

INVASIVE FISH

Round Goby

Neogobius melanostomus



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The round goby is a small, but aggressive bottom-dwelling fish that grows rapidly and reproduces several times in one spawning season. It is a huge threat to North American aquatic ecosystems because it is adaptable to a wide range of environmental conditions and will eat just about anything alive that will fit in its mouth.

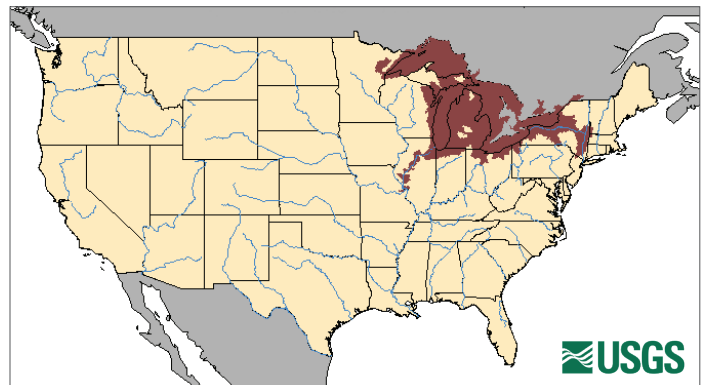
Species Description

Round gobies have a soft body and a large round head with thick lips and distinctive frog-like raised eyes. They can reach up to 25.5 cm (10 in) in length as adults but are usually less than 18 cm (7 in) in the Great Lakes. Females and immature males are a solid slate gray mottled with black and brown spots. Spawning males turn almost solid black. Two distinguishing characteristics of round gobies are a single, scallop-shaped pelvic fin and a distinctive black spot located on the dorsal fin.

Round gobies closely resemble the native mottled sculpin, but the two species can be easily separated by looking at the pelvic fins. The sculpin has two separated pelvic fins compared to the single, fused pelvic fin found on the round goby. The sculpin also lacks the large black spot found on the dorsal fin of the round goby.

Native & Introduced Ranges

Round gobies are native to Eurasia in the Black, Caspian, and Azov seas, and tributaries. They were first discovered in the St. Clair River in 1990, presumably released during ballast water exchanges of transoceanic ships. They have since spread to all of the Great Lakes and are now working their way inland through rivers and canal systems. In Pennsylvania, the round goby is abundant in Lake Erie



and its lower tributaries. The first inland occurrence for Pennsylvania was confirmed in 2010 at the Fairview Gravel Pits in Erie County.

Biology & Spread

Young round gobies often resemble small bait fish and can be spread by boaters and fishermen who carry them from one body of water to another in bait buckets, bilge water, and on plant debris. They quickly establish and spawn from April to September, with females visiting multiple nests to spawn with several different males. Male gobies ferociously defend the nests, and as a result, the species can produce a large number of healthy offspring in a very short time.

Habitat

Round gobies prefer shallow waters with rocky and sandy bottoms where they can perch on top of rocks and hide in crevices. They can occupy a variety of depths and tolerate a wide range of temperatures, water quality, and oxygen concentrations. They also thrive in brackish water and degraded ecosystems.

Impacts

Threat to Biodiversity

The aggressive round goby is thriving at the expense of native fish populations including sculpins, logperch, lake trout, and darters. They feed voraciously on the eggs and young of native species and are able to out compete them for food and breeding habitat. Round gobies have a competitive advantage because they can feed in complete darkness, survive in degraded water conditions, and use their pelvic fin as suction cups to keep them anchored to rocks and substrates in rapid currents. Because round gobies aggressively defend prime spawning areas, they reduce the reproductive success of native species by denying them access.

Economic Costs

Round gobies feed on the eggs of many important sport fish, reducing their ability to maintain population size. In addition, anglers who fish in areas with round goby infestations often find that they steal bait and appear to be the only type of fish in that area.

Threat to Human Health

In addition to fish eggs and other aquatic organisms, round gobies feed heavily on zebra mussels and quagga mussels. Because invasive mussels are filter feeders, they can accumulate contaminants such as heavy metals, PCBs, harmful bacteria, and toxins in their fatty tissues. Since many sport fish, including smallmouth bass, yellow perch, and walleye, are found to prey on round gobies, the direct

Photo courtesy of Eric Engbretson, U.S. Fish and Wildlife Service, Bugwood.org.



Photo courtesy of Sean Rafferty, Pennsylvania Sea Grant.

transfer and bioaccumulation of the contaminants moves up the food chain, leading to more restrictive fish consumption advisories. Gobies have also been implicated as vectors of disease such as Type E botulism in the Great Lakes that has caused widespread fish and bird kills.

Prevention & Control

Preventing the spread of round gobies to new areas is the best way to prevent further ecological and economic damage. Anglers are often the first to discover new infestations because they are commonly caught by hook and line.

Know how to identify the round goby. Always check for and remove any plants, mud, and debris from boats, trailers, clothing, and equipment before leaving a water body. Since young goby can resemble baitfish, it's important to drain water from bait buckets, bilges, and live wells before transporting to new areas. It is unlawful to transport round goby in Pennsylvania due to its invasive nature and impact to local ecosystems. Clean and dry all equipment, and **NEVER use round gobies as bait.**

References:

Crosier, D. and Malloy, D. 2005. Round Goby. United States Federal Aquatic Nuisance Species Task Force.

Great Lakes Science Center. 2000. Fact Sheet: Round Goby: An exotic fish in the Great Lakes.

United States Fish and Wildlife Service. 2011. Round Goby Q&A.

Pennsylvania Fish and Boat Commission 2023. 2023 Pennsylvania Fishing Summary.

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