Gulf moccasinshell (*Medionidus penicillatus*) 48 mm (1⅞ inches). Unknown location. Photo by Jason Wisniewski, GA DNR. Specimen provided by the McClung Museum courtesy of Gerry Dinkins.

Common Name: GULF MOCCASINSHELL

Scientific Name: *Medionidus penicillatus* Lea

Other Commonly Used Names: none

Previously Used Scientific Names: none

Family: Unionidae

Rarity Ranks: G1/S1

State Legal Status: Endangered

Federal Legal Status: Endangered

Description: Shell profile is sub-rhomboidal to elliptical in outline. Shell rather delicate with a maximum length of approximately 55 mm (2¼ inches). Anterior margin broadly rounded while posterior margin is pointed and terminates near the posterior-ventral margin. Ventral margin is straight to slightly arcuate. Umbos positioned anterior of the middle of the valves and elevated to

or just slightly above the hingeline. Posterior ridge is sharply developed with well developed plications present on the posterior slope. Pseudocardinal teeth are short and triangular while lateral teeth are slightly curved. The periostracum is yellow with fine, broken rays radiating from the umbo to the margin of the shell. Nacre color typically white.

Similar Species: None

Habitat: Typically occupies small streams to large rivers with moderate flow and sandy substrates. This species has also been found in gravel and cobble substrates.

Diet: The diets of unionids are poorly understood but are believed to consist of algae and/or bacteria. Some studies suggest that diets may change throughout the life of a unionid with juveniles collecting organic materials from the substrate though pedal feeding and then developing the ability to filter feed during adulthood.

Life History: Gravid females have been collected in Georgia from early spring to mid-summer. The blackbanded darter (*Percina nigrofasciata*) and brown darter (*Etheostoma edwini*) successfully transform glochidia of this species.

Survey Recommendations: Surveyors should consider sampling during periods when female individuals are spawning or brooding as this species may have higher detection rates during this period. However, since basic life history information for many of Georgia's unionids is lacking, sampling during periods when closely related species are spawning or brooding may increase probability of detection.

Range: This species is endemic to the Apalachicola River basin of Alabama, Georgia, and Florida. Historically known from the mainstem and tributaries of the Chipola, Chattahoochee, and Flint Rivers. Currently, this species appears to be rare or extirpated outside of the Chattahoochee and Flint River drainages of Georgia and has drastically declined within these drainages. Recent collections of this species have been made in Kirkland and Sawhatchee Creeks in the Chattahoochee River Basin and in Ichawaynochaway, Kinchafoonee, and Muckalee Creeks, as well as several smaller tributaries to the Flint River.

Threats: Habitat fragmentation may isolate populations and prevent fish movement, limiting the distribution of host fishes carrying glochidia. Additionally, construction of impoundments may further fragment populations and inundate suitable habitat. Excessive water withdrawals in the Lower Flint River Basin coupled with severe drought could cause this species to become extirpated from Georgia. Excess sedimentation due to inadequate riparian buffer zones also covers suitable habitat and potentially suffocates individuals.

Georgia Conservation Status: The Gulf moccasinshell is known from Chickasawhatchee Creek in the vicinity of Chickasawhatchee and Elmodel Wildlife Management Areas in Georgia. However, unlike terrestrial species, the occurrence of an aquatic species on state or federal lands may not eliminate habitat degradation due to the influences of upstream and downstream disturbances.

Conservation and Management Recommendations: Design of a sampling protocol to assess the status of rare species in the Apalachicola, Chattahoochee, and Flint basin was identified as a high management priority in the 2005 Georgia Wildlife Action Plan. Furthermore, technical team members also recommended that a population viability analysis be done for the Gulf moccasinshell. Suitable but unoccupied habitats appear to be relatively abundant in the basin, which may provide an opportunity to recover this species using re-introduction/augmentation techniques. However, prior to the initiation of any reintroduction/augmentation activities, studies of the effective population size should be completed to ensure that the genetic integrity of the species is not compromised by this management activity.

Selected References:

O'Brien, C.A. and J.D. Williams. 2002. Reproductive biology of four freshwater mussels (Bivalvia: Unionidae) endemic to the eastern Gulf Coastal Plain drainages of Alabama, Florida, and Georgia. American Malacological Bulletin 17: 147-158.

Author of Species Account: Jason Wisniewski

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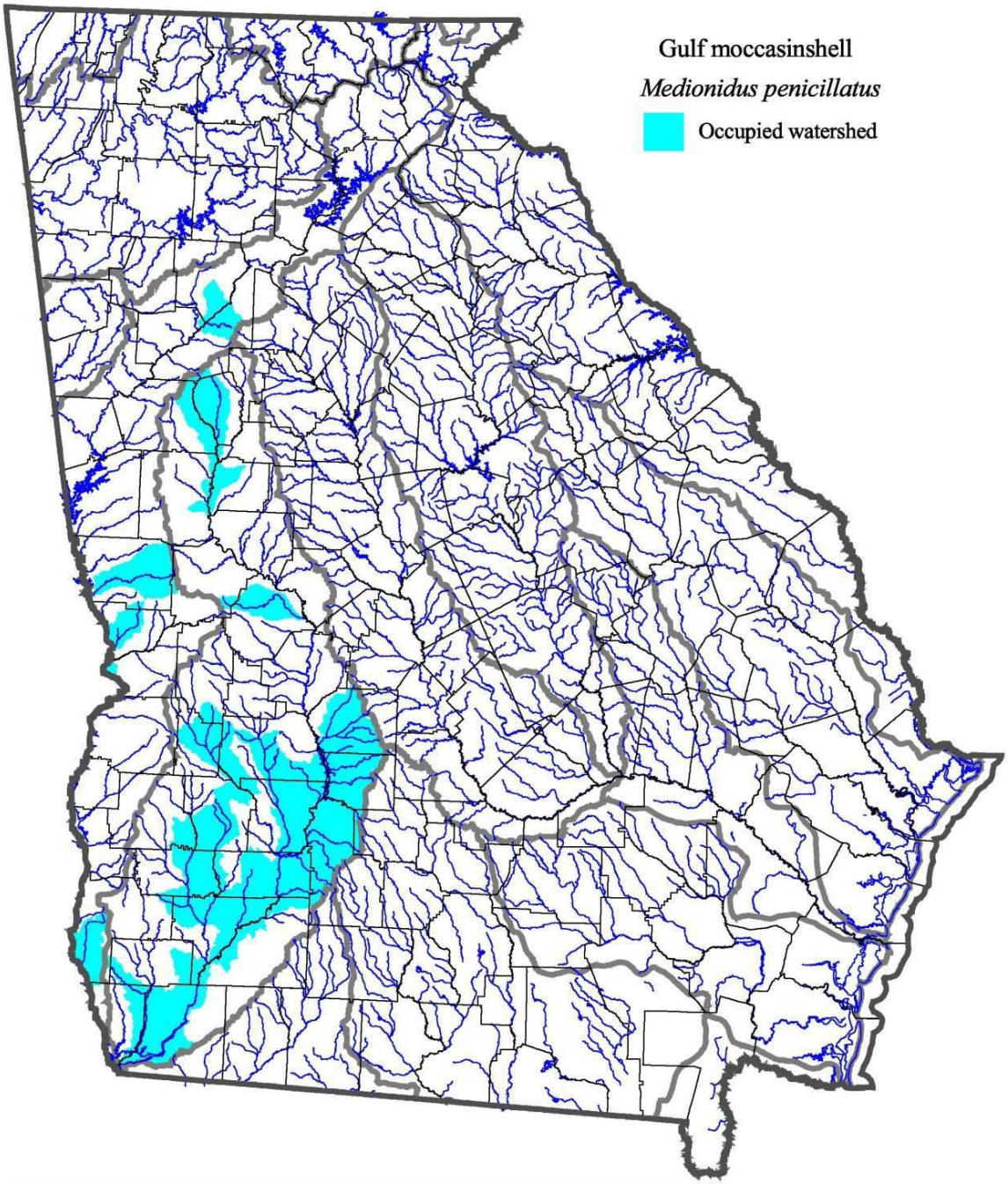

Watersheds (Huc 10) with known occurrences. Streams, county lines, and major river basin boundaries are also shown. Map generated from GADNR (Nongame Conservation Section) data on January 26, 2009.