

# Rainbow Smelt

*Osmerus mordax*



Photo courtesy of Mark Malchoff, University of Vermont Lake Champlain Sea Grant.

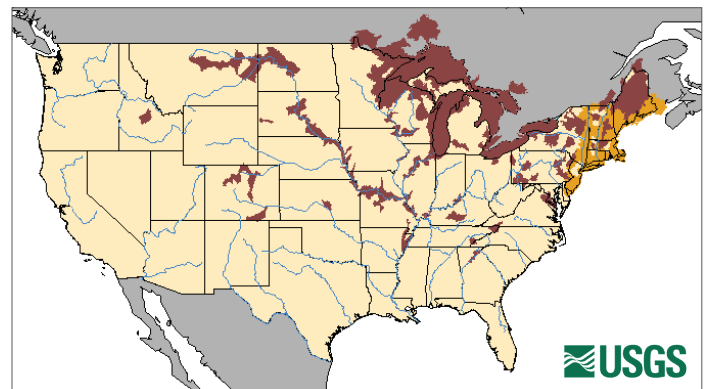
The Rainbow Smelt is a small, predatory fish popular with anglers because of its fine flavor. Its Latin name, *Osmerus*, which comes from the Greek word meaning “odor” is fitting because when removed from the water, it gives off an odor that smells like freshly cut cucumbers.

## Species Description

The Rainbow Smelt has a small, slender body that typically ranges from 7-9 in (18-23 cm) in length, and weighs around 3 oz (85 g). It is mostly silver, with a pale olive-green back and iridescent purple, blue and pink sides. In the water, the Rainbow Smelt appears to shimmer colorfully, but when removed, the color dull to a silver-white. The head is elongated, with a relatively large mouth and a pointed snout. The lower jaw protrudes and prominent teeth can be seen on the tongue and both jaws. Scales are thin and easily detached. Spawning males are covered on the head, body, and fins with tiny bumps called nuptial tubercles. The Rainbow Smelt can be distinguished from many look-a-like minnow species by its conspicuous teeth and an adipose fin that is lacking in minnows.

## Native & Introduced Ranges

Native to the Atlantic and Pacific Coastal drainages of North America and the Pacific drainages of Asia, the Rainbow Smelt was introduced into Michigan’s Crystal Lake as a food source for stocked salmon in 1912. It soon escaped into Lake Michigan and spread quickly throughout the Great Lakes, the Mississippi River, and other inland waters. This species has done so well in the Great Lakes that a commercial fishery targeting smelts has been operating for many years. The Rainbow Smelt is native



to the Delaware River portion of Pennsylvania; however, it is invasive in other parts of the state.

## Biology & Spread

This species can spread quickly through natural waterway connections, but its movement to new waterways can also be facilitated by both intentional and unintentional human transfer. Potential vectors include ballast water, bait bucket transfers, improper disposal of fish remains, and intentional introduction as forage and bait fish.

## Habitat

The Rainbow Smelt is anadromous, which means it can move from saltwater to freshwater to reproduce, but it can also live completely in freshwater. While it typically prefers deep, cool, unproductive lakes, it can inhabit a wide range of lake types and is often found in shallow coastal areas for feeding as winter approaches. When spawning, the Rainbow Smelt typically moves into streams or closer to shorelines.

## Impacts

By competing with other fish for food, and feeding on the young of native species, the Rainbow Smelt can have serious impacts on native species that eat plankton and other fish. The Rainbow Smelt feeds on zooplankton, benthic crustaceans, and the young of other fish. These feeding habits may disrupt food webs and impact the base of the food chain. It also directly competes with sport fish such as perch, walleye, lake herring, and lake trout for food, and has caused documented declines in populations of cisco, blue pike, herring, and other imperiled species in regions where it has been introduced. Smelt introductions also correspond with increased levels of pollutants such as mercury and PCBs in fish.



Photo courtesy of Claude Nozeres, WoRMS, Marine species of Maine.

## Prevention & Control

Populations of Rainbow Smelt may be controlled through the use of rotenone, intentional overfishing, increasing predator abundance, or a combination of these approaches. However, once established, Rainbow Smelt can be very difficult and costly to control and most solutions are only temporary.

Preventing the introduction and spread of the Rainbow Smelt is the best way to protect natural habitats from harm.

- Know how to identify and report the Rainbow Smelt.
- Always check for and remove plants, mud, and debris from boats, trailers, clothing, and equipment before entering a water body and before leaving a water body.
- Drain all water from bait buckets, bilges, and live wells before transporting to new areas.
- Clean all gear and equipment with hot water (140°F or 40° C) or salt water, OR let boats and equipment dry thoroughly for at least five days before entering a new water body.
- Unused live bait should be disposed of in the trash; it is unlawful in Pennsylvania to release any unused live bait.



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## References:

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