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Rosy Red Minnow

Pimephales promelas (aka Red minnows, Fathead minnows, rosy reds, pink minnows)

Alberta Regulation:
Not Regulated

Matthew Morris, Ambrose University, funded by Alberta Conservation Association

Overview:

Rosy red minnow is part of the Leuciscidae family and classified as the same species as the native fathead minnow but have a distinct morphological difference. Unlike the olive-coloured fathead minnows, rosy red minnows have a distinct orange-red colour. This originated from a spontaneous mutation that occurred two separate times in Arkansas fish farms in the 1980s.[2] No museum collection in Alberta has rosy reds prior to 2000s; the Freshwater Fishes of Canada book first published in the 1970s makes no reference to the possibility of an orange morph in Canadian waters.[3] These fish are selectively bred in captivity to maintain this colour, but it is unknown if the orange-red colouration can occur in the wild.[3]

In Alberta, rosy red minnows were first detected in the wild in the 2010s and have been confirmed in multiple freshwater water bodies in Alberta as of 2025.[4] They likely arrived via dumping of unwanted aquarium fish or illegal use of live bait. Biologists now consider them potentially invasive in Alberta, as they are very resilient and able to survive winter ice-cover and warm, low-oxygen water.[1] There is concern they could compete with native fathead minnows and disrupt local aquatic food webs.[5] Rosy red minnows could also transmit diseases or parasites acquired in the aquarium trade and transmit those to our native fathead minnows, salmonids or other fish.[3] Rosy red minnows are treated as an invasive bait fish in provincial regulations. It is illegal to use live fish as bait or to release aquarium fish into Alberta waters. Violators face steep penalties (up to $100,000 in fines and/or one year imprisonment).[1]

Habitat:

Rosy red minnows are freshwater fish that are tolerant of a wide variety of conditions, including low oxygen waters, various pH levels, and can survive freezing temperatures.[1] They can live in a variety of water types, such as streams, ponds, and shallow lakes. They thrive in cloudy, turbid waters that retain heat from sunlight.[5] In Alberta and British Columbia, rosy red minnows have been observed surviving through winter and reproducing the following spring.[1] They do not require pristine water and can thrive in margins of prairie wetlands or irrigation ponds where other fish might struggle.[6]

Identification:

Rosy red minnows are a small fish with a slender body, typically 2-6 cm long; males are usually bigger than females. They have a brightly coloured back, tail, and head, which can range in colour from golden to pink to orange-red and have silver sides and belly.[5] They have large eyes with metallic irises, and their fins are translucent. The first ray of the dorsal fin is half the length of the other rays, which is a distinguishing feature of fathead minnows[1].

Breeding males develop white bumps on their heads and their jaw lines, and often have a thicker mucus "pad" on their backs.[11] These traits distinguish rosy red minnows from native fish.

Similar Looking Species:

Native: Rosy red minnows could be confused with native fathead minnows, but rosy red minnows are brightly red-orange coloured, while fathead minnows are olive-green. Wild-type fathead minnows are often sold at pet stores under the name rosy red.

Non-native: Rosy red minnows are often confused for goldfish given the similar colour. Goldfish are easily distinguished by the deeper bodies, larger scales, and serrated dorsal fin spine.

Reproduction: Rosy red minnows breed in warm months once water temperatures rise above roughly 16–18 °C.[5] They are fractional spawners, meaning each female lays an adhesive clutch of eggs on a hard surface, then spawns again multiple times per season. A single clutch contains on the order of 100–400 eggs[1,5] and females may produce on the order of thousands of eggs during one breeding season.[7] The female attaches her eggs to submerged logs, rocks or weeds, and the male that fertilized them immediately begins guarding and fanning the nest. He remains with the eggs until they hatch (typically 4–5 days at ~25 °C).[5]

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Biology:

Similar to fathead minnows, rosy red minnows are a schooling fish and prefer to swim in large groups. During the breeding season, males become territorial and guard their clutches, employing tactics to appear stronger and more robust than they truly are.[8] Rosy red minnows are omnivorous benthic foragers and will eat mostly zooplankton, insects, algae and detritus in their natural environments.[9] This flexibility in diet lets them survive in nutrient-rich or low-oxygen waters where food webs are otherwise limited.

Environmental Impact:

There is evidence rosy red minnows are able to survive the winter and reproduce in waterbodies they have been introduced to in British Columbia.[1] There is concern these hardy fish will compete with native freshwater fish for food and habitat.[5] A high minnow density can deplete prey populations (insects, zooplankton) and indirectly impact higher trophic levels (e.g., larval amphibians, waterfowl).[6] Rosy red minnows may also have diseases that could infect other fish when they are released into new waterbodies.[3] They can act as another vector for Prussian carp spread and are known to alter insect communities in prairie pothole lakes, especially if released into water bodies that do not contain fathead minnows.[3] Overall, detailed impacts of rosy red minnows are still not well documented in Canada. However, given their ecological flexibility and reproductive power, many agencies treat them as invasive. Preventing spread is a priority because eradication or control is difficult.[1]

Economic Impact:

Negative impacts on fisheries and management costs could cause economic concerns as responding to invasive fish introductions requires extensive monitoring, public education, and removal efforts. Fathead minnows have spread enteric redmouth disease among commercially important trout in Europe, which can be very costly to aquaculture operations.[6] Alberta reports that response options, including trapping, netting, and chemical treatments, are expensive and labour-intensive.

Social Impact:

Although there are no direct human health risks known to be caused by rosy red minnows, there is a report of a fathead minnow in Wisconsin found to carry the Asian tapeworm *Bothriocephalus acheilognathi.* This tapeworm is not typically pathogenic in humans, however, there are case studies of successful infection. It is not confirmed that this tapeworm exists in rosy red minnows.[10]

Prevention:

Never release ornamental or bait fish into the wild. If you cannot keep unwanted aquarium minnows, do not dump them; instead, return them to the store, rehome them, or humanely euthanize them. Freezing then disposing of unwanted fish is safer than flushing or dumping them. Dead minnows that have been flushed are still capable of spreading diseases to aquatic organisms. Never use live minnows as bait. Always purchase legal, non-invasive bait or use artificial lures. Preventing new introductions is the easiest strategy, since there are few effective controls once rosy-red minnows are established.

Control:

Manual: In small, isolated ponds, infested fish can sometimes be removed by netting, trapping or electrofishing.[1] This is very labor-intensive and works only if the population is detected early.

Chemical: In rare cases, a piscicide (such as rotenone) can eliminate all fish in a water body. This is considered a last resort, used in ponds that contain only invasive fish.[1] After treatment, the water body must be restocked with native fish.

Biological: No targeted biological control agents exist for rosy red minnows.

Reporting: If you find rosy red minnows in the wild (or see someone using them illegally), report it immediately. In Alberta, call the Aquatic Invasive Species Hotline at 1-855-336-BOAT (2628) or use the EDDMapS Alberta app/website to submit a sighting.[1] You can also report suspected illegal bait use via the toll-free Report-a-Poacher line. Early reports allow rapid response teams to act before the fish become established.

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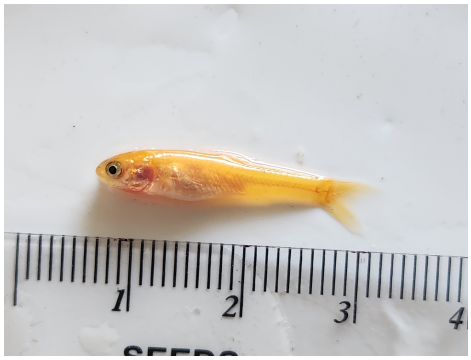

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