

**STATE
THREATENED**

Brook Floater

(*Alasmidonta varicosa*)



photo by Ethan Nedeau

Description

The Brook Floater is a small to medium-sized (usually ≤ 3 inches) freshwater mussel that in profile has a “Roman nose” shape and in cross-section is moderately inflated or swollen in appearance. The shell is yellowish-green in young animals to brownish-black in older specimens, and often has broad dark green rays. Internal hinge teeth are poorly developed, with only a small knob present on each valve. A reliable diagnostic feature for this mussel is a series of ridges and wrinkles along the dorso-posterior slope of each valve, perpendicular to the growth rings. This species has a peculiar habit of gaping its valves when removed from the water, exposing its cantaloupe-colored “foot”.

Range and Habitat

The Brook Floater is found in streams and rivers of the Atlantic coastal region, from South Carolina to Nova Scotia and New Brunswick. In Maine, its distribution is largely concentrated in the Penobscot River drainage and several Downeast river systems, with a few scattered populations also found in the Kennebec, St. George and Sheepscot River watersheds. An isolated population in the Pleasant River (Cumberland Co.) is the only known occurrence in southern Maine.

This species inhabits flowing water, from small streams to large rivers. It does not live in high-gradient streams with very fast current, nor is it usually found in slow water. It seems to prefer stable substrates such as coarse sand and gravel, and is often found in association with rooted aquatic vegetation.

Life History and Ecology

The Brook Floater breeds in summer, when males release sperm into the water column and females filter it out with their gills. Once the eggs are fertilized, females brood the growing larvae, called glochidia, in a modified portion of their gills until the following spring when they are released as tiny free-floating organisms. At this stage the glochidia of most freshwater mussels require a fish

host to change into the subadult form of a mussel. Each mussel species requires one or more specific fish species to serve as suitable hosts and since glochidia can only survive for a short time on their own, they must quickly encounter just the right fish. The lucky ones attach to the fish’s gills or fins (without apparent harm to the fish) for a period of weeks or months before transforming into tiny mussels and dropping off to settle in the substrate. Fish species reported to serve as hosts for the Brook Floater include Longnose Dace, Blacknose Dace, Golden Shiner, Pumpkinseed Sunfish, Slimy Sculpin, and Yellow Perch.

Freshwater mussels grow rapidly during their first 4-6 years of life, before they become reproductively mature. The life span of the Brook Floater is likely 15 years or more. Mussels continually filter vast quantities of water and consume bacteria, algae, and plant and animal debris. They burrow into the bottom, anchoring themselves with a muscular foot, but have a limited ability to move short distances to find the best sites for feeding and reproducing. Mussels are an important food item for some aquatic mammals, especially otters, muskrats, and raccoons, as evidenced by piles of shells (middens) often seen along shorelines.

Threats

Freshwater mussels are the most endangered group of animals in North America. Of the nearly 300 species native to the continent, approximately 75 percent are state or federally listed as endangered, threatened, possibly warranting listing status, or already extinct. Their population declines are the result of more than a century of industrialization and development of our waterways, causing alteration and loss of habitat and degradation of water quality. Because the Brook Floater requires clean, free-flowing riverine habitat, it is especially vulnerable to impacts from pollution, sedimentation, dams, and surrounding land use practices that degrade or alter its aquatic habitat.

Conservation and Management

The Brook Floater has experienced significant declines throughout its range, with many populations being extirpated. In the Northeast, the species is listed as endangered or threatened in nearly every state, where low population densities, fragmented distributions, limited or no evidence of recruitment and poor condition of individuals (i.e., excessive shell erosion) are common concerns. These same observations prompted MDIFW to list the species as Threatened in 2007.

Maine figures prominently in the Brook Floater's conservation - having more occurrences than the remainder of the Northeast combined, including some apparently healthy populations. The species may have been extirpated in at least two rivers (Dennys River in Washington Co., Presumpscot River in Cumberland Co.), where efforts to relocate previously known populations have been unsuccessful. Recent surveys of Maine's southernmost population in the Pleasant River show this occurrence is on the verge of being lost. The Brook Floater's absence from most rivers and streams in southern, midcoast, and central portions of the State suggests this mussel may have experienced additional extirpations.



Passadumkeag River – a premier Brook Floater habitat.
photo by Ethan Nedeau

Conservation of freshwater mussels requires identification and protection of their habitats and fish host populations. MDIFW has surveyed over 1600 sites statewide on Maine's lakes, ponds, streams and rivers to document the distribution and status of our native freshwater mussels. Occurrences of the Brook Floater are well documented and information is being provided to towns, land trusts, and lake and watershed associations. Long-term monitoring is needed to assess population trends, and additional life history studies are needed to learn more about the species' specific habitat requirements and fish host interactions.

Protection of clean, unaltered watersheds and associated forested riparian areas is necessary for the long-term conservation of the Brook Floater. Adhering to state wetland and Shoreland Zoning laws and water quality Best Management Practices contributes greatly to

maintaining the quality of aquatic habitats for this species. Shoreland zoning and LURC zoning standards provide protection of habitat up to 250 feet from larger rivers. Some forest companies voluntarily extend the conservation of intact, forested riparian zones to 330-600 feet for larger rivers.

Recommendations:

- ◆ Prior to land development or forest harvest near waterways providing habitat for threatened and endangered species, consult with a biologist from MDIFW to assist with planning.
- ◆ Municipalities should strive to maintain areas adjacent to waterways providing habitat for rare mussels in a low density, rural setting and identify these areas in comprehensive plans. Consider protecting waterways and a 250-foot upland buffer as Resource Protection Districts.
- ◆ Use voluntary agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect important habitat for threatened and endangered species.
- ◆ Follow Shoreland Zoning and LURC standards.
- ◆ To preserve water quality and river functions, maintain contiguous, forested riparian habitats at least 250 feet from waterways providing habitat for threatened and endangered species.
- ◆ Avoid placing roads, houses, yards, and other developments within 250 feet of waterways providing habitat for threatened and endangered species.
- ◆ When projects are proposed within 250 feet of waterways providing habitat for endangered or threatened species, adhere to forestry Best Management Practices (handbook available from the Maine Forest Service, SHS #22, Augusta, ME 04333) and Maine Erosion and Sediment Control Recommendations (available from the Maine Department of Environmental Protection, SHS #17, Augusta, ME 04333).
- ◆ Avoid road crossings or use of heavy equipment in streams or rivers.
- ◆ Avoid stream alteration projects (water withdrawals, dredging, rip-rap, channelization, pipeline crossings, dams) that would alter flow or remove natural stream features such as riffles and pools.
- ◆ Avoid the use of broad-spectrum pesticides within ¼ mile of waterways providing habitat for threatened and endangered species.
- ◆ To maintain or improve water quality, conduct thorough reviews of dam and wastewater discharge proposals. Avoid land uses that would contribute to non-point sources of pollution.
- ◆ It is illegal to introduce fish species. Such introductions could alter aquatic invertebrate communities and affect host fish populations.