



NAS - Nonindigenous Aquatic Species

***Bythotrephes longimanus***

(spiny water flea)

Crustaceans-Cladocerans

Exotic to United States

Collection Info **HUC Maps** **Point Maps** **Fact Sheet**

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***Bythotrephes longimanus*****Common name:** spiny water flea**Taxonomy:** available through

Identification: *Bythotrephes longimanus* is a large cladoceran distinguished by a long straight tail spine that is twice as long as its body and has one to three pairs of barbs. Parthenogenically produced animals have kink in middle of their spine and sexually produced animals lack the kink. *Bythotrephes* appearance is similar to *Cercopagis pengoi*, another Great Lakes invader, except *Bythotrephes* is larger with a more robust spine that lacks a hook at the end.

Size: can reach 15 mm**Native Range:** Northern Europe and Asia.



Interactive maps: [Continental US](#), [Alaska](#), [Hawaii](#), [Caribbean](#) [Point Distribution Maps](#)

Nonindigenous Occurrences: Great Lakes region. *Bythotrephes* was first detected in December 1984 in Lake Huron (Bur et al. 1986), then Lake Ontario in September 1985 (Lange and Cap 1986), Lake Erie in October 1985 (Bur et al. 1986), Lake Michigan in September 1986 (Evans 1988), and Lake Superior in August 1987 (Cullis and Johnson 1988).

Collected from Long Lake approximately 5 miles SW of Traverse City, **Michigan** (Marangelo, unpublished data). Established in Greenwood Lake and Flour Lake, **Minnesota** (Branstrator, D., U of Minn.-Duluth). Collected in Allegheny Reservoir, **New York** (Hoskin, R. U.S. Corps of Engineers).

Means of Introduction: *Bythotrephes* were probably introduced from ships ballast water (Sprules et al. 1990, Berg et al. 2002) and possibly as resting eggs from mud (Evans 1988).

Status: *Bythotrephes* are established in all of the Great Lakes and many inland lakes in the region. Densities are very low in Lake Ontario, low in southern Lake Michigan and offshore areas of Lake Superior, moderate to high in Lake Huron, and very high in the central basin of Lake Erie (Barbiero et al. 2001, Vanderploeg et al. 2002, Brown and Branstrator 2004).

Impact of Introduction: It has caused major changes in the zooplankton community structure; invasion history; reproduce rapidly; competes directly with small fish and can have impact on zooplankton community (U.S.EPA 2008). The first noticeable impact of *Bythotrephes* was on fisherman. The tail spines of *Bythotrephes* hook on fishing lines, fouling fishing gear. *Bythotrephes* consume small zooplankton such as small cladocerans, copepods, and rotifers, competing directly with planktivorous larval fish for food (Berg and Garton 1988, Evans 1988, Vanderploeg et al. 1993). *Bythotrephes* have been implicated as a factor in the decline of alewife (*Alosa pseudoharengus*) in Lakes Ontario, Erie, Huron, and Michigan (Evans 1988). *Bythotrephes* also compete with, and possibly prey on, *Leptodora kindtii* and may be a causal factor in the decline of *Leptodora* (Branstrator 1995). *Bythotrephes* and *Leptodora* abundances are often negatively correlated (Garton et al. 1990, Branstrator 1995). There is speculation that *Bythotrephes* may control the abundance of *Cercopagis pengoi* though competition and predation (Vanderploeg et al. 2002). *Bythotrephes* are a food source for fish including yellow perch, white perch, walleye, white bass, alewife, bloater chub, chinook salmon, emerald shiner, spottail shiner, rainbow smelt, lake herring, lake whitefish and deepwater sculpin (Bur et al. 1986, Makarewicz and Jones 1990, Branstrator and Lehman 1996).

Remarks: *Bythotrephes* are found among the zooplankton in the upper water column of large and small temperate lakes, can tolerate brackish water, and are most abundant in late summer and autumn. Occurrence and density of *Bythotrephes* populations are apparently determined mainly by water temperature and salinity. *Bythotrephes* is limited to regions where water temperature ranges between 4 and 30°C and salinity values between 0.04 and 8.0‰, but prefers temperature between 10 and 24°C and salinity between 0.04 and 0.4‰ (Grigorovich et al. 1998). Temperature appears to play a major role in determining the abundance and location of *Bythotrephes* in the Great Lakes, as they prefer cooler water and cannot tolerate very warm lake temperatures (Berg and Garton 1988, Garton et al. 1990, Brown and Branstrator 2004). *Bythotrephes* can reproduce asexually as well as sexually; unfertilized eggs are carried in a brood pouch, and fertilized eggs are cast in the fall, hatching the following spring (Evans 1988). The intensity and type of predation pressure appears to affect the size of *Bythotrephes*, spine length, and the extent of diel migrations (Straile and Halbach 2000).

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Other Resources:

<http://www.seagrant.umn.edu/exotics/spiny.html>

<http://sgnis.org/update/spiny.htm>

<http://sgnis.org/publicat/papers/bergdj92.pdf>

[Bythotrephes longimanus \[spiny water flea\] \(ANS Clearinghouse Bibliography\)](#)

[Bythotrephes longimanus \(Global Invasive Species Database\)](#)

[NY Invasive Species Clearinghouse](#)



NOAA Sea Grant Nonindigenous Species Site (SGNIS)

[GLIFWC-Maps](#)

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