

AQUATIC INVADERS

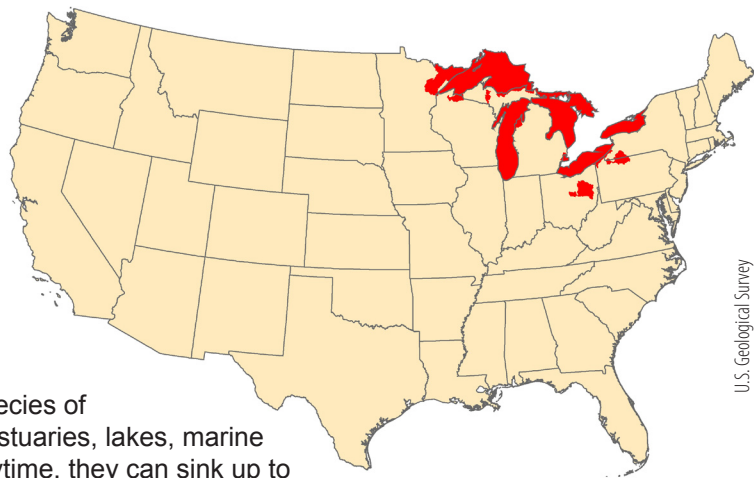


COMMON NAME: Spiny water flea

SCIENTIFIC NAME: *Bythotrephes longimanus* (Leydig 1860)

NATIVE DISTRIBUTION: The northern Palearctic from Great Britain to the Bering Sea, but successful invasions into more European lakes have made its original distribution ambiguous.

U.S. distribution: The spiny water flea was first reported in the Great Lakes region – specifically in Lake Ontario – in 1982. By 1987, it had spread to all the Great Lakes. It is also found in many inland lakes in Michigan, Minnesota, New York, Wisconsin and Ohio. The species has also invaded inland lakes in Ontario, Canada and is also invasive in Belgium and the Netherlands.



Habitat: The spiny water flea is a species of zooplankton that naturally occurs in estuaries, lakes, marine habitats and wetlands. During the daytime, they can sink up to 50 to 60 m. During the night, they accumulate in the surface layer. In its native range it shows a preference for large, deep, clear lakes with relatively low summer bottom temperatures.

Life cycle: Females and males possess 3 life-history stages (instars), differing by number of spines (barbs) on the caudal process (posterior part of the reproductive structure). During the summer, when water temperatures are warm, spiny water fleas at each instar stage can reproduce without fertilization occurring (parthenogenesis). Females produce between 1 and 24 embryos depending upon their instar stage. Because males are not needed for parthenogenesis, they are rarely found when food is plentiful, or when environmental conditions favor rapid population growth. Sex of offspring is not determined genetically, but rather by environmental factors. When food becomes limited or when the lake cools in the fall, males begin to be produced. When the water temperature declines, there is also sexual reproduction. This occurs at instars II and III, and females produce 1 to 4 resting eggs or cysts. The resting eggs are first carried as orange-brown spheres in the female brood pouch. They are later released and sink to the lake bottom where they can survive the cold winter. In spring or early summer, these eggs hatch into juvenile females that begin parthenogenic reproduction again.

Cool facts:

- They can collect on fishing lines during trolling, and accumulate to such high numbers that, at times, the line can not be reeled in.

- Eggs can survive through the winter months and can pass through digestive tracts of fish.
- A female full of eggs is double her usual weight. This causes increased predation and thereby further aids in dispersal.
- The spine often comprises 70 to 80 percent of the animal's total length, and has one to four pairs of thorn-like barbs.
- Through genetic techniques, *Bythotrephes* introductions across most of the world have been traced to populations native to St. Petersburg, Russia.

Pathways of invasion: They are thought to have arrived in the U.S. via the ballast water of trans-oceanic vessels coming from Europe. Given their tendency to attach to fishing lines and the potential to be collected in bilge water, bait buckets and livewells, it is no surprise that boating activities are responsible for spreading the species through internal waterways. Resting eggs can also be dispersed through the digestive system of ducks and fish.

Impacts: *Bythotrephes* eats smaller zooplankton, which is an important food item for the larval fish of most species. Zooplankton is also an important food source for forage fish that are, in turn, eaten by larger sport and commercial fish. In this manner, zooplankton community shifts can have an effect through the food chain. Although eaten themselves by fish, the barbed spine of the spiny water flea seems to frustrate smaller sized fish, which have difficulty swallowing them.

Biofouling of fishing lines, nets and trawls and aquaculture netting is a serious economic problem. In the U.S., spiny water fleas have become such a nuisance to anglers that fishing may become impossible during periods of peak abundance.

Ways to prevent its spread:

- Good boat hygiene is critical – boats that have been washed with warm, soapy water or mild bleach are less likely to spread non-natives.
- Clean all fishing tackle, nets, and bait buckets after use.
- Drain water from boat motors, live wells, bilges, and transom wells while on land before leaving a water area.
- Report invasive species to local officials and the USGS online at <http://nas.er.usgs.gov/> or by calling 877-7867-267 (877-STOP-ANS).

These tips apply to ALL non-native species.

Don't forget: Clean your boat after each use.
