Conservation Status Review of the Apalachicola Floater, *Anodonta heardi*

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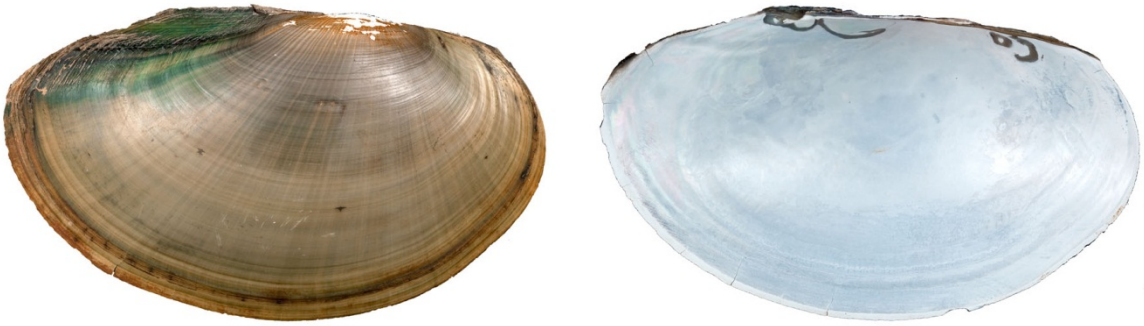
Anodonta heardi Gordon and Hoeh 1995
Apalachicola Floater



Anodonta heardi – Length 101 mm, UF 381286. Florida River, from downstream near southwest edge of Acorn Lake to point downstream of head of feeder slough into Everett Slough, Liberty County, Florida, 4 June 2002. Photograph by Zachary Randall.

Original Description

Anodonta heardi Gordon and Hoeh 1995. Holotype, UMMZ 250516, length 89 mm. Type locality: Apalachicola River, approximately 9.7 kilometers north of Blountstown at Ocheesee Landing, Calhoun County, Florida, 4 August 1968. In the original description the shell below is indicated as being the holotype in the figure legend; however, the number in the shell is referred to in the text as a paratype (Gordon and Hoeh 1995).

Synonymy

There are no synonyms of *Anodonta heardi*.

Taxonomic History

Prior to its recognition as a distinct species in 1995, *Anodonta heardi* was reported under the name *Pyganodon gibbosa* by Clench and Turner (1956) and *Anodonta couperiana* by Johnson (1969) and Heard (1975a, 1977, 1979). *Pyganodon gibbosa* is endemic to the Altamaha River basin, Georgia, and *A. couperiana* is confined to southern Atlantic Coast rivers and peninsular Florida.

The single record of *Anodonta heardi* reported from the Chattahoochee River drainage of Alabama (Brim Box and Williams 2000) was reexamined and found to be a conchologically atypical specimen of *Utterbackia imbecillis* (Williams et al. 2008). However, it has subsequently been found at several sites in impounded waters of Chattahoochee River in Barbour, Henry, and Russell counties, Alabama, and Chattahoochee and Clay counties, Georgia (Catena Group 2010; J.D. Williams, personal observation).

The original description of *Anodonta heardi* by Gordon and Hoeh (1995) was published in the journal *Walkerana* and dated 1993–1994 but not copyrighted, printed, and distributed until

1995. The recognized date of authorship is the publication date, 1995 (ICZN 1999: Articles 21 and 22).

Description

Length to 141 mm; shell thin, smooth; moderately inflated, width 25%–55% of length; outline oval; anterior margin broadly rounded; posterior margin narrowly rounded, angle of posterior and dorsal margins 20°–40°; dorsal margin straight; ventral margin broadly rounded; posterior ridge rounded, indistinct; posterior slope moderately steep, flat to slightly convex; umbo broad, inflated, elevated slightly above hinge line; umbo sculpture thin undulating ridges; umbo cavity wide, shallow; pseudocardinal and lateral teeth absent.

Periostracum usually shiny, greenish yellow to yellowish brown, usually with very fine green rays, increasing in width distally, may be obscure in large individuals; nacre white to bluish white, usually iridescent.

Habitat and Biology

Anodonta heardi inhabits Coastal Plain oxbow lakes and backwater sloughs of rivers, as well as some reservoirs. These habitats typically have little or no current and substrates composed of soft mud, sandy mud, and sand, often with detritus. Based on recent collections, it appears that *A. heardi* may be more common in deeper waters, at depths greater than two meters (J.D. Williams, personal observation; J.M. Wisniewski, personal communication). This observation is also supported by collections from the Chattahoochee River by Tim Savidge, who reported taking them in dive samples (Catena Group 2010). It is not known to occur in any habitat located in upland areas above the Fall Line in the Flint or Chattahoochee Rivers.

Anodonta heardi is presumably a long-term brooder, gravid from autumn to the following summer. A single hermaphroditic *A. heardi* was reported (as *Anodonta couperiana*) from an Apalachicola population by Heard (1975b). Glochidial hosts for *A. heardi* are unknown. Other species of *Anodonta* and several other anodontines (e.g., *Anodontoides*, *Pyganodon*, and *Utterbackia*) broadcast glochidia in loose masses in mucus webs and appear to be host generalists (Williams et al. 2008; Watters et al. 2009).

Distribution

Anodonta heardi occurs in the Apalachicola, Chipola, Chattahoochee, Flint, and Ochlockonee Rivers (Figure 1). There are 74 collection records for *Anodonta heardi* compiled from various sources including Georgia Department of Natural Resources, museums, scientific publications, and unpublished reports. Seventy-two collection records have dates and 28 were collected before 2000 and the remaining 44 during the past 13 years (Figures 2 and 3). The relatively large number of collections of *A. heardi* in the past 13 years is due in part to more intensive collecting in the Apalachicola River basin but also to a better understanding of its habitat requirements. Comparison of the distribution records between those collected before and after 2000 indicate that *A. heardi* persists in almost all watersheds where it was found historically.

Perhaps the most significant *Anodonta heardi* finding during the past 13 years has been the discovery of relatively large populations in reservoirs on the Chattahoochee and Flint Rivers. The fact that *A. heardi* went undetected in large reservoirs on the Chattahoochee River may seem surprising. However, it should be pointed out that mussel biologists rarely venture into reservoir habitat to sample mussels as the diversity is greatly reduced and typically limited to a few

reservoir-tolerant species. What is clear at this point is that they are fairly common in Walter F. George Reservoir (also known as Lake Eufaula) on the Chattahoochee River. *Anodonta heardi* appear to be less common in Seminole Reservoir but have been found at several localities. It is not known if they are present in the reservoir behind George Andrews Lock and Dam but limited sampling (one day) there did not reveal their presence. While they are likely in this reservoir, there is less overbank habitat, which could limit populations. There are additional reservoirs above the Fall Line in the Chattahoochee River (e.g., Lake Harding, West Point Lake), but it is unlikely that *A. heardi* occur there. Species of *Anodonta* are not usually found in areas above the Fall Line with the possible exceptions of reservoirs where they may be introduced.

Anodonta heardi has a limited distribution in the Chipola River. It appears to be confined to the lower Chipola River below Chipola Cut based on the absence of records in the more upstream reaches. This is most likely due to the springlike conditions of the Chipola River above Dead Lakes and Chipola Cut. Hughes (2011) reported *A. heardi* (as *Utterbackia peggyae*) from Lands Landing on the lower Chipola.

In the Flint River system, shells and live individuals have been recovered from Lake Blackshear near Cordele, Crisp County, Georgia (Brim Box and Williams 2000). More recently (2013–2014), both shells and live individuals were collected from Lake Blackshear (three collections) and Flint River (two collections), but the records were not received in time to plot on the distribution maps (Jason Wisniewski, personal communication).

Conservation Status

Anodonta heardi was described in 1995, thus, it was not included in conservation status reviews of candidate mollusks by the USFWS before the 2010 Center for Biological Diversity petition to list this species under provisions of the federal ESA.

Anodonta heardi is considered vulnerable throughout its range by Williams et al. (in review). Williams and Butler (1994) assigned it a status of endangered in Florida. It was listed as a G1 species (critically imperiled) by Herrig and Shute (2002). Vulnerable status assigned by Williams et al. (in review) represents an improvement over previous assessments and is based in part on its presence in appropriate habitat along most of the Apalachicola River and its occurrence in some reservoir habitats in Alabama, Georgia, and Florida. It is less common in the Ochlockonee River where there is less backwater and floodplain habitat.

Anodonta heardi is extant throughout its range. Unlike many other mussels in the Apalachicola River basin, its range does not appear to have been significantly reduced. While we have no quantitative data to evaluate its population densities over time, based on its persistence throughout most of its historic range in the face of major habitat alterations (e.g., impoundments, navigation dredging), its conservation status appears to be secure at this time.

Threats

The major loss of habitat and possibly some populations of *Anodonta heardi* may have occurred during construction of the impoundments on the Chattahoochee River. Most of these reservoir projects were built during the 1950s and 1960s. There were almost no collections of freshwater mussels in riverine habitats in the Chattahoochee River between 1930s and 1980s. The lack of data during this period makes it difficult to determine what kind of impact the impoundments had on *A. heardi.*

In the Apalachicola River in Florida the cessation of dredging, which occurred in 2001, has resulted in stabilization of the main channel habitat. While there are some reaches of the

Apalachicola River channel that have yet to stabilize, the river has begun to recover from the effects of dredging in some areas. However, there are some highly degraded sites or stream reaches where the species no longer occurs, but it may be present above and below such sites.

Primary threats to *Anodonta heardi* involve degradation of its habitat. Human-induced modification such as sediment originating from soil erosion associated with agricultural areas, timber harvest activities, construction sites, bridge crossings, and increased stormwater runoff from urban and industrial development.

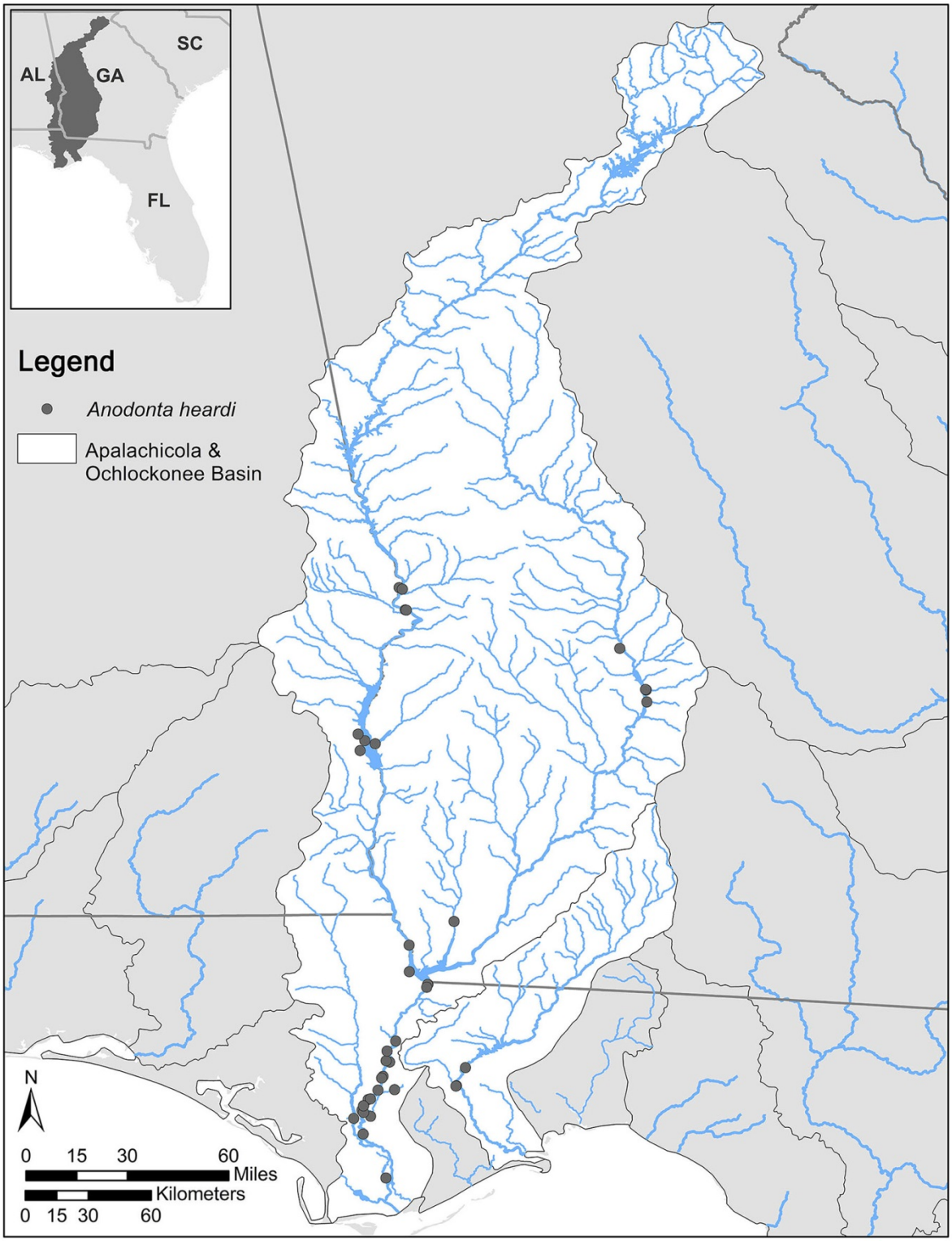


Figure 1. Collection localities for *Anodonta heardi* in Apalachicola River basin in Alabama, Florida, and Georgia and Ochlockonee River basin in Florida and Georgia through 2012.

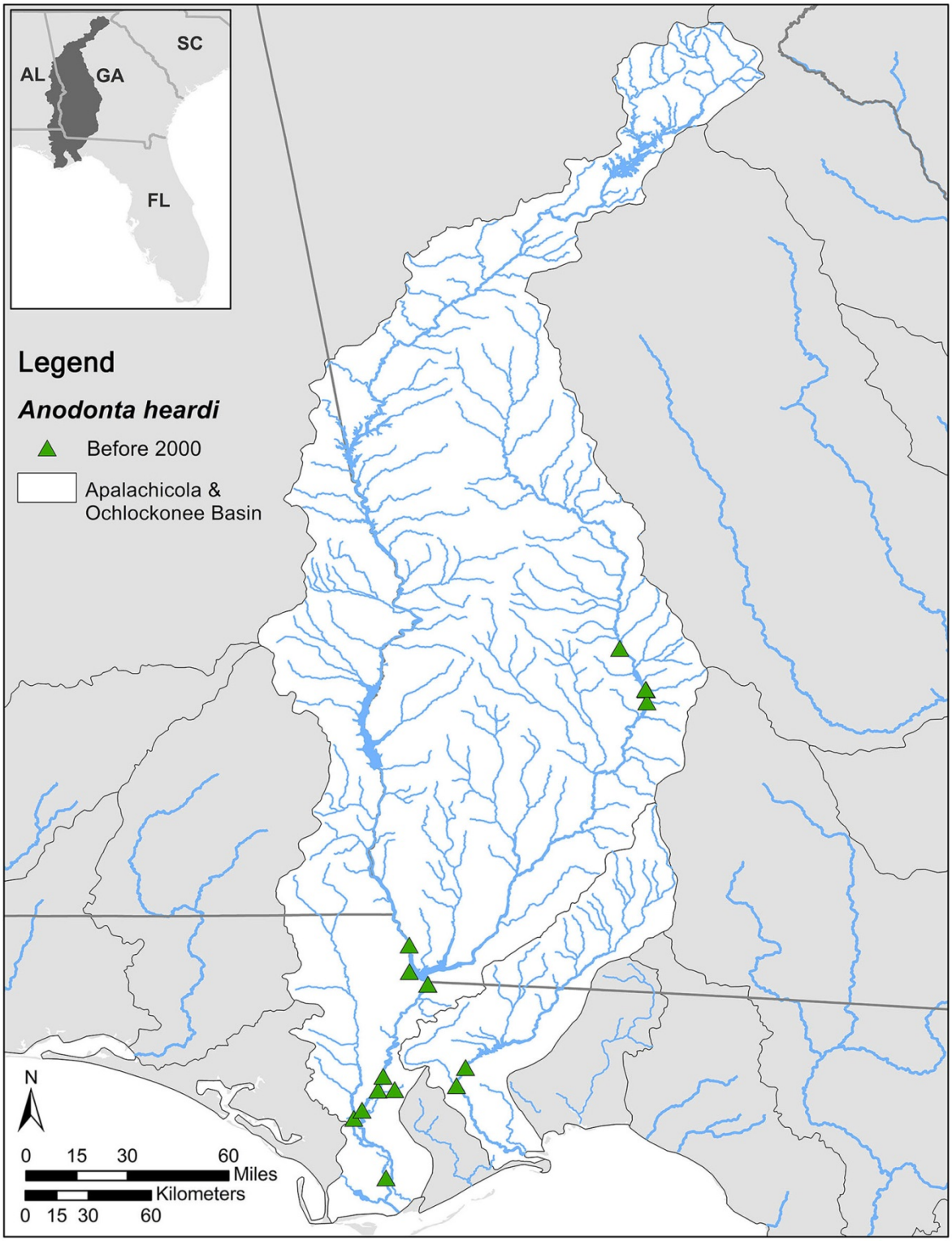


Figure 2. Collection localities for *Alasmidonta heardi* in Apalachicola River basin in Alabama, Florida, and Georgia and Ochlockonee River basin in Florida and Georgia before 2000.

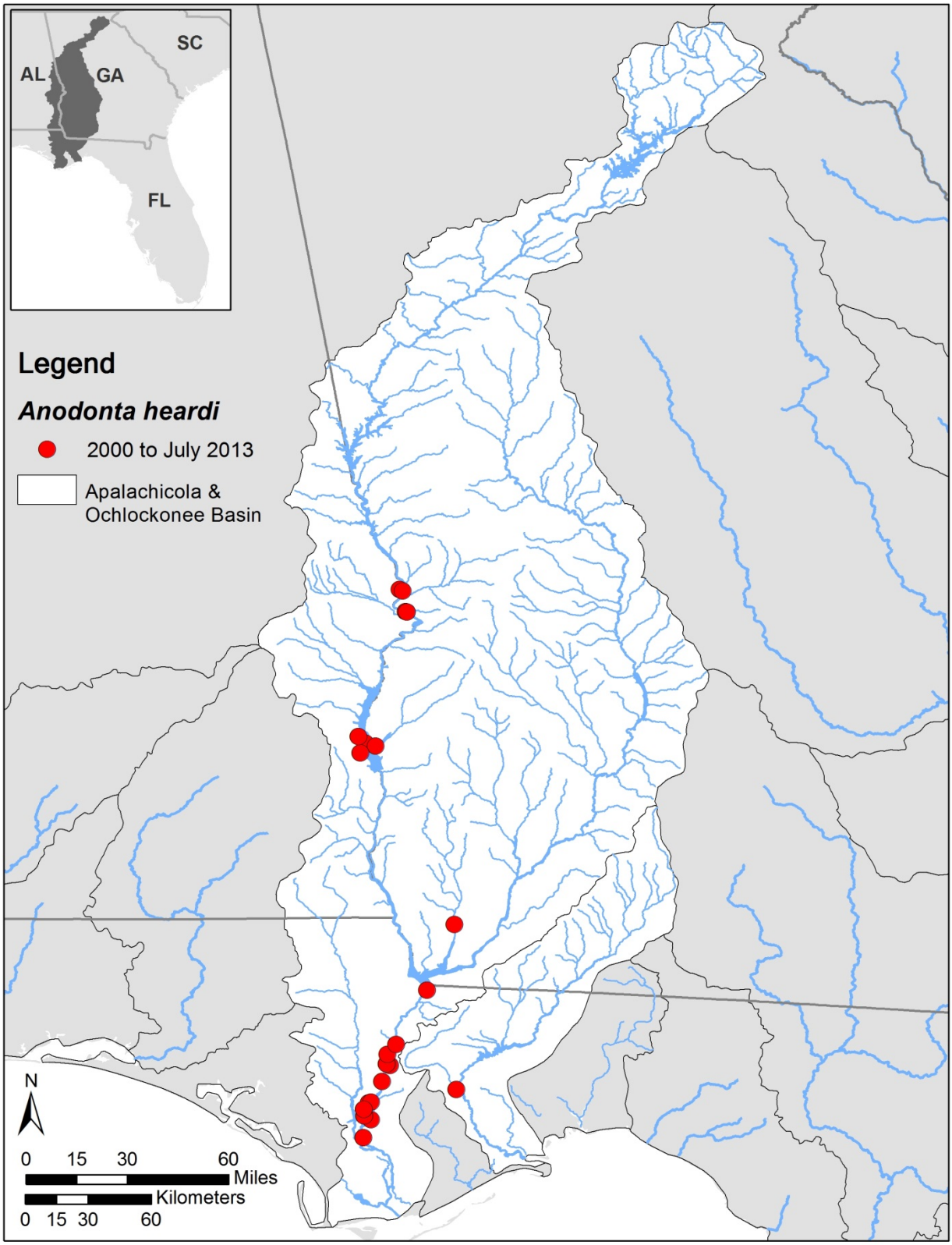


Figure 3. Collection localities for *Anodonta heardi* in Apalachicola River basin in Alabama, Florida, and Georgia and Ochlockonee River basin in Florida and Georgia from 2000 to 2013.

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