



# Round Goby

*Neogobius melanostomus* (Pallas, 1814)  
syn. *Neogobius melanostoma*, *Gobius melanostomus*, *Apollonia melanostoma*

ALBERTA REGULATION:  
FISHERIES ACT

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## Overview:

The round goby is a small, ray-finned fish of the Gobiidae family, one of the largest fish families. It is native to the Caspian and Black Sea basins of Europe.<sup>3</sup> This species can adapt to a wide range of salinities, from freshwater to brackish estuaries.<sup>1</sup> Introduction to the Great Lakes likely occurred via ship ballast water or possibly eggs attached to hulls. First recorded in 1990, *N. melanostomus* spread throughout the Great Lakes within 5 years.<sup>1</sup>

*N. melanostomus* have a wide tolerance to environmental conditions, are early maturing, spawn multiple times, and are opportunistic feeders of a variety of benthic organisms. Invasions of round goby have caused diet shifts among predators and the decline of some native species due to competition for resources.<sup>1</sup> In the Great

Lakes, round gobies have reduced the hatching success of lake trout and lake sturgeon.<sup>1</sup> In the St. Clair River, spawning interference by round gobies has been implicated in the decline of mottled sculpin (*Cottus bairdi*) populations.<sup>1</sup>

*N. melanostomus* diet also includes the non-native, invasive zebra mussel, *Dreissena polymorpha*. A research experiment investigated the size classes and amount of zebra mussels round goby consumed.<sup>5</sup> It was found that round goby, of all sizes, consumed mussels smaller than 10 mm, at an average rate of 1.0 g every 24 hours. This would impact the size structure of zebra mussel populations<sup>5</sup> but does not constitute an effective control measure for invasive mussels.

*N. melanostomus* can be distinguished from all native fish by the presence

of fused pelvic fins. Another introduced goby, the tubenose goby (*Proterorhinus marmoratus*), has a fused pelvic fin similar to the round goby but can be differentiated by elongated nostril tubes and a black spot on the rear base of the dorsal fin.<sup>1</sup>

As of January 1, 2016, the possession, sale, or transport of this species in Alberta is illegal under the Fisheries Act.

## Habitat:

Freshwater rivers and lakes, as well as brackish waters with salinities between 18-30 ppt. It prefers coastal or shallow shorelines, which are well vegetated and have a rocky or cobble bottom.<sup>1</sup> It will also inhabit waters with fine gravel or sandy bottoms and may burrow into them.<sup>2</sup> It tolerates water temperatures from 0 to 30°C and can tolerate low oxygen content<sup>3</sup> (0.3-0.9



# Round Goby *(continued)*

mg/l),<sup>1</sup> for several days.<sup>3</sup> Also, tolerant of degraded habitats.<sup>1</sup>

## Identification:

The round goby is a yellowish-grey, soft-bodied and cylindrical fish with dark blotches.<sup>4</sup> Breeding males are almost black.<sup>1</sup> It has two dorsal fins, the first bearing a large black spot towards the back. The head is large and frog-like, and consists of about 22% of the total body length.<sup>1</sup> Eyes are bulbous and protrude slightly from the top of the head. The lower jaw is not prominent and the angle of the jaw is below the front quarter of the eye.<sup>1</sup> There is no visible lateral line. Cycloid scales,<sup>4</sup> being oval to round and having a smooth back edge, cover the back of the head, the back, throat, abdomen, and one quarter of the gill covers.<sup>1</sup> Total length varies between 8-18 cm,<sup>4</sup> and up to 25 cm,<sup>1</sup> with males being larger.<sup>4</sup>

The first dorsal fin has 5-7 spines, the second has 1 spine<sup>1</sup> and 12-17 dorsal soft rays. The anal fin has 1 spine and 9-14 soft rays.<sup>3</sup> The pelvic fins are fused to form a suction-like disk to help anchor the fish to substrate in flowing waters.<sup>4</sup> Both sexes bear an erectile papilla between the anus and base of the anal fin.<sup>1</sup>

## Ecology:

Males become sexually mature by 3 years of age, females by 2 years. The breeding season can last from April

to September.<sup>1</sup> Females can spawn repeatedly through the season and more than one female may deposit eggs in one nest.<sup>4</sup> Eggs are deposited in a net under rocks, logs, empty mollusc shells, and human waste articles (cans, etc.).<sup>1</sup> Eggs are pale yellow to orange and measure 3.9 by 2.8 mm. Egg fecundity increases linearly with female body weight<sup>4</sup> and ranges from 200 to over 5000 eggs per female.<sup>1</sup> Males guard the nest and juveniles, then die after the spawning season.<sup>3</sup> Hatched larvae measure 5.5-5.7 mm and resemble adults.<sup>1</sup> Life span for round goby is 3-4 years.<sup>4</sup>

*N. melanostomus* are bottom feeders and their diet is composed primarily of crustaceans and molluscs, notably the non-native zebra mussels.<sup>2</sup> They will also prey upon fish eggs and larvae, including their own, as well as insect larvae<sup>2</sup>, snails and zooplankton.<sup>5</sup> Their lateral line system, used to detect movement and vibrations in the water, enables feeding in complete darkness.<sup>2</sup>

Typically, round goby will stay in one place; however, migration to and from deeper waters for overwintering contributes to dispersal.<sup>4</sup>

## Economic Impacts:

Round goby compete directly with native shallow water fishes for resources and habitat.<sup>1</sup> In the Great Lakes round goby have reduced the

hatching success of lake trout and lake sturgeon.<sup>1</sup> Predation of sportfish eggs and/or larvae could have impacts on recreation and tourism.

## Environmental Impacts:

Round goby compete directly with native shallow water fishes for resources and habitat.<sup>1</sup> Predation of native fish eggs and/or larvae would negatively impact populations. Diet shifts among predators negatively impacts natural food webs.<sup>1</sup>

## Sociological Impacts:

The transformation of native aquatic communities results in the intrinsic loss of natural capital and enjoyment of natural areas.

## Prevention:

Learn how to identify round goby and how to prevent spread. Do not use round goby for bait. Never empty your aquarium into natural water bodies. Inspect boats, trailers, and recreational equipment upon leaving a waterbody and clean, drain and dry all mud or vegetation.

## Control:

Currently there are no widely established options for the round goby control other than preventing introduction. If caught, round goby should be killed and not released. Report any sightings.



# Round Goby *(continued)*



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