

# Overview of Mussel Diversity in the Apalachicola Basin in Alabama, Florida, and Georgia

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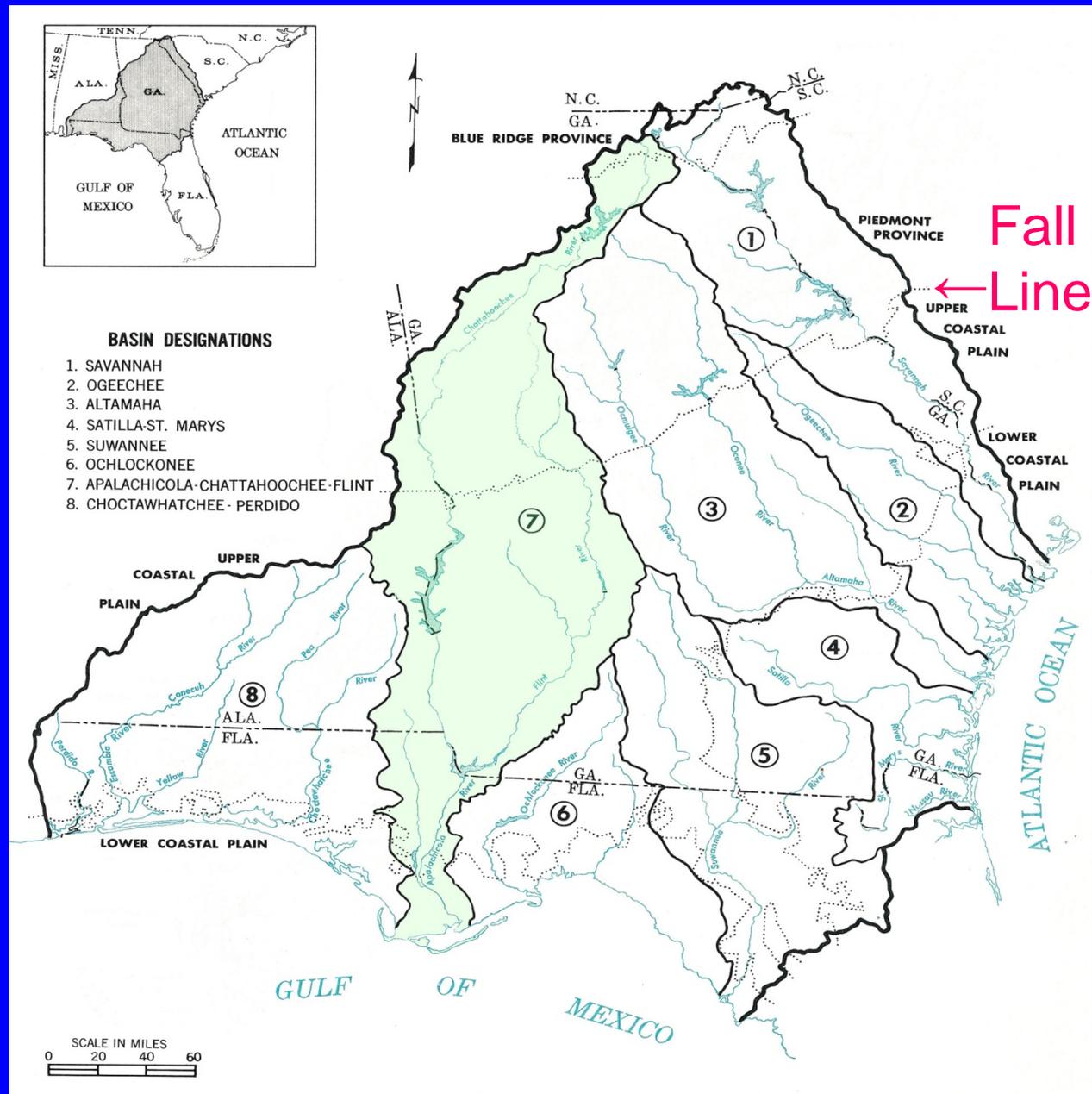
# Geographic Position of the ACF Basin

Easternmost Gulf Coast basin (and only 1 of 2) with headwaters above Fall Line.

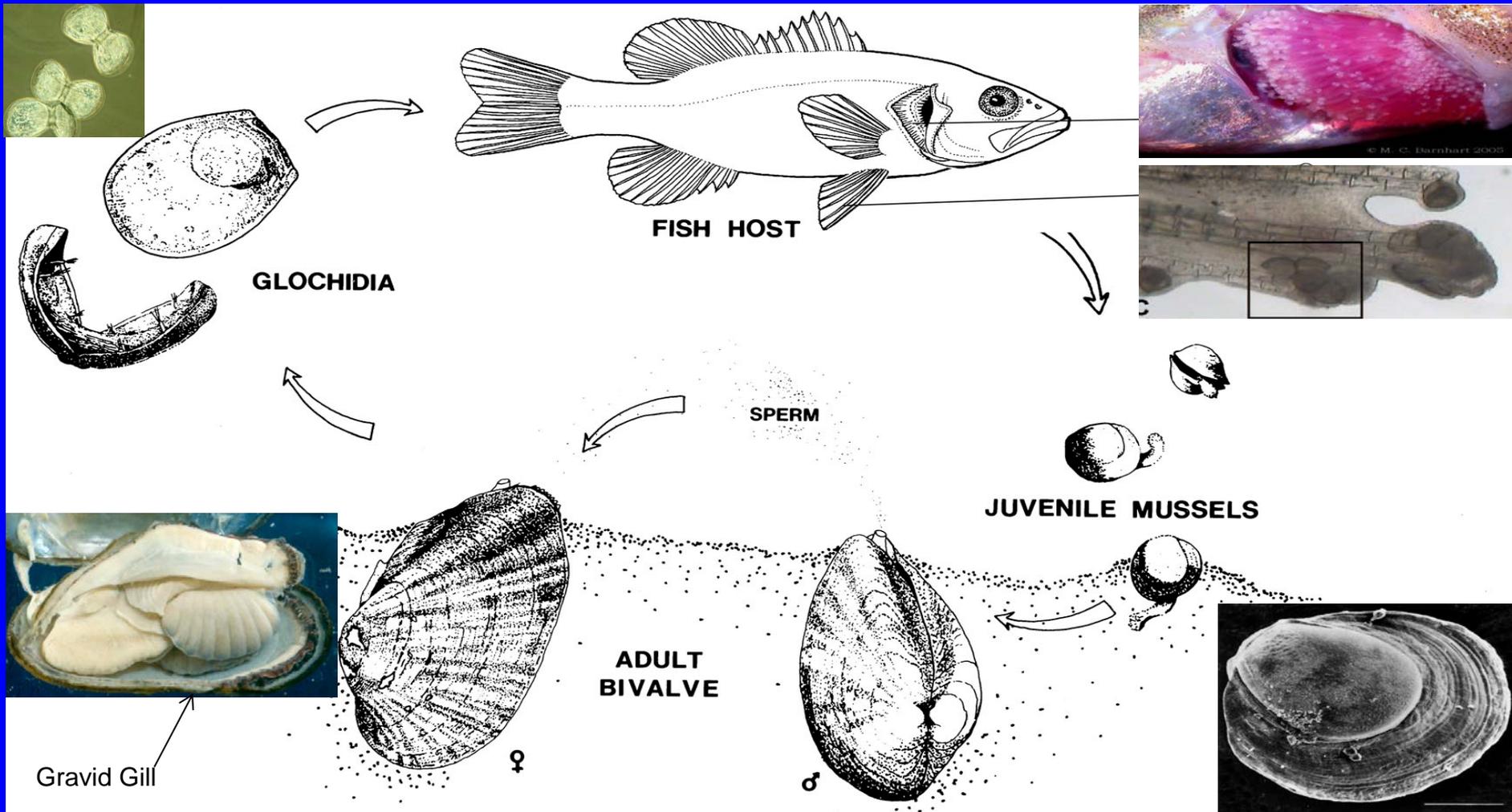
Abuts 2 Atlantic Coast basins (Savannah & Altamaha)

1 Interior basin (Tennessee)

4 Gulf Coast basins (Suwannee, Ochlockonee, Choctawhatchee & Mobile)



# Freshwater Mussel Life Cycle



The complex life cycle of freshwater mussels leaves them vulnerable to a variety of anthropogenic perturbations (e.g., alteration in flow, dredging) in aquatic systems. Host fishes for many of the Apalachicola Basin mussels remain unknown.

# Enhanced Host Fish Infection via Packaging of Glochidia into Conglutinates



*Ptychobranthus fasciolaris*  
conglutinates mimic larval fishes.



*Ptychobranthus subtentum*  
conglutinates mimic larval insects.

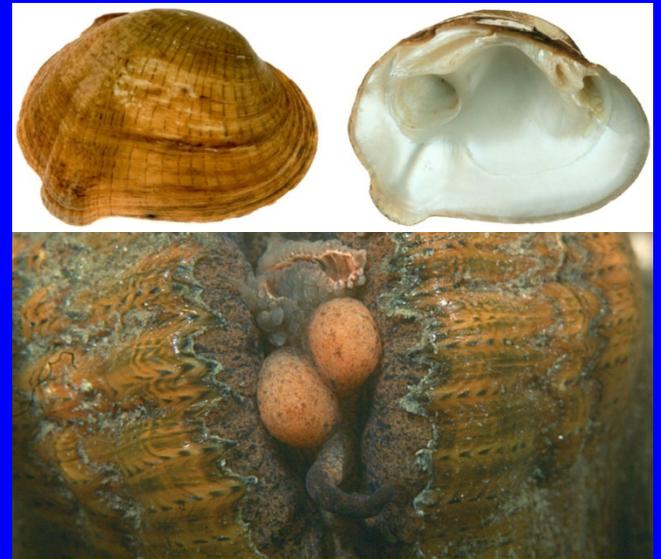
Conglutinates of *Dromus dromas* mimic flatworms?



# Lures of Gravid Females of the Genus *Epioblasma*



*Epioblasma brevidens*



*Epioblasma capsaeformis*

## Genus *Hamiota* - Endemic to SE U.S.



*Hamiota perovalis*. Early stages of superconglutinate discharge.



*Hamiota subangulata* in an artificial stream, discharging a superconglutinate attached to paired mucus tubes. May 1995.

# Apalachicola Basin Mussels...Their Place in the Big Picture

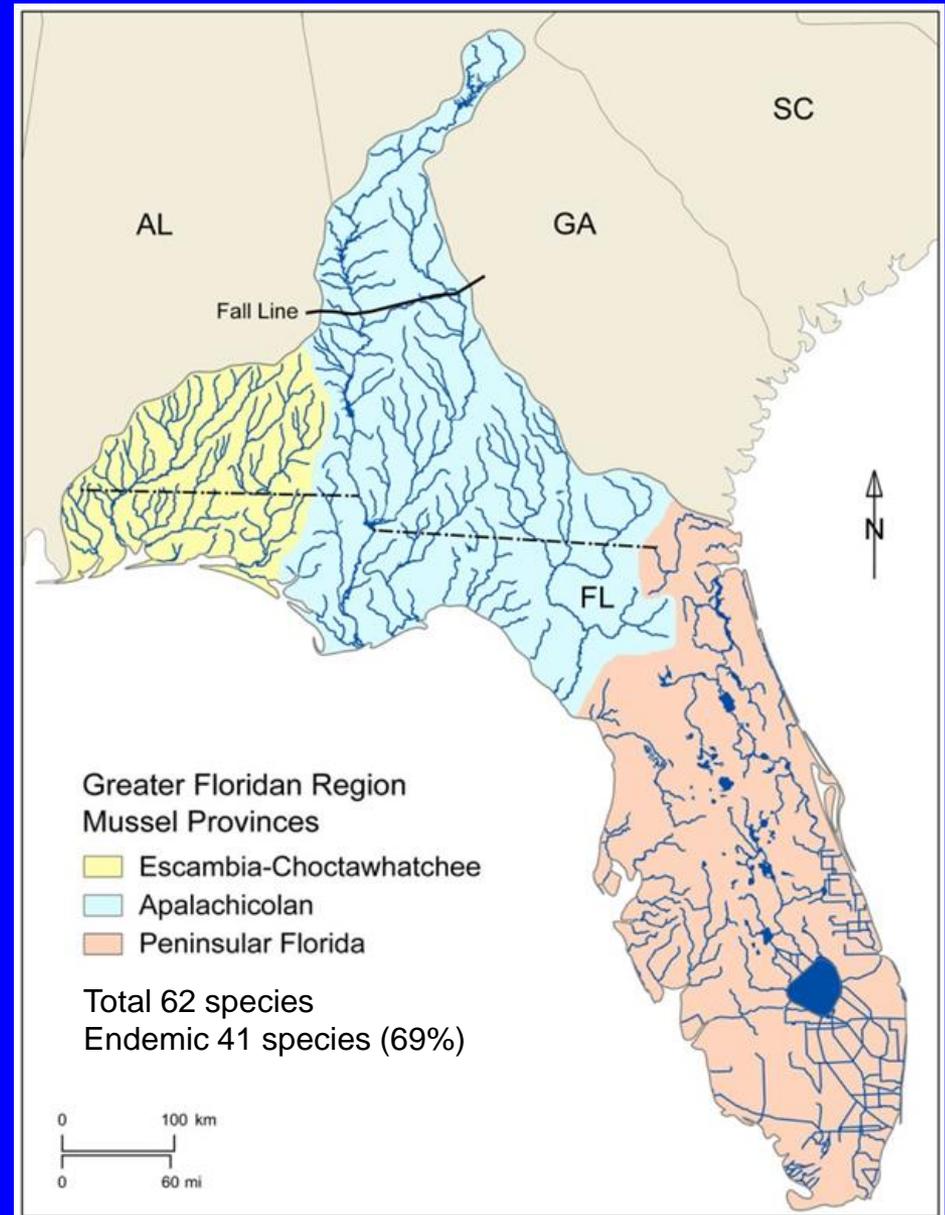
North American (north of Mexico)  
Mussel Diversity

Analysis by Haag (2010) recognized  
4 regions  
17 provinces

One of the 4 regions is the **Greater Floridan Region**.

Greater Floridan Region is comprised of  
3 of the 17 recognized provinces:

1. **Escambia-Choctawhatchee Province** – Escambia, Yellow, and Choctawhatchee.
2. **Apalachicolan Province** – extends from Econfina and Apalachicola basin east to Suwannee basin.
3. **Peninsular Florida Province** – south of Waccasassa River on the eastern Gulf Coast and St. Marys River on southern Atlantic Coast.



# Freshwater Mussels (Unionidae) of the Apalachicola Basin

- Mussel fauna first explored by Timothy Conrad in the early 1830s
- 35 species currently recognized, 32 native and 3 introduced
- 32 native species – 28 found in all 3 states

Endemic to the Apalachicolan Province – 14 species (44%)

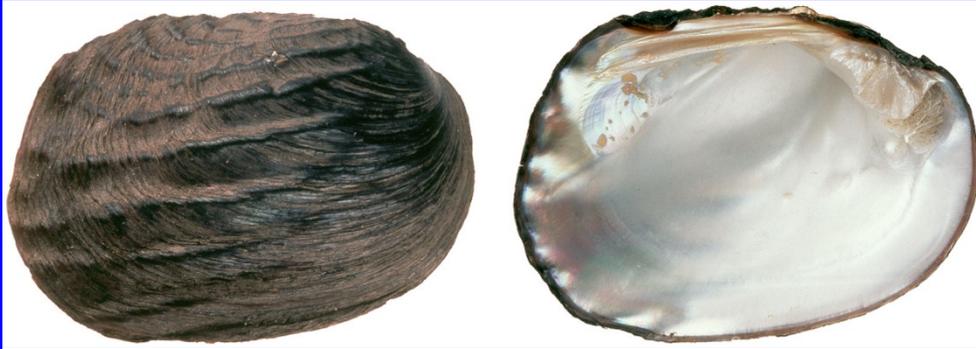
\* = Endemic to ACF Basin – 8 species (25%)

1. \**Alasmidonta triangulata*
2. \**Amblema neislerii*
3. *Anodonta heardi*
4. *Anodontoides radiatus*
5. *Elliptio arctata*
6. \**Elliptio chipolaensis* (AL & FL)
7. *Elliptio crassidens*
8. *Elliptio fraterna*
9. \**Elliptio fumata*
10. *Elliptio jayensis* – introduced in FL
11. \**Elliptio nigella* (AL & GA)
12. *Elliptio pullata*
13. *Elliptio purpurella*
14. *Elliptoideus sloatianus*
15. *Glebula rotundata*

16. *Hamiota subangulata*
17. \**Lampsilis binominata* (AL & GA) appears to be extinct
18. *Lampsilis floridensis*
19. *Lampsilis straminea*
20. *Lasmigona subviridis* (AL & GA) appears to be extirpated
21. \**Medionidus penicillatus*
22. *Megaloniaias nervosa*
23. *Pleurobema pyriforme*
24. *Pyganodon cataracta* – Introduced in GA
25. *Pyganodon grandis*
26. *Quadrula infucata*
27. \**Reginaia apalachicola* – Known from archaeological specimens
28. *Toxolasma parvum* – Introduced in FL & GA
29. *Toxolasma paulum*
30. *Uniomerus columbensis*
31. *Utterbackia imbecillis*
32. *Utterbackia peggyae*
33. *Villosa lienosa*
34. *Villosa vibex*
35. *Villosa villosa*

*Strophitus subvexus* – not in ACF Basin, Brim Box & Williams (2000) in error.

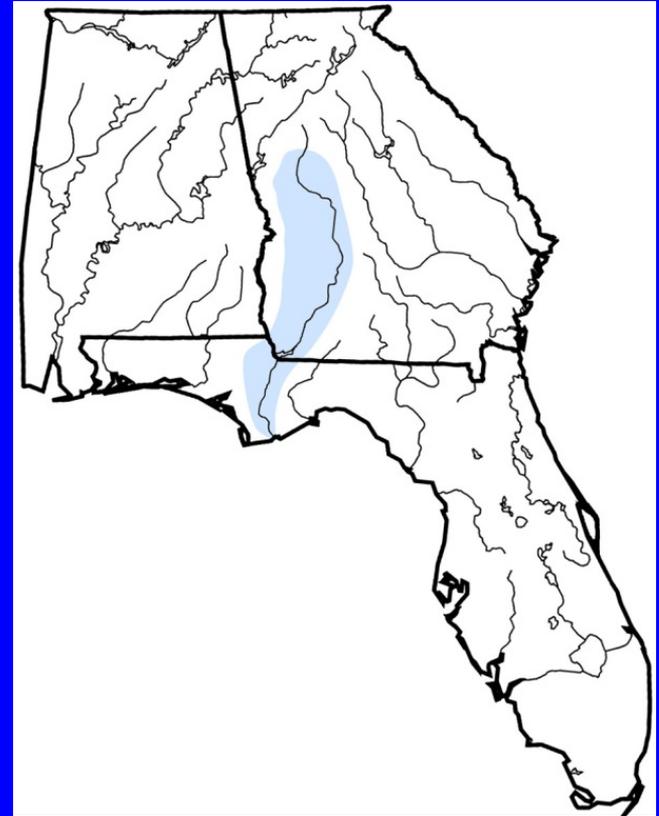
*Amblema neislerii* (Lea 1858) ENDANGERED  
Fat Threeridge



*Amblema neislerii* – length 70 mm. Calhoun Co., FL.



*Amblema neislerii* – length 41 mm. Gulf Co., FL.



*Amblema neislerii* is widespread in the Apalachicola River and middle and lower portions of the Chipola River. It is currently known from a short reach (5-8 miles) of the Flint River in the vicinity of Newton, Georgia. In the Chattahoochee River drainage it is known only from archaeological specimens reported from the Florida portion of the drainage (above Jim Woodruff Dam).

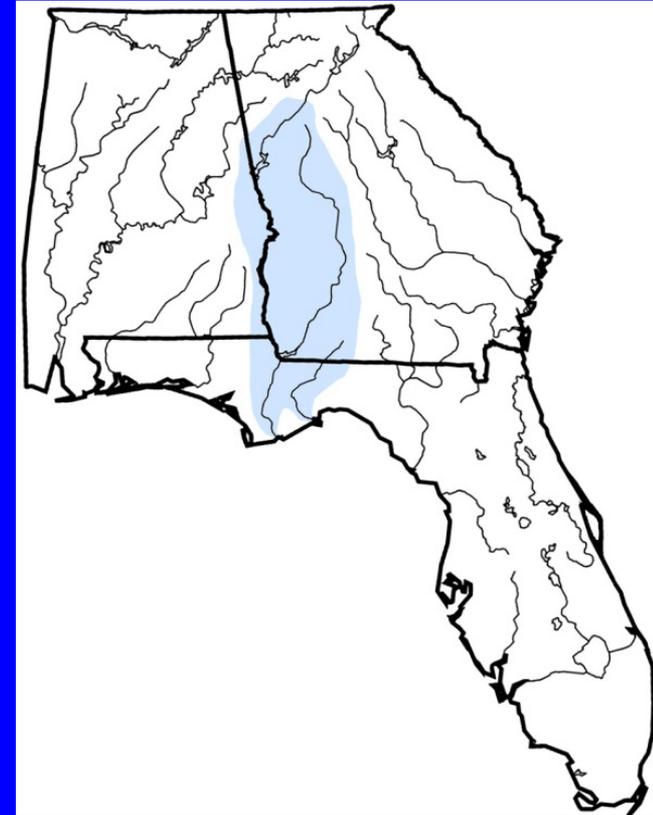
*Elliptoideus sloatianus* (Lea 1840) THREATENED  
Purple Bankclimber



*Elliptoideus sloatianus* – length 117 mm. Flint River, Decatur Co., GA.



*Elliptoideus sloatianus* – length 38 mm. Ochlockonee River,  
Leon Co., FL.



*Elliptoideus sloatianus* is widespread in the Apalachicola River and lower portion of the Chipola River. It is also known from the Flint River from the backwaters of Jim Woodruff Dam upstream to the Fall Line. It is historically known from the Chattahoochee River drainage upstream to the Fall Line at Columbus, Georgia. It also occurs above and below the dam on the Ochlockonee River.

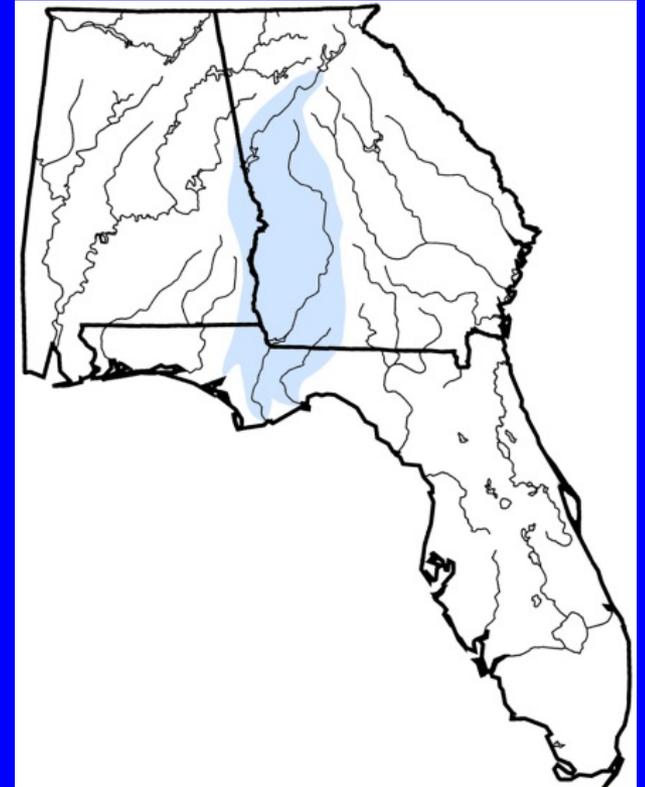
*Hamiota subangulata* (Lea 1840) ENDANGERED  
Shinyrayed Pocketbook



*Hamiota subangulata* – length 48 mm. Leon Co., FL.



*Hamiota subangulata* – length 40 mm. Jackson Co., FL.



*Hamiota subangulata* occurs in the middle and upper portions of the Chipola River. It is also known from a few reaches of the Flint River and several of its tributaries and a few Chattahoochee River tributaries in Alabama and Georgia. It also occurs in the Ochlockonee and Econfina Rivers.

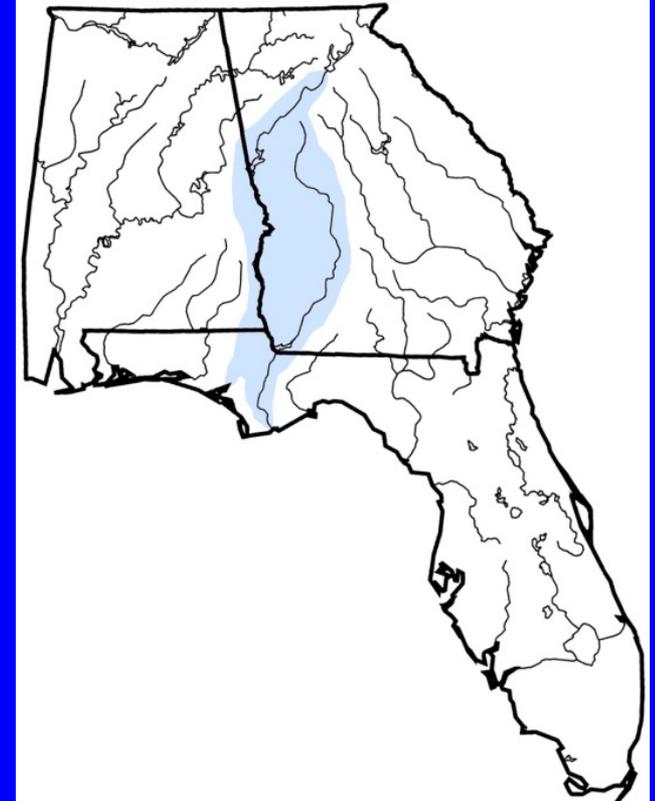
*Medionidus penicillatus* (Lea 1857) ENDANGERED  
Gulf Moccasinshell



*Medionidus penicillatus* – length 42 mm. Flint River, Decatur Co., GA.



*Medionidus penicillatus* – length 29 mm. Houston Co., AL.



*Medionidus penicillatus* is currently found in Chipola, Chattahoochee and Flint River drainages. It is also known from a short reach of the Econfina River just west of the Chipola River.

*Elliptio chipolaensis* (Walker 1905) THREATNED  
Chipola Slabshell



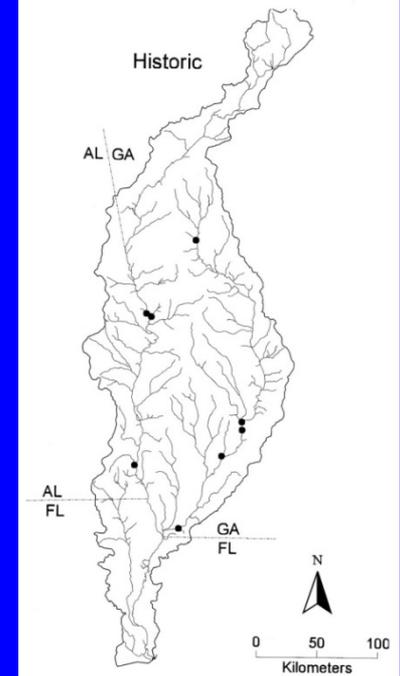
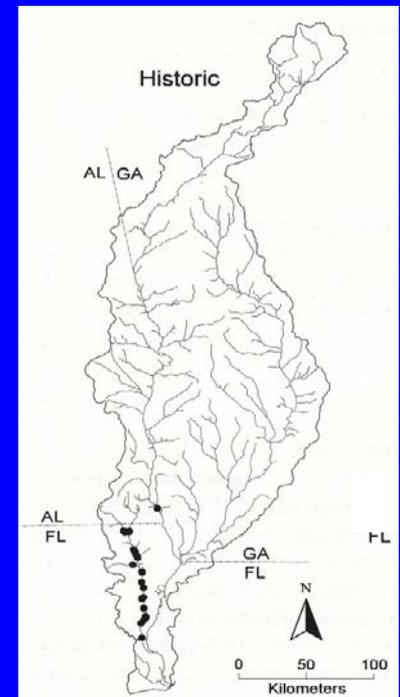
*Elliptio chipolaensis* – length 53 mm.

*Elliptio nigella* (Lea 1852)  
Winged Spike



*Elliptio nigella* – length 67 mm.

*Elliptio chipolaensis* was recently collected in the main channel of the Apalachicola River upstream of the Wewahitchka boat ramp.



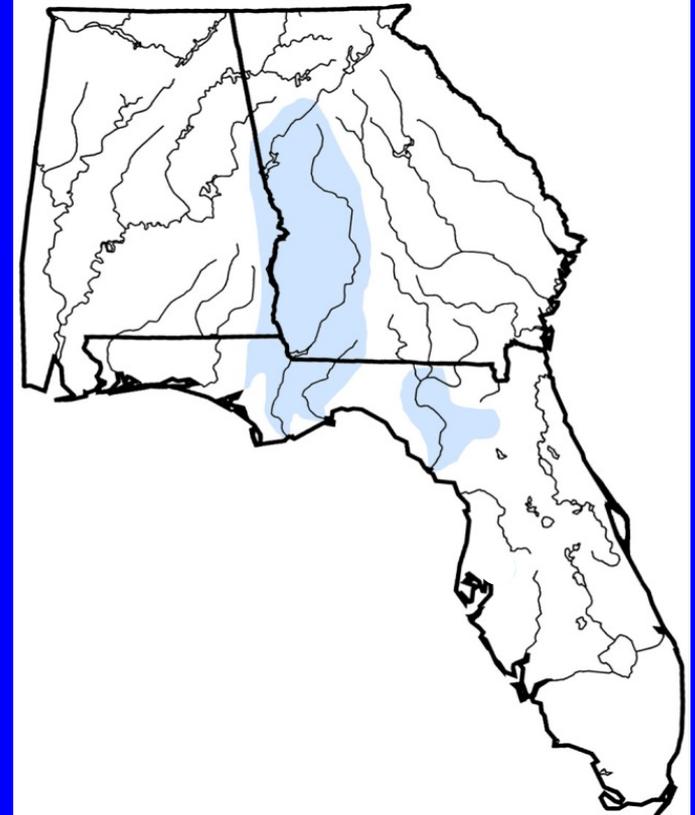
*Pleurobema pyriforme* (Lea 1857) ENDANGERED  
Oval Pigtoe



*Pleurobema pyriforme* – length 54 mm. Muscogee Co., GA.



*Pleurobema pyriforme* – length 52 mm. Flint River, GA.

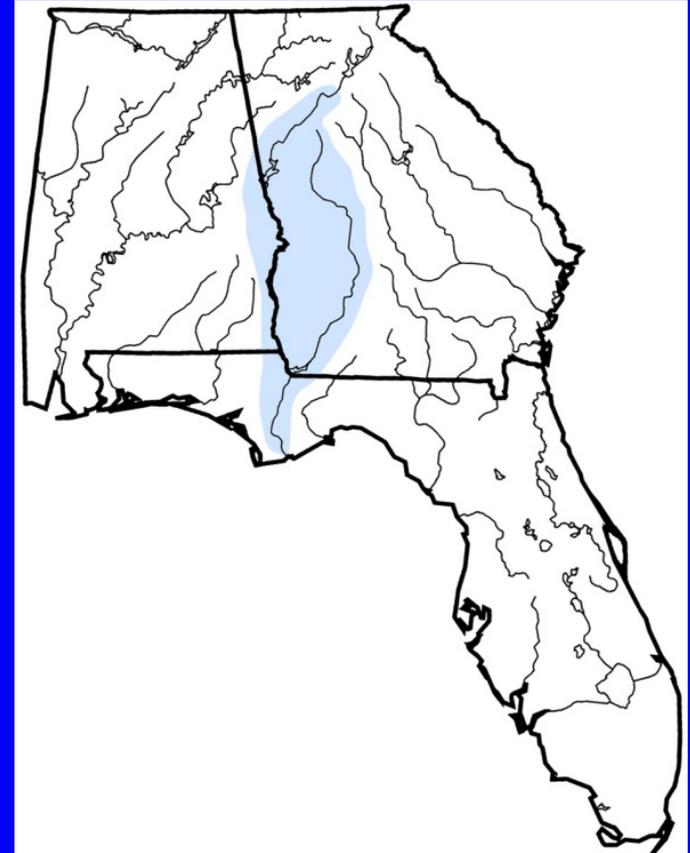


*Pleurobema pyriforme* occurs in the Econfina and Chipola Rivers and a few tributaries in the Chattahoochee and Flint Rivers. It was found in the Ochlockonee River but was not detected during recent surveys and may be extirpated from that system. It also occurs in the Suwannee, where it is extremely rare, currently known from only a few localities.

# *Alasmidonta triangulata* (Lea 1858) Candidate Species Southern Elktoe



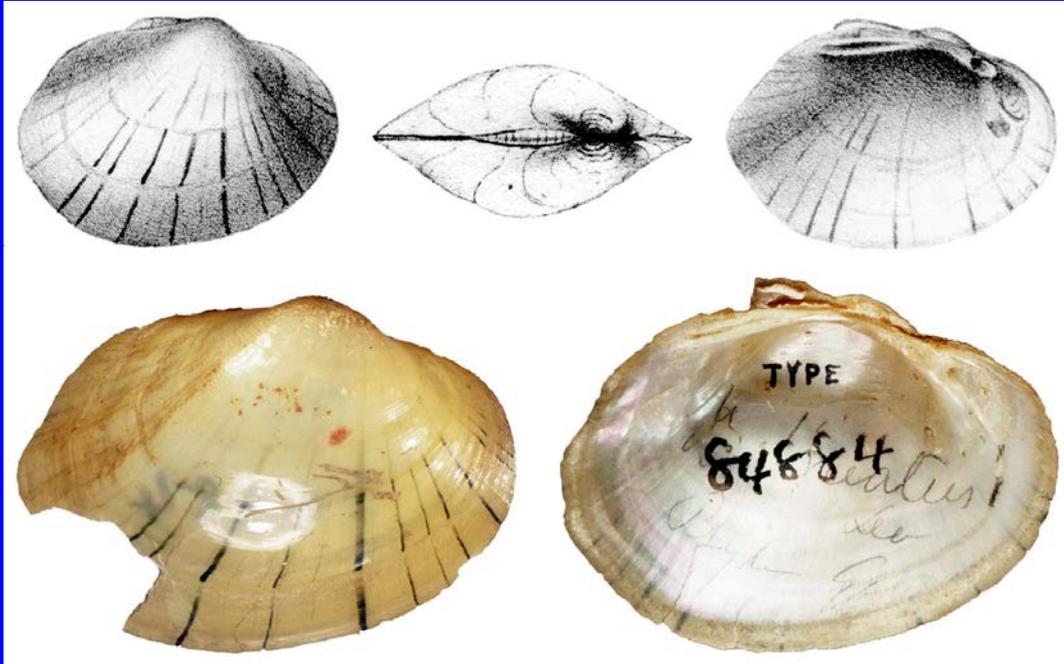
*Alasmidonta triangulata* – length 50 mm. Flint River, Decatur Co., GA.



*Alasmidonta triangulata* – length 39 mm. Chattahoochee River, Columbus, Muscogee Co., GA.

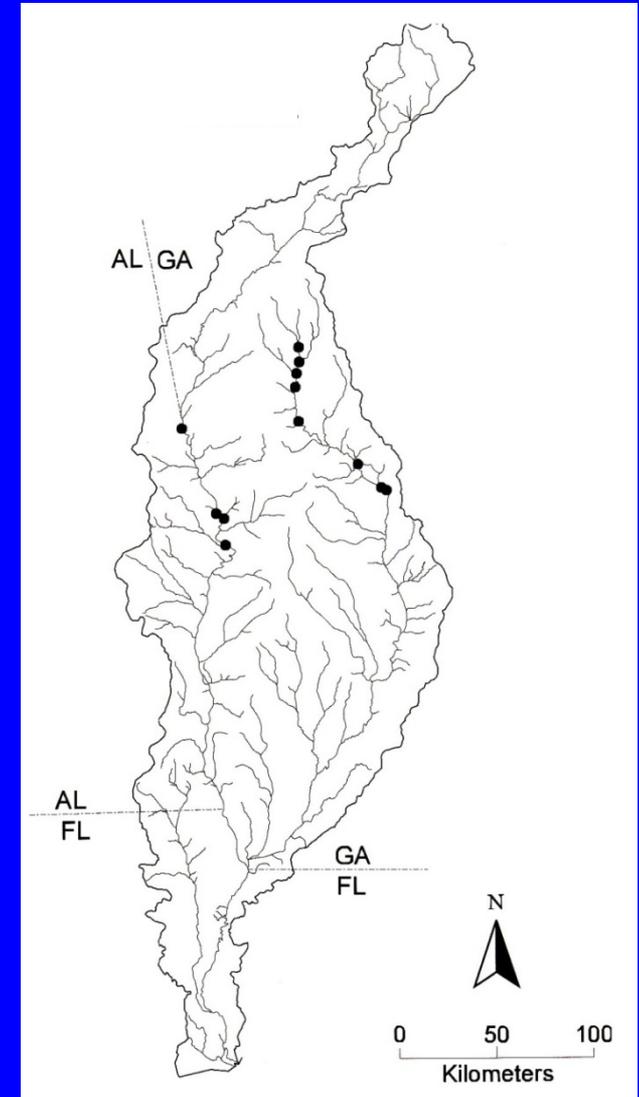
*Alasmidonta triangulata* is currently known from a few isolated localities in the Apalachicola, Chipola, and Flint Rivers proper. It is also known from a few tributaries of the Chattahoochee and Flint Rivers. Historically it was more widespread in the Apalachicola Basin.

# *Lampsilis binominata* Simpson 1900 Possibly Extinct Lined Pocketbook

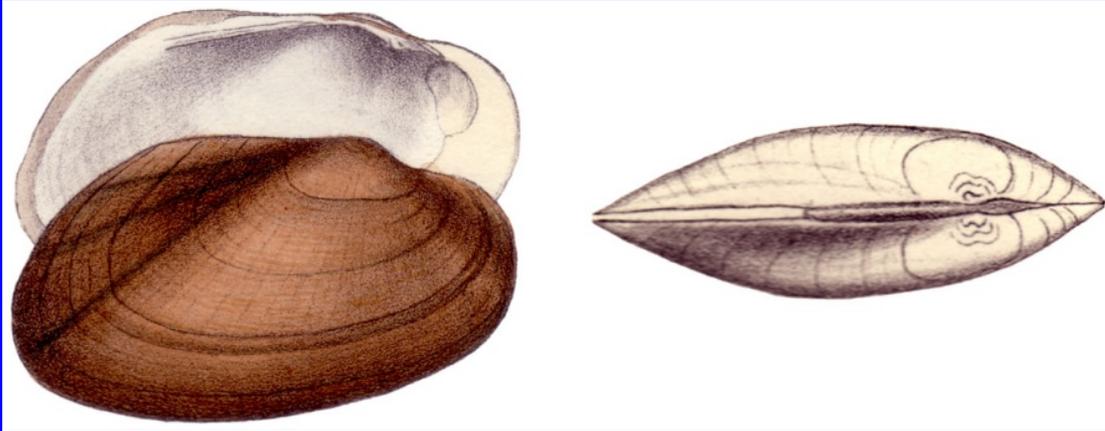


*Lampsilis binominata* – length 41 mm. Chattahoochee River, Columbus, Muscogee Co., GA.

*Lampsilis binominata*, based on museum records, was endemic to the Apalachicola Basin in the area above the Fall Line in the Chattahoochee and Flint Rivers. The last shells were found in the Flint River in the 1970s. This species may be extinct.



*Lasmigona subviridis* (Conrad 1835)  
Green Floater

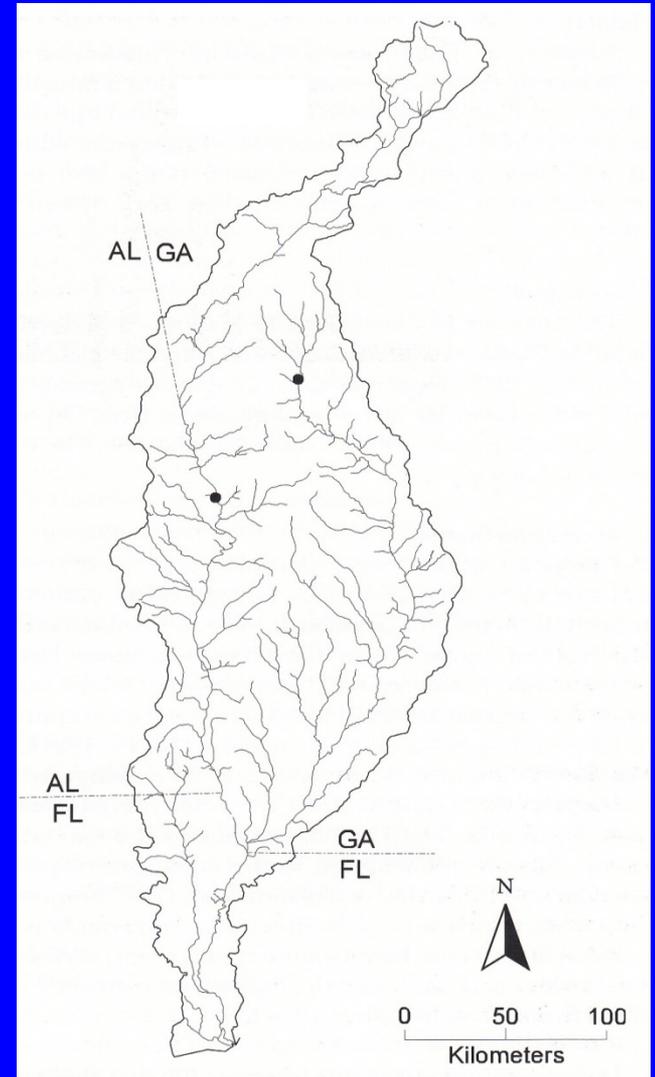


*Unio subviridis* – Schuylkill River drainage, Lancaster Co., PA.



*Lasmigona subviridis* – length 48 mm. Chattahoochee River, Columbus, Muscogee Co., GA.

*Lasmigona subviridis* in the Apalachicola Basin likely represented a new species distinct from its geographically disjunct Atlantic coast populations. The last known collection from the Flint River was in the 1970s.



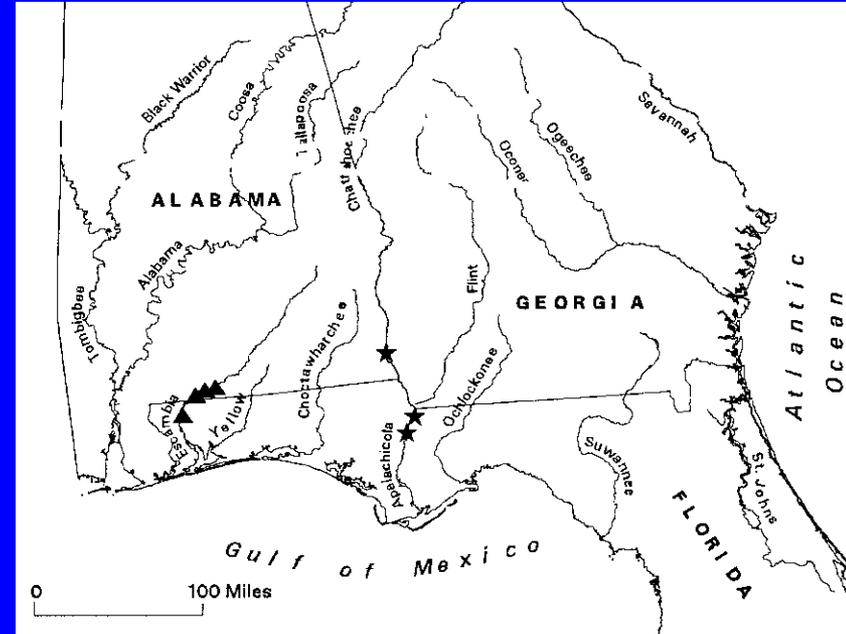
# *Reginaia apalachicola* (Williams and Fradkin 1999) Extinct Apalachicola Ebonyshell



*Reginaia apalachicola* – 34 mm. Mouth of Omusee Creek at Chattahoochee River, Houston Co., AL.



*Reginaia rotulata* – length 49 mm. Escambia Co., FL.



Distribution of *Reginaia apalachicola* (stars) and the conchologically similar (related) *Reginaia rotulata* (triangles). *Reginaia apalachicola* is known only from archaeological material.

# Changes in Mussel Community in the Main Channel of the Apalachicola River Over Time

## Apalachicola River Core Mussel Community Today Across Mesohabitats

*Alasmidonta triangulata*

*Anodonta heardi*

*Amblema neislerii*

*Elliptio arctata*

*Elliptio crassidens*

*Elliptio pullata*

*Elliptoideus sloatianus*

*Glebula rotundata*

*Lampsilis floridensis*

*Megalonaias nervosa*

*Quadrula infucata*

*Pyganodon grandis*

*Toxolasma paulum*

*Utterbackia imbecillis*

*Villosa vibex*

*Villosa villosa*

## Pre-Jim Woodruff Dam (1955) Mussel Community in the Main Channel of the River Based on Archaeological Remains (800–1300 years old)

*Hamiota subangulata*

*Medionidus penicillatus*

*Pleurobema pyriforme*

*Reginaia apalachicola*

Channel incision and subsequent dredging of the Apalachicola River following construction of Jim Woodruff Dam in the 1950s was likely responsible for the extirpation of populations of these four mussels in the main channel of the river.