

Can you identify these four species of Asian Carp



1 Photo credit: Ryan Hagerty USFWS



2 Photo credit: USFWS



3 Photo credit: Ryan Hagerty USFWS



4 Photo credit: ACRCC

General Facts About Asian Carp

In the United States, the term “Asian Carp” refers to four different species of fish: Bighead Carp, Silver Carp, Grass Carp, and Black Carp.

This term can often cause confusion as these species differ in some important aspects of their life history such as their trophic ecology (what they eat), which dictates the nature of their impact on an ecosystem they invade.

This term is also confusing because they are not the only carp species that are native to Asia. For instance the common carp (*Cyprinus carpio*) would qualify as a carp from Asia, but is not what managers/scientists mean when they say “Asian Carp”.

All Asian Carp species grow to large sizes quickly, which precludes them from predation from most fish once they reach adulthood. However, certain fish that grow large enough may still try to eat adult Asian Carp.

General Facts About Asian Carp

Juvenile Asian Carp are found in the diets of several predatory fish in the Mississippi River basin such as Blue Catfish, Largemouth Bass and Flathead Catfish. In the Great Lakes, we don't know how long it would take our local piscivores to recognize juvenile Asian Carp as a viable prey and whether they would prefer them over other prey fish. Potential predators of Asian Carp in the Great Lakes include Walleye, Smallmouth Bass, and Northern Pike.

All species originated from Eastern Asia and were intentionally brought to the US in the 1960s. Bighead and Silver Carp were brought to control algae growth in sewage treatment lagoons and aquaculture ponds. Grass Carp were stocked to control aquatic weeds, and Black Carp were brought over for aquaculture purposes.

Bighead Carp

Which fish below is the juvenile Bighead Carp? 1, 2, 3, or 4?



Photo credit: Ryan Hagerty USFWS

1



Photo credit: Ryan Hagerty USFWS

2



Photo credit: Sam Finney USFWS

3



Photo credit: Ryan Hagerty USFWS

4



Photo credit: USFWS

Answer: 1

Silver Carp

Which fish below is the juvenile Silver Carp?



1



Photo credit: Ryan Hagerty USFWS

2



Photo credit: Sam Finney USFWS

3



Photo credit: Ryan Hagerty USFWS

4

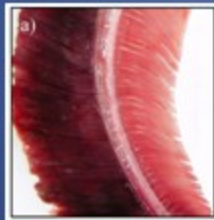


Photo credit: USFWS

Answer: 2

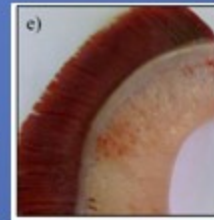
Facts about Bighead Carp and Silver Carp

1. Bighead Carp and Silver Carp are collectively referred to as bigheaded carps
2. Both fish have eye's below their body's midline, large heads, and deep bodies. Silver Carp tend to be lighter in color and lack the dark blotches that the Bighead Carp have on their bodies.
3. Silver Carp are known for jumping out of the water when startled by boat engines. They can jump 8-9 feet out of the water!
4. Lacking a true stomach, they feed on plankton and detritus almost continuously by filtering particles from the water with their gill rakers that pass their food to their digestive tract. Bighead Carp have "comb-like" gill rakers that are better at grabbing larger particles, like zooplankton. Silver Carp have "sponge-like" gill rakers that allows them to filter smaller particles than the Bighead Carp.



Bighead Carp gill raker

Photo Credit: Mozsár et al. 2017
(DOI: <https://doi.org/10.1007/s10750-017-3137-z>)



Silver Carp gillraker

3. In North America, Bighead Carp mature in 2-3 years and average weight is 40 lbs. Their maximum size can be more than 80 lbs and and nearly 5 ft in length.
4. In North America, Silver Carp mature in 2-4 years and commonly weigh 20 lbs, but can grow upwards of 80 lbs and reach 4 ft in length.

Grass Carp

Which fish below is the juvenile Grass Carp?



1



Photo credit: Ryan Hagerty USFWS

2



Photo credit: Sam Finney USFWS

3



Photo credit: Ryan Hagerty USFWS

4



Photo credit: USFWS

Answer: 3

Facts about Grass Carp

1. Grass Carp have a slightly flattened head and color varying from blackish to olive-brown with brassy or silvery white on sides of belly.
2. They were originally brought to the US to control aquatic weed growth.
3. Grass Carp are unique in that they are true herbivores and feed predominantly on aquatic vegetation. They will also consume detritus, small invertebrates, and small fish in the absence of vegetation.
4. They can consume up to 40% of their body weight per day.
5. Grass Carp reach maturity in 2 years and can grow more than 80 lbs and nearly 5 ft. in length
6. Because they can eat such huge quantities of aquatic plants, Grass Carp can alter the composition of habitat by reducing food sources, shelter and nursery habitats for resident fish species.

Black Carp

Which fish below is the juvenile Black Carp?



Photo credit: Ryan Hagerty USFWS

1



Photo credit: Ryan Hagerty USFWS

2



Photo credit: Sam Finney USFWS

3



Photo credit: Ryan Hagerty USFWS

4



Photo credit: USFWS

Answer: 4

Facts about Black Carp

1. Black Carp are elongated and laterally compressed with a pointed head and flattened anterior portion and small toothless mouth.
2. Their body is brown to black in color and bluish-grey to white on the belly.
3. The established Black Carp population front in the Mississippi River basin is further from the Great Lakes than the other three species population fronts. No Black Carp have been captured upstream of Starved Rock Lock and Dam in the Illinois River.
4. Adult Black Carp feed on molluscs. They have pharyngeal teeth that allow them to crush the shells of snails and mussels. They can consume up to 20% of their body weight per day.
5. They are the largest of the Asian Carp species and can reach up to 150 lbs and 5 ft in length.

The top four photos outlined in black are commonly used as baitfish

Gizzard Shad



Emerald Shiner



Flathead Minnow



Golden Shiner



The bottom four photos are juvenile Asian Carp

Bighead Carp



Photo credit: Ryan Hagerty USFWS

Grass Carp



Photo credit: Ryan Hagerty USFWS

Black Carp



Photo credit: Sam Finney USFWS

Silver Carp



Photo credit: USFWS

Asian Carp have been an ecologically and economically disruptive force in North American waterways. The most effective way to protect the Great Lakes from the potentially indelible impact of Asian Carp is by preventing them from ever reaching the lakes and this includes accidental use as baitfish.

Potential Impacts in the Great Lakes

Habitat Suitability Models (including those from CIGLR and NOAA-GLERL) indicate that most open water habitats of the Great Lakes are not favorable habitats for Bighead and Silver Carp due to low availability of plankton. However, near-shore productive areas like Green Bay, Saginaw Bay, and Western Lake Erie would provide enough food for these fishes to potentially thrive. These locations and perhaps some warmer, productive tributaries are the areas where these species would likely reside and, therefore, are the most vulnerable to the potential impacts of bigheaded carps.

For more information see these papers:

Alsip et al. (2019) DOI: <https://doi.org/10.1111/fwb.13382>

Anderson et al. (2017) DOI: <https://doi.org/10.1016/j.jglr.2017.03.005>

Anderson et al. (2015) DOI: <https://doi.org/10.1016/j.jglr.2015.03.029>

Potential Impacts in the Great Lakes

In general the direct effects of Bighead and Silver Carp on resident planktivorous fish are well-documented in rivers they have invaded. Competition with bigheaded carps is believed to be a primary cause in the decline of several planktivores in the Mississippi River Basin including Bigmouth Buffalo, Paddlefish, and Gizzard Shad (Irons et al. 2007, Pendleton et al. 2017). Because fish of all species feed on plankton during their larval stages, Bigheaded carps have the capacity to affect more than just planktivores through their voracious feeding habits.

For more information, see these papers:

Irons et al. (2007) DOI: <https://doi.org/10.1111/j.1095-8649.2007.01670.x>

Pendleton et al. (2017) DOI: <https://doi.org/10.1007/s10641-017-0637-7>

Potential Impacts in the Great Lakes

CIGLR and NOAA GLERL-led modeling study of Bighead and Silver Carps' impact on Lake Erie's food web found that Bighead and Silver Carp could reduce the biomass of resident planktivores like Gizzard Shad and Rainbow Smelt by outcompeting them for food. The study also found that certain piscivores may benefit from feeding on juvenile bigheaded carps, such as Smallmouth Bass (Zhang et al. 2016). However, discerning the effect of bigheaded carps on piscivores is difficult because there are many direct and indirect interactions to consider.

For more information, see this paper:

Zhang et al. (2016) DOI: <http://dx.doi.org/10.1080/00028487.2015.1069211>