Ohio Field Guide to Aquatic Invasive Species

- Developed by
  1. ODNR, Division of Wildlife
  2. Ohio Sea Grant
  3. The Ohio State University

- Includes the Following (61)
  1. Plants (28)
  2. Invertebrates (14)
  3. Fish (19)

- Developed as an early detection tool for aquatic invasive species
Species Accounts

Silver Carp

**Species at a Glance**

The silver carp is a member of the Asian carp complex, which also includes bighead, black, and grass carp. Its large size, voracious appetite, and ability to thrive in new habitats are major concerns. Its body is slender and streamlined, with a dark gray coloration.

**Identification**

The Silver carp has a large, dark eye, and a distinctive lateral line system that runs along the side of its body. Its scales are large and easily visible. The species is known for its ability to thrive in freshwater environments.

**Habitat**

Silver carp are found in freshwater habitats, including rivers, lakes, and ponds. They are tolerant of a wide range of water conditions, including salinity levels.

**Spread**

Silver carp have been introduced to many countries, primarily through the aquarium trade and as a result of releases from aquaculture facilities. They have also been accidentally introduced through the movement of water in ships and other vessels.

**Environmental Impacts**

Silver carp are considered an invasive species due to their high fecundity and ability to outcompete native species for resources. They can also cause damage to infrastructure, such as levees and dams, and can alter ecosystem dynamics.

**Distribution in Ohio and Nationally**

Silver carp have been found in numerous locations across the United States, including Ohio. They have spread through waterways and are now present in many Ohio rivers and streams. They are continuing to spread across the country, posing a significant threat to native species and ecosystems.
How to Use The Guide

- Sent to People in the Field:
  1. ODNR Biologists and Law Enforcement
  2. Ohio EPA
  3. County SWCD’s
  4. USFWS
  5. Universities
  6. Consultants

- Printed on waterproof paper and spiral bound (durability)

- Public version pending

- Phone Icon Indicates that you should report your find to the ODNR Division of Wildlife at [http://ohiodnr.gov/ais/reporting](http://ohiodnr.gov/ais/reporting)
Silver Carp
*Hypophthalmichthys molitrix*

Species at a Glance
The silver carp is a member of the Asian carp complex, which also includes bighead, black, and grass carp. Its large size, voracious appetite, and ability to leap out of the water make it an enormous threat to the state’s fisheries and recreational economies.

Identification
This very large filter feeder averages 40–70 cm (16–28 in) in length, but can reach up to 130 cm (51 in) and weigh up to 36 kg (80 lbs). Its deep body is laterally compressed, with a ventral keel that extends forward from the anus almost reaching the base of the gills. Large eyes are located low and forward on the head. The mouth is large and terminal, and the lower jaw is slightly longer than the upper jaw. No barbels are present on the mouth. The short dorsal fin, which lacks spines, contains 7–10 rays. Scales are very small, coloration is olive to grayish-black on the back, with silvery sides blending to white below, and darker pigmentation on the fins.

Similar Species
While it most closely resembles the invasive bighead carp (*Hypophthalmichthys nobilis*), the silver carp is fairly uniform in color, whereas the bighead has irregular dark blotches on its back and sides. The bighead also has a less extensive keel, spanning from the pelvic fin to the anal fin. Silver carp may also resemble the common carp (*Cyprinus carpio*), which has barbels on either side of the mouth, and species of suckers (*Catostomidae*), which have thick lips containing small folds or nipple-like bumps. Small, juvenile silver carp also look superficially similar to native gizzard shad.

Habitat
The silver carp is an exclusively freshwater fish, preferring large river systems, lakes, or impoundments with flowing water needed for spawning. It can feed in temperatures as low as 2.5°C (36.5°F) and can withstand low levels of oxygen.

Spread
Once introduced to open waters, the silver carp readily spawns and disperses. Because juveniles resemble some common baitfish species, it may be unintentionally spread through the use of live bait. It can also spread in illegal shipments of live Asian carps, which is popular in the Asian food market.

Distribution
Native to eastern Asia, the silver carp was intentionally introduced into the United States to control algae in aquaculture ponds. During flooding in the early 1980s, it escaped into the Mississippi River and has since moved upstream towards the Great Lakes. In Ohio it can be found in the Ohio River drainage, and there are records from Adams, Brown, Clermont, Gallia, and Hamilton counties.
**Oriental Weatherfish**

*Misgurnus anguillicaudatus*

**Species at a Glance**
The oriental weatherfish, also called the dojo and Chinese loach, is a small eel-like fish that gets its name from its ability to “forecast the weather.” It is sensitive to changes in barometric pressure, so increases in activity and swimming in fast circles can indicate that major weather changes are imminent. This species is also popular in the aquarium trade because it is hardy and has a voracious appetite that can help keep tanks clean. Unfortunately, the release of this species into natural waterways has caused negative impacts to water quality, native species, and the food web.

**Identification**
The oriental weatherfish has a long, cylindrical, eel-like body with greenish-gray-brown marble markings on the dorsal side, and pale silver sides and underbelly. Many specimens have a large pigmented spot located above the base of the caudal fin. The mouth is small and narrow with thick, fleshy lips surrounded by ten barbels. The lateral line is short and doesn’t extend past the pectoral fins. Each pectoral fin has a stout spine, and the caudal fin is rounded. Average size is up to 28 cm (11 in). This species exhibits sexual size dimorphism, with the average length of the female being considerably larger than that of the males.

**Similar Species**
Because of its eel-like body, the oriental weatherfish may be confused with species of lamprey; however, lampreys are typically thinner, have no pectoral or pelvic fins, and don’t have the characteristic barbels on the mouth.

**Habitat**
This species is very hardy and can survive a wide range of temperatures and environmental conditions. It is typically found in slow or still waters with muddy or silty bottoms abundant with aquatic plants. It feeds on bottom-dwelling animals, insect larvae, snails, and worms. The oriental weatherfish can breathe atmospheric oxygen by using its intestine as an accessory respiratory organ, allowing it to live in oxygen-poor waters and to bury itself in soft substrates to survive long droughts.

**Spread**
Commonly used as bait and sold in the aquarium trade, the oriental weatherfish is released when aquariums are dumped or when bait buckets are emptied. Its popularity as a food-fish is also linked with its purposeful introduction into the wild to create harvestable populations.

**Distribution**
Native to eastern Asia, the oriental weatherfish was most likely introduced to natural waters in the United States by fish farm and aquarium escapes. It is found in both eastern and western parts of the United States, and has established in eastern Illinois, western Indiana, and central Michigan within the Midwest.

**Environmental Impacts**
The oriental weatherfish can negatively impact native species by predation and competition for food, habitat, and spawning sites. It can also increase turbidity and nitrogen levels in standing water, which can negatively impact water quality.
Hydrilla
Hydrilla verticillata

Species at a Glance
Hydrilla is a *submerged* aquatic perennial that could be considered nature’s “perfect weed.” It comes in two forms, *dioecious* and *monoeious*. Both forms grow and spread at a very fast rate, covering the surface of water bodies and restricting boating, fishing, swimming, and other recreational uses. Stands of *dioecious* Hydrilla in Florida constitute the only aquatic plant known to have developed resistance to an herbicide.

Identification
**Leaves:** While morphological characteristics can vary, leaves are typically strap-like and pointed, with small sharp teeth on the edges that are difficult to see with the naked eye. Spines or conical bumps are sometimes found on the mid-rib on the underside of the leaf; however, these are not always present. The underside of the mid-rib can also be red. They are generally 2–4 mm (0.08–0.2 in) wide, 6–20 mm (0.2–0.8 in) long, and occur in **whorls** of 3–8.
**Flowers:** Small (10–50 mm [0.4–2 in] long), white flowers which float on the water’s surface are attached at the leaf **axis** and are clustered towards the tips of the stems.
**Stems/Roots:** Long and branching stems form intertwined mats at the water’s surface. Plants are usually rooted to the lake bottom, growing upward from the substrate in water up to 3.7 m (12 ft) deep. During the late growing season, small white **tubers**, which are used for energy storage, are formed on the plants root’s, allowing it to overwinter.

Similar Species
*Hydrilla* closely resembles Brazilian waterweed (*Egeria densa*) and common elodea (*Elodea canadensis*). Brazilian waterweed typically has **whorls** of 3–6 leaves, is usually 2–3 cm (0.8–1.2 in) long, and has minute teeth on the **margins** with no conical bumps on the **mid-rib** below. The native common elodea has leaves that occur in **whorls** of three and is usually a much smaller plant. Neither common elodea nor Brazilian waterweed produces the **tubers** or **turions** found on *Hydrilla*.

Habitat
*Hydrilla* grows in a wide variety of still and flowing water, including freshwater lakes, ponds, rivers, impoundments and canals. It tolerates a wide range of pH, nutrient, and light levels and is somewhat winter-hardy, but optimum temperature for growth is 20–27°C (68–81°F).

Spread
Because *Hydrilla* reproduces primarily vegetatively, even the smallest living plant fragment can float downstream and form a new plant. While it was imported to the United States as an aquarium plant, recreational activities now help it spread.

Distribution
While it is unknown where *Hydrilla* originated, possible native ranges include Asia, Africa, and Australia. It continues to spread and is listed as a federal noxious weed in the United States. While the *dioecious* form appears to spread from South Carolina south, the *monoeious* form is spreading both north and south and is typically the form found north of North Carolina. The Ohio range map data is incomplete; it was first reported in the Cleveland area and has now spread along the Ohio waters of the Ohio River. Care should be taken by boaters on the river to not inadvertently transport this aggressive invasive plant.

Environmental Impacts
*Hydrilla*’s dense thick mats interfere with commercial activities by clogging water intake pipes and filters and hindering irrigation. It also restricts recreational uses and prevents sunlight from reaching other species growing beneath it. As the mats die and decay, bacteria deplete oxygen from the water, impacting fish and other aquatic organisms.
We Need a Refresh

• Species:
  1. What to add
  2. What to remove

• Edits:
  1. Content
  2. Maps

• Reviewers:
  1. Eugene, Tory, John, Mark
  2. Others Interested?