Scientific Name: *Gammarus fasciatus* Say, 1818

Common Name: (gammarid) amphipod

Taxonomy: available through ITIS

Identification: The 1st antenna, which is typically longer than the 2nd antenna of this species, exhibits a 2–7 segmented accessory flagellum. There are no cylindrical appendages on the coxal gills. The uronites have obvious dorsal spines and the telson shows a deep cleft, almost to the joint with the body (Pennak 1978; Peckarsky et al. 1993).

Size: *G. fasciatus* can grow to 14 mm in length (Pennak 1978).

Native Range: *G. fasciatus* is native to the Mississippi drainage and the Atlantic coast of North America from the Atlantic coastal plain to North Carolina, including such drainages as the Hudson, Delaware, and Chesapeake river systems. It may be native to the Great Lakes drainage (Pennak 1978; Mills et al. 1993; Grigorovich et al. 2003).

Nonindigenous Occurrences: *G. fasciatus* was first recorded from the Great Lakes around the late 1800s to early 1900s and is known to occur throughout the drainage. It is unknown whether or not it is native to the Great Lakes. It is particularly difficult to find clear information on its distribution before 1940 (Mills et al. 1993; Grigorovich et al. 2003).

Means of Introduction: Unknown. If *G. fasciatus* is an introduced species in the Great Lakes, possible means of introduction could include transport in either solid or liquid ballast, arrival on aquatic plants, arrival with stocked fish, dispersal via canals, and/or introduction via fish bait (Mills et al. 1993; Hogg et al. 2000).

Status: Established throughout all the Great Lakes but may be native to the basin.

Ecology: *G. fasciatus* is a freshwater benthic species that can tolerate some very low levels of salinity. It occurs in both rivers and lakes and is particular abundant in shallow well oxygenated areas. In the St. Lawrence River, the abundance of *G. fasciatus* is correlated with the biomass of *Cladophora* spp. and macrophytes as well as pH. In some ponds in Ontario, it occurs at pH above 7. *G. fasciatus* survives well at water temperatures around 10–15°C. Starting at 20°C, temperatures are less tolerable. The length of time *G. fasciatus* can tolerate a specific water temperature above 20°C decreases with increasing temperature. Temperatures of around 34–35°C and more cause relatively rapid mortality. *G. fasciatus* is frequently associated with thick macrophyte beds (Pentland 1930; Sprague 1963; Pennak 1978; Van Maren 1978; Thibault and Couture 1980, 1982; Borgmann et al. 1989; Palmer and Ricciardi 2004).

G. fasciatus feeds on detritus and sediments, coarse and fine particulate organic matter, filamentous algae, diatoms, animal matter, its own species, and zooplankton such as *Daphnia* spp. Smaller individuals feed on detritus more frequently. *G. fasciatus* from

Lake Erie exhibit better growth and survivorship feeding on faeces and pseudofaeces of introduced mussels in the genus *Dreissena* than those subsisting in macrophytes beds with prolific epiphytic algal growth. *G. fasciatus* can be a common food item for many fish species, including yellow perch (*Perca flavescens*) (Swiss and Johnson 1976; Borgmann et al. 1989; Weisberg and Janicki 1990; Delong et al. 1993; Brent Summers et al. 1997; Gonzalez and Burkart 2004).

In Lake Ontario *G. fasciatus* is potentially one of the hosts for the nematode *Cosmocephalus obvelatus*, which infects the oesophagus of gulls. In the St. John estuary, New Brunswick, it is host to the nematode *Capillospirura pseudoargumentosa*, which develops to the infective stage in the amphipod and then infects shortnose sturgeon. The swim bladder nematode *Cystidicola farionis* develops to the 3rd stage in this species, and then eventually infects fish species. *G. fasciatus* is intermediate host to other aquatic parasites as well, including some acanthocephalans (Johnson 1975; Smith and Lankester 1979; Wong and Anderson 1982; Appy and Dadswell 1983).

G. fasciatus can produce on the order of 20 embryos in a given clutch (Borgmann et al. 1989). See Clemens (1950) for a detailed account of the life cycle and ecology of *G. fasciatus*.

Impact of Introduction

A) Realized: Unknown.

B) Potential: Unknown.

Remarks: *G. fasciatus* and the introduced amphipod *Echinogammarus ischnus* both increase in density in the presence of invasive *Dreissena* spp. in the St. Lawrence River, probably due to refugia and increased food resources from mussel pseudofaeces. However, in the presence of the introduced round goby, *Neogobius melanostomus*, the abundance of *G. fasciatus* has decreased in eastern Lake Erie by up to 85%. In some parts of the Detroit River, Niagara River, and Lake St. Clair, *Echinogammarus ischnus* is replacing *Gammarus fasciatus*, probably due to a stronger affinity of the former for *Dreissena* spp. substrate in these water bodies. In spite of this, *G. fasciatus* does still increase in the Great Lakes in the presence of invasive mussels through increased habitat heterogeneity and increased food from mussel pseudofaeces (Dermott et al. 1998; Stewart et al. 1998a, b; Van Overdijk et al. 2003; Barton et al. 2005; Limen et al. 2005; Palmer and Ricciardi 2005).

There is little genetic variation between and within populations of *G. fasciatus* throughout the Great Lakes. There is more variability in populations found in the St. Lawrence River. This would lend evidence to the hypothesis that the Great Lakes' populations of *G. fasciatus* were relatively recent introductions, possibly from systems such as the St. Lawrence, Hudson, Chesapeake, or Delaware drainages. However, it is still unclear whether or not this species is native to the Great Lakes (Hogg et al. 2000).

Voucher Specimens:

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Other Resources:

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Group: Crustaceans - All

Lake(s): All Great Lakes Drainages

Genus: *Gammarus*

Species: *fasciatus*

Common Name: (gammarid) amphipod

Status: Established: cryptogenic

Freshwater/Marine: Freshwater (some tolerance to very low salinities)

Pathway: Unknown

Exotic/Transplant: Native Transplant if introduced – may be a native species