



Department of
Environmental
Conservation

I  NY Beginners' Guide to

FRESHWATER FISHING





LET'S GO FISHING!

Fishing is an excellent way to enjoy nature and make lasting memories with family and friends. Anyone—from children to retirees—can learn to fish. Enticing a fish to bite your hook is always fun, and can be as relaxing or challenging as you decide to make it. Fishing offers a never-ending stream of intriguing experiences: Wade into a cold, rocky stream fishing for trout. Watch a pink sunset reflected in a still pond as a bass explodes on your lure. Wonder if you can catch more fish than that osprey flying overhead. Let this guide help you take your first step into a lifetime of fishing fun and adventure.



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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?

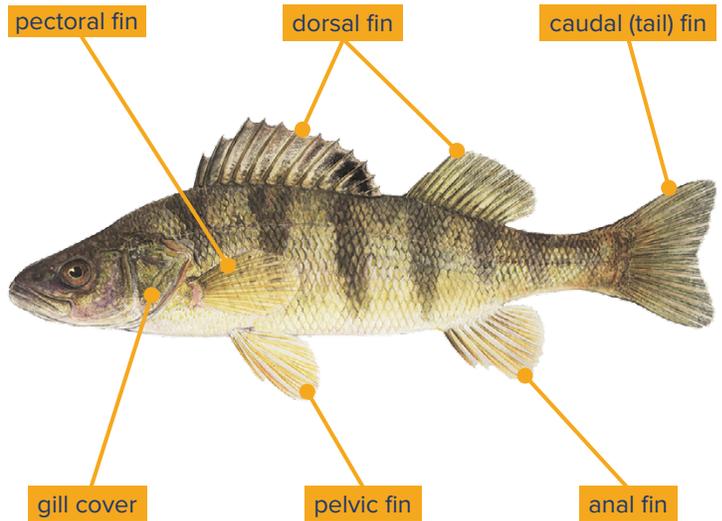
- It lives in water.
- It has fins.
- It has gills.
- It is cold-blooded.

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.

Scales – Most fish have scales that cover all or a portion of their bodies, protecting them against injury. Some fish are completely scaleless, such as catfish and lamprey.



Rock Bass

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. Go to page 23 for tips on how to hold the fish you catch.

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.

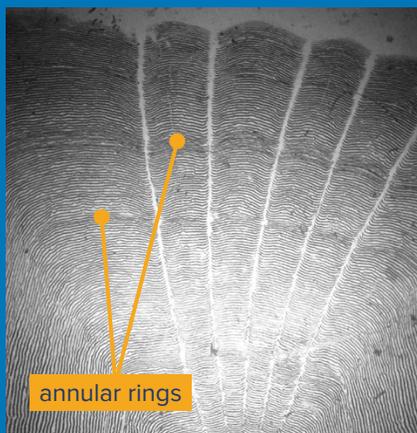
Sight

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.



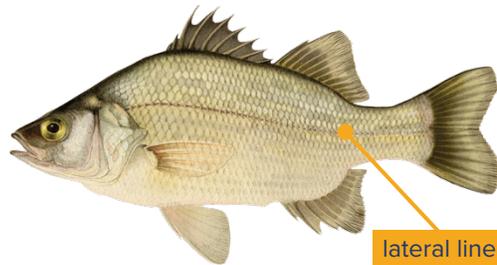
Unlike warm-blooded birds and mammals whose body temperature changes very little, the body temperature of cold-blooded animals, such as fish and reptiles, changes with the temperature of the environment. That's a big reason why you should retrieve your lure slowly when the water is cold.

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 if you make too much noise when fishing.

Lateral Line

Fish 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.

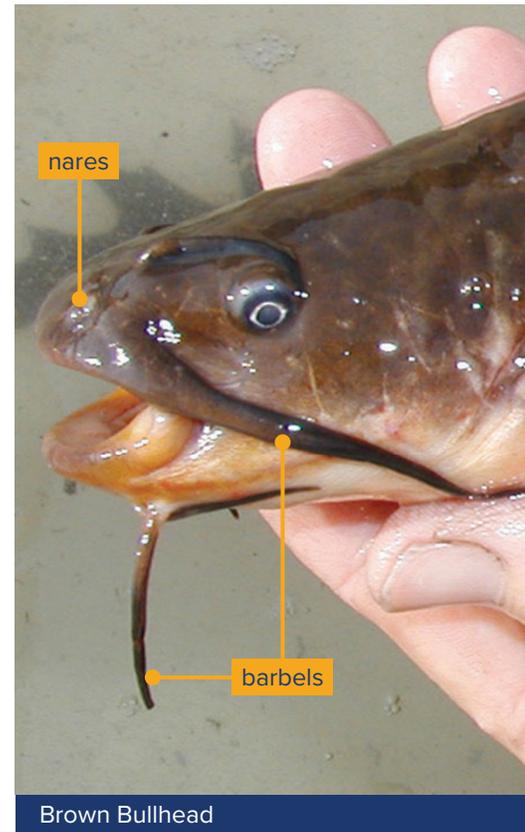


Smell

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).

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 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.

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.

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.



Largemouth bass blending in with its habitat

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.



Mark Batur

Fertilized eggs with developing embryos



Mark Batur

Sac fry



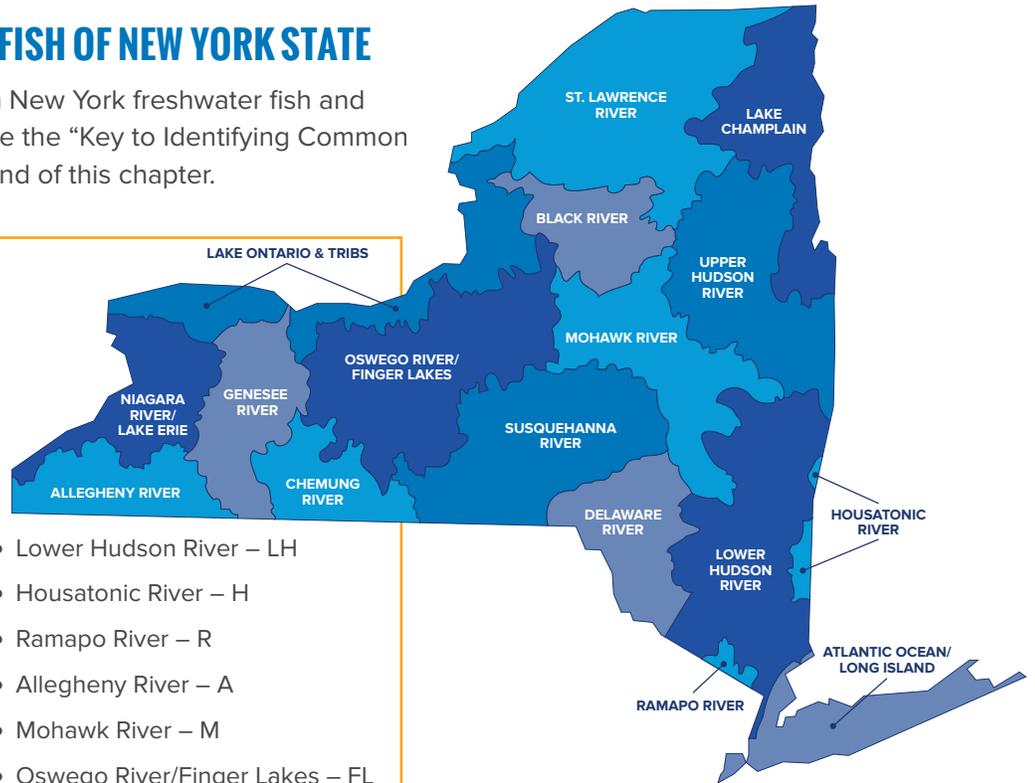
Juvenile (fingerling)

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
- Black River – B
- Atlantic Ocean/Long Island – LI
- Delaware River – D
- St. Lawrence River – SL
- Lake Champlain – LC
- Chemung River – C
- Lake Ontario & tribs – LO
- 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
 <p>Sea Lamprey</p>	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.					
 <p>Lake Sturgeon</p>	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.					
 <p>Bowfin</p>	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
<p>Longnose Gar</p> 	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.					
<p>Channel Catfish</p> 	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.					
<p>Brown Bullhead</p> 	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.					
<p>Chinook Salmon</p> 	30-38 in./ grow to 48 in.	Deep, open water	Alewife, smelt and other small fish	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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Oswego River/Finger Lakes – FL

SPECIES	AVERAGE/ MAXIMUM SIZE	HABITAT PREFERENCE	DIET	SPAWNING	DISTRIBUTION
<p>Coho Salmon</p> 	18-28 in./ grow to 33 in.	Deep, open water	Alewife, smelt and other small fish	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.					
<p>Rainbow Trout</p> 	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.					
<p>Brown Trout</p> 	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.					
<p>Atlantic Salmon</p> 	15-30 in./ grow to 38 in.	Cold, clear well-oxygenated lakes and rivers	Small fish 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.					
<p>Brook Trout</p> 	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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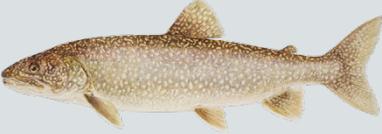
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SPECIES	AVERAGE/ MAXIMUM SIZE	HABITAT PREFERENCE	DIET	SPAWNING	DISTRIBUTION
<p>Lake Trout</p> 	15-24 in./ grow to 43 in.	Deep, cold, well-oxygenated lakes	Zooplankton, insects and fish	October- December in less than 100 feet of water, where eggs are 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.					
<p>Chain Pickerel</p> 	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.					
<p>Northern Pike</p> 	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.					
<p>Muskellunge</p> 	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.					
<p>Pumpkinseed & Bluegill Sunfish</p> 	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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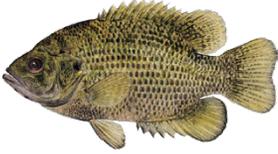
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SPECIES	AVERAGE/ MAXIMUM SIZE	HABITAT PREFERENCE	DIET	SPAWNING	DISTRIBUTION
<p>Rock Bass</p> 	5-10 in./ grow to 11 in.	Rocky and gravelly shallow water areas in lakes and ponds; also in warm reaches of streams and large rivers	Insects, crayfish and 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.					
<p>Black Crappie</p> 	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.					
<p>Largemouth Bass</p> 	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.					
<p>Smallmouth Bass</p> 	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.					
<p>Walleye</p> 	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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SPECIES	AVERAGE/ MAXIMUM SIZE	HABITAT PREFERENCE	DIET	SPAWNING	DISTRIBUTION
<p>Yellow Perch</p> 	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!					
<p>White Perch</p> 	8-10 in./ grow to 16 in.	Freshwater and estuaries in warm, shallow water	Minnnows, crustaceans and insects	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.					
<p>White Sucker</p> 	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.					
<p>Common Carp</p> 	18-28 in./ grow to 40 in.	Lakes or large rivers with soft bottoms and vegetation	Plant and animal material	May-June in very shallow water near vegetation, where eggs are broadcast 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.					
<p>American Eel</p> 	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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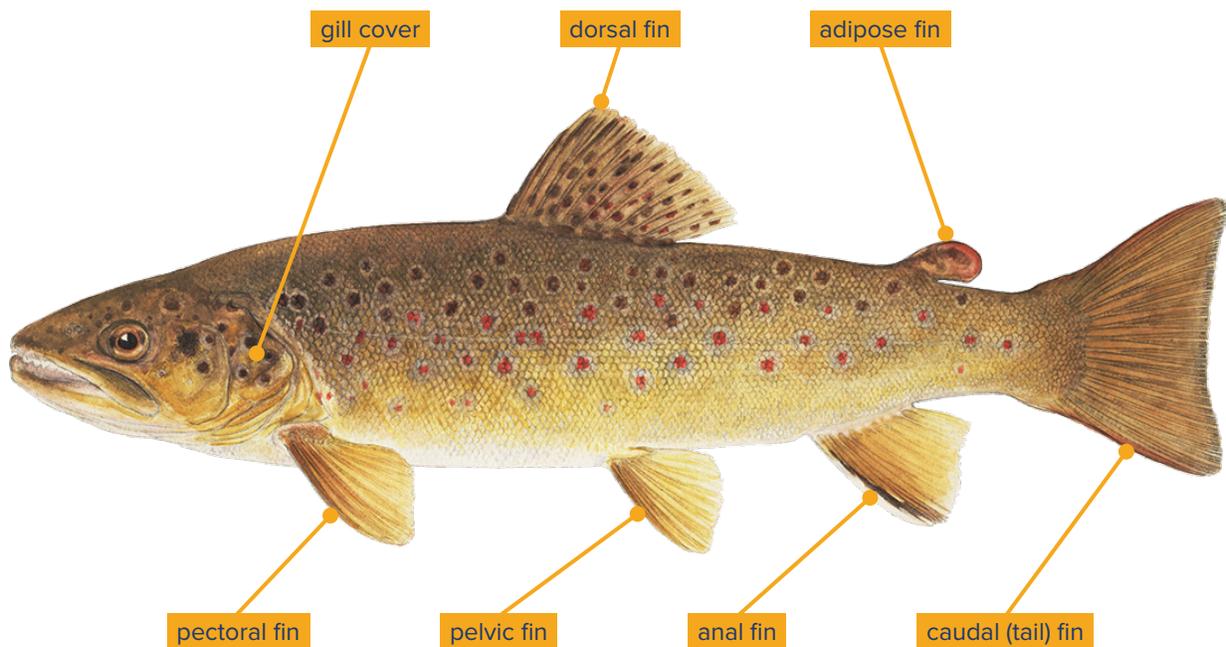
Mohawk River – M
Oswego River/Finger Lakes – FL

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



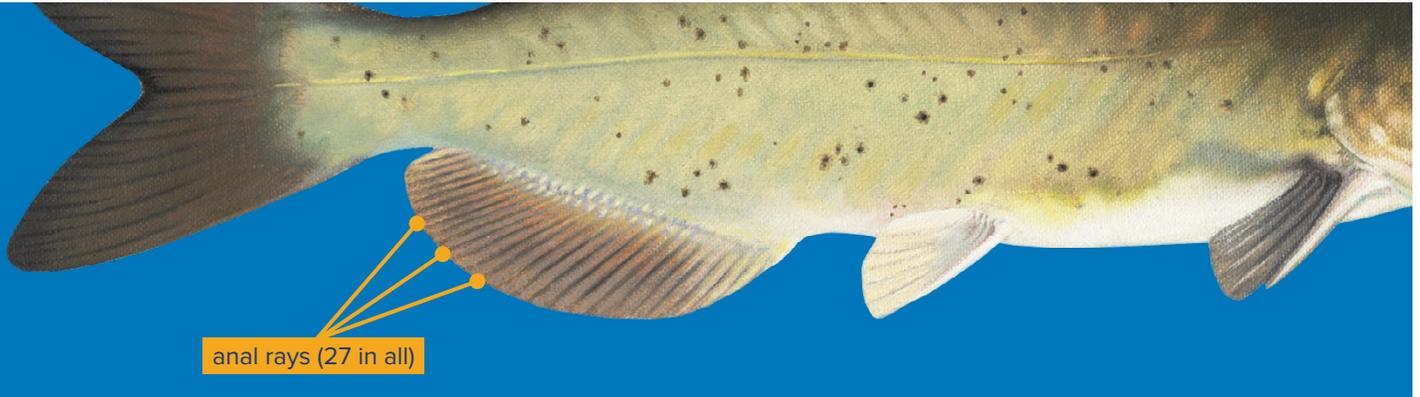
- 5b.** Pelvic fins present; dorsal, caudal and anal fins usually separate – 6

- 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



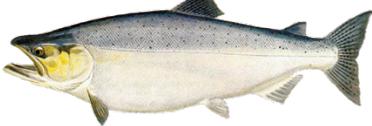
8b. Tail rounded and not forked; stout pectoral-fin spines with sawlike teeth; anal fin with 21-24 rays – Brown Bullhead



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



RESOURCES

Web Resources

- www.takemefishing.org
- www.dec.ny.gov/animals/269.html

Books

- *Freshwater Fishes of the Northeastern United States: A Field Guide* by Robert G. Werner
- *Fish of New York Field Guide Paperback* by Dave Bosanko
- *Peterson Field Guide to Freshwater Fishes* by Lawrence M. Page and Brooks M. Burr
- *The Diversity of Fishes: Biology, Evolution and Ecology* by Gene Helfman, Bruce Collette, Douglas Facey and Brian Bowen
- *Biology of Fishes* by Quentin Bone and Richard Moore
- *Buck Wilder's Small Fry Fishing Guide* by Tim Smith and Mark Herrick
- *Outdoor Kids Club Ultimate Fishing Guide Paperback* by Dave D. Shellhaas
- *DK Eyewitness Books: Fish* by Steve Parker
- *A Place for Fish* by Melissa Stewart

ACTIVITIES

Test your knowledge of freshwater fish! Can you figure out which fish species doesn't belong? If so, circle it. Answer key at bottom left.

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



2. Hanging out in weeds isn't my thing. I prefer open water.



3. Who are you calling a dinosaur? I'm considered to be more of a modern-day fish.



Using the Key to Identifying Freshwater Fish in this chapter, can you find the answers to the following questions? Once you fill in the circled letters, unscramble them and fill in the spaces at bottom right to find a special message.

4. My mouth is made up of jaws, and the upper lobe of my tail is much larger than the bottom lobe. Who am I?



5. My mouth is made up of jaws, the lobes of my tail are the same size and I have a fleshy bottom jaw. My scales aren't diamond-shaped and all my fins are separate. I don't have an adipose fin, but I have two separate dorsal fins, and my mouth does not extend past my eye. Who am I?



6. My mouth is made up of jaws, the lobes of my tail fin are the same size and I have a fleshy bottom jaw. My scales aren't diamond-shaped. All of my fins are separate, but I don't have an adipose fin. I have a single dorsal fin, a forked tail, and a duck-like snout with many teeth. My tail fin is rounded, I have a dark vertical bar under both of my eyes, and chain-like markings on my sides. Who am I?



7. My mouth is made up of jaws, the lobes of my tail are the same size and I have a fleshy bottom jaw. My scales aren't diamond-shaped and all my fins are separate. I don't have an adipose fin, but I have two separate dorsal fins, large teeth, and a large black blotch at the base of my spiny dorsal fin. Who am I?



8. My mouth is made up of jaws and my tail is unlobed. I have a flat bony plate on the bottom of my jaw and a long single dorsal fin extending over half my body. Who am I?



SPECIAL MESSAGE



(see answer key)

ANSWERS: 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



BASIC FISHING TACKLE AND TECHNIQUES

START WITH THE BASICS

Every angler has stories to tell: my first fish, my biggest fish, and, of course, the one-that-got-away. Before you can tell your own story, you need to hook your first fish. To make this happen, you need a rod, reel, hook, line, bait, lure and other tackle that will get you off to a good start. You also need to learn how to cast and how to choose the spots where you're most likely to catch fish in a lake, pond or stream. Once you learn these basics, it won't be long before you have your own stories to tell.

WHAT DO I NEED TO GO FISHING?

The fishing section of any sporting goods store can be overwhelming. There is so much fishing tackle and fancy equipment to look at. How do you decide what to buy? The truth is, all you need is a small investment in a beginner's rod and reel, a hook, line and some kind of bait or lure, and you'll soon be on your way to catching fish!

ROD AND REEL TYPES

You can choose from four main types of fishing rods and reels: spin-casting, spinning, bait-casting and fly rods. Spin-casting is generally considered the easiest to use while bait-casting and fly rods are considered the hardest to use. Spinning is considered the most versatile since it can cast light and moderately heavy lures/baits. For beginning anglers, a spin-casting rod and reel is recommended.

SPIN-CASTING ROD AND REEL

Most people start fishing with a spin-casting rod and reel combo because it is easy to use. You cast using a push-button (right). Spin-casting tackle consists of a closed-faced reel mounted on top of the rod. Spin-casting reels can be used on any rod designed for bait-casting, but usually perform best on light- to medium-action rods. If you are a beginner, use a rod that is your height or shorter for better control.

Fishing Line

Fishing line is what connects you to the fish. While there are many different types of fishing line to choose from, monofilament line (mono) is the best choice for beginning anglers. Mono is inexpensive and works well in most fishing situations.

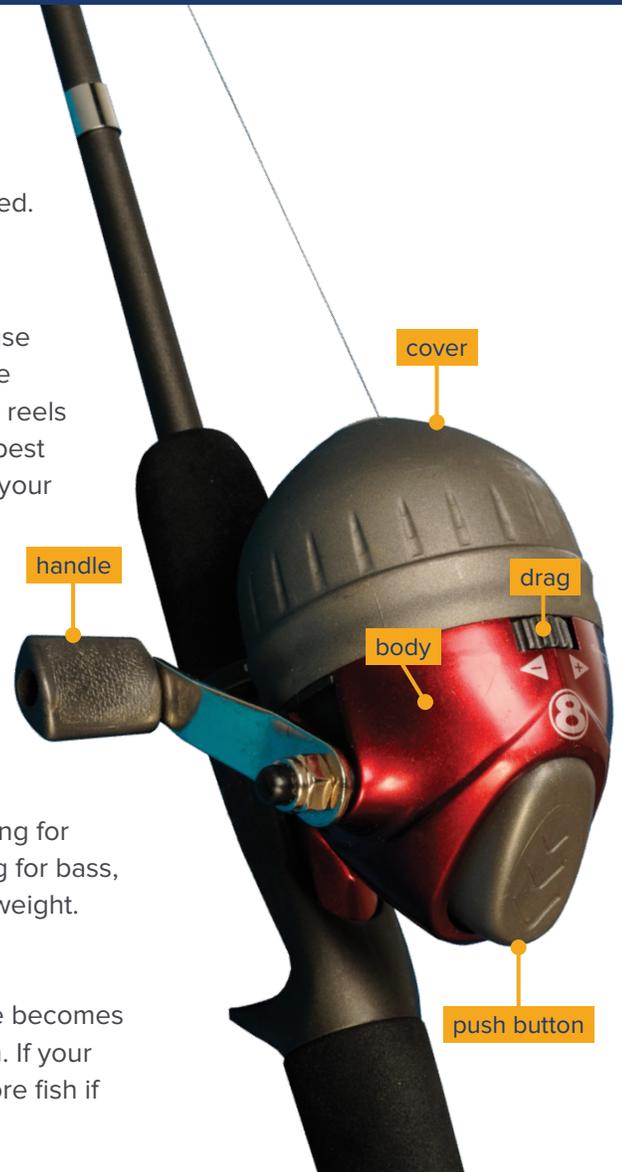
Line comes in different strengths called "pound test." Choose a line that best fits the type of fishing you plan to do. For example, when fishing for bluegills and yellow perch, 4- to 8-pound test line is good. When fishing for bass, use 8- to 12-pound test line. Eight-pound test is a good all-around line weight.

Replacing Your Fishing Line

Keeping fresh line on your reel is very important. Old monofilament line becomes brittle and loses its strength. This can lead to broken line and a lost fish. If your line breaks easily after tying a knot, it's time to replace it. You'll land more fish if you replace your line at least once a year.



Where to begin? The variety of reels, rods, hooks and lures can be bewildering.



A closed-faced, spin-casting rod and reel is a good first choice.

Look for instructions on how to tie line to your reel in the package of line you purchase.

Setting the “Drag”

All reels have a drag system that differs in appearance between reel types. The drag puts pressure on the reel’s spool, setting how much force it takes to pull line off the reel. The tighter the drag, the harder it is to pull line off the reel. To tighten the drag, you turn one way (usually labeled with a “+” sign), and to loosen the drag, you turn the other way (usually labeled with a “-” sign).

Setting the drag properly is important. You want the drag tight enough to set the hook and control the fish, but not so tight that the line breaks. This gives you the ability to land a bigger fish than your line may be rated for. You can test the drag by pulling line off the spool with the reel engaged to retrieve line, as it would be if you hooked a fish. If the line you’re using breaks, loosen the drag. If the line comes off too easily, tighten the drag. We recommend that you set the drag about 25% less than the pound test line you are using. This is done “by feel,” which gets better with experience.

CASTING

Learning how to cast well can greatly improve your chances of catching fish. Sometimes being able to cast far really helps, such as when you are trying to reach deeper water or when surf casting (casting into the waves). But casting accurately is usually more important. Fish love cover, such as a downed tree or a rock in the middle of a stream, so casting in just the right place without getting snagged will help you catch more fish.

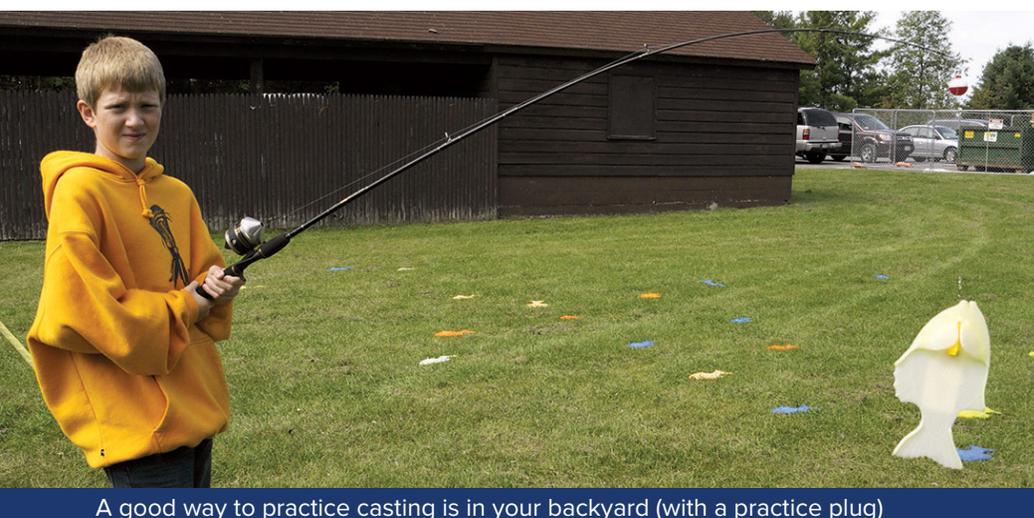
Learn more about cover, and how to change your fishing strategy to take advantage of it, later in this chapter.

How to Cast

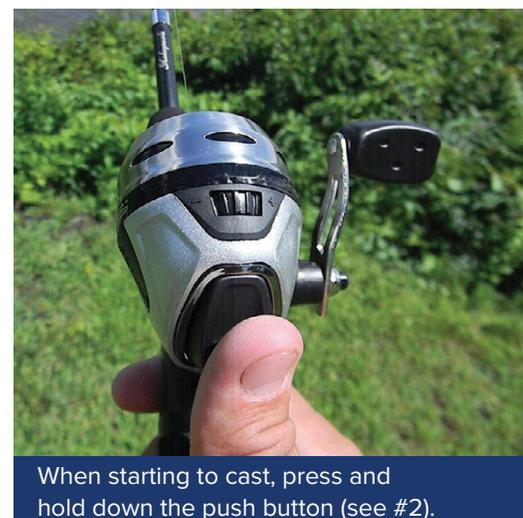
1. When your line is ready and a practice plug is tied on (right), place the practice plug 6-12” from your rod tip. Before you cast, look behind you and make sure nobody is close enough to get hit by your cast. Check for trees and bushes that can get in your way. Make sure your line is not wrapped around your rod tip.
2. Press and **hold down** the reel’s push button.
3. Using your wrist and elbow (not your whole arm), gently bring the rod straight up over your shoulder to about the ten o’clock position. Gently sweep the rod forward, causing the rod to bend with the motion. When the rod is in front of you at about one o’clock, release your thumb from the button. The bend in the rod casts the practice plug out.
4. Turn the reel handle clockwise, and reel the practice plug back in.



Practice plug



A good way to practice casting is in your backyard (with a practice plug)



When starting to cast, press and hold down the push button (see #2).

Cast Troubleshooting

Sometimes when you are casting, things just don't work right. Use these simple tips to fix some common problems.

- ***I try to reel in, but the line doesn't come in.***

Sometimes, when there is loose line on the reel, the reel can't "pick up" the line. Try pulling the line tight and then reel in. Most of the time, this fixes the problem.

- ***The handle fell off my reel!***

If you reel the wrong way, you can spin the handle right off the reel. Put the handle back on the reel and reel in the opposite direction. That will spin it back on correctly. Keep reeling in that direction to pick up the line.

- ***I cast, but the line doesn't go out.***

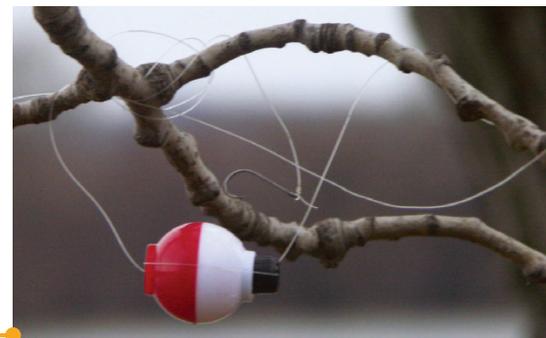
There are two possible solutions:

1. Check the rod tip to make sure the line isn't twisted around it. If it is, unwind the line and try to cast again.
2. If the line is not tangled at the rod tip, it might be tangled in the reel. Push down the button on the reel and let go, but do not start reeling in. Try to pull some line from the reel. If no line comes out, take the cap off the reel and try to untangle the line.

Casting and Fishing Safety

Below are some safety tips to keep in mind while fishing:

- Always walk when holding your fishing rod. Don't run!
- When walking with the fishing rod, always keep the rod tip up and behind you so it comes through the brush and trees easier.
- Make sure to attach the hook to a rod line-guide when not fishing. This keeps the hook from swinging into branches or even people.
- Look around before you cast to make sure it's safe. You don't want to hit another person or get your line tangled in a tree.
- Stand on safe stable ground while fishing from shore.



When casting, avoid bobber-snagging branches.

TERMINAL TACKLE

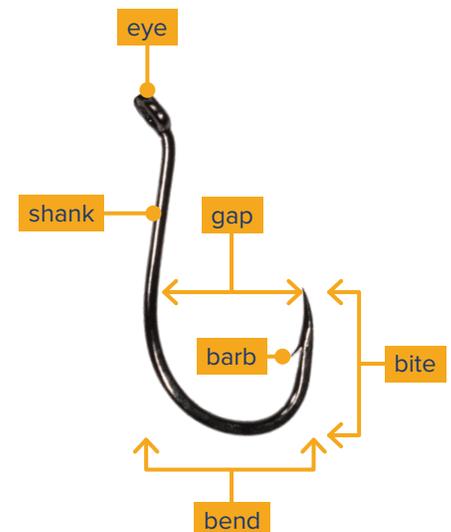
Terminal tackle is fishing gear that is attached to the end of your line.

Hooks

Fishing hooks are one of the most important inventions of all time. They have helped people catch fish for over 9,000 years. Today, there are many different styles of hooks to choose from, depending on how you are fishing. For now we will stick to the basics.

Anatomy of a Fish Hook

Choosing the right size hook is very important when targeting a certain species of fish. Hook sizes are classified by numbers ranging from the tiny #22, used for tying small flies, to the giant #16/0 used for shark fishing. In between, are a variety of different sized hooks used for different sized fish. The chart that follows will help you decide which hook size to use. In general, use a hook that is not so big that a fish can easily detect it, but not so small that it can be easily swallowed.



GOING BARBLESS

Some people may prefer to use barbless hooks. Any hook can be made barbless simply by using a pair of pliers to bend the barb down. Barbless hooks are good to use when catch-and-release fishing. However, remember to keep a tight line when reeling in your fish, as you will not have the barb to help keep the fish on the hook.

BAIT HOOK SIZES															
Hook Size		Hook Length in Inches	Trout	Northern Pike	Muskellunge	Channel Catfish	Bullhead	Smallmouth Bass	Largemouth Bass	Bluegill	Crappie	Yellow Perch	Walleye	Suckers	Carp
13/0		4													
12/0		3 3/4													
11/0		3 1/2													
10/0		3 1/4													
9/0		3													
8/0		2 3/4													
7/0		2 1/2													
6/0		2 1/4													
5/0		2													
4/0		1 7/8													
3/0		1 3/4													
2/0		1 5/8													
1/0		1 1/2													
1 1/2		1 3/8													
1		1 1/4													
2		1 1/8													
4		15/16													
6		13/16													
8		11/16													
10		9/16													
12		7/16													
14		11/32													
16		9/32													
18		7/32													
20		5/32													

Hook sizes are determined by length of shank excluding eye

Sizes recommended for bait fishing

Basic Fish Hooks

Bait holder – This style of hook has two barbs on the shank to help prevent bait from sliding down to the bend. This is a popular style of hook when using worms for bait.



Aberdeen – This is the classic j-shaped hook. It is very popular when fishing for panfish (such as sunfish and perch) and trout. It has a long shank that makes it easy to remove the hook from the fish.



Circle – This hook is becoming more popular with anglers because it will rarely hook a fish in the gut or the gills. It is a good hook to use when fishing with live bait. One major difference is that you do not set the hook. Instead, just reel steadily when you detect a bite until the hook is set.



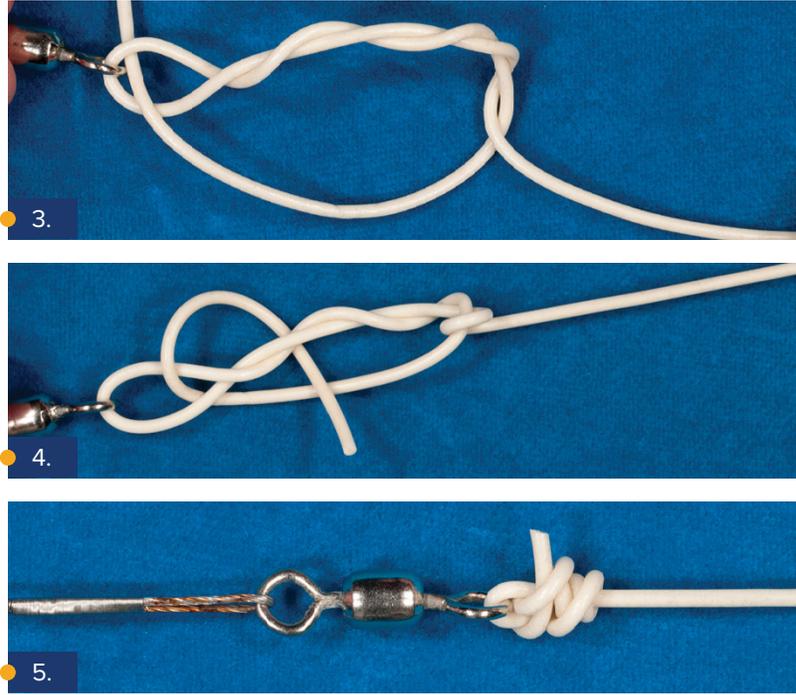
When fishing for panfish, size 6 to 8 aberdeen hooks work best.

Knots

Knots connect your fishing line to the hook. They are the weakest point in your fishing line. Some knots are stronger than others. You can help keep fish from breaking your line with a good knot such as an improved clinch knot.

How to Tie an Improved Clinch Knot

1. Put the end of the line through the eye of the hook and bring it back toward the line.
2. Make six "S" twists around the line.
3. Take the end back toward the hook and push it through the first loop nearest the eye.
4. Bring the end back through the big loop.
5. Moisten the line. Holding the hook and line, pull the knot tight until it looks like the knot shown.



Bobbers

A bobber or float is designed to do three things. First, it keeps bait suspended above the bottom, weeds or other cover. Second, it indicates when a fish is striking (biting or nibbling). Third, it provides additional weight when casting.



Bobbers can be made of hollow plastic, foam, or cork and come in a variety of sizes and shapes. The most common type of bobber is round and is made of hollow plastic.

Use the smallest size bobber that you can easily see and holds your bait without submerging. The reason for this is that the fish do not like to feel resistance when taking your bait. The smaller the bobber, the more likely it is for the fish to hold the bait. This equals more fish!

Fish are not always near the bottom or the surface. Try adjusting your bait until you find the depth where the fish are hanging out.

Weights

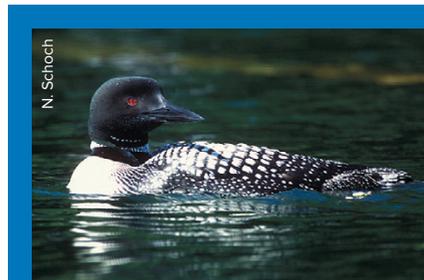
Weights or sinkers keep your bait at or near the bottom, or can make your lure run deeper. They come in different shapes and sizes, each for a special purpose.



(Left-right) bullet weight, split-shot, egg sinker

Traditionally sinkers were made of lead. However, lead sinkers can be dangerous to waterfowl and other animals if swallowed. Small lead sinkers under ½-oz. can no longer be sold in New York State, but there are now many sinkers available that are not made of lead. Like bobbers, the larger the weight, the more resistance the fish feels. Use the smallest weight you need to keep your bait at the bottom.

Note: use a pair of pliers to put split shot on your line. Do not use your teeth!



When lead sinkers are lost through a broken line or in other ways, birds and other wildlife can mistakenly swallow them while feeding and be poisoned.

Swivels and Snaps

A swivel is a small metal connector used to prevent line from twisting. It is helpful when using different types of fishing rigs, such as the bottom rig below.

A snap-swivel is a swivel with an interlocking snap attached for changing lures quickly. Snap-swivels are good for lures that twist line, such as spinners and spoons, but may keep other types of lures from moving as they were designed to through the water. Keep that in mind when using them.



(Left-right) snap swivel, 3-way swivel, swivel

Leaders

A leader is a short piece of line or wire that connects your main fishing line to your bait or lure. Wire is used for sharp-toothed fish, such as pike and pickerel. Fluorocarbon is used for line-shy fish such as trout because fluorocarbon blends into the water so the fish cannot see it.

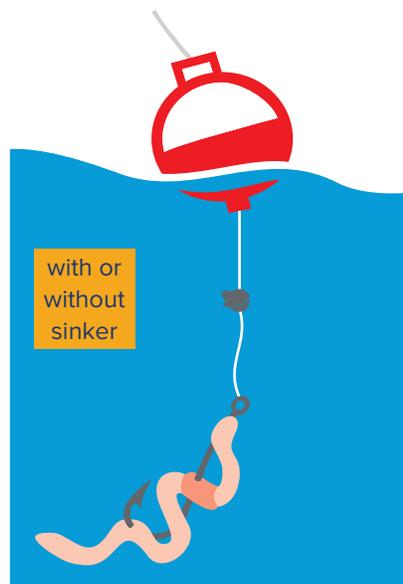
NATURAL BAIT/RIGS

Common Bait Rigs

A rig is the combination of terminal tackle used to catch fish.

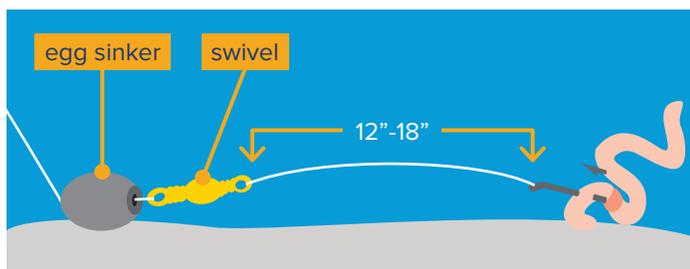
Bobber and Bait Rig

This is the best rig for beginners because the bobber lets you know when a fish takes the bait. You can use this rig with all types of live bait. A split shot sinker is optional and should only be used if necessary to improve casting or to keep your bait down. This rig can be difficult to use on windy days.



Bottom Rig

This a great rig to use, especially when fishing for species that feed on the bottom. It's also good to use on windy days when it is difficult to use a bobber and bait rig.

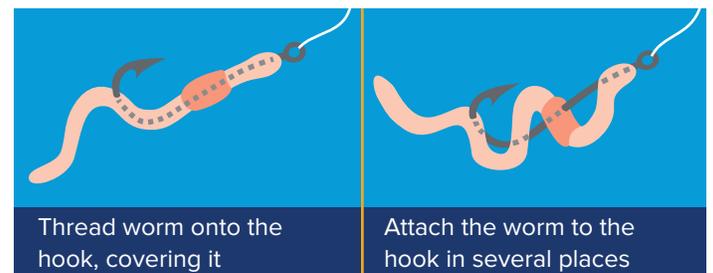


Natural (Live) Bait

Natural baits consist of things like earthworms, crickets and minnows, and natural materials such as corn or dough balls. The use of natural baits is recommended for beginning anglers. You can purchase natural baits at bait shops, some mini-marts, and in the sporting goods sections of some department stores.

Worms

As bait, worms will pretty much catch anything that swims! Worms are found in rich soil, under leaves in the woods, or in gravelly soil along streams. Keep them in the shade in a can with moist soil. Because a worm will wiggle, hold it tightly at one end with your thumb and finger. Bring the hook down through one end of the worm and attach it in one of the ways shown below.



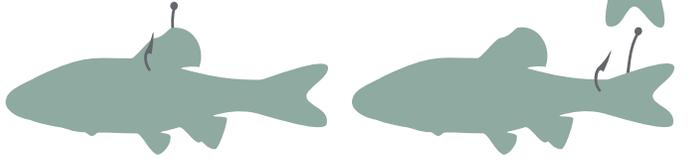
Thread worm onto the hook, covering it

Attach the worm to the hook in several places

Be careful when putting bait on your hook. It is easy to poke yourself with a fish hook!

Minnows

Minnows used for bait are usually 1- to 3-inches long. Put the hook through the very top of its back, avoiding its spine, just in front of the fin. Minnows can also be hooked through the tail or lip. These methods will allow the minnow to swim naturally.



Crickets

Crickets are a good bait for catching panfish. Hook them through the collar just behind their necks. The hook should be slipped under this collar so that the point is exposed. This keeps the insect alive so it will attract more fish. Look for crickets under rocks and logs.



Crayfish

Crayfish make great bass bait, but will catch plenty of other fish as well. Hold them along the back so you won't get pinched, and push the hook through the tail. Not all bait shops sell crayfish, so you might have to find them yourself. Your best bet is to flip over rocks along rocky shorelines.



CATCHING A FISH

So you have your bait in the water, now what? How do you know when a fish is striking your hook?

- If you are fishing with a bobber and bait rig, keep a close eye on your bobber. If it starts to go under the water, a fish is biting.
- When fishing with a bottom rig, keep your line fairly tight. Closely watch your rod tip and line. If your rod tip starts bobbing, or your line starts to move or get slack, you are getting a bite.
- When using an artificial lure, detecting a strike depends on what kind of lure you are using. For example, if fishing with a plastic worm, wait to feel a tap on your bait or some resistance. If fishing with a fast-moving bait, your line will immediately get tight.

When you think a fish is biting your bait or lure, you need to “set the hook” (see exception in the box below). This is done by raising your rod in a fast upward motion, which causes the hook point to penetrate the fish’s mouth.

Remember, if you’re using a circle hook, there’s no need to set the hook. If a fish is biting on the end of your line, simply start reeling in.

DID YOU KNOW

Minnows can spread fish diseases. Use only minnows caught from the same water you are using them in. Otherwise, you can use certified disease-free minnows from your local tackle shop. Also, make sure that the use of baitfish is permitted in the water you are fishing (see the current Fishing Regulations Guide).



Wax Worms

Wax worms are great for catching trout, perch, crappie and sunfish. They tend to be less messy than earthworms, making them perfect for the beginning angler. They work well with either a bobber or a bottom rig. Grab the wax worm by the head between your thumb and index finger. With your other hand, insert the hook through the tail end of the wax worm.



Dough-like Baits

Dough balls are great bait for carp. Dough balls are easily made from flour, bread and cornmeal dampened with water or honey. Experiment and find what works best for you. The dough ball should be formed in a tight ball and pressed onto the hook.



Hopefully, after you set the hook, you will feel the fish at the end of your line. Now is the time to try to judge the fish's size and figure out how you are going to "play" it. The bigger the fish, the more careful you must be to avoid breaking the line. Setting the drag (page 17) is a way for you to adjust how much resistance a fish feels when pulling on the line. If you think you have a large fish, consider loosening the drag. This allows the fish to take some line and prevents the line from breaking.

When you get the fish close to the shore or the boat, you are ready to land the fish. If you plan to keep your catch, a net can be a big help. If you plan to release your fish, try to avoid taking the fish out of the water. Excessive handling can remove the protective slime that coats a fish. If you are not keeping the fish, try to release it as quickly as possible. Needle nose pliers can be a big help when removing the hook. If your fish is deeply hooked, avoid tearing it out as this can harm the fish. Instead, simply cut the line above the hook, and the hook will corrode and dissolve over time.

Holding Fish

Some fish have spines; some have teeth; a few have both. There are several ways to hold fish so you or the fish won't get hurt. Whenever you are holding a fish, make sure to wet your hands first. This helps keep the protective mucus layer (slime) on the fish where it belongs.

Spiny-rayed Fish

For most spiny fish (i.e. sunfish, perch and walleye), wet your hand and then slide it over the head of the fish and slowly down the back. Let the spiny dorsal fin fold down against the back. Hold the fish firmly around the body.



Soft-rayed Fish

Soft-rayed fish (i.e. trout) can be held the same way as spiny-rayed fish except that you don't have to worry about spines!



Bass

If you catch a small bass, place your thumb inside the lower lip and your forefinger on the outside. You can pick up a larger bass the same way, but you should also cradle the body with your other hand or hold it straight down to prevent injury to the organs. Avoid holding the bass so that the lip bends down as this can injure its mouth. Because of the size of their mouths, you can also use this technique with crappies.



Pike, Pickerel and Muskellunge

Pike, pickerel and muskellunge all have a set of very sharp teeth. Never put your hand into their mouths to remove a hook! Instead use forceps or needle nose pliers to remove the hook.



To hold a member of the pike family, grab the fish behind the head. Never grab a fish by the eye sockets or gill covers, because you can hurt it. If you plan to release the fish, keep it in the water as long as possible. If you do pick up the fish out of the water, hold it horizontally and support the fish's belly to prevent injury to the fish.

Catfish/Bullhead

Members of the catfish family have three large spines to be aware of: one on the dorsal and one on each pectoral fin. For small catfish (i.e.; bullheads), put your fingers in a V-shape. Run the "V" along the belly of the catfish toward the head. Your fingers will slide under the pectoral fin spines, allowing you to hold the fish easily. For large channel catfish, place one hand under the pectoral spines and hold the tail with your other hand.



WHERE TO FISH IN LAKES AND PONDS

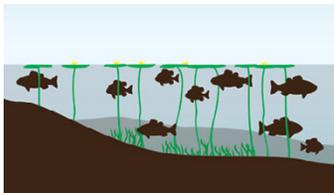
Lakes and ponds are a great place to start fishing. You can fish lakes and ponds from shore or from a boat. You can fish in shallow or deep water, in open water, or near structure/cover. Depending on the lake or pond you are fishing, you can catch a variety of fish species.

Structure = Fish!

When you first get to a pond, look for “fishy” looking spots, such as a downed tree, lily pads, weed edges, or a dock. What do all these places have in common? They are all structure, and where you find structure, you will likely find fish!

Structure provides shelter, shade, and protection for fish. Structure can also attract baitfish, and baitfish attract game fish, the fish you want to catch. The formula is simple: find structure and you’ll find fish! Other types of structure are submerged objects, such as stumps, rocks and branches, overhanging trees and brush, points, coves and inlets.

Most people begin fishing from shore or from a small boat near shore. So this section will concentrate on structure near the shoreline.



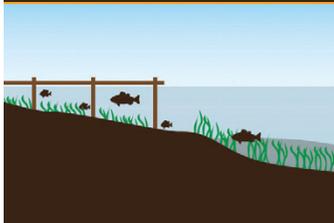
Floating and Submerged Vegetation

Cast into the edges and openings to avoid tangling your gear. Look for weed beds that lead to deeper water, or look for sunken weed beds in deep, open water. Fish the edges of the weed bed, where fish like to cruise looking for food.



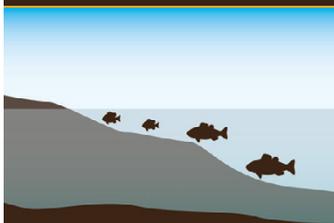
Downed Trees and Other Submerged Objects

When experienced anglers see a sunken tree, they head straight for it because it provides structure that attracts fish. Other submerged objects to fish around are rocks, branches and stumps. Take care not to snag your gear when fishing around submerged objects.



Docks

Have you ever walked on a dock and watched fish from it? The fish are there because a dock is great structure! Fish hide under docks to take shelter from the sun, so they are good to fish near any time of the day. Sometimes, the biggest fish can be way underneath, so don’t just fish the edges if you are able to safely cast beneath the dock.



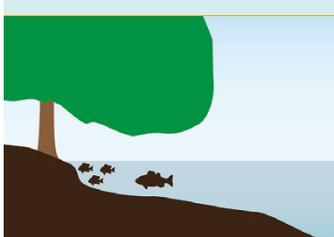
Points

Points are pieces of land that extend out from the shoreline and slope into deeper water. Gradually sloping points are good places to fish. The sloping-out formation creates a natural “highway” for fish to move from deep to shallow water in search of food. Fish the tip of the point and the corners of the point (the part that curves back into the shore).



Inlets

Areas where rivers and streams enter a lake or pond are called inlets. They are great places to fish because they carry food into the lake. Wherever there is food, there are fish! Spawning fish often gather near inlets before moving upstream to spawn. They can be excellent places to fish seasonally (usually spring or fall).



Overhanging Trees and Bushes

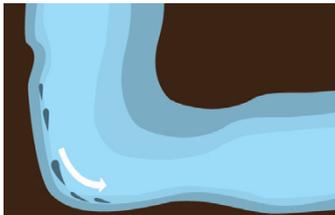
Overhanging trees and brushy shorelines provide cover from fish-eating birds as well as shade. Insects often drop into the water from overhanging trees and brush, providing food for fish. Huge fish can live under overhangs just feet from shore. The deeper the water under an overhanging tree, the better place it is to fish.

WHERE TO FISH IN STREAMS AND RIVERS

Fishing in streams and rivers offers different challenges than fishing in lakes and ponds because you have to deal with moving water. River and stream fishing involves knowing where the water is moving and how fish behave in it.

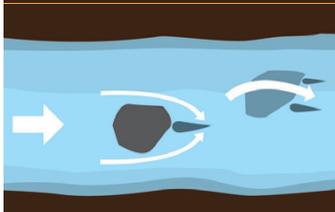
The first thing you need to know is where fish hide in streams and rivers. Undercut banks, eddies (a small circular current), sunken trees, rocks, and overhanging trees and bushes provide protection from the current and predators such as birds.

Feeding places include the outsides of bends, merging currents, drop-offs, feeder brooks and springs. These are places where the current slows and food collects or sinks. When you have a hiding place next to a feeding place, you have a really good fishing spot!



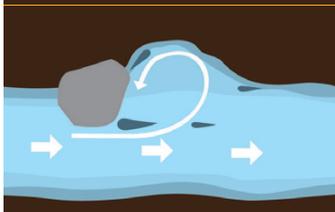
Outside Bends

When the river or stream curves, the faster water (which carries the food) moves to the outside of the bend. Fish look for food in these bends. Sometimes the outside of the bend also contains a rock or fallen tree. This slows down the food-carrying current and provides shelter, making it an even better place to catch fish.



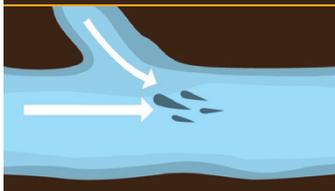
Rocks (Pocket Water)

When flowing water hits a rock, the current splits around the rock. This creates a quiet pocket of water for fish to rest in. Since the current is next to the pockets, fish can dart out to grab food as it drifts by. While these quiet pockets are usually small, a well placed cast can often land you a nice fish.



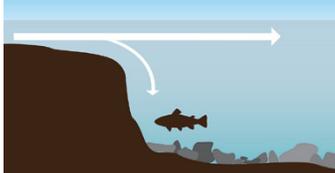
Eddies

Eddies form when flowing water hits an obstruction, such as a rock or a log, and slows down. As the water slows down, it creates a mini-whirlpool, which collects a lot of food. Cast into the slow water of the eddy and along the edge, where the faster current meets the eddy, to catch fish.



Merging Currents

Currents carry food. Where two currents meet, there is twice the food...a good place to feed if you are a fish. Plus, the water actually slows down in the "seam" where currents meet, creating a perfect place for fish to sit and for you to cast.



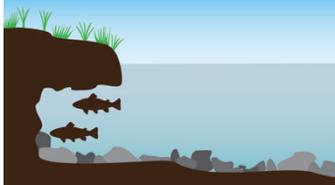
Drop-offs

When water flows over a drop-off, it slows down and sinks, taking the food it carries with it. A drop-off is a great river fishing spot because it has food, deeper water and is away from the current.



Dams and Waterfalls

When water drops off a dam or falls, it digs out a big hole in the stream bottom. Fish will sit in this hole to feed on the food coming over the dam or falls. Dams and falls can prevent fish from moving upstream, concentrating fish. This makes dams and waterfalls excellent places to fish.



Undercut Banks

Undercut banks, formed when the current cuts out a cave-like hole in the bank, are perfect hiding spots. They provide overhead cover and easy access to deeper water for feeding or escape. The largest fish in a river often live near undercut banks.

WHAT TO BRING

Below are some things to keep in mind before leaving on your next fishing trip:

- ✓ **Buddy up** – Fishing with family and friends is a lot of fun and safer too.
- ✓ **Needlenose pliers** – Great to have for taking hooks out of fish
- ✓ **Net** – Just in case you catch the big one
- ✓ **Bucket** – A place to put your fish or take a seat
- ✓ **Bug spray** – To make your fishing trip more comfortable in the spring and summer months
- ✓ **Rain gear** – Just in case
- ✓ **Sunscreen** – To protect yourself from sunburn while out on the water
- ✓ **Hand sanitizer** – To clean your hands before eating or leaving
- ✓ **Towel** – Handy when cleaning your hands after handling live bait and fish
- ✓ **Flashlight** – Important for fishing at night
- ✓ **Ruler** – To figure out if your fish is large enough to legally keep
- ✓ **Hat** – To keep the sun out of your eyes and face
- ✓ **Sunglasses** – Polarized sunglasses not only help protect your eyes but they also help you see into the water.
- ✓ **Line clippers** – To cut your fishing line. Remember, fishing line is not dental floss. Never cut line with your teeth.
- ✓ **Regulations guide** – For reference and to make sure you are doing things legally
- ✓ **Camera** – You'll definitely want to capture your memorable catch.



RESOURCES

Web Resources

- NYSDEC – Learn to Fish
www.dec.ny.gov/outdoor/44804.html
- NYSDEC – Places to Fish
www.dec.ny.gov/outdoor/7749.html
- NYSDEC – Free Fishing Clinics
www.dec.ny.gov/outdoor/27123.html
- Take Me Fishing – How to Fish
<http://takemefishing.org/fishing/fishopedia/how-to-fish>

Books

- *The Complete Idiots Guide to Fishing Basics* by Mike Toth
- *Fishing for Dummies* by Peter Kaminsky and Greg Schwipps

ACTIVITIES

Fishing Around the World Game

Find a field or lawn area with lots of room. Place a wash bin, hoop or other casting target in the middle of the area and mark various casting stations around the target. Stations should be at varying distances from the target. Casters begin at the first station and can only move to the next if they successfully hit the target. First caster “around the world” wins. If you are alone, challenge yourself to see how few casts it takes you to go “around the world!”



Catch a Fish

Now that you’ve learned how to fish, it’s time to go out and catch one! Typically, small ponds loaded with sunfish are the best places to get a bite. Visit DEC’s “Places to Fish” pages (www.dec.ny.gov/outdoor/7749.html) to find a fishing spot near you!





SECTION

3



CARE OF YOUR CATCH

Success! You caught a fish! What you do next is up to you. Some anglers release their fish while others take them home for dinner. The choice is yours.



CATCH AND RELEASE

Many people like to eat the fish they catch. However, many anglers prefer to return some or all of their catch to the water, a practice called “catch and release.” They do this so they can continue to enjoy the sport of fishing throughout their lives and pass on a healthy fishery to future generations. Letting smaller fish grow bigger and releasing larger fish to spawn again helps keep fishing great.

If you decide to practice catch and release, take these simple steps to aid in the survival of the fish you release:

- Quickly play and land your fish. Don't fight it to exhaustion.
- Handle your fish as little as possible and release it quickly. Unhook it in water if possible.
- If you have to take your fish out of the water, handle it carefully to avoid injuring it. Avoid contact with its gills and eyes, and don't squeeze it or remove its protective slime.
- If you are taking pictures, take them quickly and get the fish back in the water as soon as possible.
- When holding a long fish to pose for a picture, hold it horizontally and support its belly as in the above photo. This protects its internal organs.
- Consider using only artificial lures to avoid hooking fish deeply. It's more likely that you'll be moving an artificial lure through the water when you get a strike, making it less likely that the fish will have an opportunity to “swallow the hook.”
- Do not jerk a hook out of a deeply hooked fish. Instead, cut the leader close to the eye of the hook.
- Have the necessary tools to remove hooks, like forceps or needle nosed pliers, in easy reach, so you can rapidly remove the hook.
- Consider using barbless or circle hooks. Circle hooks, when used properly, usually hook the fish in the corner of the mouth.
- Trout become heat stressed when water is 70°F or higher. Avoid catch and release fishing for heat stressed trout, because many will die after they are released.



Just caught a trophy?

Take a picture of the fish and measure its length and girth (measurement around its fattest part) before releasing it. With a photo and your measurements, a taxidermist can produce an accurate, long-lasting, fiberglass replica of your catch. The best part is that you might be able to catch that trophy again, when it's even bigger! Qualifying catches can also be entered into the New York State Angler Achievement Awards Program. To find out more about this popular program, see www.dec.ny.gov/outdoor/7727.html.

KEEPING AND CLEANING YOUR CATCH

Keeping Your Catch

Enjoying a fresh fish meal is a great way to finish a fishing trip. Before keeping your catch, however, make sure your fish is legal to keep by checking the current Freshwater Fishing Regulations Guide.

Keep it Fresh

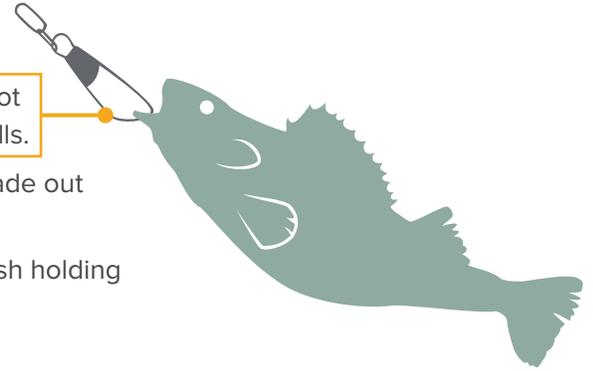
For the best tasting fish, keep your catch fresh from the time it is caught until it is cleaned, cooked or frozen. This can be done either by keeping the fish alive during your trip or by properly preserving it to avoid spoiling.

Wetting your hands before handling a fish helps keep the slime coating on its body.

Keep it Alive

Caught fish can be kept alive in three ways:

- *On a stringer:* When using a stringer, attach fish through the lower jaw not the gills. Fish will die more rapidly if the stringer is placed through the gills.
- *In a mesh fish basket immersed in cool water:* Fish baskets are often made out of steel wire mesh. Use them for smaller fish like sunfish and perch.
- *In an aerated tank:* Fishing boats often have aerated live wells. These fish holding tanks are another great way to keep fish alive and fresh.



Put dead fish on ice ASAP!

- If you cannot keep your catch alive, preserve it on ice until you can clean it. Placing fish in a cooler with ice will help keep them fresh. For the freshest fish, immediately field dress (see page 32) your catch and pack it in ice.

Cleaning Your Catch

When you're done fishing, you have to prepare your catch for cooking or storage. This is called "cleaning" fish. Fish can be cleaned using a number of methods. Filleting and pan dressing are the two most common ways to clean fish. Field dressing is another way to both clean and keep fish fresh until you get them home.

Filleting

Filleting is used to clean a variety of fish species, from larger trout and walleye, to smaller sunfish and perch. The filleting technique shown is one of several different techniques used. This method produces two boneless (or nearly boneless) pieces of meat (fillets), one from each side. All that is needed is a sharp fillet knife and a hard surface, such as a cutting board.

Pike and pickerel have a lot of bones and need special filleting techniques not shown here.

Safety tip: Remember to always move the knife away from yourself while cutting!



1. Begin by laying the fish flat on its side. Make a cut behind the pectoral fin down to, but not through, the backbone.



2. Without removing the knife, turn the blade and cut through the ribcage toward the tail with the knife blade running flat along (but not through) the backbone and just on the up side of the dorsal fin.



3. Stop cutting just before you separate the fillet from the body. While keeping the body in the same position, flip the fillet over with the skin side down.



4. Insert your knife between the flesh and the skin. Holding the knife almost flat and using a back and forth motion, remove fillet from skin.



5. The fillet still contains the ribcage, so use the knife blade to carefully cut around and remove it.



6. Turn the fish over and repeat the previous five steps on the other side for the second fillet.
7. Rinse the fillets with cold, clean water.

Pan Dressing

Pan dressing is a common way to clean smaller fish like sunfish. This technique involves removing the scales (scaling), fins, head and guts of the fish; leaving the meat, skin, backbone and ribs. Almost no meat is lost by using this method. The bones can be easily removed after cooking.



1. Using a scale scraper, or just a butter knife, scrape from tail towards the head, removing scales from both sides of fish.



2. Using a fillet knife, cut ¼- to ½-inch-deep along each side of the dorsal and anal fins for later removal.



3. Hold the fish upside down with its back resting on the table. Cut immediately behind the vent (anus). Slip knife forward just under the skin until you reach the pectoral fin.



4. Lay the fish flat. Make a deep cut on both sides of body behind the pectoral fin without cutting the backbone.



5. Pull the fish's head upward to break its backbone. The head will tear loose and the attached guts, pectoral and pelvic fins will come with it.



6. Remove the dorsal and anal fins, loosened in step 2, by pulling away and forward from the body (use pliers if needed). Cut off the tail.



7. Rinse with cold, clean water.
8. Ready for cooking!

Field Dressing

Field dressing involves removing the gills and internal organs of the fish "in the field," where you're fishing.



1. Use a knife to make a cut from the vent (anus) to the gill arches. Keep the knife blade shallow to avoid cutting the stomach or intestines.



2. Next, cut the bridge that attaches the gills.



3. Remove the gills and internal organs.



4. Some fish have a long, red kidney that runs along the backbone on the inside of the body cavity. Remove the kidney by scraping it with the knife blade or your thumbnail.



5. Rinse the body cavity with water and pack the fish in a cooler with ice.

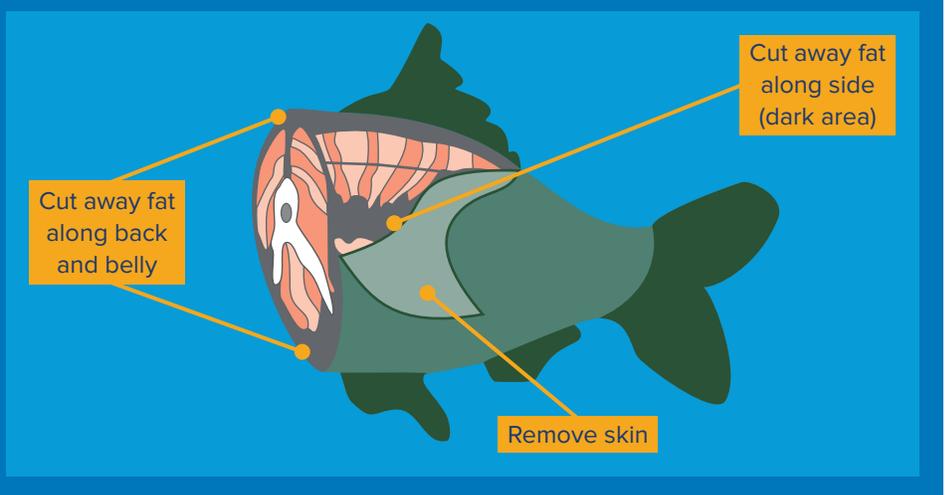
FISH CLEANING LAW

While on the water, walleye, largemouth and smallmouth bass, brook trout, lake trout or Atlantic salmon must be kept whole or field dressed only, leaving the head attached. This allows enforcement officers to measure their length from head to tail. It is illegal to fillet, pan dress, skin or cut these species in any way that prevents their total length from being determined while still on the water.

Other species may be filleted as long as the skin is left on to allow for species identification.

CLEANING FISH FOR HEALTHIER EATING

Chemicals, such as PCBs, dioxin and mirex, can accumulate in the fatty tissue of a fish. You can reduce the amount of some chemicals in a fish meal by properly trimming and skinning your catch. It is recommended to remove the skin and trim fatty areas like the belly flap, the lateral lines along each side, and the fat along the back and under the skin.



STORING AND PREPARING YOUR CATCH

Storing Your Catch

The best tasting fish are those that are freshly caught, cleaned and cooked. Unfortunately, you can't always eat your catch immediately after cleaning. Here's some advice on properly storing fish to maintain its quality.

Refrigeration

Cleaned fish can be kept in the refrigerator for up to two days after being caught and cleaned. The closer the temperature is to freezing (32°F), the better the fish will keep.

Freezing

Freeze your catch if it will not be cooked within two days of being caught and cleaned. The sooner you freeze the fish, the fresher it will taste later on. To prevent freezer burn, wrap the fish tightly with freezer paper, aluminum foil or plastic wrap. After wrapping the fish, place it in a plastic freezer bag and remove as much air as possible.

Another way to preserve your catch is to freeze the fish in water. This method works well for fillets. Place fillets in a plastic freezer bag. Add just enough water to cover the fillets. Remove air from bag and freeze.

Cooking Your Catch

Fish can be an important part of a healthy diet. They are a good source of protein and have fewer calories than other kinds of meat. Most fish are good sources of many essential vitamins and minerals. Eating fish may even reduce the risk of heart disease. However, the best part is that fish are also tasty!

Ways to Cook Fish

Fish is a food that can be cooked in almost any way. The method of cooking often depends on how the fish was cleaned.

Fillets are the most versatile form of fish for various cooking methods. They can be cooked by frying, baking, broiling, smoking or grilling. Countless recipes call for fish fillets. Smaller pan-dressed fish are often pan fried or deep fried.

Larger field- or pan-dressed fish, like trout and salmon, can be baked, grilled or smoked.

The flesh of properly cooked fish will be white (or light pink for salmon) in color and can be easily flaked with a fork. The fish should be moist and tender with a delicate flavor. Take care to avoid overcooking. This can make the flesh dry and chewy.



Broiling

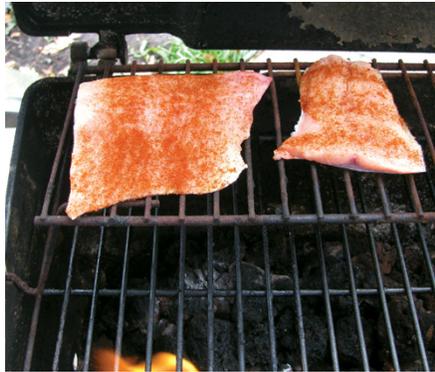
Broiling is done in an oven broiler, which uses high heat from above to cook. Fillets are placed on a preheated, greased broiler pan. Cook fillets a few inches from the heat for about five to eight minutes, turning once during cooking. The high heat of an oven broiler can dry out fish, especially lean fish like bass, walleye and sunfish. Basting with butter or other sauces helps to keep fish moist and tender.

Baking

Baking is one of the easiest ways to cook fish. Place fillets on a greased, uncovered baking dish or pan. Preheat oven to 350°F, and cook fish for 20-25 minutes. Thin fillets will take less time. Larger dressed fish can take 45-60 minutes. Baste fish with butter, margarine or other sauces to keep it from drying out while baking. Add your favorite spice(s) for extra flavor. When the fish is done, its flesh will flake easily when tested with a fork.

Grilling

Grilling involves cooking fish on a barbeque grill. Thicker fillets, pan-, or field-dressed fish can be grilled. Thinner fillets tend to fall apart when turned over. Fish fillets are cooked over medium to high heat for about six minutes for a half-inch-thick fillet, turned once during cooking. Fish should be brushed with melted butter or marinade and then cooked until meat is white (or pink for salmon) and flaky, but still moist. Grilling times will vary for whole, field-dressed fish or foil-wrapped fish, so consult a cookbook.



Pan Frying

Pan frying is a quick and easy way to cook fillets and pan-dressed fish. Fish are cooked in a frying pan with about ¼-inch of oil at medium-high heat. Pan-fried fish can be cooked plain, but are usually coated with flour, breading or batter before frying. Briefly cook the fillets on each side until golden brown, turning only once.



Tips for Healthier Eating

Overall, fish is a great tasting and healthy food. However, certain species caught from a few waters in New York State contain contaminants that may be harmful to human health. See the “Safe and Responsible Angling” chapter for where to find health advisories on consuming fish, or visit www.health.ny.gov/fish.

RESOURCES

Web Resources

- How to properly catch and release a fish (video)
www.youtube.com/watch?v=TQRGP4dY2rl
- Catching and Releasing Trout
www.dec.ny.gov/outdoor/9224.html
- The Wild Harvest Table
<http://wildharvesttable.com>

Books

New Cleaning & Cooking Fish (The Freshwater Angler) by Sylvia Bashline

ACTIVITIES

1. Catch a fish and release it!

Make sure to use this chapter’s guidelines for catching and releasing a fish. Take a picture if you want to remember your catch.

2. Enter your catch!

If the fish you caught is big enough, enter it in the New York State Angler Achievement Awards Program. You will need its length and a picture too. See, “Just Caught a Trophy?” in this chapter for more information.

3. Eat your catch!

Fish are great to eat. Which way will you clean your fish and which way will you cook it? The choice is yours! See, the “Cleaning Your Catch” and “Cooking Your Catch,” sections in this chapter for some suggestions. Check the Fishing Regulation Guide to be sure your catch is in season and of legal size to keep.



SECTION

4



SAFE AND RESPONSIBLE ANGLING

The goal of any fishing trip is to have fun. But, nothing spoils a good time more than an easily avoided accident or the thoughtlessness of others in the form of litter or bad fishing manners. Just like any other form of outdoor recreation, fishing has both written and unwritten rules for staying safe and respecting others and nature.

BEFORE YOU LEAVE THE HOUSE...

A safe and enjoyable fishing trip starts before you leave the house. Besides your fishing gear, you should bring along several other things:

- *Sunblock* – Since water reflects sunlight, you're more exposed to ultraviolet (UV) rays while fishing. Use sunblock to prevent painful sunburn.
- *Polarized sunglasses* – Polarized sunglasses cut the sun's glare on the water and allow you to see fish and places they might hide.
- *Hat* – A hat protects your eyes from the sun, helping you see your line and bobber better when a fish bites.
- *Rain gear* – Sure it's sunny when you leave the house, but you can't always count on that to last. Be prepared for all weather conditions.



- *Flashlight* – Important for fishing at night.
- *Fishing Regulations Guide* – Special regulations apply to some fishing waters, so always check your regulations guide before you go.
- *Ruler* – To figure out if your fish is large enough to legally keep.



See page 26 in the Basic Tackle and Techniques chapter for other recommended things to bring when you go fishing.

LET SOMEONE KNOW BEFORE YOU GO.

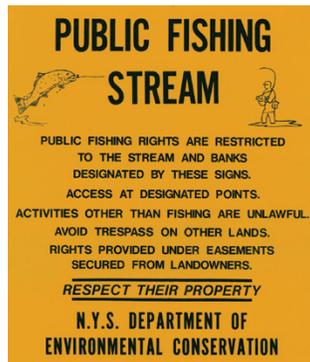
Make sure someone knows where you are going and when you expect to return...just in case!

ONCE YOU GET TO THE WATER...

Once you get to the water, your first big decision is where to fish. In your eagerness to start fishing, don't forget your manners. Keep the following tips in mind:

Respect property owners and other anglers.

- Respect private property! Only fish in areas where you have obtained permission from the property owner, or where the property owner has granted legal access to the public for fishing (see Public Fishing Rights at www.dec.ny.gov).
- Give other anglers the same amount of space you would like to have:
 - Before fishing in a crowded area, like a pier, make sure you can cast straight, without hitting others with your hook, or getting entangled with their lines.
 - Don't make a lot of noise and disturb fish or other anglers.
 - Don't "squeeze out" other anglers if they got to your favorite spot first.
- Give other waterway users, such as boaters and swimmers, the space they need to enjoy their activity. They have as much right to be there as you do.
- If you bring your dog fishing, keep an eye on it, so it doesn't bother other anglers or wildlife.



Respect nature.

When you go fishing, you are out in nature and may come in contact with wildlife. Please:

- Don't harass wildlife.
- Don't feed ducks, geese, swans or other wildlife.
- Avoid nesting birds; disturbing them can cause them to leave their nests.
- Don't try to rescue young wild animals that look like they've been abandoned. Leave them alone, or if injured, call a licensed wildlife rehabilitator.
- Avoid wading through fish nests. Destroying nests means fewer fish in the future. Nests look like circles cleared of vegetation or debris, usually with a shallow depression.



Be mindful of natural hazards.

Nature also has some hazards to be aware of while you're fishing:

- Avoid poison ivy.
- Watch for roots, rocks, stumps and other tripping hazards, and sudden drop-offs into deeper water if wading.
- Be careful when walking on wet surfaces. Rocks, roots, logs and stumps can be slippery when wet.
- Leave the water when you hear thunder. If you can hear thunder, you can be struck by lightning.

Stay safe and be considerate while afloat.

Boaters, please keep the following in mind:

- By law, everyone must wear a life jacket (personal floatation device or PFD) between November 1st and May 1st while riding in a moving boat that is less than 21-feet-long.
- By law, children under 12 must wear a PFD while in a moving boat less than 65-feet-long, unless in an enclosed cabin.
- By law, any person born on or after May 1, 1996, is now required to successfully complete an approved course in boater education in order to operate a motorboat. Approved courses include those offered by NYS Parks, the U.S. Coast Guard Auxiliary, or the U.S. Power Squadron. For more information, visit www.parks.ny.gov/recreation/boating/safety-courses.aspx.
- When fishing from a boat, please be considerate of shore anglers. Give them plenty of room to fish, especially if you are using a motor.
- Large wakes can be dangerous to those in small boats and annoying to anglers. Give anglers plenty of space when motoring by, and avoid passing between them and the shore.



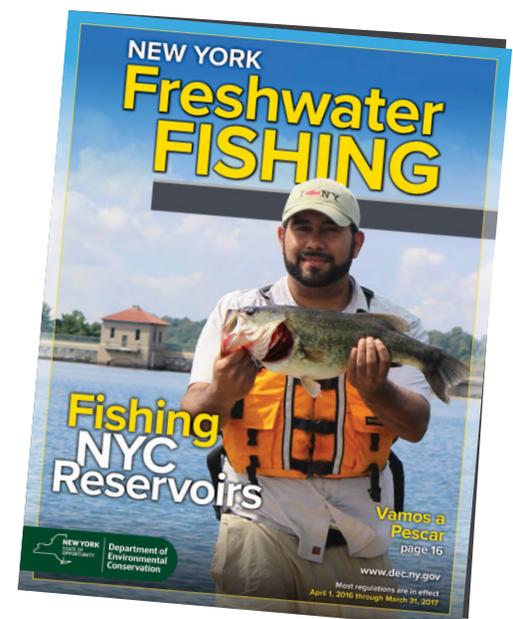
Poison ivy has three leaves that are often glossy.



Courtesy of
Take Me Fishing

Follow fishing regulations and help keep fishing great!

Check your fishing regulations guide for the regulations on the waters you plan to fish. If you use baitfish, be sure to review the baitfish regulations to prevent the spread of fish diseases. Always follow these regulations. They are designed to keep fishing great for years to come.



BEFORE YOU LEAVE THE WATER LEAVE THE WORLD A CLEANER PLACE!

Nobody likes arriving at a fishing spot and finding litter all over the place. Help keep our waterways beautiful. Bring a trash bag and carry out what you carry in. While carrying out your own trash, pick up something someone else left behind. Imagine how clean our waterways would be if everyone picked up just a few extra items when they leave.



DID YOU KNOW

An aluminum beverage can take up to 500 years to break down in the environment. Monofilament fishing line can take up to 600 years!



HEALTH ADVISORIES FOR EATING FISH

Fishing is fun, and fish are an important part of a healthy diet. Fish contain high quality protein and healthy fish oils. However, some fish also contain chemicals that may be harmful. The New York State Department of Health (DOH) has some advice that will help you make good choices about the kinds and quantities of fish you should eat. That advice comes in two forms, special health advisories that apply to some waters in the state, and the general health advisory that applies to all other waters in the state.

Special Health Advisories

When looking up advice on eating fish, start by finding out which New York State waters have special health advisories. Waters with special health advisories are located all around the state, even in the Adirondacks and Catskills. You need to know which waters they are because DOH advises kids under 15 and women under 50 not to eat any fish from such waters.

General Health Advisory and Other Tips

Most New York State waters do not have special health advisories. For those waters, DOH says you can eat up to four meals a month of fish you catch. This is called the general health advisory.

Here are some other helpful tips:

- Space out fish meals to about once a week for fish you catch.
- If you are fishing in the Adirondacks or Catskills, avoid or eat less yellow perch over 10 inches, largemouth or smallmouth bass, northern pike, pickerel and walleye. These fish tend to have higher mercury levels. Better choices are smaller yellow perch, brook trout, brown trout, rainbow trout, bullhead, bluegill/sunfish, rock bass and crappie.
- Some chemicals (like PCBs) are found at higher levels in the fat of fish. You can avoid some of these chemicals by skinning your catch, trimming off the fat, and then grilling, broiling or baking the fish. The fish that have the most of these kinds of chemicals are American eel, carp, lake trout, Chinook and coho salmon, striped bass, white and channel catfish and white perch. It is best to avoid or eat less of those fish.

Get more information for you, your family and friends at www.health.ny.gov/fish.

Checking health advisories is important, but be assured that New York State has thousands of great places to catch fish that are healthy choices for dinner.

WHAT ARE THOSE BLACK SPOTS IN THE FISH I JUST FILLETED?

Those black spots are a common small parasite that penetrates the muscles of fish and produces a black color. Cooking kills the parasite, and the fish are safe to eat once cooked. The spots do not affect the fish's flavor.



DON'T SPREAD INVASIVE SPECIES!

Invasive species can hurt native fish populations. They spread by hitching a ride to new locations in bait buckets and on fishing gear, boats and trailers. Anglers moving from one fishing spot to another can spread invasive species if they are not careful. Protect our fish populations by following these simple guidelines:



1. INSPECT & CLEAN your boat, trailer, waders and other fishing and boating gear. Remove all mud, plants and other organisms that might be clinging to it. Never release plants, fish or other animals into a water body unless they came out of that water body.

2. DRAIN & DRY everything that came into contact with water. Many aquatic invasive species and fish diseases are microscopic and can be transported in as little as a drop of water. Dry your gear for at least five days before using it in another water body. Difficult to dry gear, such as waders, may take even longer to dry. Be sure to completely drain your boat, including baitwells and livewells.



3. DISINFECT your boat or gear if you do not have the time to dry it before using it in another water body. The simplest way to do this is by soaking or flushing it with hot water that is at least 140°F (hotter than most tap water). Be careful as water of this temperature can cause burns and should only be used under adult supervision. Soak or flush the equipment to be disinfected for a minimum of 30 seconds. If hot water is not available, thoroughly flush all water-holding compartments with tap water. Household steam cleaners can also be effectively used to disinfect equipment. For additional disinfection guidance and information on how you can help stop the spread of invasive species, go to www.dec.ny.gov and search for “Prevent the Spread of Aquatic Invasives.”



DID YOU KNOW ?

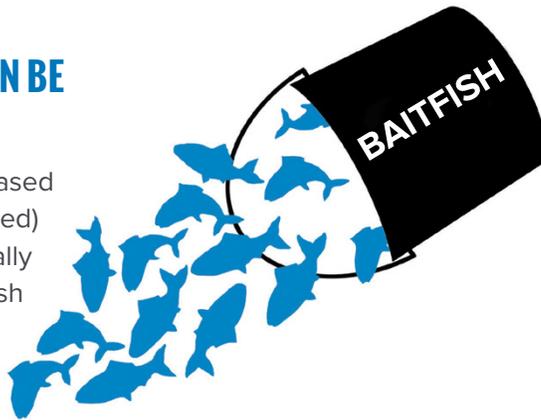
Some DEC boating access sites have special places called “Invasive Species Disposal Stations” to dispose of the weeds you pull off your boat.

DID YOU KNOW ?

Did you know that aquatic invasive species can be transported in as little as a drop of water?

WE MAY BE SMALL BUT WE CAN BE BIG TROUBLE!

Some baitfish can be harmful if released into a lake or pond. Released (stocked) baitfish can start a new and potentially harmful fish population, or spread fish diseases. Never release unused baitfish into the water you are fishing, unless you caught them in that water. If you catch your own baitfish, only use them in the same body of water where you caught them. If you use purchased baitfish, please discard the unused fish, and the water they came in, on dry land. This will ensure that undesirable species (some invisible to the eye) are not introduced into a water body by mistake.



Whether crayfish, baitfish or worms, many species used for bait are not native to New York. It is best to discard them in the trash or at another location where they will not survive to compete with native species.

DID YOU KNOW

The acres of lakes and ponds with brook trout in the Saranac Wild Forest (Adirondack Mountains) have decreased by 97 percent, due mostly to non-native fish introductions.

REFERENCES

Web Resources

- New York State Parks Safe Boating www.parks.ny.gov/recreation/boating/safe-boating.aspx
- Take Me Fishing – Boating <http://takemefishing.org/boating>
- National Safe Boating Council – Sidekicks Series www.safeboatingcampaign.com
- NYSDEC: Fishing Responsibly in New York State www.dec.ny.gov/outdoor/9223.html
- Take Me Fishing – Fishing Safety <http://takemefishing.org/fishing/fishopedia/fishing-safety>

Books

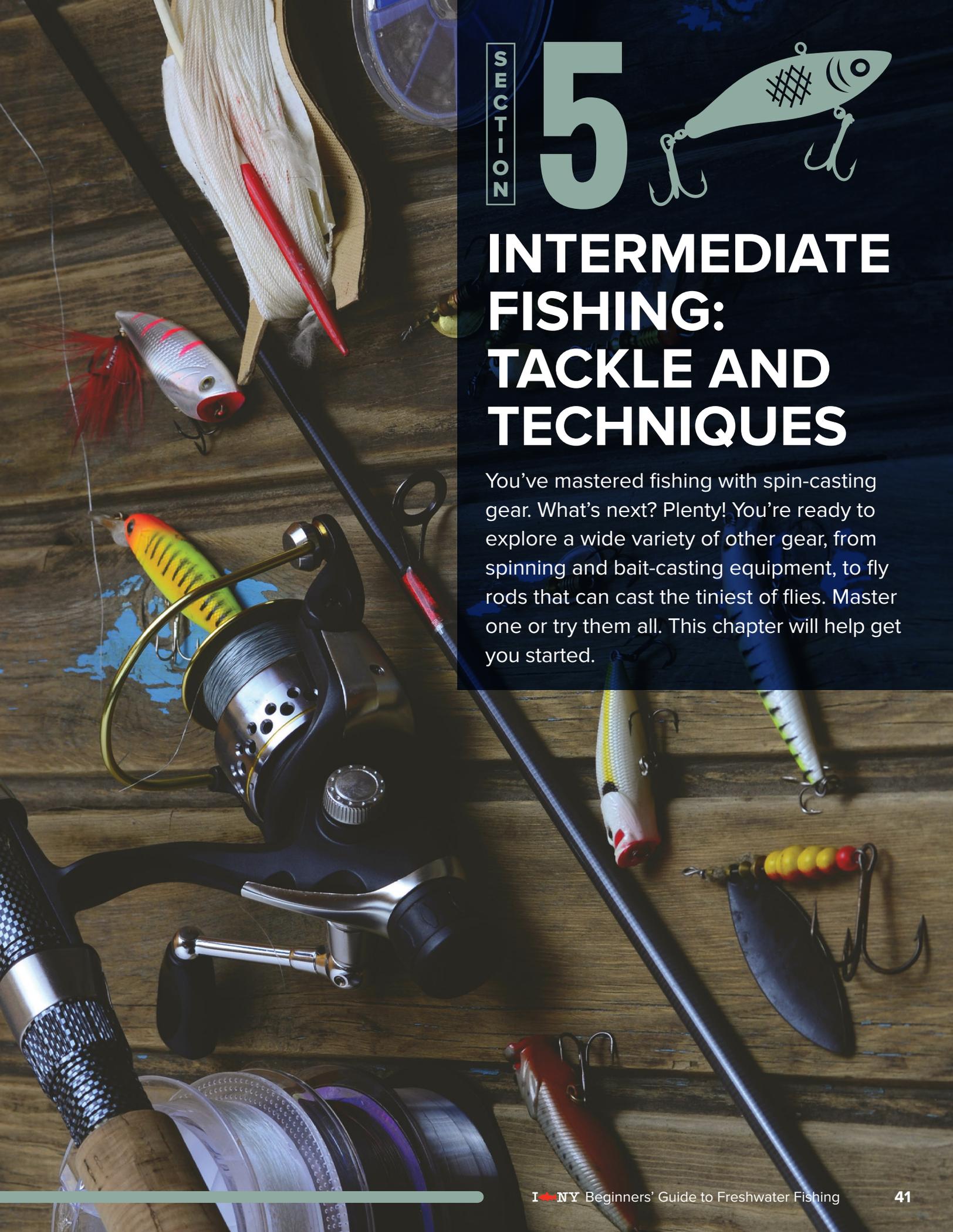
- *New York State Boater's Guide*. 2013. New York State Office of Parks, Recreation and Historic Preservation, Bureau of Marine Services. www.nxtbook.com/nxtbooks/nysparks/boatersguide2013
- *Fishing for Dummies* by Peter Kaminsky and Greg Schwipps
- *The Complete Idiot's Guide to Fishing Basics* by Mike Toth

ACTIVITIES

Find what is wrong in the picture.
See answers below.



ANSWERS: 1. Not leaving the water as a thunderstorm approaches, 2. Trespasing, 3. Littering, 4. Bothering nesting waterfowl, 5. Dumping baitfish into the lake, 6. Not wearing a life preserver, 7. Crowding another angler, 8. Casting without looking behind you, 9. Boating too close to anglers.



SECTION

5



INTERMEDIATE FISHING: TACKLE AND TECHNIQUES

You've mastered fishing with spin-casting gear. What's next? Plenty! You're ready to explore a wide variety of other gear, from spinning and bait-casting equipment, to fly rods that can cast the tiniest of flies. Master one or try them all. This chapter will help get you started.

COMPARING “SPIN-CASTING” TO “SPINNING” GEAR

While spin-casting gear is fine for catching smaller fish, many people like to learn how to use spinning gear, which is used to catch everything from little panfish to lunker pike.

Spinning reels are different from spin-casting reels in several ways:

- They are open-faced (no spool cover).
- They have a bail and line guide instead of a casting pushbutton.
- They mount under the rod (instead of on top).

Advantages of spinning reels compared to spin-casting reels:

- They typically have a better drag system.
- They hold more line.
- They make casting lightweight lures and baits easier.

Spinning rods are different from spin-casting rods in several ways:

- They have larger line guides mounted on the underside instead of the top of the rod.
- They have a much wider range of lengths and rod action (how flexible a rod is).

Disadvantages of spinning reels compared to spin-casting reels:

- They cost more.
- They sometimes have annoying line twist, requiring that you remove the line and respool the reel.



HOW TO USE SPINNING GEAR

Casting

1. Set your casting plug, lure or bait 6 to 12 inches from the rod tip.
2. Hold the line with your index finger and flip the bail over with your other hand.
3. Using your wrist and elbow, bring the rod straight over your shoulder to about the ten-o'clock position.
4. Move the rod forward to about the one-o'clock position and release your index finger from the line.

Troubleshooting spinning reel tangles

The biggest problem with spinning reels is tangles. Tangles form when line has been incorrectly put on the reel, or when reeling in loose line. Loose line twists into loops that form tangles. Don't try to untangle your line by casting when you see a loop in your line. This may seem to be the easiest solution, but will result in a worse tangle. Instead, open the bail and "strip" line off the reel until you pull the loop out. Then, close the bail and begin reeling in, keeping your line tight as you reel.

To prevent tangles, always tighten your line on the spool before reeling in. Do this by either manually closing the bail, or beginning to reel in just before the lure hits the water.

If your line keeps twisting, it's time to put new line on the reel.



Hold the line with your index finger as you get ready to cast.



Take care of any loops that form on your reel immediately.



CHOOSING THE RIGHT SPINNING ROD AND REEL

Walk through the fishing section of a store and you are surrounded by spinning rods and reels. Which you choose depends on the type of fish you want to catch and where you will be fishing. For example, you may use an ultra-light action rod and reel with four-pound test line for bluegill fishing. For big river channel catfish, you'll need a heavy action rod and reel with 15-pound test line. Fortunately, rod action, ideal line and lure sizes is written just above the rod handle. Use that information to choose the rod you need.

Matching the right rod with the right reel and line allows you to fish more effectively. Start out with a rod and reel combination that covers a wide range of fishing options. You can always add to your rod collection once you know what type of fishing you like.

- A medium action 6- to 6 ½-foot spinning rod is a good all-around starter rod.
- Match it with a reel that can hold 80 to 150 yards of 8-pound test monofilament.

TIPS FOR AVOIDING LINE TWIST WITH A SPINNING REEL

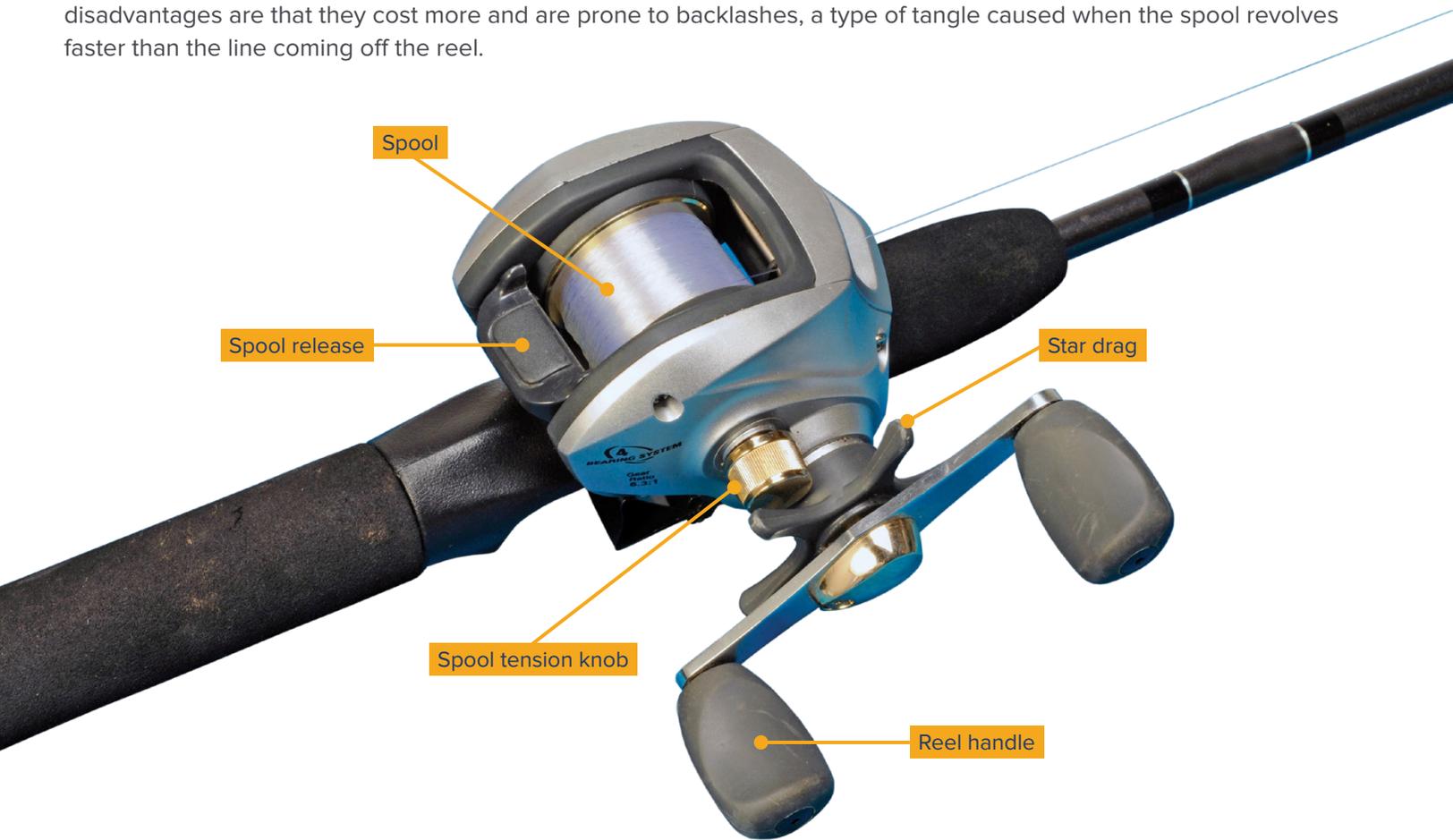
- Put the line on your reel correctly. Follow the instructions included in the line packaging.
- After making a cast, flip the bail over by hand instead of using the reel handle. Then, grab the line just above the reel and give it a slight tug before you start reeling. This will remove any loops before they start.
- For best casting, don't put too much line on your reel. Leave 1/8-inch of space from the edge of the reel's spool.

OTHER TYPES OF RODS AND REELS

The other main rod and reel types are bait-casting and fly fishing. They generally take a longer time to learn how to use than spin-casting and spinning gear. Since using these rods and reels are considered more advanced, we will only give a brief description here. There are plenty of websites and books that can provide you with more information on bait-casting and fly fishing.

Bait-casting

A bait-casting reel mounts on top of the rod. Unlike spinning and spincast reels, the spool on a baitcast reel revolves during the cast and retrieve, reducing line twist. It takes time and practice to become good at bait-casting. Once you become skilled, you will be able to cast right on target, close to structure (page 24) where fish live. Many anglers consider bait-casters the best kind of gear for casting accuracy. Bait-casters can generally cast heavier lures or weights than other fishing gear. Their higher gear ratios allow you to wind in more line with each turn of the handle. Their disadvantages are that they cost more and are prone to backlashes, a type of tangle caused when the spool revolves faster than the line coming off the reel.



Fly fishing

Fly fishing is very different from other fishing gear. When fly fishing, the weight of the line is used to make the cast, not the weight of the lure. This allows you to cast very light artificial lures called flies that you could not cast with other fishing gear. Flies get their name because they often imitate insects. Most people think fly fishing is for fishing mountain streams, but it is also popular when fishing for sunfish or even bass in lakes and ponds.



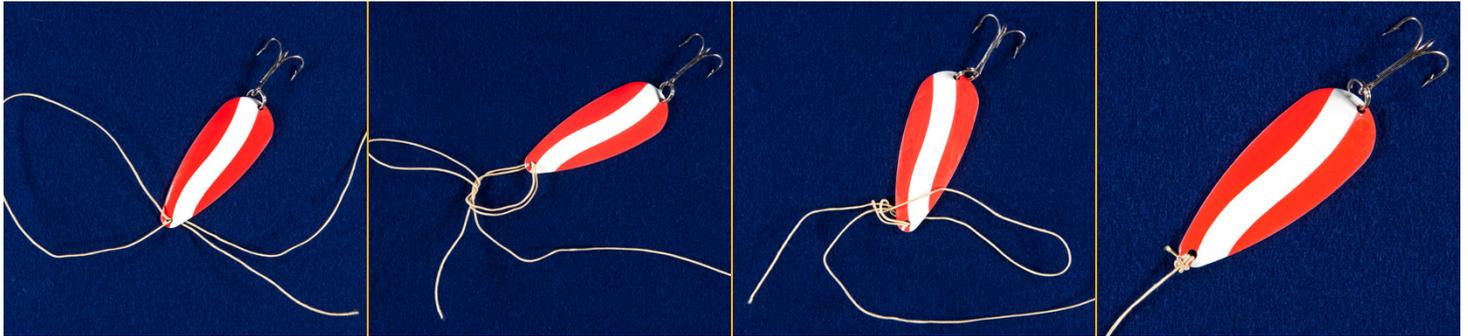
A mayfly spinner and the fly that imitates it.

BEYOND THE IMPROVED CLINCH KNOT

The improved clinch knot (page 20) is often the first knot anglers learn to tie. However, here are two other useful knots to know that will help keep fish on your line.

Palomar Knot

The palomar knot is a simple knot that is great for tying lures to your line. Stronger than the improved clinch knot, it is a good knot to use when using braided lines (see page 46). Braided line may break easily if you use a clinch knot. Try a palomar knot (or knot recommended by the manufacture) if using braid.



1. Double about 4 inches of line and pass it through the eye of the hook, swivel or lure.

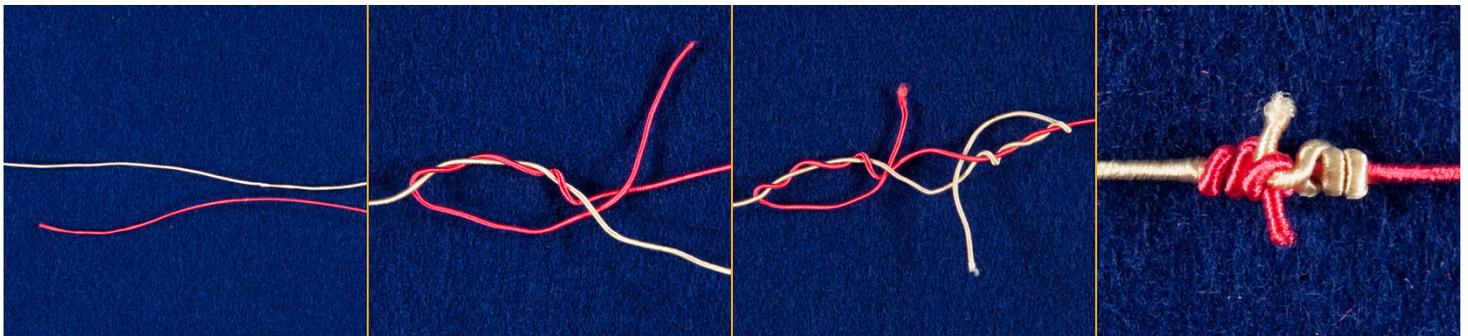
2. Let the hook, swivel or lure hang loose and tie an overhand knot in the doubled line. Avoid twisting the lines and don't tighten the knot.

3. Pull the loop of line far enough to pass it over the hook, swivel or lure. Make sure the loop passes completely over the attachment point.

4. Holding the hook, swivel or lure, and the line, pull the knot tight. Clip excess line about 1/8-inch from the knot.

Blood Knot

The blood knot is used for tying two lines together. It is very popular with fly fishermen.



1. Overlap the ends of the two lines by about 6 inches.

2. Take the end of one line and make 3 turns around the other line, then place that end between the V formed by the two lines.

3. Repeat with the other line. Make sure to pass the end through the loop in the opposite direction of the first line.

4. Pull each end to begin to tighten the knot.

5. Moisten the knot, then tighten it completely and clip the ends close to the knot.

LINE TYPES

Picking fishing line used to be pretty simple. You had two choices: monofilament or Dacron. Today's angler has more line types to choose from. In addition to monofilament and Dacron, you can also choose fluorocarbon or braided line. Each type has advantages and disadvantages. When purchasing line, keep in mind that cheap lines often cast poorly, have poor knot strength, and wear rapidly. It's best not to skimp when purchasing line.

LINE TYPE	ADVANTAGES	DISADVANTAGES
<p>Monofilament (Mono)</p> <p>Monofilament, or mono, line is basically a long strand of nylon. In general, the thicker the line, the stronger it is. Mono is still the most popular line used by anglers.</p>	<ul style="list-style-type: none"> • Inexpensive • Works well for most fishing situations • Has good knot strength • Easy to tie knots 	<ul style="list-style-type: none"> • Absorbs water • Stretches • Doesn't biodegrade (break down in the environment)
<p>Fluorocarbon</p> <p>Fluorocarbon line is nearly invisible in water. This is a popular line for easily spooked fish or very clear water. It is often used as a leader when fly fishing.</p>	<ul style="list-style-type: none"> • Invisible in water • Low stretch • Sinks • Doesn't absorb water 	<ul style="list-style-type: none"> • Expensive • Has strong memory (means it coils, forming loops which tangle easily) • Doesn't biodegrade
<p>Braided line</p> <p>Braided line is created by weaving (braiding) nylon or other man-made fibers into a single strand of line.</p>	<ul style="list-style-type: none"> • Very strong • Smaller diameter than mono • Low stretch 	<ul style="list-style-type: none"> • Expensive • Difficult to untangle • Requires special knots • Doesn't biodegrade • Can cut into cheap line guides and your hands • Easily seen by fish
<p>Dacron line</p> <p>Dacron line is mostly used on tip-ups for ice fishing with a monofilament or fluorocarbon leader.</p>	<ul style="list-style-type: none"> • Doesn't tangle as easily when coiled on the ice • Doesn't cut into your hands • Very strong 	<ul style="list-style-type: none"> • Easily seen by fish

When purchasing a reel that comes pre-spooled with line, it's best to put fresh line on the reel. Mono has a memory (stays in the shape it was stored in). If pre-spooled line has been on a reel for a while, it will curl easily and create tangles.



ARTIFICIAL LURES AND BAITS

Fishing with artificials can be fun and exciting. Artificials work by looking, smelling or moving like something a fish wants to eat. Your goal is to trick a fish into believing that the lure is alive or natural. For example, if you are using an imitation minnow, you want the lure to move like a wounded baitfish. In a school of baitfish, the wounded stand out and are targeted by predators—the bigger fish you want to catch.

TYPES OF ARTIFICIAL LURES AND BAITS



In-line Spinners

In-line spinners have a central shaft with an attached revolving blade. They work well for trout, black bass, pickerel, pike and muskellunge. Generally, they are cast out and retrieved at a steady speed fast enough to keep the blade spinning. Use a ball bearing swivel to avoid line twist.



Spinnerbaits

Unlike in-line spinners, spinnerbait blades are attached to a safety pin-like arm above a weighted hook and rubber skirt. They work well for black bass, crappie, rock bass, pickerel, pike and muskellunge. Spinnerbaits are good for beginners because their single-hook design gets snagged less than multi-hook lures. The basic retrieve is to cast out and reel in at a steady pace. Other retrieve options that work are waking the bait (causing a wake) just under the surface, slow rolling it on the bottom, or adding occasional pauses while reeling back in.



Spoons

Spoons are essentially a piece of shiny metal shaped to flutter or wobble when reeled in. Most come with treble hooks and can easily get snagged in weeds. However, some are weedless models with a single hook and a weed guard designed to avoid snagging. These work great for pickerel and bass around heavy weed cover.

TYPES OF ARTIFICIAL LURES AND BAITS



Stick Bait or Jerk Bait

Minnow-shaped plugs are either called stick baits or jerk baits. These baits are designed to mimic baitfish and can either be cast out and retrieved at a steady pace, or with a repeating cycle of sharp jerks and pauses, hence the name jerk bait. These very popular baits work well for almost all species of fish.



Topwater Lures

As their name suggests, topwater lures are fished on the surface. They come in a variety of styles that either float (e.g. plastic frogs) or have to be retrieved to stay on the surface (e.g. buzz baits). They work by using propellers, metal lips, rubber legs, cup-shaped mouths, or anything else necessary to cause a commotion on the surface. Topwater lure fishing is probably the most exciting way to fish because you can see the explosive strikes. The trick to catching more fish is to hesitate slightly (less than a second) before setting the hook. This should help you hook more fish and not pull the lure away before the fish closes its mouth.



Jigs

Jigs are a single hook with either a lead or tungsten head molded onto it. Plain jig heads work well when tipped with a minnow or night crawler. Jigs are often dressed with hair, rubber skirts, or feathers. Plastic baits can also be added to jig heads. This works great for walleye and panfish. Bass anglers add trailers to the jigs they use. Plastic trailers are becoming more popular than traditional pork-rind trailers because they come in a wide variety of colors and styles and do not dry out.



Soft Plastics

Soft plastic baits come in a wide variety of shapes, sizes and colors. Most have appendages or tails that impart a lifelike action when retrieved. Some, such as plastic stick baits, are just a straight tapered piece of plastic. Many plastic baits have salt or scent added to attract fish. You can add soft plastics to a jig head, plain hook or rig them weedless. They work for almost all species of fish but are really popular for bass, panfish and walleye.

RIGGING WEEDLESS

A great way to fish a soft plastic bait is to rig it weedless. This allows you to fish in the weeds where fish live and reduce your chances of getting snagged. To make a weedless rig:

1. Thread the hook through the head of the bait for about ¼ of an inch.
2. Push the bait up to the eye of the hook.
3. Straighten out the bait and insert the hook through the bait, taking care to keep the bait straight.
4. Gently push the end of the hook into the bait just far enough to hide the hook point (skin hooked). For thinner plastic baits (e. g., plastic worms), the hook point can be embedded in the middle of the bait.



Skin hooked



Texas rigged

FISHING FROM A BOAT

Fishing from the bank is fun and productive, but fishing from a boat allows you more freedom. You can get to more of the places to fish we talked about in the Basic Fishing Tackle and Techniques chapter. This increases your chances of catching fish. The three basic ways to fish from a boat are to anchor, drift or troll.

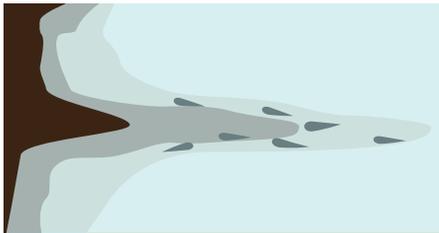
Anchor: By dropping an anchor, you can fish a spot thoroughly. It also makes it easier to make repeated casts to the same spot, and fishing conditions stay the same.

Drift: When drifting, you let the wind or current carry you along. The benefit of drifting is that you can fish a large area, putting your bait or lure in front of a lot of fish. Once you locate fish that are biting, you can anchor and fish the spot thoroughly. You can use an electric trolling motor or oars to simulate drifting.

Troll: Trolling is another popular method of fishing from a moving boat. Basic trolling is tossing out a lure behind the boat, letting out some line, and pulling the lure around with the boat. This allows you to cover a large area looking for fish that are biting.

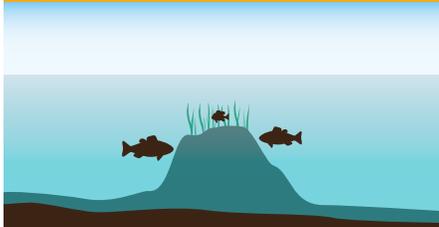
Where to fish from a boat

Boats give you the advantage of fishing shoreline (see page 24) and other structure not accessible from shore. Here are a few offshore places to try using a boat:



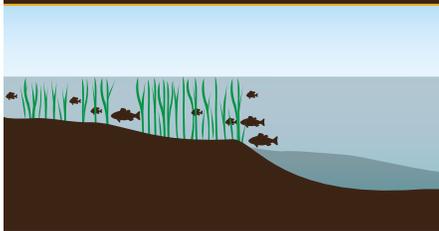
Points

While you can fish a point from shore, they often extend far offshore where you can only fish with a boat. Fish use points to travel from deep to shallow water where they feed. Try drifting over the point, fishing from deep to shallow water to find where fish are located.



Humps

Humps are a bump in the bottom of a lake and are sometimes called sunken islands. They often attract fish because they create a break in the bottom and rise from deep to shallow water. Use a good depth contour map or a depth finder to find humps.



Deep weed beds and edges

As mentioned earlier, weeds are structure. Deep weed beds and edges give fish a place to feed and hide. Feeding fish cruise the open-water side of a weed bed looking for food, so fish the edge first and work your way into the weed bed to find fish.



Boats don't have to be expensive. A kayak or canoe is an affordable option for getting you out on the water and can be easily transported on top of a car.

If you decide to fish from a boat, follow the advice on page 37 to "Stay safe and be considerate while afloat."

REFERENCES

Publications

- “Catch More Fish,” 1998, by Dick Sternberg.
- “Fishing Fundamentals,” by Wade Bourne (*In-Fisherman**)
- “The Art of Freshwater Fishing: A How-to Guide,” by Editors of Creative Publishing (*The Freshwater Angler**)

*Both *In-Fisherman* and *The Freshwater Angler* have a series of books on freshwater fishing.

Websites

- **NYSDEC – Fishing Skills**
www.dec.ny.gov/outdoor/44809.html
- **Take Me Fishing – Fishing Techniques**
takemefishing.org/fishing/freshwater-fishing/fishing-techniques
- **Take Me Fishing – Fishing Knots**
takemefishing.org/fishing/fishopedia/bait-and-equipment/knots

Web Video

- **School of Outdoor Sports – Choosing and Using Artificial Lures**
learnoutdoorsports.org/index.php?option=com_content&view=article&id=94&Itemid=122

ACTIVITIES

Practice Casting a Spinning Rod and Reel Using a Casting Plug

Place targets (hula hoops, Frisbees, coffee cans, backyard bass, etc.) in an open area like your yard or a park. Then try to hit the targets using a spinning rod and reel. As your casting improves, keep trying to hit smaller and smaller targets. Remember, casting accurately is more important than casting far.

Use an Artificial Lure to Catch a Fish

Try using one of the artificial lures mentioned to catch a fish. Take a picture of yourself with your catch.

Catch a Fishing Grand Slam!

Catch four different species of fish on the same day. Want an extra challenge? Catch them all on artificial lures using techniques you learned in this chapter.

Enter a Fish for an Angler Achievement Award

If you catch a really big fish, enter it for an Angler Achievement Award. Visit www.dec.ny.gov/outdoor/7727.html for more information.





SECTION

6



AQUATIC LIFE

We are lucky in New York to have lots of lakes, ponds, rivers and streams. Each represents an aquatic ecosystem; that is, a community of living things that live primarily in or on the water. These living things rely on each other to survive. Some of these relationships are obvious, such as when a frog is eaten by a fish. Others are less obvious. For example, fish waste fertilizes the water, fueling the growth of microscopic algae, which are an important food for young fish.

Healthy aquatic ecosystems have a wide variety of plant species and different species of insects, fish, amphibians and other animals. Unhealthy aquatic ecosystems have very few species. You have already learned about the different types of fish found in New York waters. Here are some of the other common plants and animals, from the smallest to the largest, that you might find when you fish these waters.

WATCHING AQUATIC LIFE

A perfect time to look for aquatic life is when you're fishing. Besides telling you what the fish you're after might be eating, watching aquatic life can help pass the time when the fish aren't biting. Look around. What can you see while you're out fishing?

MICROSCOPIC ANIMALS (ZOOPLANKTON)

These tiny animals float or "swim" in the water and seeing them usually requires a microscope. Along with microscopic plants (algae), they form the base of the food web (page 57) that all other organisms directly or indirectly depend upon.



LEECHES

These are often found in warmwater lakes, ponds and rivers. They like weedy areas with soft bottoms. They attach to fish and other animals and feed on blood.



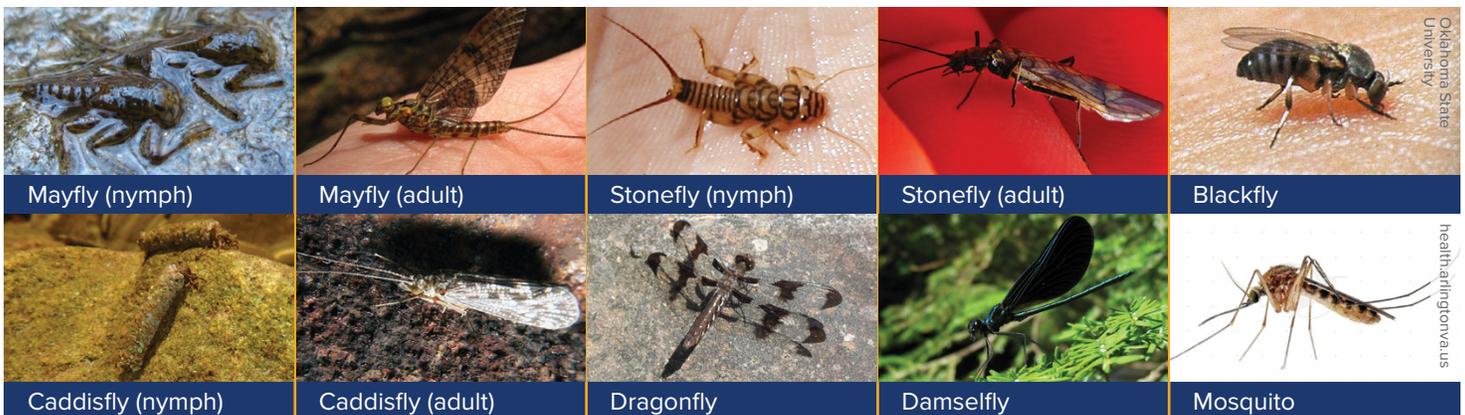
AQUATIC INSECTS

These are an important source of food for many fish species. Insects, such as mayflies, stoneflies and caddis flies, are an important food for trout. Fly fisherman tie flies to look like various aquatic insects.

Insects that Spend Most of Their Lives In or On the Water



Insects that Spend Some or All of Their Adult Lives Out of Water



Insects such as mayflies are only found in high-quality waters. Most kinds of mayflies are sensitive to pollution. Usually the presence of mayflies is an indication of good water quality.

MOLLUSKS (SNAILS, CLAMS AND MUSSELS)

These soft bodied animals are usually covered by a hard shell. Although saltwater clams and mussels are popular foods, freshwater species are not typically good to eat. Mussels and clams feed by filtering algae out of the water, while snails usually eat plants. Some mollusks move by a slimy foot that sticks out of their shell, while others attach themselves to hard surfaces, like rocks and docks, and do not move.



AP PHOTO/
DAVID FARNWICK

Pond Snail



Freshwater Mussel



Francisco Walter
Schultes

Fingernail Clam

CRUSTACEA

This very large group of animals includes crabs, lobsters and shrimp. Almost all are found in water. Crayfish, a relative of the saltwater lobster, are one of the more obvious crustaceans found in freshwater. They usually live in burrows or under rocks during the day and feed at night. Other freshwater crustaceans, such as the water flea and scud, are much smaller in size and seeing them may require a microscope.

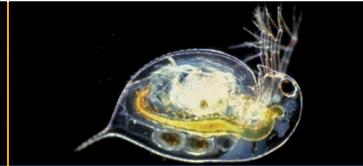


Crayfish



Michael Manias

Scud



Water Flea

REPTILES

Unlike amphibians, reptiles do not lay their eggs in water and do not have a phase of life where they live entirely in water. Their young hatch out of eggs on land and look like smaller versions of the adult. Turtles and some species of snakes prefer watery habitats. Note that although New York's water-snake species look dangerous and may bite if handled, they are not poisonous.



Dave Govoni

Snapping Turtle



Wayne W. Jones

Painted Turtle



Northern Water Snake

AMPHIBIANS

Unlike reptiles that can be found far from a lake or pond, amphibians require that their skin remain moist, so they are always found near water. Their eggs are laid in water, and young amphibians have gills and spend their early lives in water. Hellbenders and mudpuppies, two of New York's larger amphibians, spend their entire lives in water.



Mudpuppy



Juvenile Red
Spotted Newt



OHIO DNR/
Brian Gratwicke

Hellbender



Green Frog



U.S. Fish & Wildlife
Service/Ryan Hegety

Bullfrog

BIRDS THAT LIVE NEAR WATER

Abundant plant and animal life around lakes, ponds, rivers and streams attracts many birds to live near water.

Waterfowl (ducks, geese and swans)

Ducks, geese, and swans love to feed on the aquatic plants that grow in freshwater. Diving ducks, like mergansers, are excellent swimmers and divers, chasing down the fish they eat.



Canada Goose



Mallard Duck
(Male and Female)



Common Merganser



Wood Duck
(Male and Female)



Black Duck

U.S. Fish & Wildlife Service/
Steve Hillebrand

U.S. Fish & Wildlife Service/
Tim McCabe

U.S. Fish & Wildlife Service/
Gene Nieminen

Wading Birds

Herons and egrets are specially adapted with long legs for wading and pointed beaks for feeding on fish in shallow water.



Great Blue Heron



Green Heron



Snowy Egret

Other Birds that Live Near Water

The osprey, or fish hawk as it is sometimes called, is a large raptor often seen hovering over water bodies searching for fish to dive on and catch in the sharp talons on their feet. Belted kingfishers look for prey from branches overhanging the water, diving to catch small fish in their large beaks. Red-winged blackbirds are insect eaters that nest in cattails and other marsh grasses. Cormorants are large, voracious, fish-eating birds whose abundance sometimes becomes a nuisance.



Osprey



Kingfisher



Red-winged Blackbird



Double-crested Cormorant

U.S. Fish & Wildlife Service/
Robert Burton

U.S. Fish & Wildlife Service/
Dave Menke

Joby Joseph

Blake Matheson

MAMMALS

Muskrat, beaver and otter spend most of their lives in and around water. Other animals, like raccoon and mink, frequent shoreline areas, feeding on crayfish, frogs and insects. Bats can often be seen swooping after insects at dusk above a lake or river.



AQUATIC PLANTS

Except for the microscopic plants called algae, aquatic plants are classified as floating, emergent or submergent. See definitions and examples below. Aquatic plants are an important food source for many aquatic animals and provide habitat for insects that are an important food for fish. Ducks and many other aquatic birds nest among aquatic plants and many also eat them.

Emergent Plants

Plants like cattail, pickerelweed and bulrush have sturdy stalks that emerge above the water's surface.



Floating Plants

Plants like white water lily, yellow water lily and duckweed have leaves that float on the water's surface.



Submergent Plants

Plants like pondweed, water-milfoil and coontail grow completely below the water's surface.



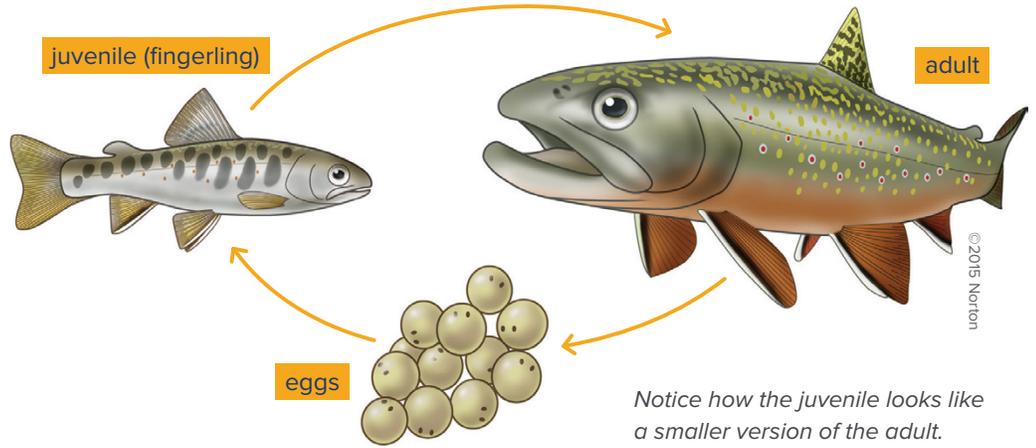
THE CYCLE OF LIFE

A life cycle is the series of changes, or stages, in the life of an animal. Most animals, including mammals, fish, reptiles and birds have simple life cycles with three life stages: before birth, young and adult. The young typically look similar to the adults, only smaller. Humans have a simple life cycle.

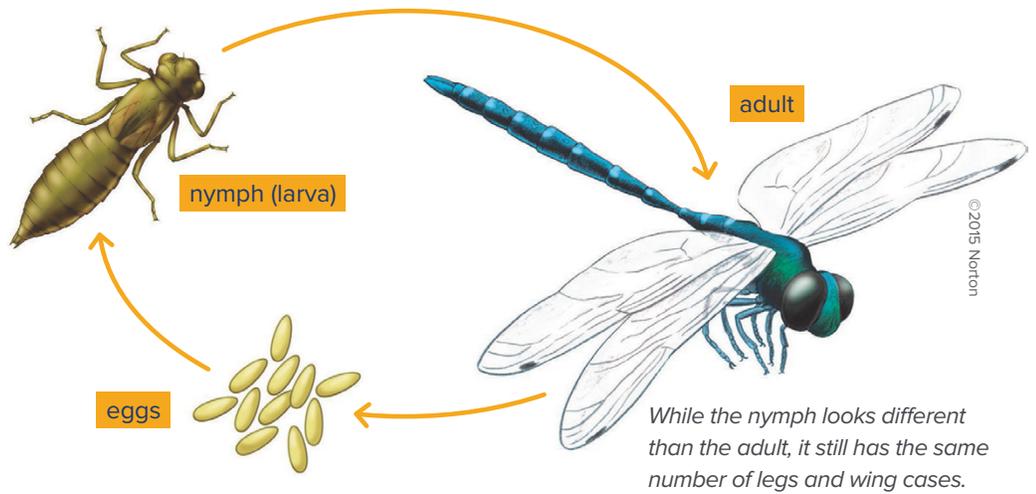
Some animals, such as amphibians, go through a more complex life cycle called metamorphosis. They completely change as they develop into adults. The adult can often live in different environments than the young. The change of a tadpole into a frog is an example of metamorphosis. The tadpole lives entirely in water, while the adult can live in both water and on land.

Look at me now!

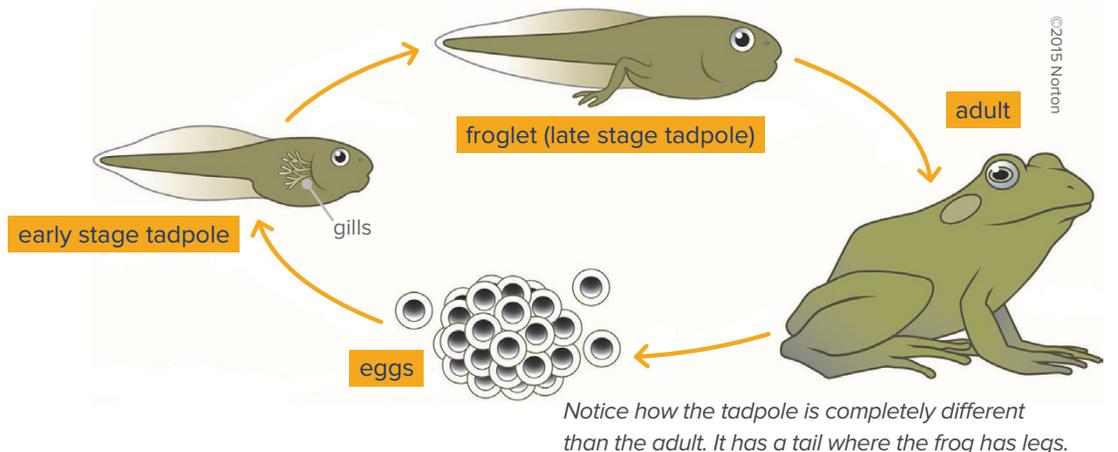
The early development stages of aquatic organisms can look similar or very different from the adult stage! At right are three examples of aquatic organism life cycles that illustrate this:



TROUT (SIMPLE LIFE CYCLE) – Egg to juvenile to adult



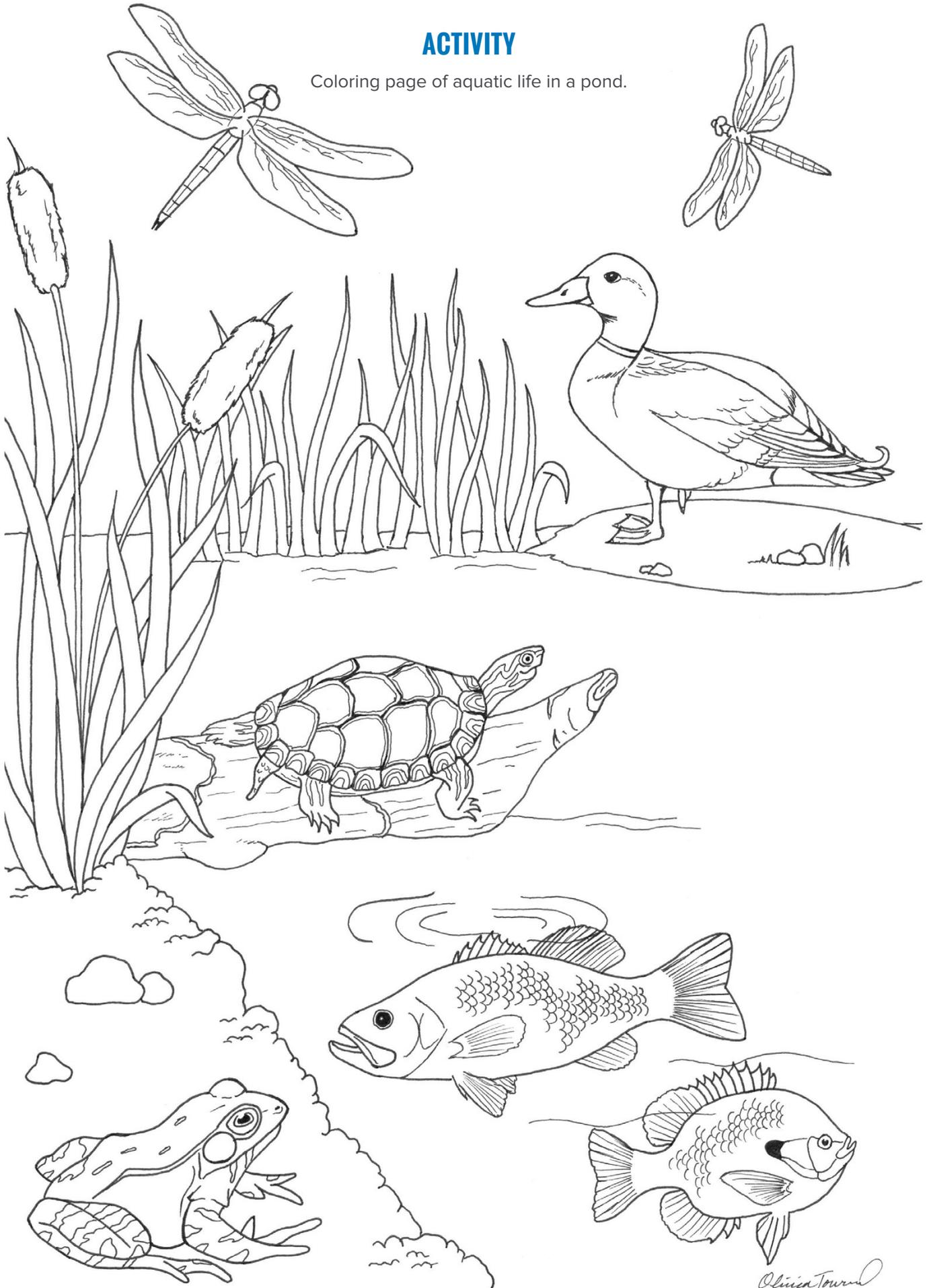
DRAGONFLY (INCOMPLETE METAMORPHOSIS) – Egg to nymph to adult



FROG (METAMORPHOSIS) – Egg to tadpole to froglet to adult

ACTIVITY

Coloring page of aquatic life in a pond.



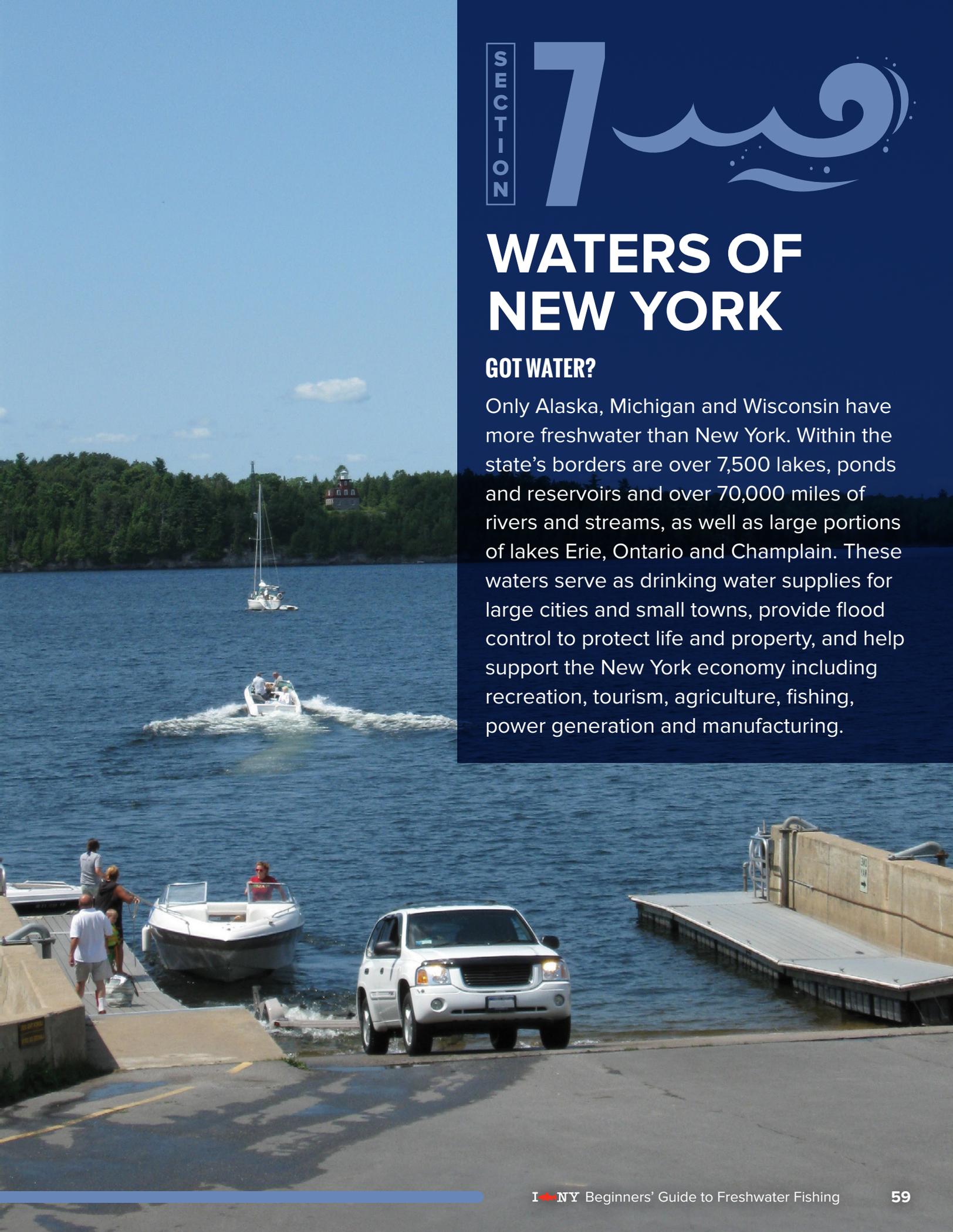
Olivia Town



WATERS OF NEW YORK

GOT WATER?

Only Alaska, Michigan and Wisconsin have more freshwater than New York. Within the state's borders are over 7,500 lakes, ponds and reservoirs and over 70,000 miles of rivers and streams, as well as large portions of lakes Erie, Ontario and Champlain. These waters serve as drinking water supplies for large cities and small towns, provide flood control to protect life and property, and help support the New York economy including recreation, tourism, agriculture, fishing, power generation and manufacturing.



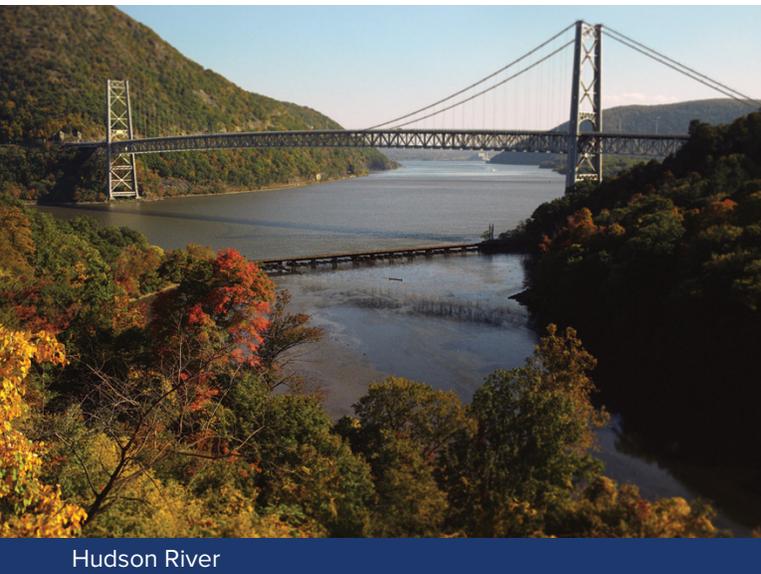
Oneida Lake is the largest lake completely in New York covering 51,243 acres. Our second largest lake, Seneca Lake is also our deepest with a maximum depth of 618 feet. Seneca is part of a system of 11 glacially created waters known as the Finger Lakes located in Central New York. Cayuga, Otisco, Skaneateles, Owasco, Keuka, Canandaigua, Honeoye, Canadice, Hemlock and Conesus make up the other 10 Finger Lakes.

In southeastern New York, the 18 reservoirs built to supply New York City with drinking water make up the bulk of the freshwater resource in the region. Ashokan Reservoir is the largest at 8,060 acres.

New York’s Adirondack Park takes up most of the northeastern section of the state and it contains over 3,000 lakes and ponds. Largest among these are Lake George at 28,523 acres and Great Sacandaga Lake at 24,707 acres. In the western part of the state, Chautauqua Lake is the largest freshwater lake at 13,126 acres.

MORE THAN ONE RIVER RUNS THROUGH IT

New York has over 59,300 rivers and streams within its borders. Some of these streams are intermittent, only flowing during wet periods. The Hudson River, which flows 301 miles from Lake Tear of the Clouds in the Adirondacks to New York Harbor, is the longest river completely in New York State. It is also the deepest, reaching depths of over 200 feet in spots. The St. Lawrence, which flows 744 miles from Lake Ontario to the Gulf of St. Lawrence in the Province of Quebec, is the longest river starting in New York.



Hudson River

NEW YORK'S LARGEST LAKES

Name	Acres	Watershed
1. Oneida Lake	51,243	Oswego
2. Seneca Lake	43,393	Oswego
3. Cayuga Lake	42,573	Oswego
4. Lake George	28,479	Champlain
5. Great Sacandaga Lake	24,707	Upper Hudson
6. Chautauqua Lake	13,126	Allegheny
7. Keuka Lake	11,654	Oswego
8. Canandaigua Lake	10,633	Oswego
9. Skaneateles Lake	8,746	Oswego
10. Ashokan Reservoir	8,060	Lower Hudson

Only includes waters solely within the borders of New York State.

NEW YORK'S LONGEST RIVERS

Name	Miles	Watershed
1. Hudson River	301	Upper/Lower Hudson
2. Susquehanna River	153	Susquehanna
3. Mohawk River	147	Mohawk
4. Genesee River	147	Genesee
5. Raquette River	136	St. Lawrence
6. Oswegatchie River	132	St. Lawrence
7. Black River	113	Black
8. St. Lawrence River	110	St. Lawrence
9. Tonawanda Creek	102	Niagara/Erie
10. Indian River	90	St. Lawrence

Only includes mileage within the borders of New York State.

SOME LIKE IT WARM, SOME LIKE IT COLD

Lakes, ponds, rivers and streams can be classified as either warmwater or coldwater. Waters classified as coldwater usually maintain a temperature below 70 degrees and provide ideal habitat for trout, salmon and other species that prefer lower temperatures. Warmwater lakes, rivers and streams get too warm for trout and salmon, but provide great habitat for fish species such as largemouth bass and chain pickerel. Some waters are deep enough that they have both warmwater habitat at the surface and deeper coldwater habitat that provides suitable conditions for a variety of fish species.

HOW IT ALL BEGAN

Over 20,000 years ago, the climate cooled dramatically during the Great Ice Age and much of New York was covered by a layer of ice about one-mile thick. When the earth warmed again about 12,000 years ago, these thick layers of ice, or glaciers, began to melt. As the glaciers moved back and forth over the land, they carved out huge holes and dragged soil and rocks with them, damming river valleys. The valleys and holes filled with water forming the waters we know today, including the Great Lakes and Finger Lakes. The melt water from these glaciers also formed channels that later became our major rivers. Other waters were created by huge chunks of ice that broke off when the glaciers melted, forming what are called kettle ponds. This process is the reason why northern states that were covered with ice during the Ice Age, such as Minnesota, Wisconsin and New York, have so many natural lakes in comparison to more southern states.

DID YOU KNOW

Prior to the retreat of the glaciers, the Lake Champlain basin was once covered with saltwater and called the Champlain Sea. Proof of this are the bones of a beluga whale uncovered along the lake's shore in Charlotte, Vermont.

A PLACE IN HISTORY

Many of our freshwater lakes and rivers have an important place in the history of our state and country. Waters such as the Hudson River and Lake Champlain were named after Henry Hudson and Samuel de Champlain, the first European explorers to discover them. Other waters, such as Chautauqua Lake and the Chemung and Mohawk rivers, were named after local Native American tribes. These waters were heavily used for transportation prior to the development of roads and railways.

The Erie Canal, completed in 1825, ran 353 miles between Albany and Buffalo, linking the Great Lakes with the east coast. At the time it was the only major means of transportation through the Appalachian Mountains and was heavily used to transport grain and other items that were difficult to move overland. The Erie Canal helped New York become a major port city and opened western regions to settlement.

DID YOU KNOW

Because of its deep waters in excess of 200 ft. and consistent deep water temperatures, Seneca Lake is the site of a U.S. Navy submarine testing facility.



Glaciers covered much of NY about 20,000 years ago.



Like today's highways, New York's waters were an important transportation network for Native Americans and early settlers.

Our streams and rivers were also important sources of power for mills built by early settlers to grind grain into flour and cut wood. Blocks of ice cut from lakes and rivers were used for refrigeration. Trapping and fur trading was a popular business for early settlers and explorers who sought the abundant beaver, otter and mink in and around our waters. Artifacts from these early settlers can be found along many of our major waters.

New York waters also played an important role in various battles that were fought both before, during and after the United States became an independent country. The Hudson River, Lake Champlain and Lake George provided an excellent water route between Canada and New York that was used by invading forces during the French and Indian war, the American Revolution and the War of 1812. Forts were built to prevent ships from sailing up or down these waters. Towns such as Fort Edward on the Upper Hudson River and Ticonderoga on Lake Champlain still bear the names of these forts. Lake Champlain was the site of one of the first battles fought by the United States Navy during the American Revolution and was also the site of a major battle against the British that helped end the War of 1812.

The Statue of Liberty, a symbol of freedom provided to the U.S. from France in 1886 as a gift of friendship, stands in New York harbor at the mouth of the Hudson River.



Lt. Thomas MacDonough defeats the British navy in an 1814 battle in Plattsburgh Bay on Lake Champlain.

IT ALL HAPPENS IN THE WATERSHED

Every river, lake and pond in New York State is surrounded by an area of land that drains into it called a watershed. A watershed is the land that water flows across or under on its way to a river, lake or bay. Water travels over farm fields, forests, lawns and streets, or it seeps into the ground and travels as groundwater. Watersheds are separated from other watersheds by high points, such as mountains, hills and ridges.

New York is divided into 17 watersheds. The watershed with the largest area in New York is the St. Lawrence River, which drains over 5,600 square miles in northern New York. The Susquehanna River watershed, with only 4,520 of its huge 27,500 square-mile drainage in New York and the rest in Pennsylvania and Maryland, is the second largest watershed east of the Mississippi River.



DID YOU KNOW

The Allegheny River watershed is the only watershed in New York that drains into the Mississippi River watershed via the Ohio River.



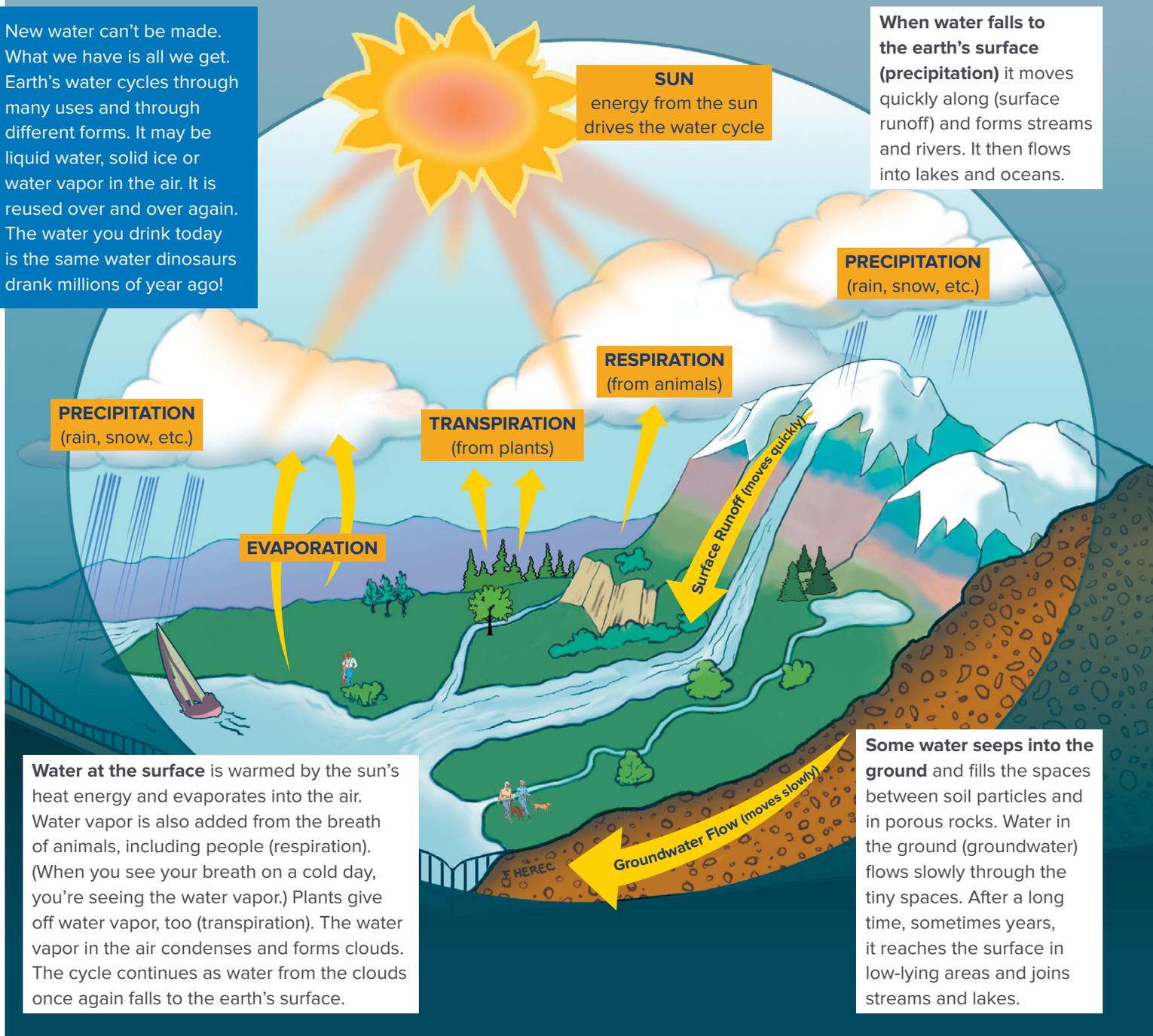
A CONTINUOUS CYCLE

Our waters are an important part of the water cycle, a continuous cycle by which water moves from the earth's surface into the air and back again. The cycle begins when the sun heats water in the ocean, a lake or stream. The heated water evaporates into the air. Water also enters the air from plants and trees through a process called transpiration.

Water vapor in the air cools down and again becomes a liquid. This often occurs when warm air rises over a mountain, or when it comes into contact with colder air. This process is called condensation. When so much water condenses that the air can no longer hold it, the water falls back to the earth as rain or snow. Some of this water seeps into the ground and becomes groundwater, an important source of drinking water. The remainder either evaporates back into the air or enters rivers, streams, lakes and oceans and the cycle continues.

Earth's Water Cycle

New water can't be made. What we have is all we get. Earth's water cycles through many uses and through different forms. It may be liquid water, solid ice or water vapor in the air. It is reused over and over again. The water you drink today is the same water dinosaurs drank millions of year ago!



THREATS TO OUR WATERS

Although acid rain and nuisance invasive species often find their way into our waters from sources outside of the State of New York, many of the major threats to our waters occur within our own watersheds. Whether it be oil dumped down a storm drain, pesticides or fertilizers used on a lawn, or runoff from a paved surface, these materials can eventually drain into our waters. Threats to our waters include:

Fertilizer

Phosphorus and nitrogen in fertilizer make our lawns green, but can also cause the nuisance growth of plants and algae when they wash into lakes. This is why caution must be used to ensure that they are used in a fashion that limits the amount that drains from the lands they are being used on. While live plants and algae are an important source of oxygen, they use oxygen when they die and decay. The decay of large quantities of plants and algae can completely use up all of the oxygen in a lake or pond, particularly in the cold deep waters preferred by trout.

Drugs and Other Medications

Although sewage and other household wastes are typically treated prior to being discharged into our waters to reduce impacts to aquatic life, the same is not the case for many drugs and other medications that we discard. These substances can be harmful to creatures living in our waters, affecting their reproduction and behavior.

Hazardous Chemicals

Pesticides, oil and other chemicals dumped into storm drains can be a particular problem for our waters because they do not receive the same amount of treatment that household waste receives. Even small amounts of oil, pesticides, paints, solvents and other potentially harmful substances can cause big problems when they are dumped or washed into storm drains and make their way into our waters.

Acid Rain

When gasoline or diesel is burned in a vehicle, or oil and coal is burned in power plants or furnaces, exhaust gases react with water, oxygen and other substances in the air to form mild solutions of acid. Winds spread these acidic materials hundreds of miles across the atmosphere. When it rains these acidic materials fall out of the atmosphere and into our waters.

Acid rain makes some mountain waters so acidic that fish and other aquatic animals can't survive. Acid rain also causes soils to release forms of aluminum and mercury that can kill aquatic animals or make them unsafe to eat.

Aquatic Invasive Species

Invasive aquatic plants and animals and harmful fish diseases find their way into New York State in a variety of ways. Some come in the ballast water of large ships traveling from ports around the world into the Hudson River, St. Lawrence River and Great Lakes. Invasive species can also be introduced when people dump fish tanks containing plants or animals purchased in a pet store. While many tropical fish cannot survive our cold winters, many aquarium plants quickly take off in our waters.

When an invasive species becomes overly abundant and impacts native species, it is termed a nuisance invasive species. Invasive species do not have to come from another country. In many cases fish introduced from other states or even from other areas of New York have caused problems. Many Adirondack brook trout ponds have been destroyed due to the introduction of common baitfish species. By moving fish from water to another or dumping unused baitfish you can also unknowingly spread harmful fish diseases.



WHAT CAN I DO TO HELP?

- Bring unused medications for proper disposal on special pharmaceutical collection days and never flush them down a household drain.
- Apply fertilizer carefully to minimize how much drains into water bodies.
- Support the efforts of our government officials to reduce or eliminate the causes of acid precipitation and invasive species introductions to New York State.
- Bring oil, pesticides, paint, solvents or other potentially harmful substances for proper disposal on special household hazardous waste days and never dump them down a household drain, in the street, or directly into a storm drain. If you don't know how to properly dispose of a hazardous substance, contact your local DEC office.
- Be sure to dry or disinfect all fishing and boating equipment before you use it in a new body of water. This will prevent the spread of invasive species from one water body to another.
- Never move bait or other fish species from one body of water to another.
- Never litter. Carry out what you carry in. Help clean up your local pond.

REFERENCES

Publications

- Going Blue: A teen guide to saving our oceans, lakes, rivers and wetlands. Cathryn Berger Kae. Free Spirit Publishing. 2010
- A drop around the world. Barbara Shaw McKinney. Dawn Publications. 1998.
- Hudson River: An adventure from the mountains to the sea. Peter Lourie. Boyds Mills Press. 1998.
- The Story of a River: Hudson. Robert Baron and Thomas Locker. Fulcrum Publishing. 2004.
- Rivers and Streams. Patricia A. Fink Martin. Franklin Watts Publishing. 1999.
- Discover the Hudson River. Project Wet. 2010.
- Exploring New York's Rivers. Conservationist for Kids. NYSDEC. 2009
- Spring Waters, Gathering Places. Sandra Chisholm DeYonge. The Watercourse, Bozeman, MT. 2000.

Websites

- USGS Water Science School
<http://water.usgs.gov/edu>
- EPA Learn about Water
<http://water.epa.gov/learn/kids>
- EPA Learning and Teaching about the Environment
www2.epa.gov/students
- DEC Watersheds
www.dec.ny.gov/lands/26561.html
- DEC Teaching About the Hudson River Estuary
www.dec.ny.gov/lands/5102.html
- DEC Prevent the Spread of Aquatic Invasive Species
www.dec.ny.gov/animals/48221.html



The spiny water flea is one of many aquatic invasive species that have been introduced to our waters.

ACTIVITY

What's Your Watershed Address?

What if your address was described by the water you live near, instead of the street you live on? Look at a map of your area (a topographic map is best) to find the water closest to your home: a stream, river or lake where runoff from your roof would travel to. Where does it go from there? Follow the water until you reach a lake or the ocean. Write down the name of each water body your water travels through, from smallest to largest. This is your watershed address.

Here are two examples:

- WATERHOUSE CREEK
Oswego River
Lake Ontario
- MALIANNE CREEK
West Canada Creek
Mohawk River
Hudson River
New York Harbor

Water Words

Across

3. Lake shared with Vermont and Quebec that was site of one of the first battles of the U.S. Navy.
4. Type of water found in lakes and ponds.
5. New York's longest river.
7. New York's largest lake found solely within its borders.
10. These species can cause problems in our waters.
13. Glaciers are made of this.
14. What you should do to boats before their use in another waterbody.
17. They covered most of New York during the ice age.
18. Never dump anything down a _____ drain.

Down

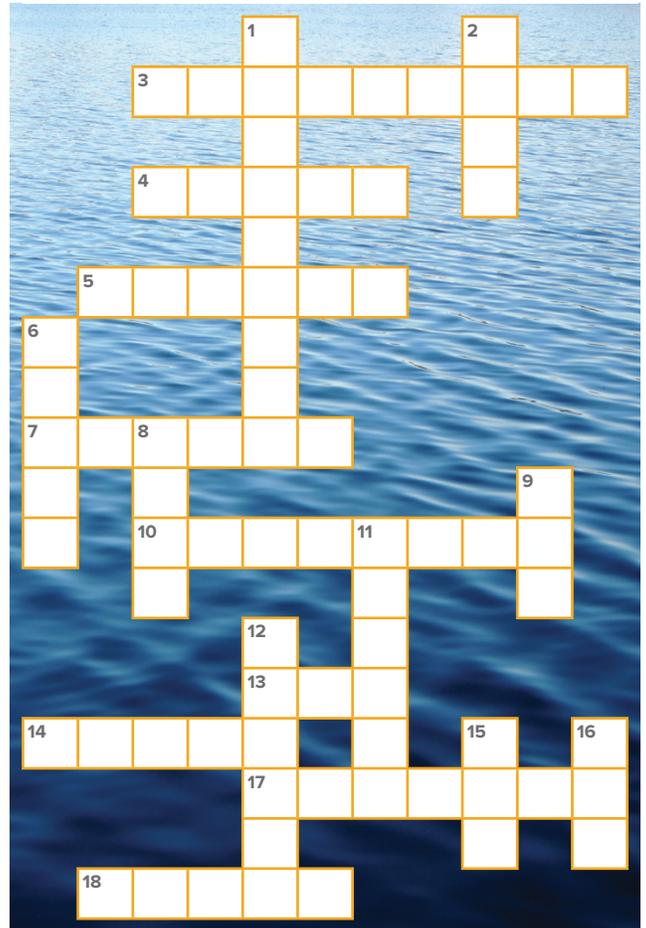
1. The area of land draining into a water body.
2. When water vapor cools this falls out of the air.
6. Common species found in coldwater lakes, ponds and streams.
8. This canal runs between Albany and Buffalo.
9. Who you should contact if you are unsure how to dispose of a hazardous material.
11. New York's deepest lake.
12. There are 11 of these lakes in central New York.
15. This hazardous material can drain off of paved roads and driveways.
16. Boating and fishing equipment should be _____ before it is used in another body of water.

What is your home address?



What is your watershed address?





ANSWERS: Across – 3. Champlain, 4. Fresh, 5. Hudson, 7. Oneida, 10. Invasive, 13. Ice, 14. Drain, 17. Glacier, 18. Storm; **Down** – 1. Watershed, 2. Rain, 6. Trout, 8. Erie, 9. DEC, 11. Seneca, 12. Finger, 15. Oil, 16. Dry



SECTION

8



FISHERIES MANAGEMENT

People have been catching fish for over 40,000 years. Why not? Fish are great to eat and fun to catch. But what happens when people keep too many fish? The fish that remain can't reproduce fast enough to sustain their population and few if any fish are left to catch. Fish populations can also be reduced by habitat destruction. Very simply, if you destroy the places where fish live, there will be fewer fish. Fisheries management involves protecting fish and their habitat in order to keep fishing great today and for generations to come.

Fish populations are commonly managed through:

1. Fishery assessments
2. Protective regulations
3. Stocking
4. Habitat protection and improvement

Let's take a closer look at each.

FISHERY ASSESSMENTS

Biologists check the condition of a fishery by conducting fish population surveys or collecting information from anglers. During surveys they use nets alone or with electrofishing gear to capture fish (see cover). Electrofishing uses electricity to temporarily stun fish. Fish are then identified by species, measured, weighed and released. When biologists want to know the age of a fish, they take some of its scales. Like a tree, fish grow a new scale ring each year. The number of rings tells the age of the fish.

Information biologists gain during a survey may include the types of fish present in a waterbody, how abundant and large they are, and how fast they are growing. Such information is useful in determining the condition of a fishery. Depending on what they find, biologists may use one or more of the following management actions to maintain or improve a fishery.

REGULATIONS

Fishing regulations prevent overfishing, allow fish to grow to larger sizes, and help spread the catch out to more anglers.

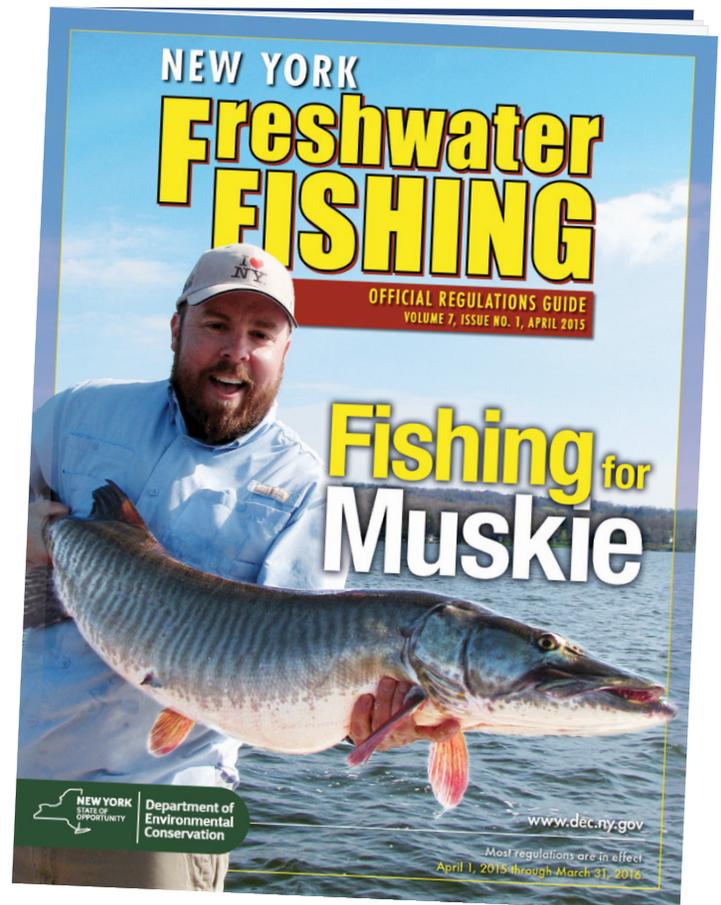
Fishing regulations fall into five categories:

- **Gear Restrictions** – Specify the kind of equipment you can use to catch fish. For example, on some waters, you can only use artificial lures.
- **Daily Limits** – Specify how many fish you can keep per day of certain species. Daily limits are designed to prevent overfishing.
- **Size Regulations** – Specify the smallest size fish or size range of a species that you can keep. Size limits are designed to allow a fish to reach the age at which they can spawn (reproduce) and also allow fish to get bigger.
- **Open Seasons** – Specify when you can fish for certain species. Some species are much easier to catch when spawning. To protect them, fishing is not allowed during spawning periods.
- **Bait Restrictions** – Specify the kind of natural bait that can be used or prohibits the use of all or some forms of bait. The use of baitfish is regulated in New York, as they can spread diseases and damage native fish communities if illegally released in a water body.

Fishing regulations are enforced by DEC Environmental Conservation Officers (ECOs). Several hundred ECOs patrol the woods and waters of New York annually.



Biologists measure a muskellunge during a fisheries survey.



The freshwater fishing regulations guide provides a summary of New York's fishing regulations.

STOCKING FISH

Releasing or “stocking” fish is another common way to manage fisheries. DEC stocks millions of fish annually throughout New York. That’s a lot of fish! It is likely some of them are stocked near you.

DEC does three kinds of stocking for the following reasons:

- **Put-and-take:** Fish are stocked at a legal size to provide immediate fish catching opportunities. In NY, put-and-take fish are almost always trout. Each spring millions of catchable-size brook, brown and rainbow trout ranging in size from 9 to 14 inches are stocked throughout the state for anglers to enjoy.
- **Put-grow-and-take:** Fish are stocked smaller than the legal size and then grow to a size anglers can keep. For example, millions of walleye less than one-inch-long are stocked annually to enhance walleye populations in New York.
- **Restoration:** These fish are stocked to restore native fish populations, including endangered species, which have become rare or completely disappeared from waters where they originally thrived. Native fish populations are fish that were originally found in a body of water.

Depending on fish management goals, DEC stocks fish at various life stages:

- Fry (about 1-inch-long),
- Fingerling (2 to 5-inches-long),
- Yearling (8 to 10-inches-long), and
- Two-year-olds (12 to 15-inches-long).

YOU NEED A PERMIT TO STOCK FISH

While stocking fish can greatly improve fishing, the wrong species stocked in the wrong place can seriously damage a fish community and destroy the fishery. That is why stocking fish without a DEC permit is illegal. DEC stocking permits also help ensure that stocked fish are free of harmful fish diseases.



Yearling and two-year-old trout are stocked each spring to provide good fishing right after stocking.



These sauger fry will help restore sauger in New York.

FISH HATCHERIES

Fish that are stocked are raised in a place called a fish hatchery before stocking. Hatchery fish are raised from eggs to stocking size. The eggs come from fish captured in the wild or adult fish kept at the hatchery.

DEC operates 12 fish hatcheries that annually raise between 800,000 and 900,000 pounds of fish for stocking in public waters. Nine hatcheries raise cold-water fish and three raise cool-water fish.

Cold-water hatcheries raise:

- Brook, brown and rainbow trout
- Steelhead
- Lake trout
- Splake (a brook/lake trout hybrid)
- Atlantic, coho and Chinook salmon

Cold-water fish grow best in water temperatures in the high 50s (°F). Most of DEC's hatcheries are cold water and raise most of the catchable-size fish that are stocked.

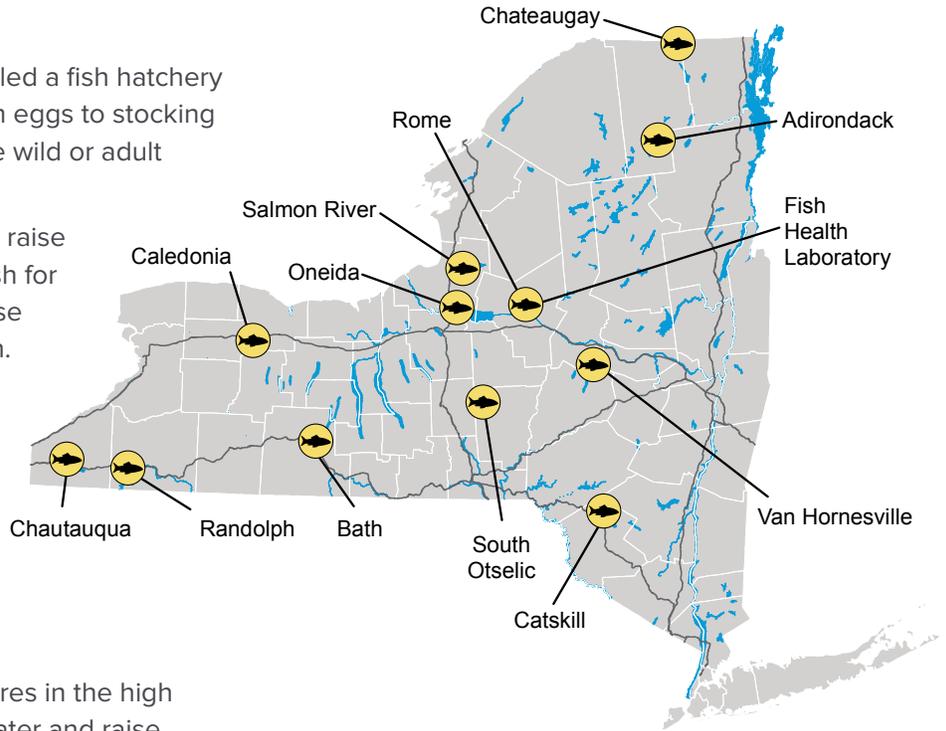
Cool-water hatcheries raise:

- Walleye
- Muskellunge
- Tiger muskellunge (a northern pike/muskellunge hybrid)
- Sauger
- Lake sturgeon (threatened)

These fish grow best in warmer water. New York has fewer cool-water hatcheries, but they raise the most fish because the fish are usually very small when stocked.

Road trip!

Stocking fish is a lot of work. Many different forms of transportation are used to get fish into the water. Most are stocked with special trucks that have large tanks filled with oxygenated water to keep the fish alive. Some are flown into remote ponds in the Adirondacks by helicopter or plane! Hatchery staff drive over 350,000 miles to bring fish to a place near you each year. That's enough to go around the world 14 times!



Locations of DEC's 12 fish hatcheries.



Aerial view of DEC's Rome Fish Hatchery.



HABITAT PROTECTION AND IMPROVEMENT

The area where fish live is called their habitat. What happens when this habitat is damaged or destroyed? Simple: No habitat = No fish.

Damaged Habitats

Fish habitat can be damaged by nature and by people. Natural damage is caused by floods, landslides, drought or other natural phenomena. People can damage habitat in various ways, including filling a stream or other water body with soil and debris or cutting trees from the water's edge. Allowing runoff to enter a water body from an over-fertilized lakeshore property can also damage fish habitat. Even letting cows graze too close to a stream bank can cause damage. In streams and rivers, dams and culverts can prevent fish from being able to move from one place to another. The habitat might not be "damaged," but if the fish can't get to where they need to go, the habitat is lost to them. DEC staff review projects that have the potential to damage habitat and impose conditions designed to protect aquatic habitats.

Fixing the Damage

Although it is often difficult to completely fix damaged habitat, fisheries managers often conduct habitat improvement programs in an effort to repair it as best they can. Projects can be simple and cheap, such as planting trees along a stream. However, most projects are complex and expensive, such as dredging or digging out a pond that has been filled in. If fish cannot move through a stream culvert, it can be replaced with a culvert or bridge that they can move through.

Sometimes structures are placed into streams or lakes as habitat improvement. Tree stumps can be sunk into lakes to add structure. Pool diggers, wing dams, and "lunker" structures can be placed into streams for the same reason. They also help stabilize eroded stream banks. These projects are usually expensive, but the rewards can be great. Just ask anyone who has ever caught a fish near one of these structures.

ELIMINATING THE BARRIER



Fish can't swim through this culvert because the water coming through it and onto the rocks is too shallow.



Fish can now swim through because both the culvert and downstream pool were modified to increase water depth.



Installing lunker structures



After installation

WHAT CAN I DO TO HELP KEEP FISHING GREAT?

Follow Fishing Regulations: They are designed to protect fish populations.

Limit your take:

- Don't keep your limit every time you fish. Keeping fewer fish increases the possibility of catching fish in the future, and lets fish grow larger.
- Release the largest fish you catch. The genes that enabled them to survive and grow larger, contribute more to strengthening future fish populations than smaller fish. Maybe you can catch the same fish again when it is even bigger!
- Keep more panfish than gamefish to help keep the fish population balanced. Panfish may be smaller, but are generally much more abundant.

Catch-and-Release: Fishing is fun. Releasing your fish allows them to be caught another day.

Report Violations: Anglers can be the eyes and ears of DEC. If you see someone violating fishing regulations or harming the environment, call DEC's 24-hour toll-free dispatch number 1-844-DEC-ECOS (1-844-332-3267). Be prepared to tell the dispatcher where you are, what you have seen, and what the violators look like. License plate numbers and vehicle descriptions are particularly helpful. DO NOT try to confront the violator yourself; leave that to the professionals.

Do Not Move or Stock Fish: Moving fish from one water body to another can spread diseases and hurt fishing quality. Never stock fish without a DEC stocking permit. Also, never release (stock) your unused baitfish unless you collected them from the water body where you are fishing.

Improve Habitat: If you or your family owns property adjacent to a pond or stream, you can improve fish habitat by not mowing up to the water's edge and planting trees near the water's edge. You can also protect fish habitat by not fertilizing near the water. For more suggestions on how to improve habitat, contact your local DEC office.



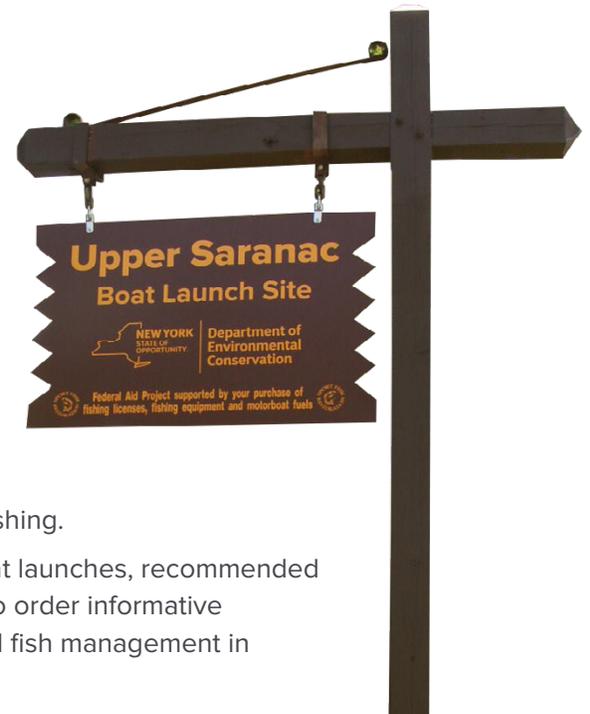
Practicing catch and release or releasing your largest fish can help keep fishing great.

DEC'S 24-HOUR TOLL-FREE DISPATCH NUMBER
1-844-DEC-ECOS (1-844-332-3267)

PUBLIC FISHING ACCESS

No matter how good fishing may be at a particular place, if you can't get there, you can't catch the fish. As a result, DEC manages 400 boat launches, fishing piers and shore-fishing locations. Some are on DEC property, others are developed in cooperation with public or private landowners. In addition, over 1,300 miles of fishing easements on private land are provided on NY trout streams as part of DEC's Public Fishing Rights Program. These easements provide access for the sole purpose of fishing.

DEC's website www.dec.ny.gov is a great location to find information on boat launches, recommended fishing locations, fish stocking and a host of other useful topics. You can also order informative brochures and sign up for the regular e-mail updates concerning fishing and fish management in New York State.



REFERENCES

Publications

- New York Freshwater Fishing Regulations Guide (current version). NYSDEC.

Websites

- NYSDEC – Fishing Regulations www.dec.ny.gov/outdoor/7917.html
- NYSDEC – Fishing Stocking www.dec.ny.gov/outdoor/7739.html
- NYSDEC – Places to Fish www.dec.ny.gov/outdoor/7749.html

ACTIVITIES

Can I keep that?

Congratulations! You caught a fish. Can you keep it? Let's find out.

There are five fish on this page and two things you need to find out about each:

1. What is the name of the fish?

Hint: Review the “Fishes of NY” chapter if you don't know.

2. Is the fish long enough to keep?

Hint: Review the Statewide Angling Regulations in your copy of the Freshwater Fishing Regulations Guide, or online at www.dec.ny.gov/outdoor/31421.html. Check the minimum length against the length of the fish is on this page.

Check for something special!

Some waters have “special regulations” that are different from statewide regulations. Always check your regulations guide to see if special regulations apply to the water you are fishing.

Pick a water where you go fishing. Then, note the length of each fish shown on this page. Using your copy of the Freshwater Fishing Regulations Guide, find out if each fish is long enough to keep on the water you chose by:

- Reviewing the Statewide Angling Regulations.
- Reviewing Special Regulations by County which include regulations for specific waters (i.e. Lake Champlain) or a group of waters (i.e. Great Lakes). If the water you selected is not listed in Special Regulations by County, Statewide Angling Regulations apply.

If you don't have a copy of the Freshwater Fishing Regulations Guide, visit www.dec.ny.gov/outdoor/7917.html and follow the “How to find freshwater fishing regulations” instructions.



Name of Fish:

Long Enough to Keep? **YES** **NO**



Name of Fish:

Long Enough to Keep? **YES** **NO**



Name of Fish:

Long Enough to Keep? **YES** **NO**



Name of Fish:

Long Enough to Keep? **YES** **NO**



Name of Fish:

Long Enough to Keep? **YES** **NO**

ANSWERS – CAN I KEEP THAT?
 Largemouth Bass, Yes; Chain Pickerel, Yes;
 Bluegill, Yes; Black Crappie, No; Brown Trout, Yes;





SECTION

9



INTRODUCTION TO ICE FISHING

Not only is fishing a great summertime activity, it's also a fun winter pastime. Ice fishing is a great way to spend those cold winter days.

Many species of fish can be caught through the ice. For certain species, ice fishing can often be better than open-water fishing. The main species sought by ice anglers are pike, pickerel, walleye, panfish (sunfish, yellow perch and crappie), and rainbow, brown and lake trout.

Fishing access can often be better during the winter. Anglers normally limited to shore during open-water seasons can access an entire lake, as long as the ice is thick enough.

WHAT GEAR WILL YOU NEED?

Ice Augers and Spud Bars

In order to ice fish, you must first cut a hole through the ice. This can be done with either a spud bar or an ice auger.

Spud Bar (Ice Chisel)

A metal rod with a sharp tip used for chiseling a hole through the ice and checking ice thickness. Be sure to have a lanyard attached to your spud, to avoid losing it through the ice.



Skimmer (Ice Scoop)

A skimmer or ice scoop is used to remove slush and ice chunks from the hole you are fishing through.

Tip-ups

Tip-ups are devices that sit over holes in the ice and signal anglers when fish bite. The most common signal is a flag that trips (pops up) when fish take the bait. Each fish is then retrieved by pulling the line in by hand. Most anglers set out multiple tip-ups to increase their odds of catching fish.

Rigging a tip-up

For most fish, wind 50 yards of backing (Dacron™ or ice-line) on the spool. Add a 2- to 3-foot monofilament leader between the backing and the hook. The strength of the leader will depend on species of fish you're after (see table on page 78). Use a barrel swivel to connect the leader to the backing. Hook size will also depend on the species of fish you're after and the bait you are using (see table on page 78). Attach a split-shot sinker to the leader 18 to 24 inches above the hook to help get the bait down.

Ice Auger

A device to drill or cut a hole through the ice. Hand augers require muscle power. Power augers use a motor. Power augers are heavier and much more expensive, but they allow you to drill holes quicker and easier. Augers come in a variety of sizes. The larger the size, the harder it is to cut a hole through the ice. See table on page 78 to choose the auger size that best meets your needs.



Setting a tip-up

Attach a weight, called a depth sounder, to the hook and lower it to the bottom. Raise the weight the distance from the bottom you would like your bait to be. Attach a line marker (e.g. a small float/bobber or a button) to your line at the water line and reel up to it. This will allow you to return the bait to the same depth you want to fish. Bring the weight back up and remove it. Bait your hook and lower it to your pre-marked depth. Set the flag or other signaling device depending upon the type of tip-up you are using. It is a good idea to check your tip-ups often to make sure they still have bait. Make sure to keep the holes clear of ice and slush.



Traditional tip-up



A depth sounder helps you find out how deep the water is.



A button makes a cheap line marker.

Minnnows are the bait most often used with tip-ups. You can either hook the minnow through the lips or under the dorsal fin. Make sure your baitfish are certified disease free when you purchase them. Never dump unused baitfish or water from your bait bucket into a lake or pond. Undesirable aquatic invasive species might be mixed in with your bait or bait water.

Jigging Rods

Jigging rods are usually around 2- to 3-feet long. Choose a rod power and line strength to match the species of fish you are targeting (see table on page 78). You can attach a reel or use a simple line holder, such as two pegs, to wrap line around. A small spinning reel spooled with monofilament works best in most situations.

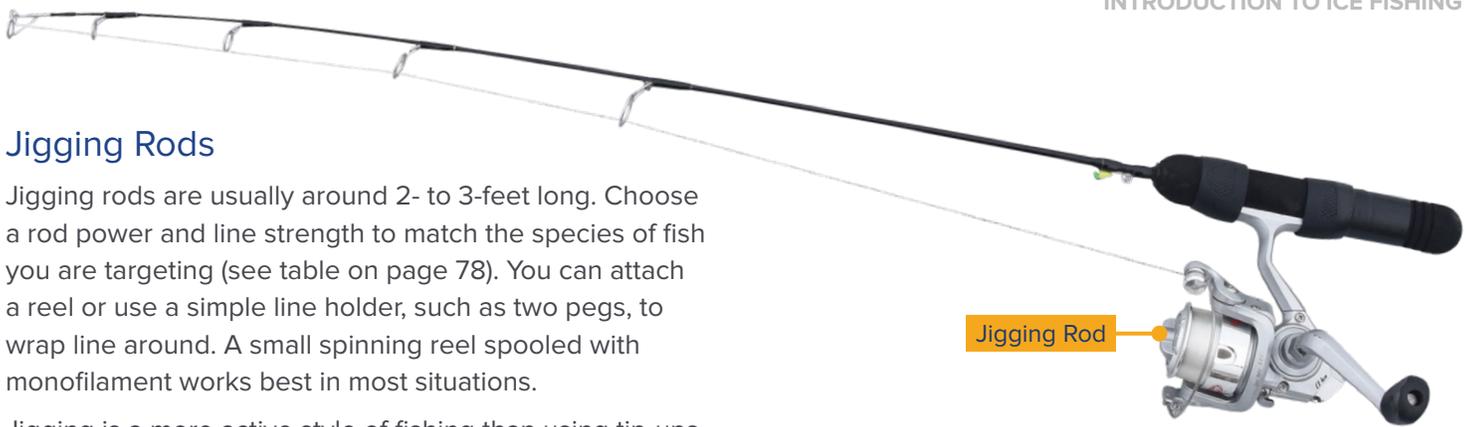
Jigging is a more active style of fishing than using tip-ups. By jigging your bait (raising the rod tip up and down a few inches), you help attract fish. Generally, you will jig the bait a few times, and then pause for a few seconds. Fish usually take the bait during the pause.

Lures and Bait

You can use live or artificial bait while ice fishing. For panfish and small trout, use small jigs. For walleye, pike, pickerel and lake trout (or larger trout), use jigging spoons and swimming jigs. Lures are often tipped with some form of bait. The natural baits commonly used with jigging lures are minnows, minnow heads, and fly larvae, e.g., called spikes or mousies.

Sleds/Shelters

Getting your gear to your fishing spot is easier with a sled. A child's plastic sled works well. Many types of sleds made especially for ice fishing are also available. These often have compartments for storing gear, and many come with an attached shelter. Many types of ice-fishing shelters, from simple wind breaks to portable fish houses, are also available. Shelters block the wind and make ice fishing more comfortable.



Jigging Rod

Ice fishing jigs



Jig tipped with spikes



Ice sled



Ice Shelter

WHEN TO FISH

Fish during the same times of day you would during open-water fishing. Early morning or late afternoon tend to be best. Midday is generally less productive.

WHERE TO FISH

Fish in the same areas you do in other seasons: weed lines, humps, depth changes, points or other structure. Contour maps (www.dec.ny.gov/outdoor/9920.html) can help you find some of these places.

If you think you are in a good spot but are not catching fish, try changing the depth you are fishing. Since fish, especially panfish, tend to school in winter, if you find one, there should be others around.

You may have to move around to find where the fish are. Schooling fish also tend to form schools of the same size fish, so if all you are catching is small fish, move on to try to find a school with larger fish.

WHAT ARE YOU FISHING FOR?

Bluegills

Bluegills can usually be found over or on the edge of weed beds in 15 feet of water or less. Try jigging with small jigs tipped with spikes from a few feet under the ice to just off the bottom until fish are found.



Perch

Perch can be found at depths from shallow weed beds less than 10-feet deep to flats in 40 feet of water.

Try setting tip-ups baited with small minnows or jigging with small jigs tipped with spikes.

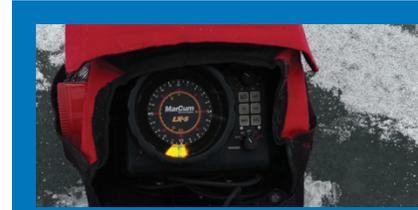
Fish within a foot or less of the bottom where perch are usually found.



Crappie

Crappies may be found along weed edges or suspended in the water column anywhere from a few feet under the ice to inches off the bottom.

Start jigging near the bottom with small minnows or small jigs tipped with spikes. If no fish are found, jig at different depths to find suspended fish. Fishing for crappie can be very good after dark.



VIDEO GAME FISHING?

Veteran ice anglers often use fish finders or “flashers” and underwater cameras while fishing. These electronic “toys” help them find fish, find structure, and determine water depth under the ice.

The following table provides guidelines for gear choices based on your target species.

RECOMMENDED GEAR BY FISH SPECIES				
Species	Hook Size	Line/ Leader LB Test	Auger Size	Jigging Rod Power
Panfish	6-8	4-6	4-6"	Ultra light (UL)
Trout	4-6	6-10	6-8"	Medium (M)
Lake Trout	4-6	8-12	8"+	Medium heavy (MH)
Walleye	4-6	6-10	6-8"	Medium (M)
Pickerel	4-6	6-10	6-8"	Medium (M)
Northern Pike	1-2	10-17	8"+	Medium heavy (MH)

Pike/Pickerel

Anglers usually fish for pike and pickerel in shallow water (5-15 feet) around or over weed beds, using tip-ups baited with minnows. Pike usually prefer large minnows from 4-7 inches.

Pike and pickerel have sharp teeth, so a wire leader is recommended. When setting your tip-ups, suspend your minnows 2-3 feet off the bottom or high enough so they are above any weed growth.



Trout

Trout can be found around points, drop offs or humps. Unlike the open-water seasons when they avoid warm shallow water, trout can be found anywhere from just a few feet under the ice to just off the bottom. Set tip-ups at a variety of depths until fish are found. Fish tip-ups baited with minnows, or jig with jiggling spoons tipped with minnows or minnow heads.



Walleye

Look for walleye around points, flats and shoals. Fishing is often best just before and after dark. Fish within a foot of the bottom. Jig with jiggling spoons tipped with a minnow or a minnow head, or use tip-ups with 3-4 inch minnows.



WHAT TO WEAR

It's going to be cold when you are ice fishing, so it's important to dress for it.

- Dress in layers. Start with a layer of material with the ability to wick (remove) moisture from your skin. Avoid cotton clothing which loses its ability to keep you warm when wet. Many wind and water resistant clothing options are available today. Clothing made of Gore-Tex™ or wool are two good material choices.
- Use waterproof boots with thick soles. The thicker the soles, the more insulation between your feet and the ice. Wearing moisture wicking liner socks under warm socks will help keep you comfortable.
- Add cleats to your boots to prevent falls.
- Bring extra gloves or mittens as these items have a way of getting wet or misplaced.
- Disposable hand warmers and toe warmers are a good way to keep you warm. Make sure to throw the wrapper in the garbage and not on the ice!
- Bring sunglasses. Sun glare off of snow can be intense.
- Use sunscreen. Just because it is cold outside doesn't mean you can't get a sunburn.



The right clothes and gear will help you enjoy the day and stay safe.

ICE SAFETY

- Ice thickness and condition are the main safety concern. Most water bodies do not freeze evenly. A minimum of 4 inches of solid (clear) ice or 8 inches of white or “snow ice” (which is half as strong as clear ice) is the general rule for safely walking on the ice. If you are unsure of the ice thickness, drill regular test holes as you go, at least every 150 feet.
- Avoid ice near moving/open water or around docks because it is often unsafe. Dock owners often put “bubblers” around their docks to prevent thick ice from forming and damaging them.
- Always carry ice safety picks (two handles with spike points) to help you to get out of the water should you break through the ice. You can purchase them (right) or make your own with dowels and nails.
- Let someone know where you will be fishing and when you plan on returning. For adults, fishing with a friend is a good idea. Children should be accompanied by an adult. Using good judgment is essential.



Over 4 inches of clear ice – OK to walk on.

REFERENCES

Publications

- Ice Fishing Secrets (In-Fisherman Library Series).1991. Al Linder, Doug Stange and Dave Genz. In-Fisherman Inc.

Websites

- NYSDEC – Ice Fishing Basics www.dec.ny.gov/outdoor/7733.html
- Wisconsin natural resources – What fish do under the ice. dnr.wi.gov/wnrmag/2009/12/ice.htm
- Ice Safety www.dnr.state.mn.us/safety/ice
- Take Me Fishing – Ice fishing <http://takemefishing.org/fishing/ice-fishing/what-is-ice-fishing>

ACTIVITIES

Make a Jigging Rod



1. Take the tip section of a broken fishing rod. If the tip section is the one that’s broken, cut the rod back to just above the next guide. Use the top 24-30” section.



2. Make a handle by sawing a 6-inch piece of 1-inch wooden dowel. Drill a hole slightly larger than the diameter of the rod into one end of the dowel.



3. Insert and glue the rod into the hole you drilled (may need to wrap tape around the rod end for a snug fit).



4. Either hammer two nails into the dowel about 3 inches apart to make a simple line holder, or tape a spinning reel to the dowel with electrical tape, making sure the guides line up with the reel.





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