



Silver Carp

Hypophthalmichthys Molitrix (Valenciennes, 1844)

syn. *Hypophthalmichthys molitrix*, *H. microlepis*, *Abramocephalus microlepis*, *Leuciscus molitrix*, *L. hypophthalmus*, *Onychodon mantschuricus*

ALBERTA REGULATION:
FISHERIES ACT

Last Updated: February 2018



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USGS

Overview:

The silver carp is a ray-finned fish of the carp family. It is native to most of the major Pacific drainages of Eastern Asia and Eastern Siberia.³ It was first introduced to the U.S. in 1973 to control phytoplankton in aquaculture ponds. By the end of the decade many private and federal aquaculture and sewage facilities had been stocked with this fish species.¹ By 1980, silver carp were discovered in natural waters.⁴ Today, they are considered a highly invasive species due to their voracious appetite and fast growth.¹

Silver carp are present in the Mississippi River drainage and surrounding tributaries. To date, *H. molitrix* are not present in the Canada; however, their native range is in the same latitudes as the Great Lakes and it has been observed actively feeding in the U.S. at temperatures

as low as 2.5°C.¹ Therefore, Canada and the bordering U.S. states are actively working to prevent silver carp introduction into the Great Lakes.¹

Silver carp are a freshwater species that migrate upstream to spawn.³ They are filter feeders of both zooplankton and phytoplankton using specialized gill structures.⁴ *H. molitrix* is known for leaping out of the water when startled by noises such as boat motors⁴ presenting an injury risk to any boaters, which may be struck by leaping fish.

Silver carp can be confused with bighead carp, *Hypophthalmichthys nobilis*, but can be differentiated by pectoral fin that extends to the base of the pelvic fin,⁴ darker overall color, dark blotches, and low positioned eyes that project downward in the bighead carp.³

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

Habitat:

Large freshwater rivers with marked seasonal water-level fluctuations³ They can tolerate salinities up to 12 ppt and oxygen concentrations as low as 3 mg/L.⁴ *H. molitrix* can inhabit lakes and ponds but requires moving water for spawning.²

Identification:

Silver carp are deep-bodied and laterally compressed. They are silver in colour, but with age they gain an olive-green cast over their backs.⁴ The head and opercles (gill covers) are scale-less while the rest of the body is covered with tiny scales. The eyes are placed far forward on the



Silver Carp *(continued)*

head at the midline of the body and turned downwards. The mouth is large, upturned and without teeth in the jaw, instead it has pharyngeal teeth (throat teeth).⁴

The dorsal fin has 1-3 spines and 6-7 soft rays, and the anal fin has 1-3 spines and 10-14 soft rays. The edge of the last simple dorsal ray is not serrated.³ The keel is sharp and without scales from the pectoral region to the anal origin. The gills bear 650-820 long, slender gill rakers.³

Ecology:

Mature *H. molitrix* migrate upstream when water levels increase and are able to leap obstacles of 1 m in height. Juveniles and adults form large schools during spawning.³ Breeding occurs in rapids or tributaries when water levels rise 50-120 cm above normal and water current is high (0.5 to 1.7 m/s).³ Spawning occurs in turbid waters with temperatures above 15°C (generally 18-26°C) and high oxygen concentrations. Spawning will cease, if conditions change, and resume when water levels rise again.³ Eggs are cast over shallow rapids at the upper water layer or even at the surface during floods.³ The eggs require a current to remain suspended. A mature female can lay up to 5 million eggs per year.⁴ After hatching larvae drift downstream and settle in waters with little to no current.³

After spawning adults migrate to foraging habitats with shallow (0.5-1.0 m deep) waters over 21°C, such

as backwaters, lakes and flooded areas with low current.³ Larvae and juveniles feed on zooplankton while silver carp larger than 1.5 cm feed on phytoplankton only. Adults overwinter in deeper parts of the water course and cease feeding.³

Length at maturity can range from 18 to 51 cm. Maximum reported length is 105 cm and maximum weight 50 kg.³ Silver carp in the U.S. have been observed to reach sexual maturity as early as 2 years. Lifespan can be as long as 20 years.⁴

Economic Impacts:

H. molitrix compete directly with native larval fish for plankton.¹ Competition for food resources with larval sportfish could have impacts on recreation and tourism.

Environmental Impacts:

H. molitrix compete directly with native fish, juvenile and adult stage, as well as native mussels for plankton.⁴ In general, when present, Asian carp have been associated with significant changes to resources in various trophic levels, such as the zooplankton and fish communities.

Sociological Impacts:

The transformation of native aquatic communities results in the intrinsic loss of natural capital and enjoyment of natural areas. Boaters are at risk of injury from leaping silver carp.

Prevention:

Learn how to identify silver carp and how to prevent spread. Do not purchase silver carp and release them. Never empty your aquarium into natural water bodies. Inspect boats, trailers and recreational equipment upon leaving a waterbody and clean, drain and dry it of all mud and vegetation.

Control:

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



Silver Carp (continued)



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Illinois Natural History Survey, Bugwood.org

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4. *Hypophthalmichthys molitrix* (Silver Carp). U.S. Geological Survey. [2017]. Nonindigenous Aquatic Species Database. Gainesville, Florida. <https://nas.er.usgs.gov/queries/factsheet.aspx?speciesID=549> Accessed: February 7, 2018.