



Goldfish



Last Updated: March 2024

Carassius auratus (Linnaeus 1758)

syn. *C. discolor*, *C. burgeri*, *C. coeruleus*, *C. encobia*, *C. grandoculis*, *C. pekinensis*, *C. gibeloides*, *C. mauritanus*, *C. chinensis*, *C. maillardi*, *C. nigrescens*, *C. thoracatus*, *Neocarassius ventricosus*.



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Overview

Native to eastern Asia, including China, Hong Kong, Korea, and Taiwan, goldfish are part of the carp and minnow family. This family of fish is known to increase the turbidity (decrease water clarity) of their environment through their feeding behaviour.¹ Goldfish are thought to be one of the first fish species introduced to North America¹ and are a popular household pet, bred for aquaculture and ornamental ponds for over 500 years.²

When released into the wild, goldfish can cause severe damage to aquatic ecosystems and negatively impact native species.³ Goldfish can grow much larger outside of tanks (some as large as a football or dinner plate!) and can live up to 30-40 years. There are over 100 known locations of goldfish in Alberta's water bodies, with some populations occurring as far north as Fort McMurray.⁵

As a common household pet, goldfish are often released or flushed when they become unwanted. In some

instances, goldfish have been intentionally released, reportedly occurring as early as the 1600s in North America.¹ Some individuals also use goldfish as live bait while fishing.² It is illegal to release, flush and use goldfish as live bait in Alberta. Today, goldfish are one of the most widespread non-native fish in North America due to their easy accessibility in aquaculture and their preference as pets.⁵

Habitat

Goldfish typically occur in fresh inland waters and wetlands in temperate regions. They prefer slow moving or stagnant bodies of water, including rivers, lakes, ponds, streams, marshes, bogs, or swamps.¹ Invasive goldfish are most often found in urban stormwater ponds, golf courses and campground ponds. Goldfish are also highly adaptable and survive in a wide range of habitat conditions including high temperatures, turbidity, pollution and eutrophic waters.³

Identification

Goldfish are stout and deep bodied with 25-31 large scales on their lateral line. They have a large, scaleless head and eyes with a small protruding mouth. Goldfish have a forked caudal fin, as well as a distinct, stiff serrated spine at the origin of their anal and dorsal fins.³ Goldfish hatch around 4.5-5 mm long with dark, pigmented scales, but will lose pigment within 2-3 months. Adult goldfish can grow up to 15-45 cm long and weigh 0.1-3 kg and are a yellow-orange colour with transparent fins. In captivity, goldfish can range in colour from red-orange to black, gold and silver depending on diet, light, and illness. If released into the wild, goldfish will lose their bright orange colour within a couple of generations.⁵

Ecology

Goldfish are rapid reproducers, and can quickly increase their population size. A female goldfish can spawn as early as one year old, and may spawn up to 3 times a year. Within each spawning period, a female goldfish can



Goldfish *(continued)*

lay anywhere from 500 to 1000 eggs.³ Goldfish are generalists and their diets consist of a variety of organisms, including benthic algae and weeds, detritus, plants, insects and zooplankton.³ Goldfish also prey on small crustaceans or fish/amphibian eggs and larvae.

Economic Impacts

Removing goldfish from the wild can be costly and damaging to aquatic ecosystems.¹ For example, the City of Red Deer spent \$250,000 to cull a population of goldfish from a stormwater pond. This resulted in the removal of 882 goldfish; however, this effort could easily be erased if more goldfish are reintroduced.⁴

Environmental Impacts

Goldfish feed on fish eggs, larvae and aquatic plants, limiting food availability to native species, and reducing biodiversity. Much like their carp and minnow relatives, goldfish also increase water turbidity through feeding. This can reduce the amount of light reaching benthic aquatic plants and contributes to habitat loss.⁵ The introduction of goldfish into the wild may increase the risk of algal blooms,

as studies have shown that the growth of cyanobacteria is stimulated through passage of their intestines.² In addition to these attributes, goldfish have a high reproductive rate, allowing them to easily outcompete native fish and making them a threat to aquatic ecosystems.¹

Sociological Impacts

Due to their generalist behaviour and rapid reproduction, goldfish have the ability to outcompete native species such as trout. This can lower stocks of native fish species available for recreational and subsistence anglers, resulting in less tourism and food security.¹ Goldfish can also lower the

the water quality and aesthetic value of waterbodies, as they increase turbidity and may cause more algal blooms, resulting in intrinsic loss of natural capital and enjoyment of natural areas.²

Prevention

It is important to remember that goldfish are a household pet, and they do not belong in the wild. Releasing goldfish or flushing dead fish can contribute to the spread of non-native fish in the wild and disease in our

waterbodies.³ If you plan to get a goldfish or other aquarium species, it is essential to educate yourself on responsible pet ownership, including life expectancy and required space. There are many options for unwanted fish including returning it to a pet store, talking to your veterinarian about humane disposal, or giving it to another aquarium owner or local school.³ Do your part as a responsible pet owner and don't let it loose!

Control

Prevention is the best method of control for stopping the spread of goldfish.

Cultivation: Goldfish may be controlled through netting and angling, but this is a labour-intensive method.¹

Chemical: Pesticide treatment such as rotenone can be used as a last resort; however, this method can only be used in isolated water bodies without other species of fish.¹

Reporting: If you have seen goldfish in the wild, you can use EDDMapS to report your sighting across Canada through www.eddmaps.org or call Alberta's invasive species hotline at 1-855-336-BOAT (2628).

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