam 2002, 2002a, Harris and others 1993, 1997, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Oesch 1995, ONHI 2003, Rust 1993, Stansbery and Stein 1982, Stewart 1995, Stoeckel and others 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

Arcidens confragosus

Rock Pocketbook

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **19 out of 100**



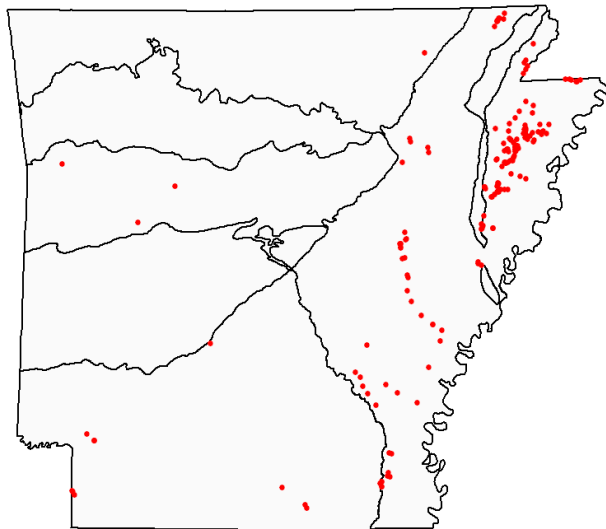
Population Trend: Unknown



G Rank: G4 – Apparently secure species

S Rank: S3 – Vulnerable in Arkansas

Distribution



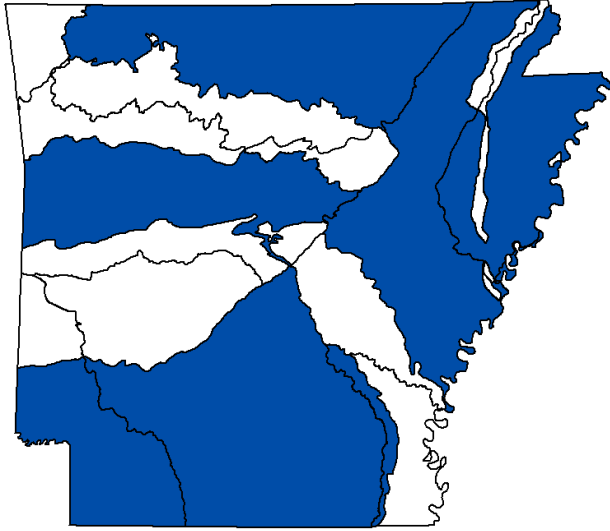
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

Substrate

sand/silt

Description

Shell thin to moderately thick, elliptical, and inflated. Anterior end rounded, posterior end squared or bluntly pointed. Ventral margin straight or slightly rounded. Umbos full, elevated above the hinge line and located near the middle of the shell. Beak sculpture of large pronounced knobs or double-looped ridges that continue to the edge of the shell in two rows, developing into folds on the surface. Periostracum dark green, brown, or black. Length to seven inches (17.8 cm). Pseudocardinal teeth compressed, elongate; two in the left valve, one in the right. Poorly developed lateral teeth, often present only as a finely serrated thickening of the hinge line. Beak cavity moderately deep. Nacre white, iridescent on the posterior third.

Host Fish

rock bass, American eel, freshwater drum, gizzard shad, channel catfish, white crappie

Ecobasins

Arkansas Valley - Arkansas River

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats

Natural Pool: - Small - Medium - Large

Natural Run: - Small - Medium - Large

Weight

Optimal

Suitable

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Determine habitat preferences.

Determine problems faced and sources of problems faced.

Conservation Actions

Importance **Category**

More data are needed to determine conservation actions.

Medium

Data Gap

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

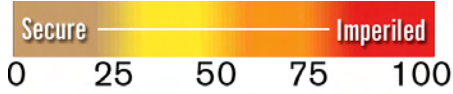
Widespread but usually not abundant at any site. (AFMC 2004a, AFMC 2004b, AFMC 2004c, AFMC 2005).

Arkansia wheeleri

Ouachita Rock Pocketbook

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **80 out of 100**



Population Trend: Unknown

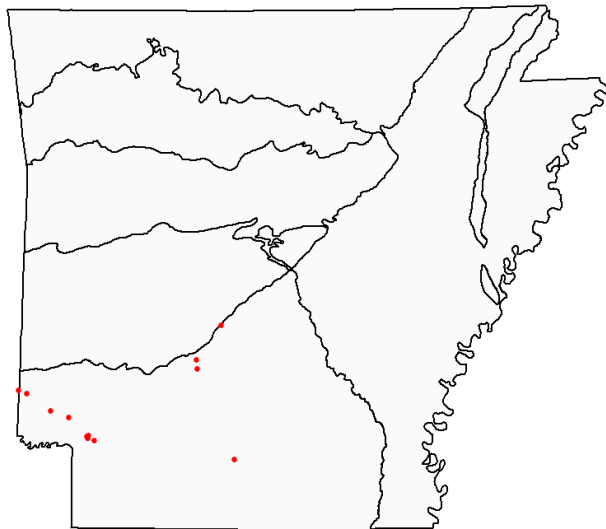


©Bill Posey

G Rank: G1 – Critically imperiled species

S Rank: S1 – Critically imperiled in Arkansas

Distribution



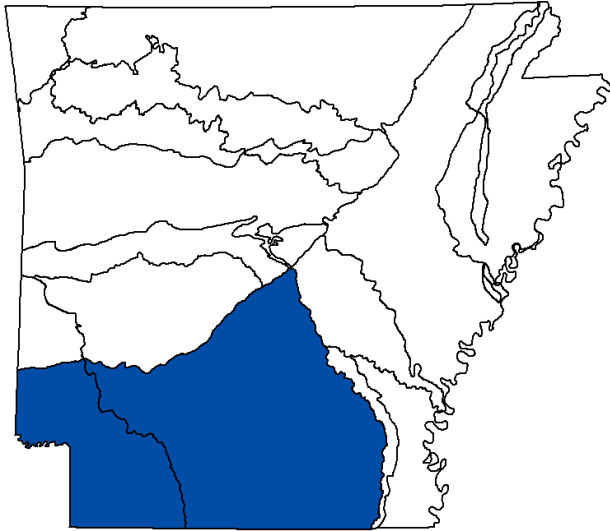
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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 to 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.

Substrate

gravel/cobble/sand

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

Natural Oxbow - connected: - Medium - Large
 Natural Pool: - Medium - Large
 Natural Run: - Medium - Large
 Natural Shoal: - Medium - Large

Weight

Optimal
 Suitable
 Optimal
 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

Conduct status survey.

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

Determine habitat preferences and habitat availability.

Determine sustainable flow below dams to improve habitat.

Survey streams and rivers for unknown populations.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Implement habitat conservation plan.	High	Habitat Protection
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.	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

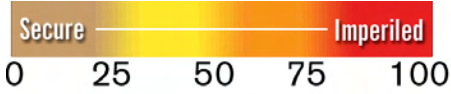
Federally-listed endangered species. Populations occur in the Kiamichi and Glover rivers in Oklahoma, and the Little River system in Oklahoma and Arkansas. The only known reproducing population, based on juveniles and gravid females, occurs in the Little River in Arkansas. This species should be considered for reintroduction to the Ouachita River as part of recovery efforts. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, 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, 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).

Cumberlandia monodonta

Spectaclecase

Class: Bivalvia
 Order: Unionoida
 Family: Margaritiferidae

Priority Score: **52 out of 100**

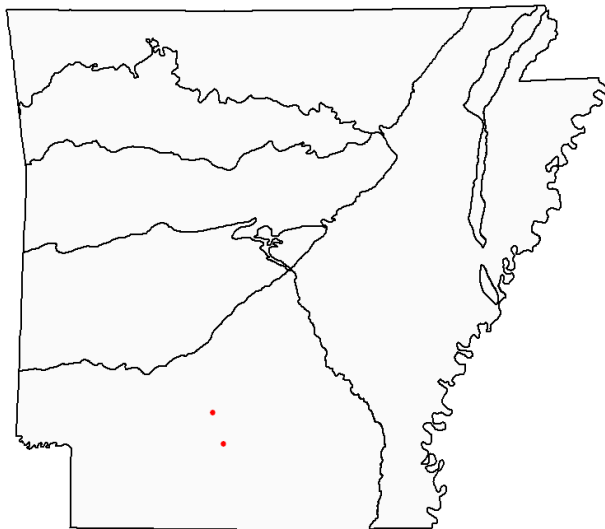


Population Trend: Decreasing



G Rank: G2G3 – Imperiled (uncertain rank)
 S Rank: S1 – Critically imperiled in Arkansas

Distribution



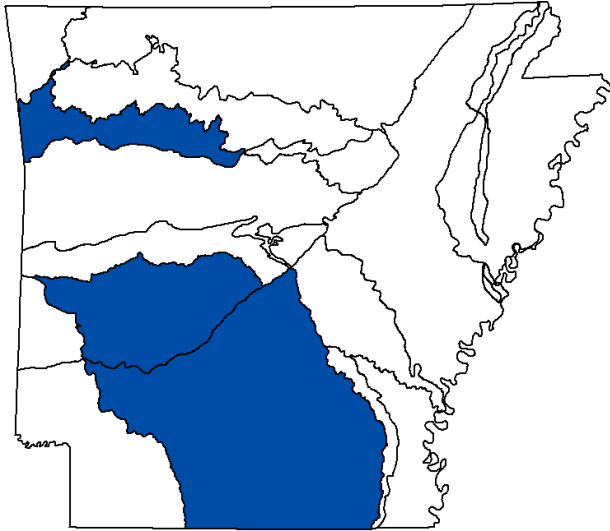
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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

Substrate

gravel

Host Fish

unknown

Ecobasins

Boston Mountains - Arkansas River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats

Natural Pool: Headwater - Medium - Large

Natural Run: - Medium - Large

Natural Shoal: - Medium - Large

Weight

Optimal

Optimal

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.

Conduct genetic studies to determine taxonomy of the different groups.

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

Conservation Actions	Importance	Category
Develop an outreach/education program.	Low	Public Relations/Education
Develop and implement habitat conservation plan.	Low	Habitat Restoration/Improvement
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

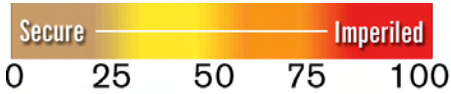
Federally-listed candidate species. Extremely rare, on periphery of range. Known from one relict above Lake Ouachita but known to occur downstream of Rammel Dam (Malvern, Ark.) in the Ouachita River mainstem. One record reported from the Mulberry River. A difficult species to detect since it utilizes habitat that is not generally used by other bivalve species. Two 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, 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).

Cyclonaias tuberculata

Purple Wartback

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **15 out of 100**



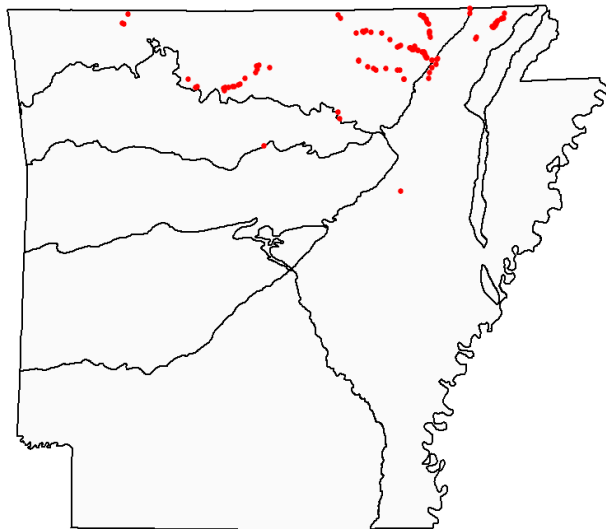
Population Trend: Unknown



G Rank: G5 – Secure

S Rank: S3? – Vulnerable in Arkansas (inexact numeric rank)

Distribution



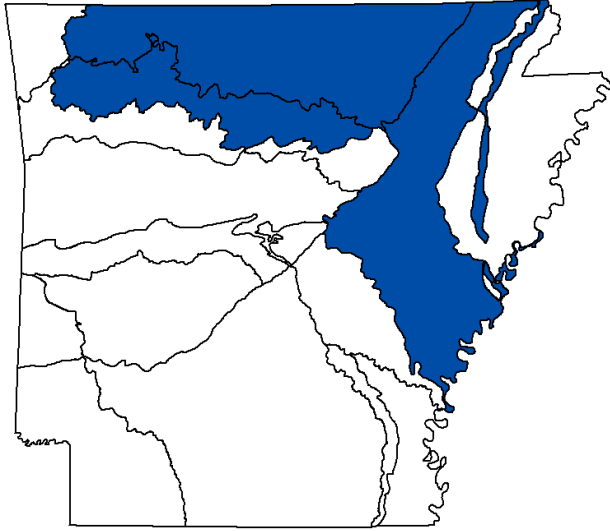
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

Description

Shell round, moderately thick, and compressed to moderately inflated (large rivers). Anterior end rounded, posterior end somewhat squared off. Dorsal margin straight, a wing present behind the umbo; ventral margin curved. Umbos low, even with, or barely rising above the hinge line. Beak sculpture of numerous wavy ridges covering the surface of the umbo. Shell surface, except the anterior fourth, covered with tubercles, forming small ridges on the dorsal wing. Periostracum yellowish brown or greenish brown in young shells (rarely rayed), becoming dark brown in older shells. Length to five inches (12.7 cm). Pseudocardinal teeth large and well developed; two in the left valve, one in the right (usually with a small tooth on either side). Lateral teeth short, striated, and straight or slightly curved; two in the left valve, one in the right. Beak cavity very deep. Nacre usually deep purple, occasionally white with a purple tinge.

Substrate

sand/gravel

Host Fish

black bullhead, yellow bullhead, channel catfish, flathead catfish

Ecobasins

Boston Mountains - White River

Mississippi River Alluvial Plain - White River

Mississippi Valley Loess Plains - St. Francis River

Ozark Highlands - White River

Habitats

Natural Pool: Headwater - Medium - Large

Natural Riffle: Headwater

Natural Run: Headwater - Medium - Large

Natural Shoal: - Medium - Large

Weight

Suitable

Suitable

Optimal

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

Data Gaps/Research Needs

Determine habitat preferences and availability.

Determine host fish and host fish availability.

Determine regional life history.

Conservation Actions

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

Importance	Category
Medium	Threat Abatement

Monitoring Strategies

Monitor occurrence in ongoing river surveys.

Comments

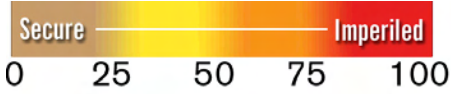
Widespread and locally abundant in White River drainage. Rare in the St. Francis River drainage (AFMC 2004a, 2004b, 2004c, 2005).

Cyprogenia aberti

Western Fanshell

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **57 out of 100**



Population Trend: Decreasing

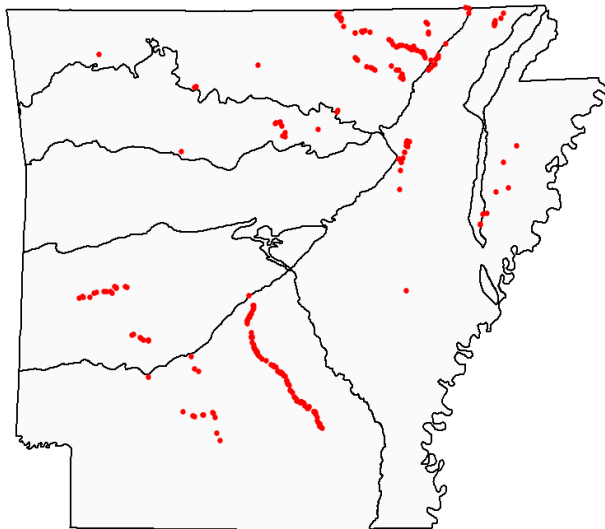


©Bill Posey

G Rank: G2 – Imperiled species

S Rank: S2 – Imperiled in Arkansas

Distribution



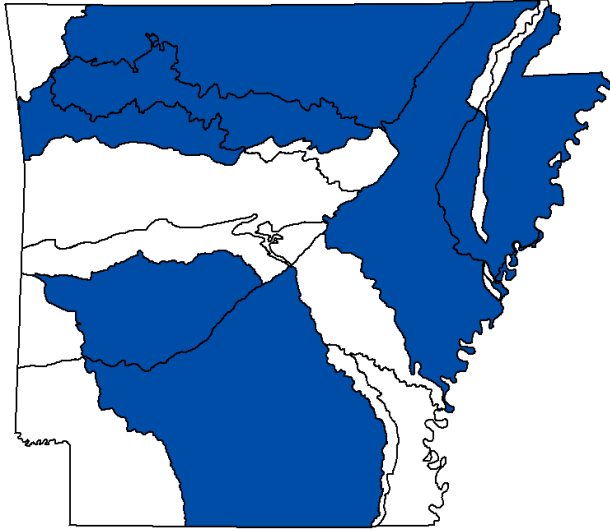
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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

goldfish, banded sculpin, fantail darter, logperch

Ecobasins

Boston Mountains - Arkansas River

Boston Mountains - White River

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Ouachita Mountains - Ouachita River

Ozark Highlands - White River

South Central Plains - Ouachita 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

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing

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

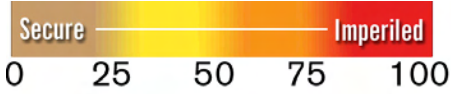
Ongoing taxonomic work indicates that this complex may be comprised of more than one species, possibly up to five. Widespread, rare to locally common. The western fanshell may be declining across its range (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1987, 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).

Ellipsaria lineolata

Butterfly

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **19 out of 100**



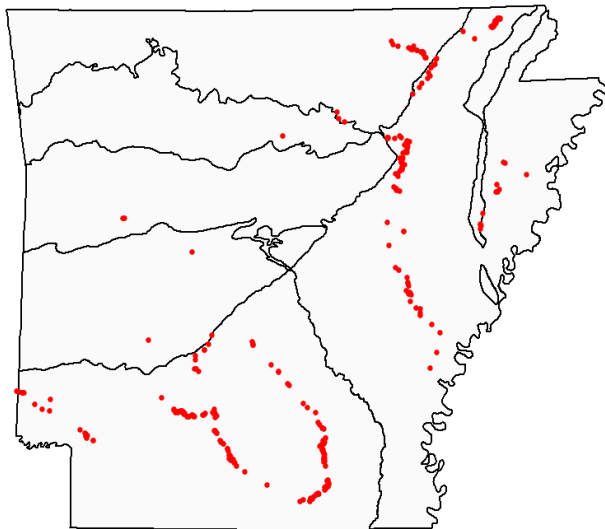
Population Trend: Unknown



G Rank: G4 – Apparently secure species

S Rank: S3 – Vulnerable in Arkansas

Distribution



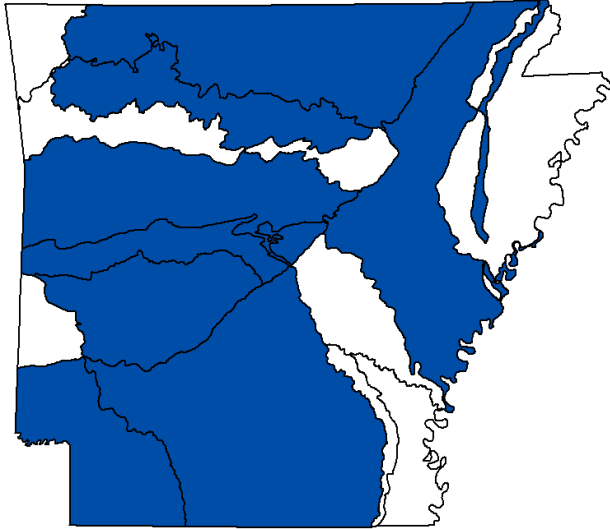
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

Substrate

sand/gravel

Description

Shell somewhat triangular, thick, solid, and compressed. Anterior end broadly rounded, posterior end pointed. Umbos compressed, directed forward, and not elevated above the hinge line. Posterior ridge sharply defined. Lateral surfaces broadly flattened, less so in older females. Beak sculpture, if visible, of a few fine, double-looped ridges. Shell smooth, yellow or yellowish green, with scattered brown rays that are usually broken into V-shaped or irregular rectangular blotches. Old shells with faint brown rays or rayless. Length to four inches (10.2 cm). Pseudocardinal teeth relatively large, slightly elevated, serrated, and divergent; two in the left valve, one in the right. Usually two lateral teeth in each valve, serrated, short, and straight. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.

Host Fish

freshwater drum, green sunfish, sauger

Ecobasins

Arkansas Valley - Arkansas River

Boston Mountains - White River

Mississippi River Alluvial Plain - White River

Mississippi Valley Loess Plains - St. Francis River

Ouachita Mountains - Arkansas River

Ouachita Mountains - Ouachita River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Pool: - 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: Dam

Threat: Hydrological alteration
Source: Confined animal operations

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Grazing

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Crop production practices

Threat: Sedimentation
Source: Dam

Data Gaps/Research Needs

Determine habitat preferences and availability.

Determine host fish suitability and availability.

Determine regional life history.

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

Continue to monitor occurrence in ongoing river surveys.

Comments

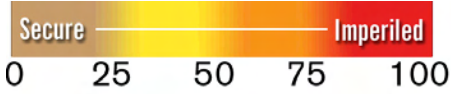
The butterfly is found in medium to large rivers with gravel and gravel-sand substrate and moderate current. It is considered widespread but typically not abundant. The status of this species in Arkansas is relatively uncertain but is often detected during general mussel surveys (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1994, ANHI 2003, Bates and Dennis 1983, Brann 1947, Branson 1984, Christian 1995, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Dames and Moore 1997, Davidson 1997, Ecological Consultants 1984, Gordon 1980a, 1982, Gordon and others 1980, Harris 1986, 1987, 1989a, 1989b, 1992b, 1994b, 1994c, 1995, 1997c, 1999, 1999a, 2001, 2002, 2002a, Harris and Gordon 1990, Harris and Milam 2002a, Jenkinson and Ahlstedt 1987, 1994, Mehlhop-Cifelli and Miller 1989, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery and Stein 1982, Stein and Stansbery 1980, USDA FS 1999, Vaughn 1996, Vaughn and others 1993, White 1977).

Epioblasma florentina curtisi

Curtis Pearlymussel

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **100** out of 100



Population Trend: Decreasing

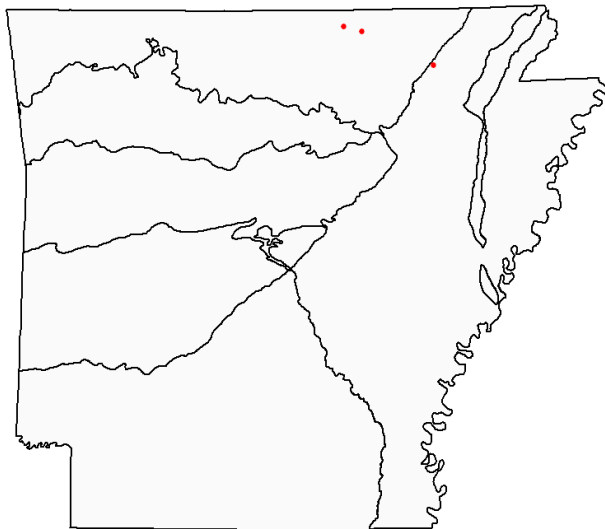


©Ohio State University

G Rank: G1T1 – Critically imperiled subspecies

S Rank: S1 – Critically imperiled in Arkansas

Distribution



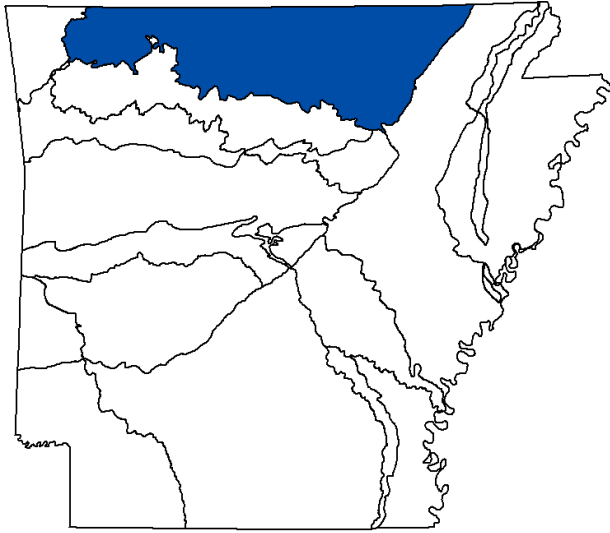
Ecoregions where the species occurs:



Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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.

Substrate

gravel

Host Fish

rainbow darter

Ecobasins

Ozark Highlands - White River

Habitats

Natural Riffle: Headwater

Natural Run: Headwater

Weight

Suitable

Optimal

Problems Faced

Threat: Habitat destruction

Source: Grazing

Threat: Habitat destruction

Source: Recreation

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing

Threat: Nutrient loading

Source: Urban development

Data Gaps/Research Needs

Conduct status survey.

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

Determine host fish and host fish availability.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Develop and implement habitat conservation plan.	High	Habitat Restoration/Improvement
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

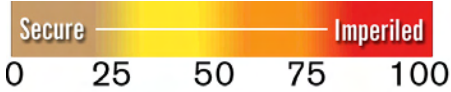
Historically known from the Spring Rivers in Arkansas. Reported from South Fork Spring River in early 1980s. Recent surveys of Spring River yielded no live, dead or relict specimens. The last live specimen was found in the Little Black River in Missouri in 1993 (AFMC 2004a, 2004b, 2004c, 2005, Bruendeman and others 2001).

Epioblasma triquetra

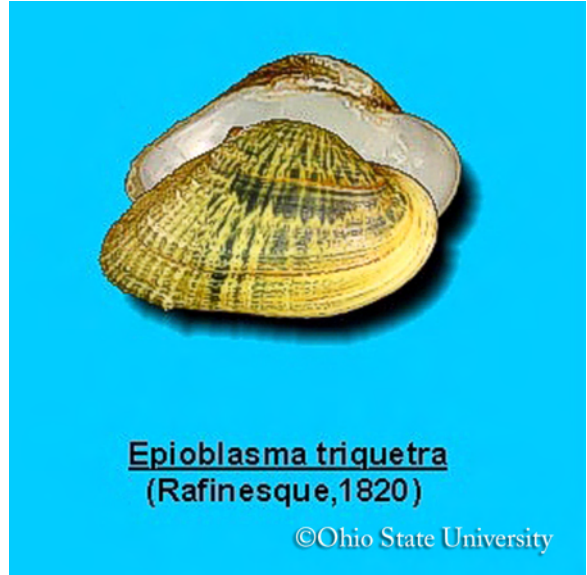
Snuffbox

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **43 out of 100**

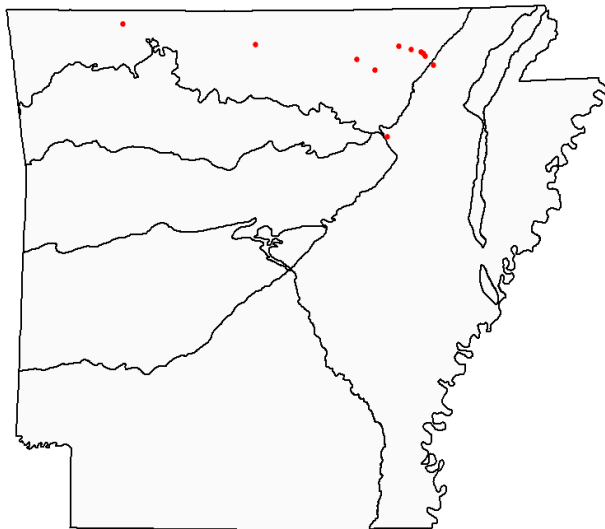


Population Trend: Decreasing



G Rank: G3 – Vulnerable species
 S Rank: S1 – Critically imperiled in Arkansas

Distribution



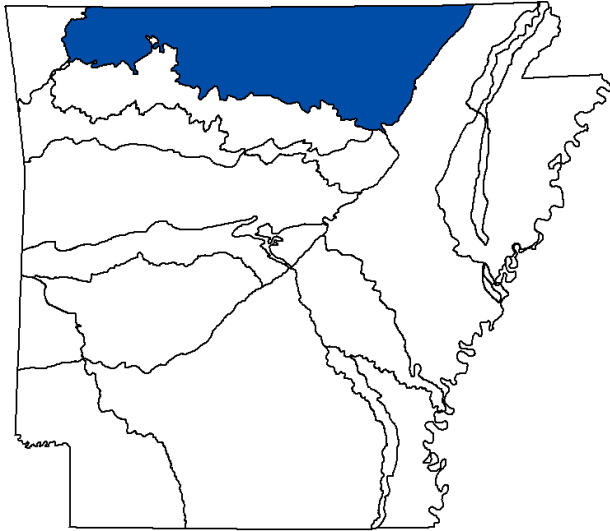
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

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Ecobasins where the species occurs

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.

Substrate

gravel

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

Threat: Habitat destruction
Source: Recreation

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing

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.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Develop and implement habitat conservation plan.	High	Habitat Restoration/Improvement
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

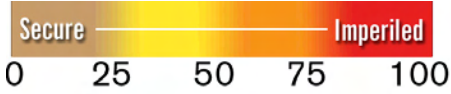
Only one live specimen reported from Arkansas since 2003. Relict shells have been found in the Kings and Strawberry rivers. Widespread distribution in North America but declining rangewide and is thought to exist in 40 percent of its former range (AFMC 2004a, 2004b, 2004c, 2005, Roe 2002).

Epioblasma turgidula

Turgid Blossom

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **100** out of 100



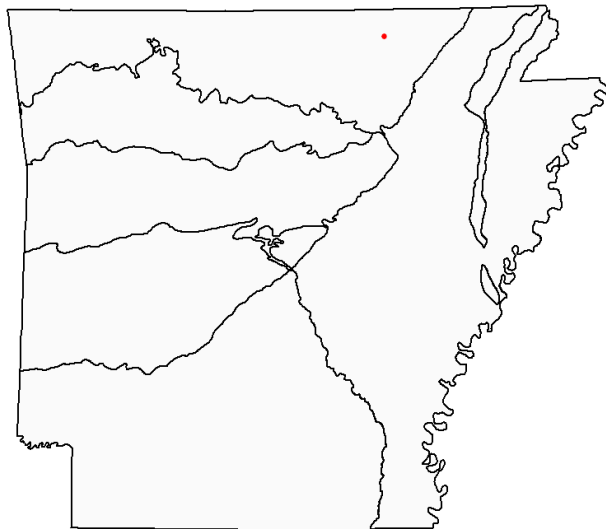
Population Trend: Decreasing



G Rank: GH – Possibly extinct

S Rank: SX – Presumed extinct

Distribution



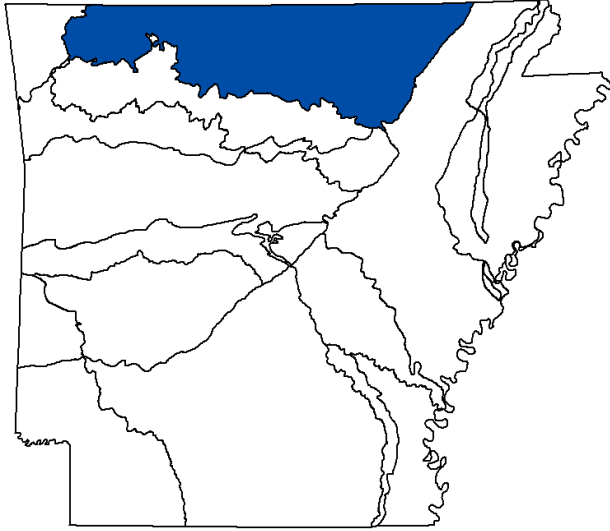
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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.

Substrate

gravel

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

Threat: Habitat destruction

Source: Recreation

Threat: Nutrient loading

Source: Confined animal operations

Threat: Nutrient loading

Source: Grazing

Threat: Nutrient loading

Source: Recreation

Data Gaps/Research Needs

Conduct life history studies.

Conduct status survey.

Conduct survey for additional populations.

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

Determine host fish.

Conservation Actions

Importance Category

Develop an outreach program.

Medium

Public Relations/Education

Develop and implement habitat conservation plan.

Medium

Habitat Restoration/Improvement

Propagate, augment and reintroduce species where appropriate.

Medium

Population Management

Protect habitat from recreational uses.

Medium

Habitat Protection

Protect or enhance riparian buffer.

Medium

Habitat Protection

Monitoring Strategies

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

Comments

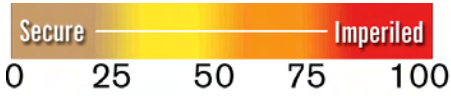
Possibly extinct but exhaustive surveys have not been conducted in Arkansas (AFMC 2004a, 2004b, 2004c, 2005, USFW 1985).

Fusconaia ozarkensis

Ozark Pigtoe

Class: Bivalvia
 Order: Unionoida
 Family: Unionidae

Priority Score: **27 out of 100**



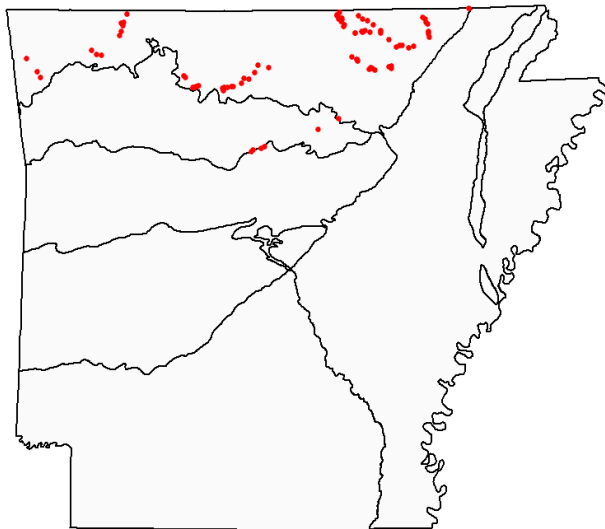
Population Trend: Unknown



G Rank: G3 – Vulnerable species

S Rank: S3 – Vulnerable in Arkansas

Distribution



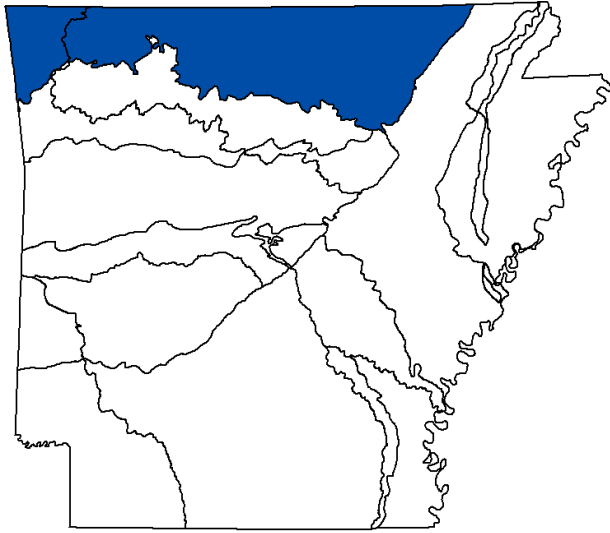
Ecoregions where the species occurs:

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

Element Occurrence Records

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. Alan Christian, TNC Mr. Doug Zollner, AHTD Dr. John Harris, AHTD Mr. Josh Seagraves



Ecobasins where the species occurs

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.

Substrate

gravel/cobble

Host Fish

unknown

Ecobasins

Ozark Highlands - Arkansas River

Ozark Highlands - White River

Habitats

Natural Glide: Headwater

Natural Pool: Headwater - Medium - Large

Natural Riffle: Headwater

Natural Run: Headwater - Medium - Large

Natural Shoal: - Medium - Large

Weight

Suitable

Suitable

Optimal

Optimal

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

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).