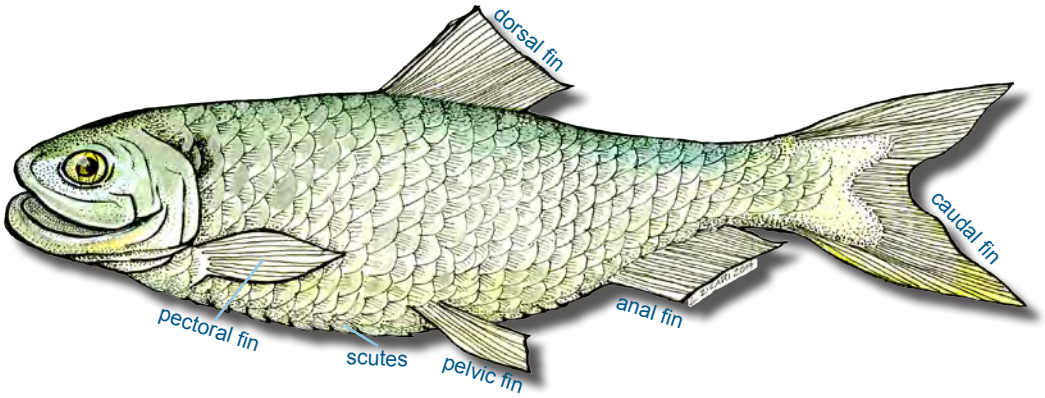


RIVER HERRING: ALEWIFE AND BLUEBACK HERRING

OUR SCIENTIFIC NAME

Alosa pseudoharengus (alewife)
Alosa aestivalis (blueback herring)

BY THE NUMBERS

We both are 10 to 12 inches long, and weigh 0.5 pounds.

HOW TO IDENTIFY US

We look alike, and are often lumped together as "river herring" but we are really two different species. We are silvery in color with a single black spot just behind our eye, and alewife have a larger eye. We have sharply-angled bony scutes on our belly that feel like a saw. Alewives are grey-green and blueback herrings are blue-green on our **dorsal** (back) sides. We are thin or compressed from side to side, but long from our dorsal to **ventral** (belly) sides, and we both have a forked tail.

WHY WE MATTER AND WHAT'S BEEN HAPPENING

We are food for many other animals, including other fishes, that people like to eat: striped bass, bluefish, weakfish, cod, haddock, halibut and tuna. Seals, birds and otters eat us. We are even eaten by whales! In the past, we were an important food for people, too.

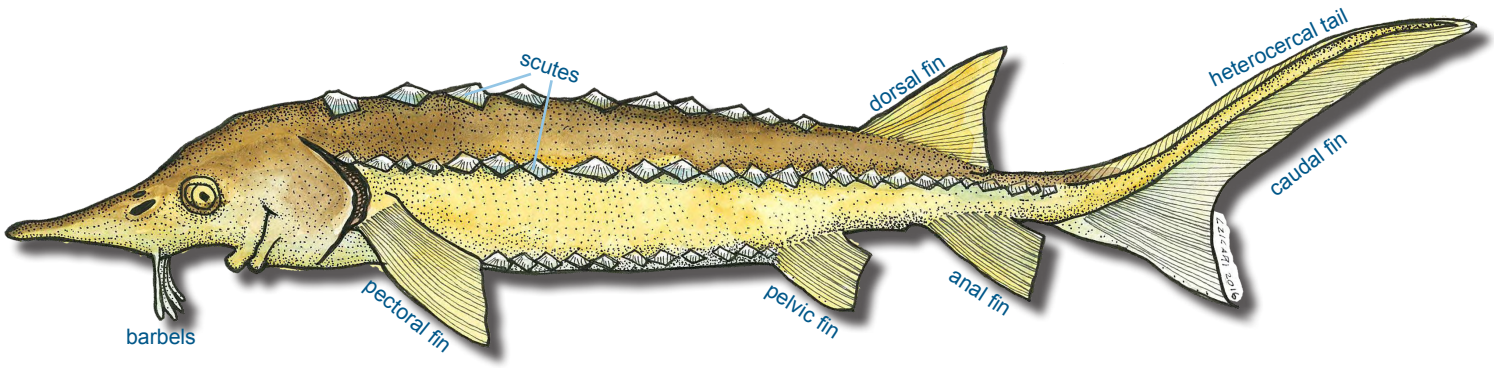
OUR STATUS

Our numbers became so low we were almost endangered, but we are beginning to recover in a few rivers. Government agencies are working to prevent overfishing out at sea, and are removing obstacles, like dams, so we can migrate back to our home rivers to spawn new generations of alewife and blueback herring.

DID YOU KNOW?

- Alewives and blueback herring spawn in freshwater but spend most of their life at sea.
- They don't jump like salmon, but they can swim very fast in short bursts to pass through rapids.
- They migrate from the ocean back to their home rivers in spring, where they were hatched to **spawn**.
- Alewife and blueback herring use the same rivers, but alewife migrations happen earlier.
- Alewives prefer to lay their eggs at night in slow moving water.
- Blueback herring prefer spawning over rocks in fast-moving water during daylight.
- River herring runs used to turn some rivers "silver" each spring when they migrated by the millions upstream. They are abundant now only in rivers where they can reach good spawning habitat.
- Females produce 60,000 to 350,000 eggs, but only a few young fish survive to spawn 3 to 5 years later. The rest get eaten by other fish and animals.
- Alewife is the preferred bait for lobstermen. Helping the alewife will help local lobstermen by providing them with fresh, cheap and better quality bait.
- Rivers and lakes with alewife and blueback herring tend to grow larger sport fish like smallmouth bass, largemouth bass, trout and landlocked salmon.

Fish illustration by Laury Zicari, USFWS, Retired.



ATLANTIC STURGEON

MY SCIENTIFIC NAME

Acipenser oxyrhynchus oxyrhynchus

BY THE NUMBERS

Atlantic sturgeon can grow to 14 feet in length, and weigh up to 800 pounds. The largest on record was captured in Canada and weighed 811 pounds!

HOW TO IDENTIFY ME

I have a brown and tan body with a whitish belly. I do not have scales like most fish; my skin is rough, similar to sand paper. I have five rows of bony plates, called **scutes**, along the sides and top of my body. Like all sturgeon, I have a long forked **heterocercal tail**, the top of my tail fin is longer than the bottom. My snout is hard and upturned at the tip, with four whisker-like **barbels** below, and my mouth is soft and toothless.

WHY I MATTER AND WHAT'S BEEN HAPPENING

People used to catch me for my delicious meat and eggs, which were sold as a gourmet food called caviar. There was a very large commercial fishery for me in the 1880's. Fishing continued into the 1950's but by the 1990s many states no longer allowed fishing. Decades of pollution, overfishing and damming of rivers, which prevented us from reaching our home **spawning** grounds and eliminated a lot of our good nursery habitat, caused our numbers in the wild to become very low.

MY STATUS

In 2012, The National Oceanic and Atmospheric Administration listed us as endangered along parts of the eastern United States. It is illegal to fish for us, and illegal to take our eggs where we are endangered.

Fish illustration by Laury Zicari, USFWS, Retired.

DID YOU KNOW?

- Atlantic sturgeon ancestors can be traced back 245 million years ago when dinosaurs roamed the earth.
- The species hasn't changed much in 120 million years, surviving even after dinosaurs went extinct.
- Those bony plates topped with sharp ridges on their sides and back are called **scutes**, making them look like "living dinosaurs."
- It spends most of its life in the ocean and coastal areas. But they migrate back to freshwater rivers where they were hatched to **spawn** and produce fish each year.
- Female Atlantic sturgeon spawn once every 2 to 6 years at ages 7 to 30 years old, depending on where they live.
- They are found from Canada to Florida (Figure 1).
- They were a reliable food source for people arriving in the 1600s and settling at Jamestown, VA, playing a major role in the history of the United States.
- Dams block them from getting back to their home spawning grounds, and their populations are very low compared to historical levels.

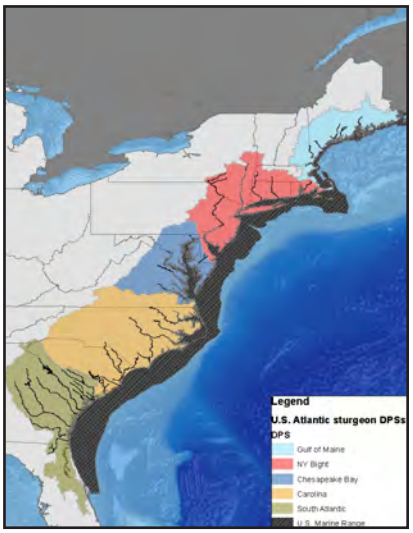


Figure 1 – Where Atlantic sturgeon are found along the United States. Credit: NMFS.

- There are populations that migrate back to rivers flowing into the Gulf of Maine, the New York Bight, the Chesapeake Bay, the Carolinas and South Atlantic coast.
- Adults swim up the James and York rivers of Virginia to spawn in spring and fall, too.
- Atlantic sturgeon leap completely out the water, making a loud splash which can be heard half a mile away and possibly further under water.

MORE ABOUT US

This young Atlantic sturgeon was raised at a national fish hatchery and stocked into the Hudson river to help boost local populations back in 1994. Scientists wanted to learn whether hatchery fishes would return back to their home river as adults to spawn, just like other wild Atlantic sturgeon. Several have been recaptured as adults off the coast of DE and NJ, and in the Hudson River, and the number keeps growing. Atlantic sturgeon don't reproduce until they are at least 5 years old in southern rivers, and as old as 34 years in northern rivers, so it takes them a long time to build up their numbers in nature.

Biologists study Atlantic sturgeon to better understand their needs for survival and to determine how healthy they are in the wild. They track population numbers over time, identify the number of males and females, and measure body length and weight. This Atlantic sturgeon was captured in the Chesapeake Bay outside of the James River.

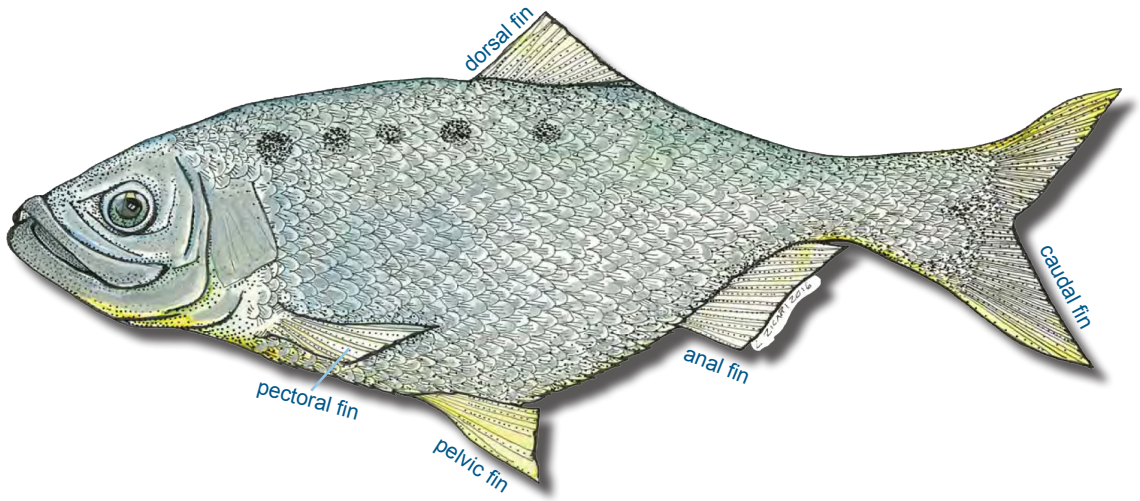
Four whisker-like barbels hang down from their snout to help them find food on the bottom of the river or the bay.

As bottom-feeders, they use their barbels to find food, and their toothless mouth acts like a vacuum, capturing worms, small fish and other small animals living on the bottom.

YOU CAN HELP ME

Get to know me, if you don't already. Help make me visible to people who don't have the chance to see me by sharing your stories about me. Get involved in efforts to help conserve my habitat and maintain my populations into the future.

Learn more about Atlantic sturgeon!
www.greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/
www.youtube.com/watch?v=N-OiVb6CM8o



AMERICAN SHAD

MY SCIENTIFIC NAME

Alosa sapidissima

BY THE NUMBERS

I can be from 16 to 30 inches long and weigh 4 to 7 pounds (females are usually bigger). The world record of my species is 11 pounds, 4 ounces, caught in the Connecticut River in 1986.

HOW TO IDENTIFY ME

I'm a silvery fish with a greenish band along my back and a series of dark spots along my flanks (shoulder area). My body is compressed from side to side, but long from dorsal to ventral (back to belly). I have a deeply forked tail and large, easily shed scales that create a saw-toothed edge at my belly. I get darker in color when I return to rivers.

WHY I MATTER AND REASONS FOR MY DECLINE

Since colonial days we have been prized for our meat and **roe**, or eggs. By the late 1800s, we were one of the most commercially valued fish on the east coast. Today, our populations are dramatically reduced. Overfishing, pollution, and not being able to reach our spawning habitat because of dams and other barriers, caused our decline. Fishing for us is not allowed in many states, or the number people can catch is limited.

MY STATUS

We are now protected under the Anadromous Fish Conservation Act. Along with restoring rivers and removing dams that block our migration, this Act helps us reestablish ourselves. Some of our populations are beginning to rise and become stable.

DID YOU KNOW?

- American shad are the largest member of the herring fish family.
- Their latin species name *sapidissima* means most savory or most delicious.
- They are found along the east coast of North America from Newfoundland to Florida, and are most abundant from Connecticut to North Carolina. (Figure 1)
- American shad are an **anadromous** fish, meaning they spend most of their lives in saltwater, but return to freshwater rivers to spawn and produce fish.
- Shad live in coastal ocean waters most of the time, but every year they **migrate** back to the rivers where they hatched to spawn.

Figure 1 – Where American shad are found. The yellow to red colors indicate low to high occurrences. Credit: www.aquamaps.org.

- An American shad may swim over 12,000 miles during its lifetime.
- A female American shad can lay up to 600,000 eggs.
- American shad prefer to eat plankton, insects, crustaceans and small fish.
- Biologists stock hatchery-raised shad into rivers after barriers to their migration have been removed. This helps boost their local populations.
- The spring shad **run** (schools of fish swimming up a river) up the Schuylkill River helped feed George Washington's troops at Valley Forge in 1778.

Fish illustration by Laury Zicari, USFWS, Retired.

MORE ABOUT US

Fishing for American shad is not allowed in many states because their numbers are too low. Fishing for hickory shad, however, is allowed and very popular. You can help recover the American shad by releasing any you accidentally catch. When American shad are in the ocean or even the lower tidal rivers, they are elusive and rarely encountered by anglers.

National and state fish hatcheries help by raising and stocking young American shad into rivers. Our goal is to increase the number of fish that will return as adults to spawn and produce new generations of shad.

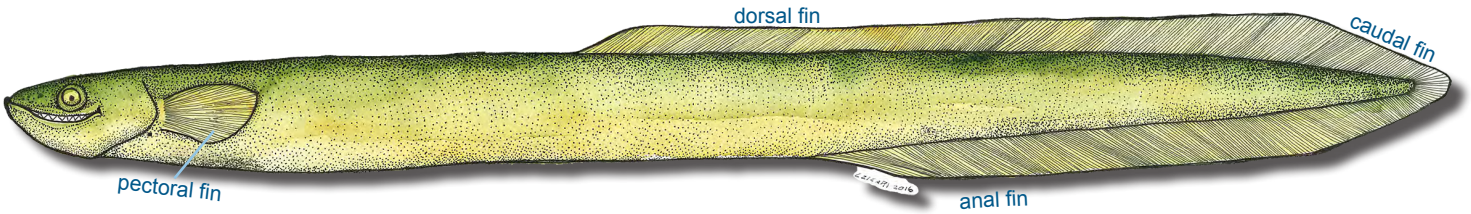
American shad eggs typically hatch within a few days.

A school of young American shad in late-summer, in the upper James River, VA, are growing well. These hatchery-produced fish were stocked in spring as larvae to restore the population. They will migrate downstream to the ocean in the fall as the river begins to cool.

Learn more about American shad!
www.crwa.org/american-shad-restoration
fishandboat.com/anglerboater/2005/04julaug/play2cycle.pdf

YOU CAN HELP ME

Get to know me, if you don't already. Help make me visible to people who don't have the chance to see me by sharing your stories about me. Get involved in efforts to help conserve my habitat and maintain my populations into the future.



AMERICAN EEL

MY SCIENTIFIC NAME

Anguilla rostrata

BY THE NUMBERS

If I am a female, I can grow up to 4 feet in length and weigh up to 9 pounds. Males only reach 1.5 feet in length. Females also are lighter in color, with smaller eyes and higher fins than males.

HOW TO IDENTIFY ME

When I am an adult my coloring is olive-green or brown on my back and pale green or yellow on my sides and underneath. I have long dorsal and anal fins that are joined to my tail fin with two small pectoral fins behind my gills.

WHY I MATTER AND WHAT'S BEEN HAPPENING

My species once made up over a quarter of the total fish found in Atlantic coastal streams. Dams have prevented us from reaching our feeding grounds, and have reduced the amount of good habitat for us to live in the river. And when we migrate downstream to return to the ocean, we can get caught, and sometimes even die, in turbines at hydroelectric facilities, where electricity is generated using river water.

MY STATUS

Biologists are studying my downstream migration to see if large dams that are used to generate electricity are having an effect on my journey. The biologists are also working on ways to safely move us up and downstream of dams.

DID YOU KNOW?

- American eels are the only species of freshwater eel found in North America.
- They live along the Atlantic coastline from Venezuela to Greenland and Iceland. Eels can also be found in the Great Lakes and Mississippi River (Figure 1).
- Eels have a complex lifecycle that begins far offshore in the Sargasso Sea where adults **spawn**.
- After eggs hatch, young eels drift inland with ocean currents into streams, rivers and lakes for over 3,700 miles. This journey may take many years.

Figure 1 – Where American eel are found.

- Young eels stay in freshwater until they reach maturity, between 10 to 25 years, before migrating back to the Sargasso Sea.
- Eels hunt at night, feeding on crustaceans, small insects and other fish.
- During the day, they hide among tree snags, plants, and other types of shelters found close to shore.

Fish illustration by Laury Zicari, USFWS, Retired.

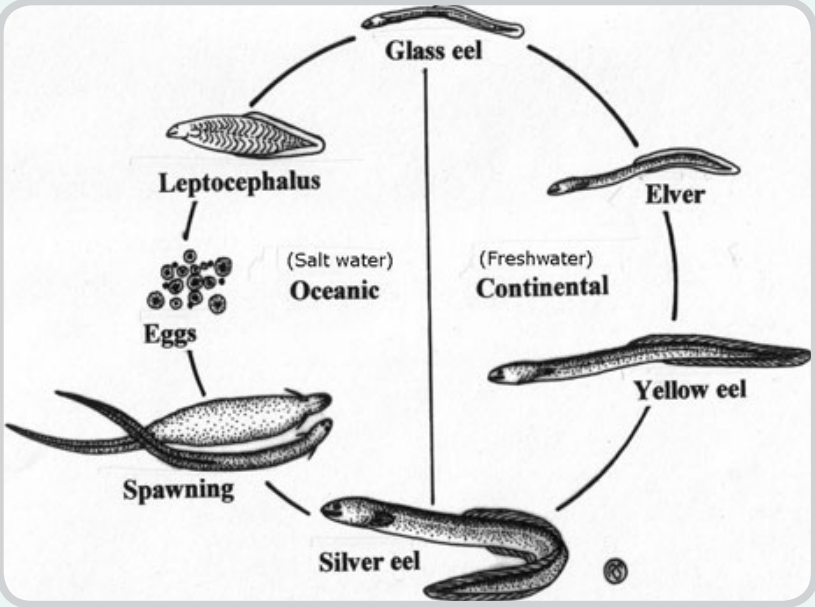
MORE ABOUT US

Along the way, eels metamorphose, or change, through different life stages - glass eel, elver and yellow eel, as they enter freshwater. Elvers are climbing up rocks near the base of a dam.

Ever heard the phrase slippery as an eel? Eels can cover their bodies with a mucous layer, making them nearly impossible to capture by hand.

Biologists study upstream migration of juvenile eels, or elvers, that are using specially designed ramps to migrate around a dam.

AMERICAN EEL LIFE CYCLE



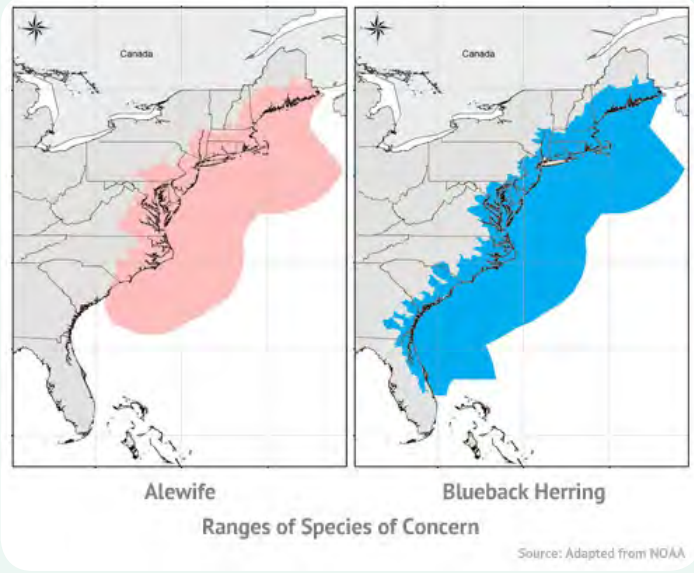
Learn more about the American eel!
usfwsnortheast.wordpress.com/2014/06/20/bringing-back-american-eels-in-the-susquehanna-river

YOU CAN HELP ME

Get to know me, if you don't already. Help make me visible to people who don't have the chance to see me by sharing your stories about me. Get involved in efforts to help conserve my habitat and maintain my populations into the future.

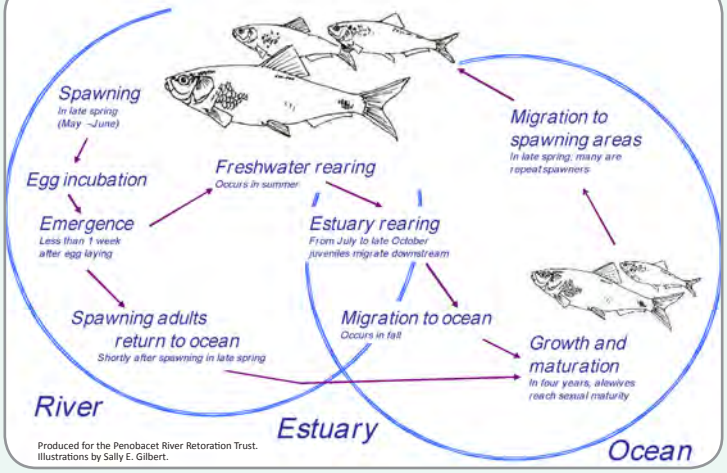
MORE ABOUT US

These river herring were caught by biologists in the Connecticut River during annual fish surveys. The alewife (top) has a slightly larger eye than the blueback herring (bottom).



Many coastal rivers along the East Coast supported huge river herring runs. They were so abundant that the fish were used for fertilizer, to feed hogs, as well as salted or roasted in smoke houses so they could be eaten over many weeks.

THE "RIVER HERRING" LIFE CYCLE



When rivers begin warming in spring, adult alewife and blueback herring migrate up our rivers to spawn. Alewives run first and begin spawning when water temperatures are 51°F followed by bluebacks, which begin spawning when water temperatures reach 57°F. Spawning is very stressful and makes them vulnerable to being eaten. Adults that survive spawning head back to the ocean to recover and prepare for their next spawning season. Depending on water temperature, their eggs hatch in just 3-6 days. The young fish stay in freshwater until they grow large enough to start their journey in late-summer and fall to the estuary where the salt and freshwater mix, and then slowly out to sea where they join large schools of other alewives or blueback herring migrating along the Atlantic Coast. They stay in the ocean until they become adults at 3-5 years of age, and then return to their home river to spawn.

After a hundred fifty years, river herring can now migrate up the Rappahannock River in Virginia to their historic limit to spawn. Removing the Embrey Dam opened up the river to more fish which is helping to restore river herring.

YOU CAN HELP ME

Get to know me, if you don't already. Help make me visible to people who don't have the chance to see me by sharing your stories about me. Get involved in efforts to help conserve my habitat and maintain my populations into the future.