

SECTION

1

Fishes of New York



New York State is home to more than 165 freshwater fish species, including some that were around when dinosaurs roamed the land. These fish come in all different sizes, from two-inch darters to sturgeon that can grow to more than seven feet. They come in all different shapes, too. Sunfish have compressed bodies, whereas common carp are fat and round. Pike and pickerel are long and narrow. The different sizes, shapes and colors are not accidental—each has a purpose in helping a fish survive and reproduce.

What makes a fish a fish?

- ✓ It lives in water.
- ✓ It has fins.
- ✓ It has gills.
- ✓ It is cold-blooded.

Fish Features

Fins – Fins help fish move through the water. The caudal (tail) fin pushes the fish forward, while the other fins are used for steering and balance. They allow the fish to stay in one place and to dive to the bottom or rise to the surface.

Gills – We use our lungs to get oxygen from the air. Fish use their gills to get oxygen from the water. Without gills, fish cannot live. The gill cover protects the sensitive gills from injury.



Rock Bass

Scales – Most fish have scales that cover all or a portion of their bodies, protecting them against injury. Catfish and lamprey are exceptions, as their skin is completely scaleless.

Spines – Some fish, like sunfish and perch, have spines in their fins to protect them against predators. Always be careful when handling these types of fish. For tips on how to hold the fish you catch, check the Care of Catch chapter.

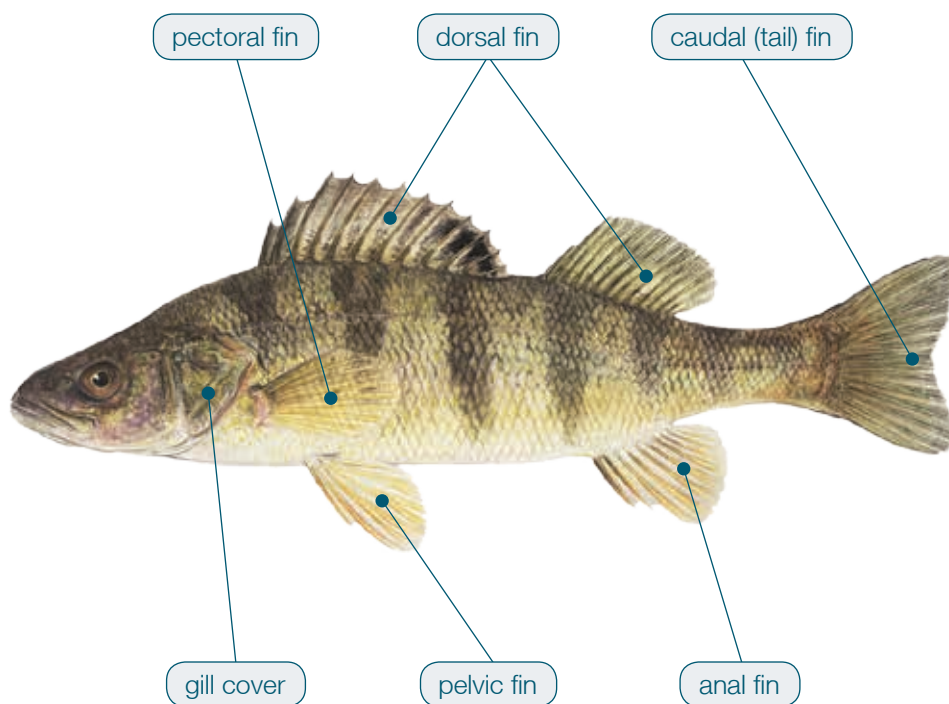
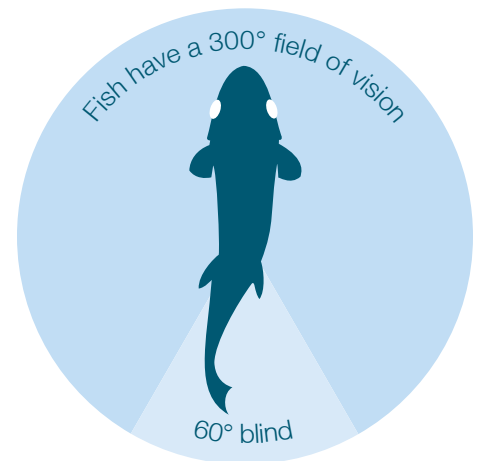
Slime – Have you ever held a fish? What does it feel like? Slimy? Slippery? The slime is there for a reason—to protect fish against diseases and help them glide through the water. So before you hold a fish, always wet your hands. That way, the slime will stay where it belongs.

Fish Senses

Fish use most of the senses humans do to help them survive in their environment.

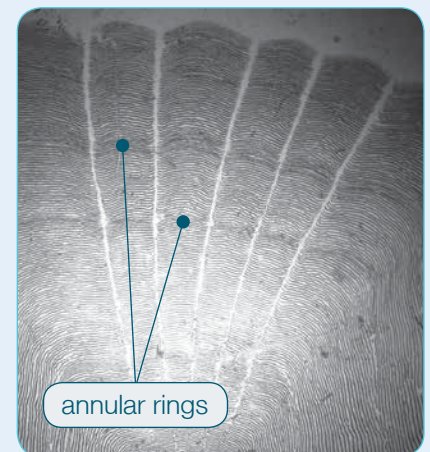
Sight

The next time you look at a fish, see how its eyes bulge out of its head. While humans can only see about 180 degrees around themselves, fish have a much broader field of vision and can see 300 degrees.



How old am I?

Biologists can use scales or otoliths (ear stones) to age fish. Just as you can age a tree by the rings in a cross-section of the trunk, you can estimate a fish's age by looking at its scales or otoliths.



Hearing

Even though you can't see them, fish have an inner ear on each side of their heads that aids in balance and allows them to sense vibrations caused by sounds in the water. That's why fish spook so easily when you're out fishing.

Lateral Line

Fish also have a lateral line that runs down the length of their bodies. This row of special cells helps them sense vibrations caused by other animals in the water.



Smell

Even though they're underwater, fish have nostrils, or nares, that they use to seek out food. Some fish even use their sense of smell to return to their birth streams to spawn (reproduce).



Brown Bullhead

Taste

Most fish have taste buds in their mouths, but some fish have them in their gills and barbels (whiskers). Catfish, with their very small eyes and poor vision, rely on their barbels to locate food. Despite myths you may have heard, barbels don't sting!

Swimbladder

We know fins help fish move about, but what is it that keeps them suspended within a waterbody instead of floating to the top or sinking to the bottom? It's an organ called the swim bladder. This gas-filled sac can be inflated or deflated by the fish. When it is filled just right, the fish is "neutrally buoyant," meaning it won't sink or float. This helps the fish stay exactly where it wants to be without having to swim.

Body Shape

A fish's shape tells you a lot about how it lives.



Built for speed

With its torpedo-shaped body and large fins in the back, chain pickerel are one of the state's fastest fish.



Laying Low

Catfish have compressed bodies, large pectoral fins and barbels, making them ideal for living on the bottom.



Did You Know

A freshwater drum can make a grunting noise by vibrating its swim bladder.



Coloration

When it comes to coloration, fish are very good at blending into their surroundings. After all, it's all about survival.



Largemouth bass blending in with its habitat

Largemouth bass tend to have a greenish color, which helps them blend in with the weedy areas where they live. Smallmouth bass prefer rocky areas, so they have a brown body. Sunfish and perch can be found hiding in plants. Having vertical bars up and down their bodies helps them blend in.

Most fish exhibit countershading, an adaptation that makes them difficult for predators to see. By having dark coloration on the top half of

their bodies, they blend in with the bottom when looked at from above. Similarly, by being light colored on the bottom half of their bodies, they blend with the light from the surface when looked at from below.

A Fish's Tale

All living things must reproduce so their species continues. Spawning between male and female fish occurs at certain times of the year, usually spring or fall, depending on the species. Most eggs are laid on plants or on the bottom of a lake or river, often in nests guarded by the male. Fish that don't take care of their young lay more eggs than fish that do. After eggs are fertilized, the embryo begins to form in the egg.



Fertilized eggs with developing embryos

After hatching, the young are called fry. The amount of time it takes for fry to hatch depends on the species and the water temperature. Young fish, called sac fry, have a yolk sac which provides nourishment as they grow.



Sac fry

Eventually, the yolk sac is absorbed and fry begin feeding on tiny, microscopic animals called zooplankton.

As they grow larger, the young are called juveniles, or fingerlings. Their diet consists of aquatic insects and smaller fish.



Bird's Eye View

Ever look for fish from a bridge? It's tough! From above, their dark-colored backs make them hard to see against shadowed bottoms. To make it easier, look for fish swimming over light-colored patches. This is a great example of a form of natural camouflage called "countershading."



Find the trout

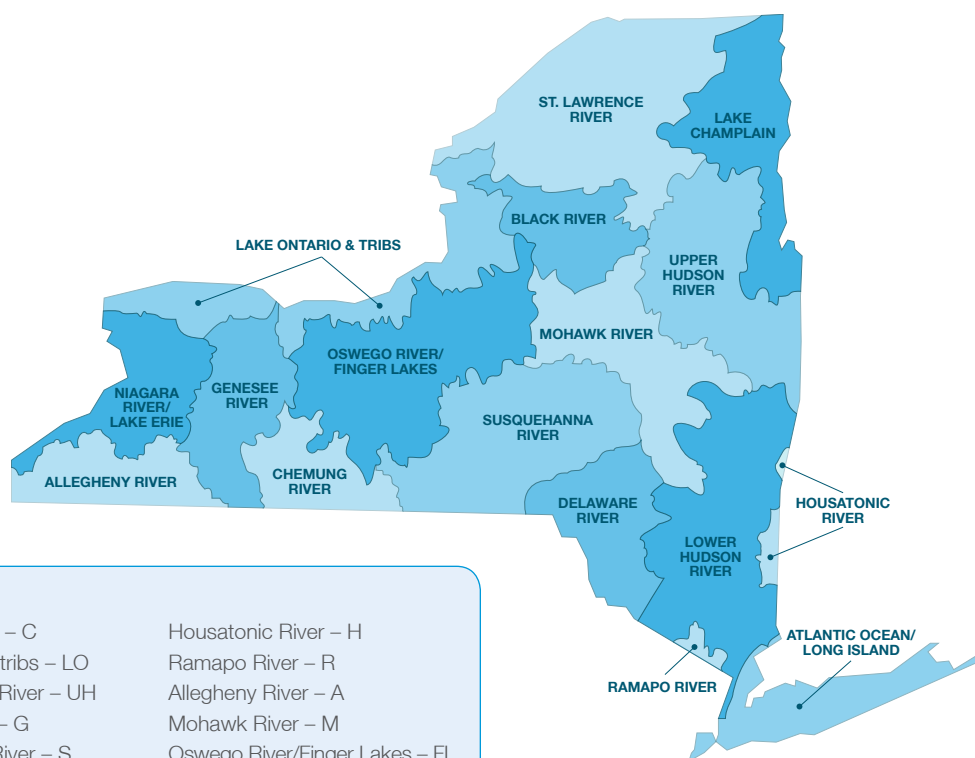
Fun Facts

- A female walleye can produce up to 500,000 eggs, but only around 25,000 will actually hatch.
- Bass eggs take a few days to hatch, but trout eggs can take weeks or longer.






Common and Interesting Fish of New York State





The following tables show common New York freshwater fish and some other interesting fish. Also see the “Key to Identifying Common New York Freshwater Fish” at the end of this chapter.



Watershed Key:

Niagara River/Lake Erie – LE	Chemung River – C	Housatonic River – H
Black River – B	Lake Ontario & tribs – LO	Ramapo River – R
Atlantic Ocean/Long Island – LI	Upper Hudson River – UH	Allegheny River – A
Delaware River – D	Genesee River – G	Mohawk River – M
St. Lawrence River – SL	Susquehanna River – S	Oswego River/Finger Lakes – FL
Lake Champlain – LC	Lower Hudson River – LH	

Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Sea Lamprey 	14-24 in./grow to 4 ft.	Larvae burrow in sand in quiet water for 4-5 years; adults move to ocean or large lakes	Fine-scaled fish such as trout and salmon	Swim up streams in spring to spawn in nests dug in gravel	LE, LO, SL, FL, B, LC, UH, LH, R, H, D, S, C, LI
Fish fact: Sea lampreys are parasitic, living off the body fluids of fish they attach to. This can reduce the host fish's growth or even kill it. Great effort is spent to control sea lampreys in waters where they are not native.					
Lake Sturgeon 	3-5 ft./grow to 7 ft.	Clean sand, gravel or rock bottom areas of large lakes and rivers	Leeches, snails, mussels, small fish and algae	May-June in shallow water, where eggs are deposited over gravel bottoms with swift current	LE, LO, SL, B, FL, LC, G
Fish fact: New York State is home to three sturgeon species: lake (threatened), Atlantic (federally endangered), and shortnose (endangered). Fishing for any sturgeon species is strictly prohibited.					
Bowfin 	18-24 in./grow to 34 in.	Weedy, clear lakes and rivers	Crayfish and small fish	May-June in shallow, weedy areas, where nests are built by clearing vegetation away to form a depression	LE, LO, FL, SL, B, LC
Fish fact: Bowfin can live in waters with low oxygen levels and can even gulp air at the surface.					

Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Longnose Gar 	2 ft./grow to 4 ft.	Close to shore in weedy lakes and rivers	Small fish	Late May-early June in shallow water, where eggs are spread across the bottom	LE, A, LO, SL, LC, FL
Fish fact: Considered a “living fossil,” gar have been around for nearly 10 million years.					
Channel Catfish 	15-25 in./grow to 37 in.	Rivers and lakes with sandy or rocky bottoms	Worms, crayfish, insects and fish	Late spring-early summer near the shore or stream bank, where fertilized eggs are deposited in a burrow dug near a stump, log or boulder	LE, LO, SL, UH, LH, R, H, LC, FL, C, S, B, M
Fish fact: Largest of the catfish/bullhead species in New York State, its forked tail makes younger fish easy to identify. The tail becomes worn and less forked with age, however.					
Brown Bullhead 	8-14 in./grow to 21 in.	Still water with mud bottom	Worms, insects, leeches, plant material, crayfish and small fish	May-June in shallow water near logs or rocks, where a burrow is dug to form a nest	All watersheds
Fish fact: Brown bullhead are among the few fish species where both parents spend a lot of time caring for their young.					
Chinook Salmon 	30-38 in./grow to 48 in.	Deep, open water	Alewife, smelt and shad	September-October in Lake Ontario tributary streams, where nests (redds) are dug in gravel. Interestingly, chinook die soon after spawning.	LE, LO, G
Fish fact: The largest of the Pacific salmon, chinook salmon are commonly called king salmon and were first introduced into the Great Lakes in 1873. They were extensively stocked in the 1960s to control overabundant alewife.					

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 Upper Hudson River – UH
 Genesee River – G
 Susquehanna River – S

Lower Hudson River – LH
 Housatonic River – H
 Ramapo River – R
 Allegheny River – A

Mohawk River – M
 Oswego River/Finger Lakes – FL

Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Coho Salmon 	18-28 in./grow to 33 in.	Deep, open water	Alewife and smelt	October-November in Lake Ontario tributary streams, where nests (redds) are dug in gravel. Interestingly, coho die soon after spawning.	LO, G, LE
Fish fact: Both coho and chinook salmon are native to the Pacific Ocean. Coho, also called silver salmon, were introduced into the Great Lakes in the 1960s.					
Rainbow Trout 	8-12 in./grow to 27 in.	Clear, cold streams and lakes	Zooplankton (microscopic animals), insects and small fish	March-April in streams flowing over clean gravel, where nests (redds) are dug	All watersheds
Fish fact: Rainbow trout that live in large lakes and spawn in streams are called steelhead. They look more silvery and grow much larger than rainbow trout that live in small streams or lakes. Steelhead can grow to 35 inches.					
Brown Trout 	8-15 in. (streams), 16-30 in. (large lakes and rivers)/grow to 38 in.	Coldwater streams and rivers, coldwater lakes	Insects, clams, mussels, crayfish and small fish	October-November in streams with clean, gravel bottoms, where nests (redds) are dug	All watersheds
Fish fact: Originally from Europe, brown trout are one of the most difficult trout species to catch.					
Atlantic Salmon 	15-30 in./grow to 38 in.	Cold, clear well-oxygenated lakes and rivers	Smelt, alewife, cisco and insects	October-November in tributaries with gravel bottoms and swift flowing currents; eggs are deposited in nests (redds)	LO, LC, SL, FL, D, UH, LH, R, H
Fish fact: Atlantic salmon are native to New York State. They used to live in the ocean and migrate to freshwater to spawn, but landlocked populations that spend their entire lives in freshwater now exist. They are known to leap high out of the water when hooked.					
Brook Trout 	8-14 in./grow to 22 in.	Small to moderate-sized coldwater streams, lakes and ponds	Insects, zooplankton and small fish	September-December spawn over springs or headwater streams with gravel bottoms and good flow of cold, clear water; eggs are deposited in nests (redds)	All watersheds
Fish fact: Brook trout are native to New York and the official state fish.					

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Allegheny River – A

Mohawk River – M
Oswego River/Finger Lakes – FL

Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Lake Trout 	15-24 in./grow to 43 in.	Deep, cold, well-oxygenated lakes	Zooplankton, insects and fish	October-December in less than 100 feet of water, where eggs are deposited over rocky bottoms	LC, FL, LE, LO, SL, UH, LH, R, H, S
Fish fact: Lake trout are New York State's largest native trout and have the longest life span.					
Chain Pickerel 	15-20 in./grow to 30 in.	Shallow, weedy areas of ponds, lakes and rivers	Insects, crayfish and fish	April-May in marshy areas and shallow bays, where eggs are spread randomly and fertilized	All watersheds except A
Fish fact: Chain pickerel get their name from the chain-like markings on their bodies.					
Northern Pike 	18-35 in./grow to 4 ft.	Shallow, weedy areas of lakes and rivers; large pike live in deeper waters	Insects, crayfish, fish, frogs and birds	April-May in shallow marshes or flooded meadows, where eggs are spread randomly and fertilized	All watersheds except D, LI
Fish fact: With their razor sharp teeth and quick speed, they're the top predators in many New York waters.					
Muskellunge 	28-48 in./grow to 5 ft.	Large, cool lakes and rivers	Fish, frogs, small mammals and birds	April-May in shallow bays and marshy areas, where eggs are spread randomly, then fertilized.	A, LE, LO, SL, LC
Fish fact: Muskellunge are the largest freshwater game fish in New York State.					
Pumpkinseed & Bluegill Sunfish 	5-7 in./grow to 11 in.	Around weeds, docks and other cover in lakes, ponds and rivers	Plant material, insects, zooplankton, crustaceans and small fish	June-August in shallow water over gravel to sand bottoms, where eggs are spread over nests. Males guard the nests until the young disperse.	All watersheds
Fish fact: These two species are usually the first fish kids catch.					

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Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Rock Bass 	5-10 in./grow to 11 in.	Rocky and gravelly shallow water areas in lakes and ponds; also in warm reaches of streams and large rivers	Insects, crayfish and small fish	Mid-May to mid-June in shallow water, where eggs are spread over nests. Males guard the nests until the young disperse.	All watersheds
Fish fact: Rock bass have red eyes, making them easy to identify.					
Black Crappie 	8-12 in./grow to 18 in.	Quiet, clear ponds, lakes and rivers with abundant vegetation	Insect larvae, crustaceans and small fish	May-June in sand or gravel areas with some vegetation, where eggs are spread over nests. Males guard the nests until the young disperse.	All watersheds except G
Fish fact: Crappie, also called strawberry bass and calico bass, are most commonly caught when they congregate in shallow water to spawn in the spring. They seek deeper, cooler water during the summer.					
Largemouth Bass 	12-18 in./grow to 25 in.	Shallow, weedy areas of lakes, ponds and rivers; also prefer cover, such as logs, docks and stumps	Insects, fish and frogs	May-July in shallow, weedy areas, where eggs are spread over nests. Males guard the nests until the young disperse.	All watersheds
Fish fact: Largemouth bass are New York State's most popular sport fish.					
Smallmouth Bass 	10-16 in./grow to 24 in.	Rocky or sandy areas of lakes; also prefer cover of boulders or logs	Crayfish, insects and fish	May-June over gravel or rocky bottoms, where eggs are spread over nests. Males guard the nests until the young disperse.	All watersheds
Fish fact: Pound for pound, many anglers consider smallmouth bass the best fighting freshwater fish when hooked.					
Walleye 	14-25 in./grow to 34 in.	Deep water sections of large lakes, streams and rivers	Perch and other fish	April in tributaries with swift flow and gravel bottom, where eggs are spread randomly	All watersheds
Fish fact: Walleye have a shiny lining on the inside of their eyes, helping them to seek prey at night.					

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Oswego River/Finger Lakes – FL

Species	Average/ Maximum Size	Habitat Preference	Diet	Spawning	Distribution
Yellow Perch 	6-12 in./grow to 16 in.	Shallow, weedy protected sections of rivers, lakes and ponds	Insect larvae, crayfish, small fish and invertebrates	April-May in shallow water near vegetation	All watersheds
Fish fact: Female yellow perch lay their eggs in a jelly-like tube that can measure up to seven feet long!					
White Perch 	8-10 in./grow to 16 in.	Freshwater and estuaries in warm, shallow water	Minnows, crustaceans and insects; considered a major predator of larval fish in some waters	Late spring in tributary streams or along gravelly shoal areas, where eggs are randomly spread over the bottom, then fertilized.	A, LE, LO, SL, FL, LH, R, H, LI, LC
Fish fact: Though similar in size to yellow perch, white perch are more closely related to their much larger cousins, striped bass.					
White Sucker 	8-10 in./grow to 20 in.	Gravel and mud bottoms of warm lakes, rivers and streams	Plant material, insects, snails, crustaceans and clams	April-May in fast-flowing streams with gravel bottoms, where eggs are randomly spread, then fertilized	All watersheds
Fish fact: Most suckers have downturned mouths, enabling them to suck up plant and animal material from the bottom.					
Common Carp 	18-28 in./grow to 40 in.	Lakes or large rivers with soft bottoms and vegetation	Plant and animal material along the bottom	May-June in very shallow water near vegetation, where eggs are broadcasted over the bottom	All watersheds
Fish fact: During spawning season, they are often seen thrashing about close to the surface, with their bodies partially exposed.					
American Eel 	24-40 in.	In gravel and mud bottoms, or hiding under rocks	Fish, crayfish and insect larvae	February-April	All except A
Fish fact: After spending 5-20 years in freshwater rivers and streams, American eels swim to the Sargasso Sea (near the Bahamas) to spawn. The eggs drift back to the coast with ocean currents and hatch along the way. The transparent hatchlings, called glass eels, swim by the millions up freshwater rivers and streams where they'll feed and grow until they reach sexual maturity.					

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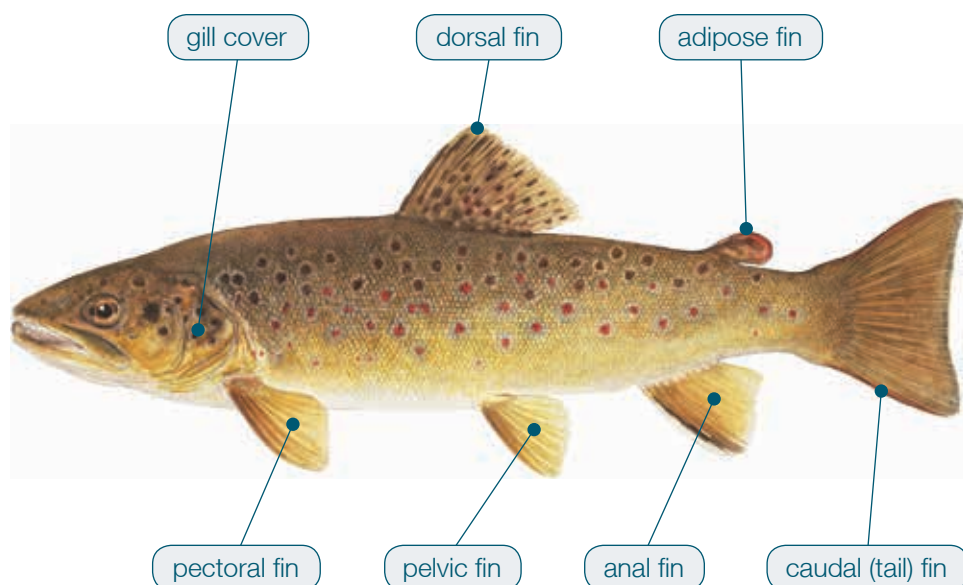
Mohawk River – M
 Oswego River/Finger Lakes – FL

Key to Identifying Common New York Freshwater Fish (and some less common but interesting species)

Although some fish species can be easily identified by color or some other obvious feature, this is not the case for all. Species such as black crappie and white crappie, or Atlantic salmon and brown trout, can look very similar and are very difficult to tell apart. Fisheries biologists use a tool called a *dichotomous key*, such as the simplified version provided here, to help them identify fish species. Occasionally, even a dichotomous key may not provide the answer and a genetic analysis of the fish may be necessary.

How to Use a Dichotomous Key

In the adjacent key, pairs of fish-feature descriptions are numbered and labeled “a” and “b” (hence, a dichotomy). Starting with number 1, compare your fish to the descriptions. A match leads either to the common name of the fish, or the number of the next feature to look for until the fish’s name is revealed.



- 1a.** Mouth a round sucking disk, no jaws; no pelvic or pectoral fins – Lamprey



- 1b.** Mouth with jaws; pectoral fins always present; one large slit-like opening on both sides of the head; pair of nostrils on snout – 2

- 2a.** Upper lobe of tail fin much larger than bottom lobe – Sturgeon



- 2b.** Both lobes of tail fin about the same size – 3

- 3a.** Bottom jaw protected by a flat bony plate; long single dorsal fin extending over half of body length – Bowfin



- 3b.** Bottom jaw fleshy and unprotected by a plate; dorsal fin either long or short – 4

- 4a.** Very long, thin snout; body covered with diamond-shaped scales – Longnose Gar



- 4b.** Snout not long and thin; scales not diamond-shaped or body scaleless – 5

- 5a.** Pelvic fins absent; dorsal, tail and anal fins join to form single fin; body snake-like – American Eel



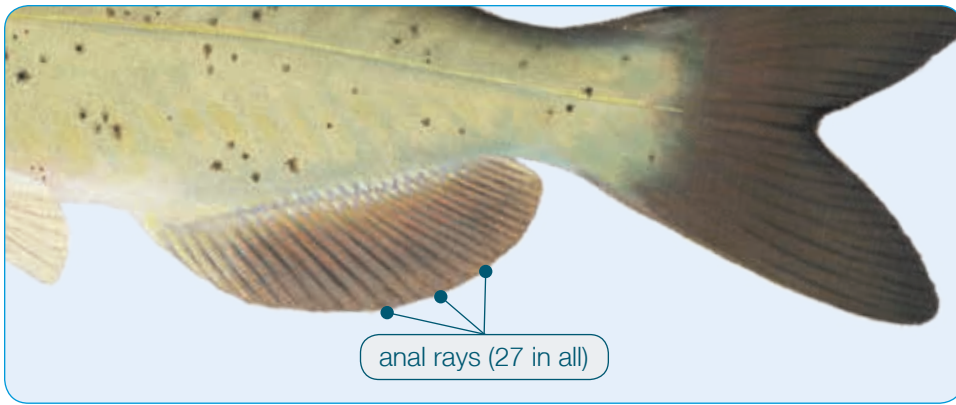
- 5b.** Pelvic fins present; dorsal, caudal and anal fins usually separate – 6

- 6a.** Adipose fin present – 7

- 6b.** Adipose fin absent – 15

- 7a.** Barbels (whiskers) surrounding mouth; no scales – 8

- 7b.** No barbels (whiskers) – 9



- 8a.** Tail deeply forked (particularly in young fish); anal fin with 24-29 rays – Channel Catfish



- 8b.** Tail rounded and not forked; stout pectoral-fin spines with sawlike teeth; anal fin with 21-24 rays – Brown Bullhead



- 9a.** Anal fin longer than it is wide – 10

- 9b.** Anal fin wider than it is long – 11

- 10a.** Black mouth; spotting on dorsal fin and entire tail fin – Chinook Salmon



- 10b.** Black mouth with white gums; spots only on dorsal fin and upper lobe of tail – Coho Salmon



- 11a.** Pattern of dark spots on light background – 12

- 11b.** Pattern of light spots on a dark background – 14

- 12a.** Many small black spots on dorsal fin, tail and back; pink line along side – Rainbow Trout



- 12b.** Fewer larger black spots on sides; few, if any, present on tail – 13

- 13a.** Many reddish spots found on sides and adipose fin (not evident in some lake fish) – Brown Trout



- 13b.** No reddish spots – Atlantic Salmon



- 14a.** Lower fins with white leading edge followed by a black stripe; body with small red spots circled with blue – Brook Trout



- 14b.** Grayish body; light spots on back and sides, forked tail – Lake Trout



- 15a.** Single dorsal fin – 16

- 15b.** Two distinctly separate dorsal fins – 25

- 16a.** Single dorsal fin with only soft rays – 17

- 16b.** Single dorsal fin with a mix of hard (spiny) and soft rays – 18

- 17a.** Tail forked; jaws forming duck-like snout with many teeth – 19

- 17b.** No duck-like snout; downturned mouth with no noticeable teeth – Sucker Family



- 18a.** Large, stout spine at forward edge of dorsal fin; two barbels (whiskers) along upper jaw – Common Carp



- 18b.** Single dorsal fin composed of a front set of spiny rays and rear set of soft rays, may or may not have a notch between ray sets – 21

- 19a.** Tips of tail fin rounded – 20

- 19b.** Tips of tail fin pointed – Muskellunge



- 20a.** Cheek and gill cover fully scaled; dark vertical bar under eye; chain-like markings on side – Chain Pickerel



- 20b.** Cheek and upper half of gill cover scaled; sides covered with light bean-shaped spots on dark background – Northern Pike



- 21a.** Flat, oval-shaped body; small mouth – 22

- 21b.** Long body; large mouth – 25

- 22a.** Red eyes – Rock Bass



- 22b.** Eyes not red – 23

- 23a.** Diamond-shaped, silvery-gray body with black blotches – Black Crappie



- 23b.** Body not silvery-gray – 24

- 24a.** Red spot at tip of gill cover; no black blotch on rear of soft dorsal fin – Pumpkinseed



- 24b.** No red spot at tip of gill cover; black blotch on rear of soft dorsal fin – Bluegill



- 25a.** Mouth extends past eye – Largemouth Bass



- 25b.** Mouth does not extend past eye – Smallmouth Bass



- 26a.** Teeth very large; large black blotch at base of spiny dorsal fin; tip of tail fin whitish – Walleye



- 26b.** Teeth not noticeable; tip of tail fin not whitish – 27

- 27a.** Yellow with six to seven dark vertical bars – Yellow Perch



- 27b.** Gray/silvery; no dark bars running along body – White Perch



1. This isn't my family! My soft fins and body type set me apart from the others.



Largemouth Bass



Muskellunge



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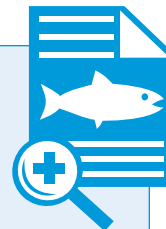
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- *A Place for Fish* by Melissa Stewart



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(see answer key)

1. Brown trout, 2. Lake trout, 3. Muskellunge
4. Sturgeon, 5. Smallmouth Bass,
6. Chain Pickerel, 7. Walleye, 8. Bowfin,
Special Message: I FISH NY

Answers: