

# The Fathead Minnow, *Pimephales promelas*, in New Brunswick

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A second record for the occurrence of the Fathead Minnow (*Pimephales promelas*) in New Brunswick, the first for the south-west portion of the province, is reported. This is the first documented occurrence of the species in the province in 44 years, and the first indication that the Fathead Minnow occurs outside the upper Saint John River system in New Brunswick.

Key Words: Fathead Minnow, *Pimephales promelas*, distribution, occurrence, habitat, St. Croix River, New Brunswick.

The Fathead Minnow (*Pimephales promelas*) is widely distributed in Canada (Scott and Crossman 1973), occurring from New Brunswick in the east, west through southern Quebec, all of Ontario, and large parts of Manitoba, Saskatchewan, Alberta, and a small area in the southern Northwest Territories. Various checklists and documents on fish species in New Brunswick identify the Fathead Minnow as occurring in the province (Scott and Crossman 1959, 1973; Gorham 1970s).

The status of the Fathead Minnow in New Brunswick has been uncertain, and sometimes a subject of debate, since it was first recorded here. Scott and Crossman (1959) reported the first record of the Fathead Minnow in New Brunswick waters. That record was based on the collection of two specimens in 1958 from an unnamed tributary to the Saint John River near Edmundston (Royal Ontario Museum Catalogue Number 19705).

Here, we report the collection of Fathead Minnows in southwestern New Brunswick during 2002. Based on the new records, it is important to alert researchers and fisheries resource managers of the potential for the species to be more widely distributed in the province than previously believed.

The Fathead Minnow is characteristically a small schooling species found in freshwater and brackish environments. The habitats associated with the species vary greatly throughout its range (Scott and Crossman 1973). It is found in lakes, ponds, and streams of varying sizes, ditches, reservoirs, and residual pools of intermittent streams, usually in sluggish or still water with a muddy bottom and abundant floating and submerged vegetation. The species is tolerant of high temperature, turbidity, low oxygen concentration, and high salinity.

Fathead Minnows were found at three sites in the watershed of a small unnamed tributary to the St. Croix River at St. Stephen, while conducting systematic electrofishing spot-checks for fish presence on 1 and 3 August 2002. All sites were located in settings that represented areas highly disturbed by human activities.

Table 1 summarizes details of the settings and habitat characteristics at sites of the historical and new records.

The sites where Fathead Minnows were collected in 2002 are approximately 250 km from the location where they were collected in 1958 by Scott and Crossman (1959). Figure 1 shows the localities where Fathead Minnows have been documented in New Brunswick.

The Fathead Minnow was the only species of fish present at the three sites where it was collected in 2002. These sites are located upstream of Queensway Street (St. Stephen), in a section of stream with an average slope of 1.7%. A fourth site, sampled downstream of Queensway Street in a section of stream with an average slope of 7.2%, had a fish species assemblage that consisted of American Eel (*Anguilla rostrata*), Brook Trout (*Salvelinus fontinalis*), Creek Chub (*Semotilus atromaculatus*) and Lake Chub (*Couesius plumbeus*). The culvert under Queensway Street appears to be a barrier to upstream fish passage.

Six specimens of Fathead Minnows were captured at SC1, nine specimens at SC2, and one specimen at SC3. Fork length was measured for specimens at SC1 (range = 34–56 mm; mean = 40 mm) and SC2 (range = 32–61 mm; mean = 43 mm). One specimen retained from SC1 and two specimens from SC2 were deposited in the collections of the New Brunswick Museum (NBM), catalogued as NBM 1181 and NBM 1182, respectively. All other specimens were released back into the waters from which they were captured.

These new records raise questions related to the spoty distribution of populations of the Fathead Minnow in the province: are the recorded populations native or have they resulted from introductions of the species in some localities? Scott and Crossman (1973) identified the waters of western New Brunswick as being on the northeast fringe of the distribution range for the Fathead Minnow.

The Fathead Minnow has been recorded in approximately 100 lakes and ponds in the neighbouring State of Maine, occurring in all regions of the state (David Halliwell, Maine Department of Environmental Pro-

TABLE 1. Historical and new distribution records for the Fathead Minnow in New Brunswick. Preserved museum collections are noted: NBM = New Brunswick Museum; ROM = Royal Ontario Museum.

Site and Catalogue No.	Location Description	Date	Coordinates (Lat/Long)	Setting and Habitat	Sample Method
SJ1 (6(a)*) ROM 19705	Flood plain of creek between Saint John River and Highway 2, 8 miles south of Edmundston, NB	23 May 1958	47 19 44.63070N, 68 09 32.86147W	Water deep brown, visibility 10-15 inches; bottom hard mud; creek 10 feet wide, 4 feet deep	Seine, dip net
SC1 NBM 1181	Downstream of culvert under Route 725, St. Stephen, NB	1 August 2002	45 11 37.11892N, 67 18 53.61411W	Rural highway/residential; residual plunge pool, in intermittent stream, approximately 0.4 m deep; substrate of small gravel, sand, and mud, with small woody debris and detritus; water temperature 16° C	Electrofisher, dip net
SC2 NBM 1182	Downstream of culvert under St. Stephen Drive, St. Stephen, NB	3 August 2002	45 11 20.21655N, 67 18 39.21542W	Urban street/industrial park; quiet plunge pool approximately 1m deep; substrate of sand and mud, with detritus, emergent vegetation; water temperature 15° C	Electrofisher, dip net
SC3	Upstream of culvert under Queensway Street, St. Stephen, NB	3 August 2002	45 11 4.11048N, 67 17 36.36927W	Urban street/residential; sluggish stream approximately 0.4m deep; substrate of rock, gravel, sand and mud, with detritus, submerged vegetation; water temperature 18° C	Electrofisher, dip net

\* Station designation assigned by Scott and Crossman (1959)

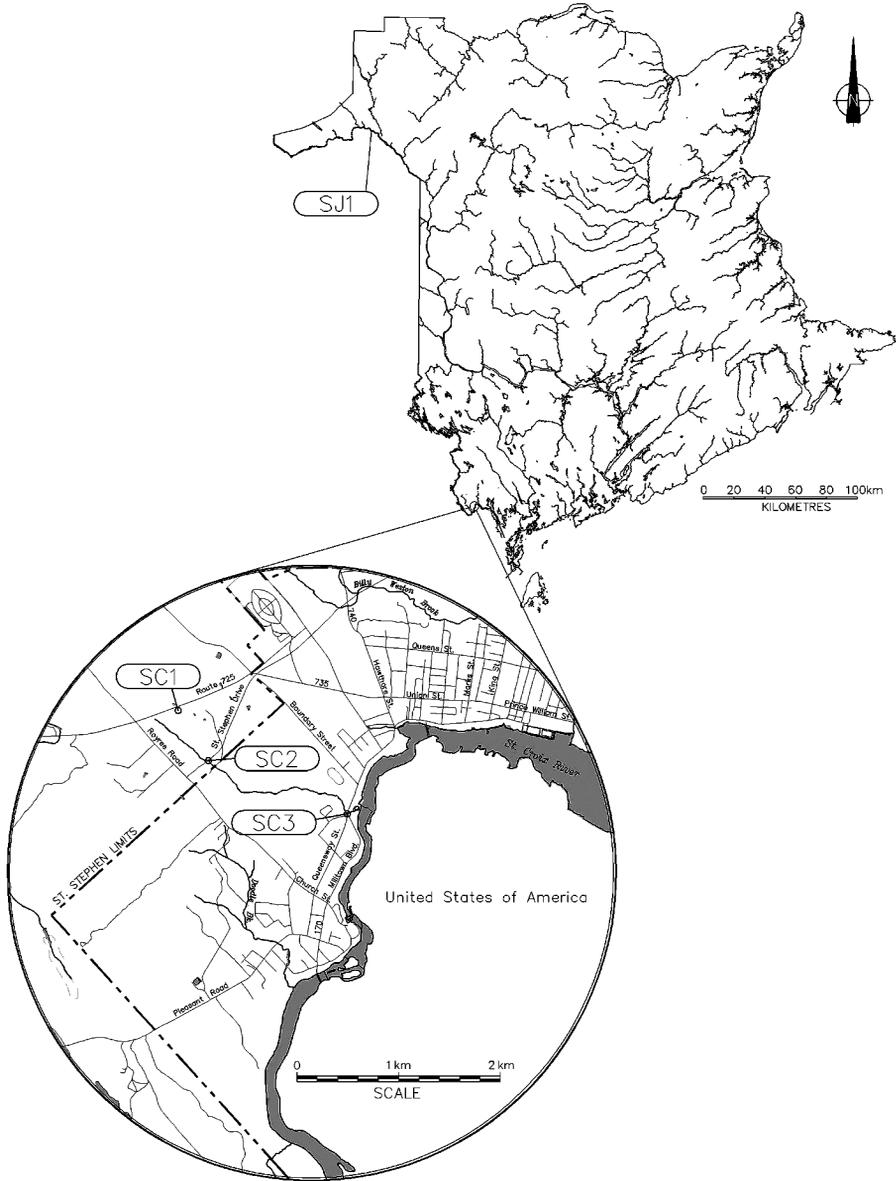


FIGURE 1. Distribution of the Fathead Minnow in New Brunswick. Locality designations correspond to those in Table 1.

tection, personal communication to DJH; Richard Jordan, Maine Department of Inland Fisheries and Wildlife, personal communication to DJH). Several of these locations occur in watersheds that drain to the Maine–New Brunswick boundary waters of the Saint John River or the St. Croix River systems. The waters in Maine where the Fathead Minnow has been recorded, nearest the sites in St. Stephen, are Upper and Lower Mud Lakes (Machias River watershed) and Orié Lake

(St. Croix River watershed), located approximately 23 km southwest and 49 km northwest, respectively.

The records of occurrence of the Fathead Minnow in Maine are biased by the sampling effort associated with management of lakes that support important recreational fisheries for species of salmonids and smallmouth bass (*Micropterus dolomieu*). If sampling was expanded to other waters, it is believed that the Fathead Minnow would be found at other locations in

Maine (Richard Jordan, Maine Department of Inland Fisheries and Wildlife, personal communication to DJH).

Whittier et al. (2000) described the general distribution and native status of 24 minnow species in north-eastern USA. They determined the Fathead Minnow to be native to the lakes where they collected it in central and northern Maine. However, the native status of this species has not been determined for the various locations where it has been recorded in the waters of eastern Maine (Richard Jordan, Maine Department of Inland Fisheries and Wildlife, personal communication to DJH). The Fathead Minnow is considered representative of intrastate introduced native fish species in Maine, as a result of illegal baitfish transplants (Halliwell 2003).

Live baitfish can be transported long distances. Consequently, bait-bucket transfer has been suggested as a major vector for illegal introductions and the occurrence of species in areas outside their native ranges (Litvak and Mandrak 1993, 2000; Rahel 2000). The use of baitfish for recreational fishing is widespread in Maine and the Fathead Minnow is a species commonly used (Richard Jordan, Maine Department of Inland Fisheries and Wildlife, personal communication to DJH). In New Brunswick, the use of baitfish is limited by provisions in the provincial angling regulations. The use or possession of live fish as bait is prohibited, except on tidal waters and on boundary waters between Maine and New Brunswick. On boundary waters, the only live fish that can be used or possessed for bait are fish taken from the waters being fished.

Due to the proximity of the St. Stephen sites to boundary waters where the Fathead Minnow could be used as a baitfish, its occurrence at these sites could be the result of a bait-bucket transfer. However, this is not certain with the information available.

In order to confirm the status of the 2002 records, the Atlantic Canada Conservation Data Centre (ACCDC) and various museums in eastern Canada were contacted to determine if they hold unreported data or collections of the Fathead Minnow from New Brunswick. The ACCDC reported that there were no records of the Fathead Minnow in New Brunswick other than that reported by Scott and Crossman in 1959 (Kate Bredin, ACCDC, personal communication to DJH). Consultation with representatives from Canadian and major regional museums confirmed that they hold no unreported collections of the Fathead Minnow from the province (Sylvie Laframboise, Canadian Museum of Nature, personal communication to DJH; Donald McAlpine, New Brunswick Museum, personal communication to DJH; John Gilhen, Nova Scotia Museum of Natural History, personal communication to

DJH; Erling Holm, Royal Ontario Museum, personal communication to DJH).

The lack of additional occurrence records for the Fathead Minnow in New Brunswick might be a reflection of the actual distribution of the species in the province, or perhaps a lack of effort among some fisheries field personnel to distinguish between the numerous species of minnows encountered. Historically, individual species of minnows have been given little attention in fisheries surveys, often being lumped together into the generic category of "minnows" (Whittier et al. 2000).

The new records in 2002 indicate the potential for the species to be more widely distributed in the province than previously believed. It is unknown if the populations of the Fathead Minnow at St. Stephen are native to southwestern New Brunswick, or if they have been introduced.

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### Literature Cited

- Goerham, S. W. 1970. Distributional checklist of the fishes of New Brunswick. The New Brunswick Museum. 32 pages.
- Halliwell, D. B. 2003. Introduced fish in Maine. Maine Aquatic Biodiversity Project series: Focus on Freshwater Biodiversity. 12 pages.
- Litvak, M. K., and N. E. Mandrak. 1993. Ecology of freshwater baitfish use in Canada and the United States. *Fisheries* 18(12): 6-13.
- Litvak, M. K., and N. E. Mandrak. 2000. Baitfish trade as a vector of aquatic introductions. Pages 163-179 in *Non-indigenous Freshwater Organisms: Vectors, Biology, and Impacts*. Edited by R. Claudi and J. H. Leach. Lewis Publishers. CRC Press. 464 pages.
- Rahel, F. J. 2000. Homogenization of fish faunas across the United States. *Science* 288: 854-856.
- Scott, W. B., and E. J. Crossman. 1959. The freshwater fishes of New Brunswick: a checklist with distributional notes. Contributions of the Royal Ontario Museum, Division of Zoology and Palaeontology Number 51. 37 pages.
- Scott, W. B., and E. J. Crossman. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada Bulletin 184. 966 pages.
- Whittier, T. R., D. B. Halliwell, and R. A. Daniels. 2000. Distributions of lake fishes in the northeast – II: the minnows (Cyprinidae). *Northeastern Naturalist* 7: 131-156.

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