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New Zealand Mudsnail

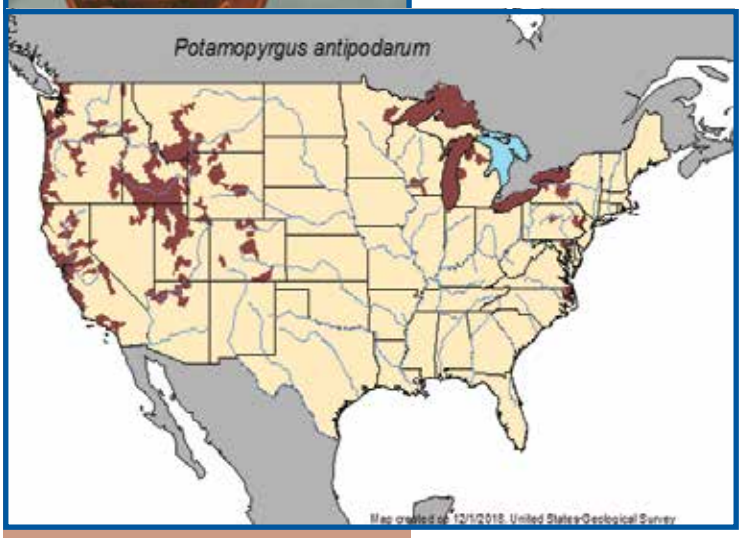
Potamopyrgus antipodarum

Photo courtesy of Larry Mayer (penny) and Daniel L. Gustafson (mudsnail), Minnesota Sea Grant..

The New Zealand mudsnail is a tiny freshwater snail that has established high densities in streams, rivers, and waterways all around the world. Since all introduced mudsnails in the United States reproduce asexually, it takes only one snail to start a new population.

Species Description

New Zealand mudsnails are small, with adults ranging from 3-12 mm (0.1-0.5 in) in their native range, and 3.5-6 mm (0.1-0.2 in) in invasive populations. The shell is long, narrow, and coiled to the right in 7-8 whorls separated by deep grooves. Some morphs, such as those in the Great Lakes, can have either smooth shells, or shells with a keel in the middle of each whorl. The operculum, which covers the opening of the shell, is thin and ear-shaped. Often confused with other native snails, the New Zealand mudsnail is usually narrower, longer, and has more whorls than most native snails in the same genus.



Map courtesy of United States Geological Survey.

Native & Introduced Ranges

Native to New Zealand, this species has spread to Europe, Asia, Australia, and North America. Two distinct populations exist in North America: a western population, which was discovered in the Snake River in Idaho and Wyoming in 1987; and a Great Lakes population, which was discovered in Lake Ontario and the St. Lawrence River in 1991. In Pennsylvania, New Zealand mudsnails were discovered in Lake Erie, about 6 km north of Presque Isle Bay in Erie County in 2007. In 2013, they were found in Spring Creek in Centre County and most recently in 2018 in Fishing Creek in Clinton County and Little Lehigh Creek in Lehigh County, showing that they are expanding their range. Populations have also been documented in tributaries of the Delaware River in New Jersey and in the Gunpowder River in Maryland.

Biology & Spread

While it is thought that Western introductions occurred by stocking fish from overseas, the Great Lakes population most likely spread by contaminated ballast water from international ships. Once established, New Zealand mudsnails can reproduce very rapidly, producing an average of 230 juveniles per year. Although in its native New Zealand, both sexual and asexual populations exist, in its invasive range all populations are asexual, consisting of almost exclusively females, which can produce twice as many daughters as sexual females. New Zealand mudsnails can spread to new locations on recreational boating and fishing equipment, through the commercial movement of aquaculture products, and aquatic ornamental plants, in mud attached to the bills or legs of birds, or even within the gut of birds or fishes.

Photo courtesy of United States Geological Survey.

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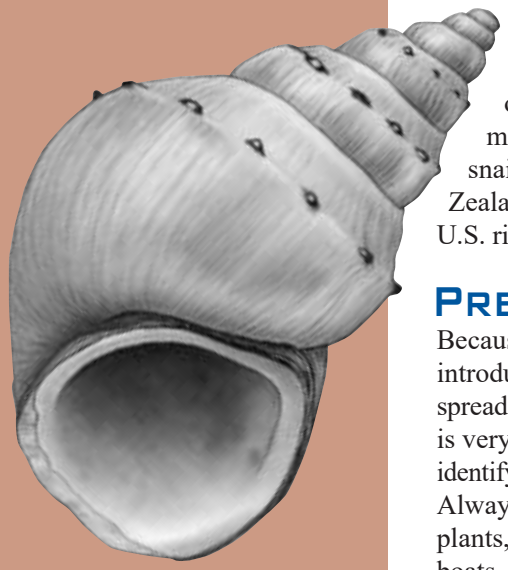

Drawing courtesy of United States Geological Survey.

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Great Lakes RESTORATION

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Habitat

The New Zealand mudsnail flourishes in a variety of aquatic habitats, including springs, rivers, lakes, and estuaries. It has been found across a wide range of water temperatures (0-30°C [32-86°F]), substrates, water depths, productivity levels, and salinities. The diet of this snail is also variable, as it feeds on green algae and diatoms as well as detritus.

Photo courtesy of Tim Worsfold, World Register of Marine Species, EOL.

Impacts

Threat to Biodiversity

High population densities may allow New Zealand mudsnails to outcompete native fauna for space on substrate and for food. In the Snake River, five species of native mollusks have been listed as endangered due in part to the establishment of the New Zealand mudsnail. Other studies have shown that in some rivers, New Zealand mudsnails make up over half the total invertebrate production, making them the dominate forage base for fish and other aquatic organisms. While they do not directly harm fish, their small, hard shells may not be digestible, resulting in little to no nutritional value gained from eating the snails. Some species, such as trout, may avoid them as a food source altogether. New Zealand mudsnails can reach densities of up to 300,000 individuals/m^2 in some western U.S. rivers, dominating habitat and impacting preferred nesting sites.

Prevention & Control

Because of its highly successful introduction, preventing further spread of New Zealand mudsnails is very important. Know how to identify the New Zealand mudsnail. Always check for and remove plants, mud, and debris from boats, trailers, clothing, and equipment before leaving a water body. Drain all water from bait buckets, bilges, and live wells before transporting to new areas. Clean all gear and equipment with hot water or salt water, OR let boats and equipment dry thoroughly for at least five days before entering a new water body.

Photo courtesy of United States Geological Survey.

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