



Spiny Water Flea (*Bythotrephes longimanus*)

Bythotrephes on fishing line
Jeff Gunderson



Tiny predator, BIG problem

The spiny water flea is a tiny, predatory crustacean with a long, sharp, barbed tail spine. Including its spine, an adult *Bythotrephes* (Byth-o-TREH-fee-z) is 1 cm (.4 inches) in length and is much larger than most zooplankton species native to the Great Lakes. The organism is a native of Northern Europe, but has since invaded the United States and Canada. It was first discovered in Lake Huron in 1984, probably introduced through the ballast water of ocean going ships. Since then populations have exploded. These crustaceans reproduce rapidly. During warm summer conditions each female can produce up to 10 offspring every two weeks. As temperatures drop in the fall, eggs are produced that can lie dormant all winter. Today the spiny water flea is found in all of the Great Lakes and has begun to invade smaller inland waters of the Great Lake states and Canada.

Though tiny, this invasive species has the potential of doing a great deal of damage in the aquatic food web. Many small fish avoid eating spiny water flea because of its barbed tail. Additionally, *Bythotrephes* is a predator, and feeds on the same native zooplankton that many small native fish also rely on for food. The more abundant *Bythotrephes* becomes, the less food remains available for juvenile fish.

To date, the only effective strategy for controlling spiny water flea is to prevent its introduction into new bodies of water. National park managers are concerned that *Bythotrephes* will make its way into additional inland lakes and upset the ecology of these waters. Dr. Charles Kerfoot of Michigan Technological University is conducting an investigation that will help.

Control Methods: Things YOU can do!

- Inspect your equipment upon leaving a lake. Remove all visible plants and animals from your boat, trailer, and accessory equipment before leaving the access area.
- Drain live wells and bilge water before you leave the access site.
- Empty all water from bait buckets onto the land, and not into a body of water. However, unwanted live bait itself should go in the trash.
- Do not move any fish, including bait, from one lake to another.
- Dry all boats and equipment for at least 5 days before entering another body of water. Some invasive organisms can survive out of water for several days.
- If you must enter another body of water within 5 days, wash your boat, trailer, tackle, downriggers, waders, etc. with hot water (above 140° F with at least one minute of contact time) first. Then dry. Flush your motor's cooling system, live wells, bilge and other boat parts that get wet. Consider having alternate anchor ropes, nets, equipment, etc.
- Learn to identify spiny water fleas and other aquatic invaders and report new sightings. If you find these unwanted invasive species in a body of water other than the Great Lakes, preserve the specimen in rubbing alcohol and contact your lake association or DNR.



**STOP AQUATIC
HITCHHIKERS!**

Prevent the transport of nuisance species.
Clean all recreational equipment.

Study Underway in National Park Lakes

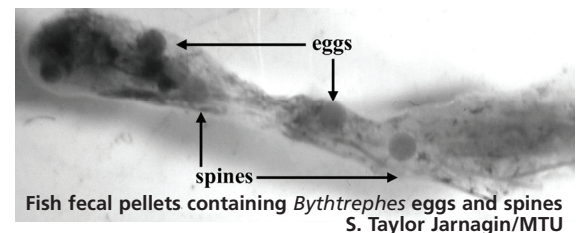
The National Park Service is currently coordinating with Dr. Charles Kerfoot on a study of *Bythotrephes* in Voyageurs National Park, Isle Royale National Park, Pictured Rocks National Lakeshore, and Sleeping Bear Dunes National Lakeshore. This study will 1) determine which inland lakes and parks have been invaded, 2) investigate effects of the *Bythotrephes* invasions on native zooplankton and fish at Pictured Rocks and Voyageurs, and 3) convey the implications of these findings to the public. Results of this study will establish a baseline against which future invasions of inland waters can be measured, and will identify which aspects of aquatic resources may be most affected by such invasions.

The first year of the study (2008) focused on surveys to determine which parks and lakes had been invaded and identify possible dispersal vectors. Sediment samples were taken from 63 lakes and sieved for evidence of spines and resting eggs (egg bank).

Isle Royale National Park is a designated wilderness area and is surrounded by Lake Superior's infested waters. By the very nature of its wilderness designation, it has limited access to its inland lakes. With rigorous control methods in place, Isle Royale's inland lakes were confirmed

free of *Bythotrephes* as no evidence of its presence was found during the study. On Michigan's Keweenaw Peninsula, also surrounded by infested Lake Superior waters, boat ramps with easy access for watercraft abound. Here, Portage, Lac La Belle, Gratiot, Medora, Fanny Hoe, and Gogebic Lakes have all been invaded by the spiny water flea.

Since geology, aquatic birds, and mammals are very similar in the Keweenaw and Isle Royale regions, contrast between the two shows that natural vectors have little influence in the spread of *Bythotrephes*. Human activity involving boat traffic and live wells/bait buckets appears to be the primary cause of dispersal.



Research also showed that even after passing through the guts of fish, spiny water flea eggs were intact and viable. Because of this, it is extremely important that fish from one body of water not be released into a different body of water.



Graduate student Foad Yousef, from Michigan Technological University, examines a plankton tow.

Protecting Your Waters

Isle Royale National Park exercises rigorous control measures to prevent the spread of spiny water flea. Paddlers, hikers, anglers, and staff wipe down all equipment (canoes, kayaks, paddles, fishing gear, etc.) when leaving infested Lake Superior waters and traveling to un-infested inland lakes. Once the equipment is wiped down, the cloths are sealed in plastic bags and not used at all near inland waters. Wiping towels and plastic bags for those who did not bring them from home are provided adjacent to educational

signs at all entry portages. Park staff launder the towels once they are returned. When possible, visitors and staff sterilize equipment with boiling water. They use separate water filters in Superior's waters and inland water bodies or backflush their filters with filtered or boiled water several times after filtering Lake Superior water and before using it in inland lakes. Anglers are encouraged to fish inland before heading to Lake Superior waters, or to change their fishing line entirely between infested and un-infested waters.