



Rayed kidneyshell (*Ptychobranthus foremanianus*) 48 mm (1 $\frac{7}{8}$  inches). Conasauga River, Polk Co., Tennessee. Photo by Jason Wisniewski, GA DNR. Specimen provided by the McClung Museum courtesy of Gerry Dinkins.

**Common Name:** RAYED KIDNEYSHELL

**Scientific Name:** *Ptychobranthus foremanianus* Lea

**Other Commonly Used Names:** Triangular kidneyshell

**Previously Used Scientific Names:** *Ptychobranthus greenii*

**Family:** Unionidae

**Rarity Ranks:** G1/S1

**State Legal Status:** Endangered

**Federal Legal Status:** Endangered

**Description:** Shell profile typically sub-triangular or elliptical and inflated with a maximum length of approximately 100 mm (4 inches). Anterior margin broadly rounded and posterior margin bluntly pointed to rounded. Ventral margin is straight to broadly rounded. Umbos positioned anteriorly elevated slightly above hingeline. Posterior ridge is angular with a smooth posterior slope. Pseudocardinal teeth are relatively heavy and triangular. Periostracum is yellow

to brown, sometimes with several dark rays present. Dark, prominent growth rings often present on surface of the shell. Pseudocardinal teeth triangular and divergent. Lateral teeth short and straight. Umbo cavity shallow. Nacre color typically white.

**Similar Species:** The rayed kidneyshell can strongly resemble the southern pigtoe (*Pleurobema georgianum*), but the rayed kidneyshell typically is more elongated.

**Habitat:** Typically occupies riffles in medium to large rivers with moderate flow and gravel and sand 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 through pedal feeding and then developing the ability to filter feed during adulthood.

**Life History:** Females of the triangular kidneyshell (*Ptychobranthus greenii*) were found releasing glochidia in April. Glochidia successfully transformed on the warrior darter (*Ethostoma bellator*), Tuskalooza darter (*E. douglasi*), blackbanded darter (*Percina nigrofasciata*), and Mobile logperch (*P. katha*). Ortmann found gravid individuals of the rayed kidneyshell brooding glochidia from late summer through the following summer. The known primary glochidial hosts for the rayed kidneyshell is the greenbreast darter (*E. jordani*), while the banded sculpin (*Cottus carolinae*) served as a secondary host.

**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 eastern Mobile River basin of Alabama, Georgia, and Tennessee. Historically, this species was known from the Black Alabama, Cahaba, Coosa, and Tallapoosa Rivers and their tributaries. In Georgia, this species appears to be restricted to the Conasauga River and its tributaries and to the mainstem Coosawattee River downstream of Carters Reservoir.

**Threats:** Excess sedimentation due to inadequate riparian buffer zones, development, and agriculture covers suitable habitat and could potentially suffocate mussels. Poor agricultural practices may also cause eutrophication and degrade water quality. Industrial effluent as well as sewage treatment plant discharges may also be degrading water quality.

**Georgia Conservation Status:** The rayed kidneyshell is not known from any state or federal lands in Georgia. 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:** Minimizing sedimentation in the Conasauga River and its tributaries is a key component to conserving the rayed kidneyshell. Restoration of riparian buffers will stabilize banks providing clean gravel and sand substrates for the species. If habitat degradation can be minimized, reintroduction/augmentation of the rayed kidneyshell populations should be explored in order to re-establish viable populations of the species. However, prior to initiating any reintroduction/augmentation projects for the rayed kidneyshell, the effective population size of this species should be examined to ensure that these actions would not negatively affect the genetic integrity of the population.

**Selected References:**

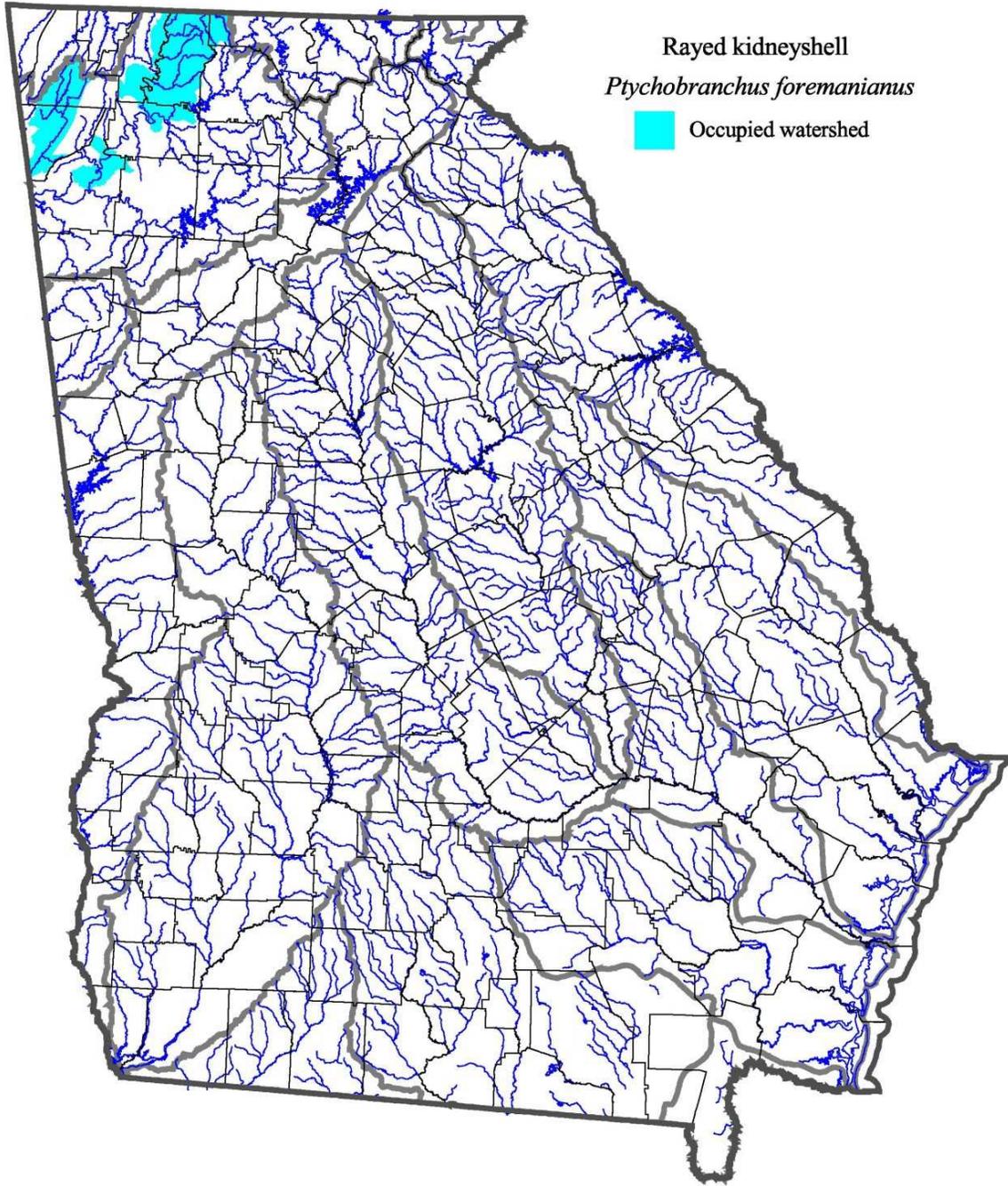
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Watersheds (Huc 10) with known occurrences. Streams, county lines, and major river basin boundaries are also shown. Map generated from GADNR (Nongame Conservation Section) data on January 2009.