



PLAY

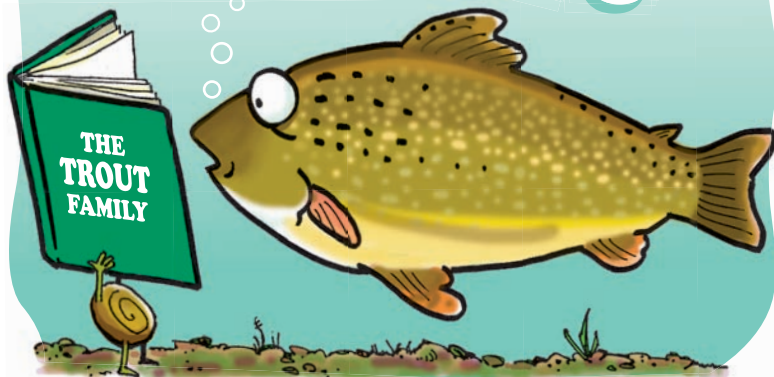
Spring
2015

Pennsylvania • League • of • Angling • Youth

All About Trout

Trout and salmon are very popular with Pennsylvania's anglers. **Taxonomists** know this group of fish as the Family Salmonidae. The Salmonidae family is large, with 39 different species of trout and salmon. There are 12 different species of trout and salmon that occur or once occurred naturally or

through stocking in Pennsylvania (Longjaw Cisco, Cisco, Lake Whitefish, Pink Salmon, Coho Salmon, Rainbow Trout, Sockeye Salmon, Chinook Salmon, Atlantic Salmon, Brown Trout, Brook Trout and Lake Trout). Only five species are native to Pennsylvania (Longjaw Cisco, Cisco, Lake Whitefish, Brook Trout and Lake Trout), and the family is native to cold streams, rivers and lakes. See the following two pages for more information. One member of the family is Pennsylvania's official state fish, the Brook Trout. Read this issue to learn all about trout.



Vocabulary *(Watch for these words!)*

- **Crustaceans** - a type of animal (such as a crayfish that has several pairs of legs and a body made up of sections that are covered in a hard outer shell)
- **Endangered** - seriously at risk of becoming extirpated
- **Extirpated** - no longer surviving in regions that were once part of their range
- **Fingerling** - a small fish about the length of a person's finger
- **Fry** - newly hatched young fish
- **Headwater streams** - the upper streams that flow into a main stem of a river or lake
- **Parr marks** - vertical lines that appear as the fry develops, which camouflage and protect the trout
- **Phylogenetic tree** - a branching diagram or "tree" showing the relationships among various species based upon similarities and differences in their physical or genetic characteristics
- **Redd** - a gravel spawning nest created by female trout swishing their tails
- **Sac fry/alevin** - a newly hatched salmon or trout that is still attached to the yolk sac
- **"Swim-up" fry** - when a sac fry swims up to the surface of the water and begins eating
- **Taxonomist** - scientist who specializes in taxonomy, which is the science of describing, classifying, naming and identifying organisms
- **Yolk sac** - a sac that is attached to the gut of an embryo and encloses the yolk



Who's Related to Whom?

Biologists use diagrams like the one below to show the relationship between species. This diagram is known as a **phylogenetic tree**. Ciscoes, whitefish and some salmon species are only found in Lake Erie. Species such as Rainbow Trout, Golden Rainbow Trout, Brown Trout and Brook Trout are found throughout Pennsylvania.

BROWN TROUT (*Salmo trutta*)

Translation of scientific name:

"Atlantic Salmon" "trout"

Status: native to Europe and introduced to Pennsylvania waters in 1880s

Habitat: cold/cool (50- to 70-degree F range) streams, rivers and deep lakes



Spawn: October through December

Eggs produced: 200 to 3,000 eggs

Average length: 10 to 12 inches long

Average lifespan: 4 to 8 years

RAINBOW TROUT

(*Oncorhynchus mykiss*)

Translation of the scientific name:

"hooked snout/hooked lower jaw"

Status: native to western North America, introduced to Pennsylvania waters in the late 1890s

PINK SALMON (*Oncorhynchus gorbuscha*)

COHO SALMON (*Oncorhynchus kisutch*)

RAINBOW TROUT (*Oncorhynchus mykiss*)

GOLDEN RAINBOW TROUT (*Oncorhynchus mykiss*)

SOCKEYE SALMON (Kokanee) (*Oncorhynchus nerka*)

CHINOOK SALMON (*Oncorhynchus tshawytscha*)



BROOK TROUT (*Salvelinus fontinalis*)

Translation of scientific name:

"char" "of springs"

Status: native to Pennsylvania

Habitat: small, cold (50- to 60-degree F range) streams

Spawn: September through November

Eggs produced: less than 100 to 1,000 eggs

Average length: 5 to 7 inches long

Average lifespan: 2 to 5 years



LAKE TROUT (*Salvelinus namaycush*)

Translation of scientific name:

"char" "Lake Trout"

Status: native to Pennsylvania

Habitat: large, coldwater lakes

Spawn: September through November

Eggs produced: 400 to 6,000 eggs

Average length: 15 to 20 inches long

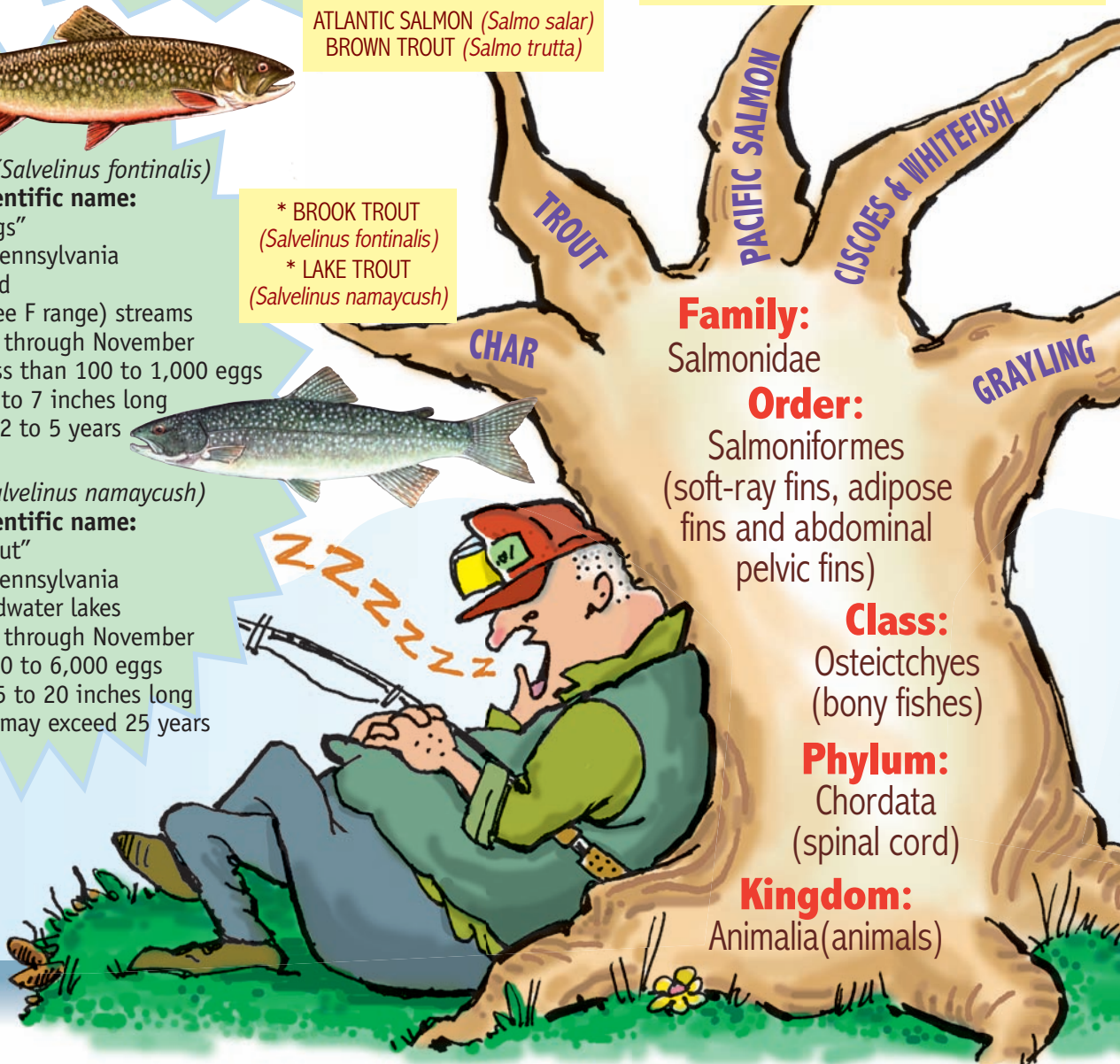
Average lifespan: may exceed 25 years

ATLANTIC SALMON (*Salmo salar*)

BROWN TROUT (*Salmo trutta*)

* BROOK TROUT (*Salvelinus fontinalis*)

* LAKE TROUT (*Salvelinus namaycush*)



Family:

Salmonidae

Order:

Salmoniformes
(soft-ray fins, adipose fins and abdominal pelvic fins)

Class:

Osteictchyes
(bony fishes)

Phylum:

Chordata
(spinal cord)

Kingdom:

Animalia (animals)



STEELHEAD (*Oncorhynchus mykiss*) are migratory Rainbow Trout.

Translation of the scientific name: "hooked snout/hooked lower jaw"

Status: native to western North America, introduced to Pennsylvania waters in the late 1890s

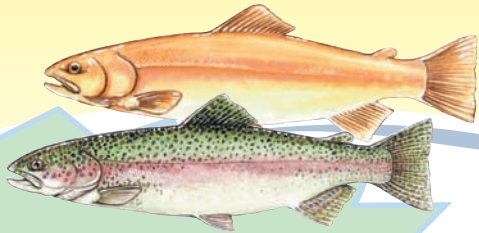
Habitat: cool waters (50- to 70-degree F range) of Lake Erie

Spawn: November through April (swim up Lake Erie tributary streams to spawn)

Eggs produced: 3,000 to 5,000 eggs

Average length: 22 to 24 inches long

Average lifespan: 6 to 8 years



Habitat: cool (50- to 70-degree F range) streams and rivers

Spawn: November through April

Eggs produced: 500 to 3,000 eggs

Average length: 10 to 12 inches long

Average lifespan: up to 8 years

Trout and Salmon Characteristics

- Elongated and torpedo-shaped bodies
- Soft-rayed dorsal fin
- Adipose fin between the caudal (tail) and dorsal fin
- Favor streams, lakes and rivers where water temperatures are less than 70-degrees F with a preferred temperature range between 50- and 65-degrees F
- Likes waterways with a clean bottom, rocks and gravel

Brown Trout has dark spots, few or none on tail.



Rainbow Trout has dark spots, especially on tail, and a pink lateral stripe.



Lake Trout has light spots over entire body. Tail deeply forked.



* **LONGJAW CISCO** (*Coregonus alpenae*)

EXTIRPATED

* **CISCO** (*Coregonus artedi*)

ENDANGERED

* **LAKE WHITEFISH** (*Coregonus clupeaformis*)

NOT FOUND IN PENNSYLVANIA

CHAR?

State Fish Facts

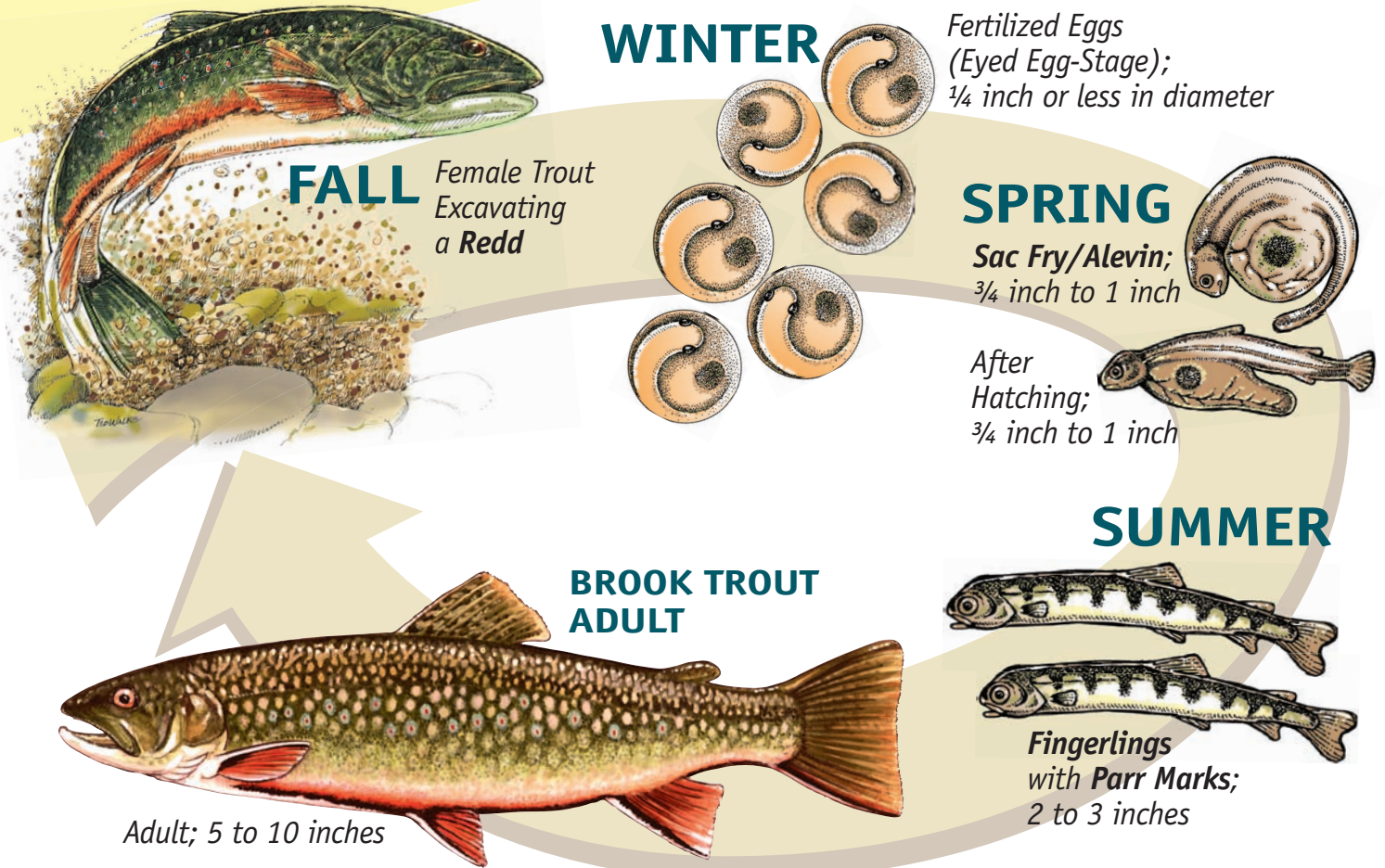
Brook Trout are classified as char, not trout. Chars live more north than other Salmonids. They prefer cold, clean, high-oxygenated waters. Today, their home waters are small **headwater streams**. Nicknames for the Brook Trout include speckled trout, squaretail or brookies.

Before European settlement, Brook Trout lived in most Pennsylvania streams. The growing human population resulted in landscape changes. Timber was overharvested, coal was mined and flowing waters became sewers. Populations of Brook Trout were eliminated from many waters because of the resulting pollution, habitat loss and warmer waters.



There's No Place Like Home!

Brook Trout Life Cycle



What's for Dinner?

Brook Trout eat aquatic and land insects, other fish, **crustaceans**, worms and more. Learn what they eat during each life stage in the wild and in a hatchery.

WILD BROOK TROUT

Egg: nutrients from the yolk

Sac Fry: nutrients from the yolk sac

Fry: plankton and other microscopic organisms in the stream

Fingerling: aquatic insects (i.e.: stoneflies, mayflies and caddisflies) as well as land insects (i.e.: ants, beetles and grasshoppers) and small fish

Adult: other fish, aquatic and land insects.

HATCHERY-RAISED BROOK TROUT

Egg: nutrients from the yolk

Sac Fry: nutrients from the yolk sac

Fry: granular food about the size of black pepper


Fingerling: granular food about the size of cornmeal

Adult: granular food pellets about the size of Grape Nuts™ cereal


What are the Differences?

Wild Brook Trout


FALL

- Adult females (2 to 5 years of age) select clean gravel to create a nest called a redd. 
- Female trout lay less than 100 to 1,000 eggs.
- About 1 to 2 percent of the eggs will survive.


WINTER

- The fertilized eggs develop. 
- Within about two weeks, the egg develops eyes (eyed egg-stage).
- The egg gets oxygen from the water flow around it.
- Nutrition for the trout comes from the egg yolk.
- At this stage, the trout are very sensitive to changes in water temperature and quality.

SPRING

- Developing eggs, still in the redd, hatch from February to March. 
- Fry live off the yolk sac.
- Between March and April, after absorbing the yolk sac, the "swim-up" fry emerge from the gravel to begin eating small insects and plankton.

SUMMER

- Young trout are active along calm edges of runs and riffles and hide among rocks, tree roots and grasses. 
- Trout are 2 to 3 inches long by the end of summer.

Hatchery-Raised Brook Trout

FALL

- Pennsylvania Fish & Boat Commission hatcheries collect eggs from 2- to 4-year-old "brood stock" trout.
- On average, about 4,000 eggs are produced from a female trout.
- Eggs are mixed with sperm/"milt" from a male trout.
- Eggs are placed in indoor hatching trays.
- Eggs hatch in about 44 days in 50-degree F water.

WINTER/EARLY SPRING

- It takes 2 to 4 weeks for the sac fry to absorb the yolk sac.
- When the yolk sac is absorbed, the "swim-up" fry are moved to indoor tanks
- Tanks hold about 50,000 fry.

SPRING

- After 8 to 10 weeks, most of the young trout are moved outside into raceways.

SPRING/WINTER

- Trout are fed pellets for 12 months and grow 11 to 12 inches long.

THE FOLLOWING SPRING

- Trout are weighed, counted and loaded into stocking trucks.
- Trucks hold a maximum of 3,500 10-inch trout.
- Waterways Conservation Officers stock the trout with help from volunteers.

Answers to Life of a Trout

Life Cycle Match: (First page of stream, from top to bottom) Fertilized Egg, Sac Fry, Fry, Fingerling; (second page of stream) Adult.

Key Habitat 1 is **Riffle**; Key Habitat 2 is **Run**;
Key Habitat 3 is **Pool**.

Rainbow Trout is **NON-NATIVE**
Brook Trout is **NATIVE**
Steelhead is **NON-NATIVE**
Brown Trout is **NON-NATIVE**

Life of a Trout

Circle native or non-native for each trout below. Look back to *"Who's Related to Whom?"* to discover which of these trout is native to Pennsylvania. Label each of the habitats below using the information on the next page in *"Key Habitats."* Cut out each of the life cycle stages on the next page in the *"Life Cycle Match"* box and paste them on the stream in life cycle order.

Rainbow Trout



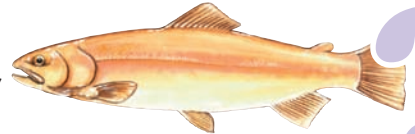
NATIVE/NON-NATIVE

Brook Trout



NATIVE/NON-NATIVE

Golden Rainbow Trout



NATIVE/NON-NATIVE

Key Habitat 1:

Key Habitat 2:

Steelhead



NATIVE/NON-NATIVE

Brown Trout



NATIVE/NON-NATIVE

PLAY

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Photo: Jeff Decker

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Key Habitat 3:

www.fishandboat.com

Key Habitats

- ✿ **Riffle:** shallow, fast water agitated by rocks.
- ✿ **Run:** any body of water that runs smoothly downstream.
- ✿ **Pool:** deep, slow-moving water that is formed from the force of the water falling over boulders or logs in the stream.

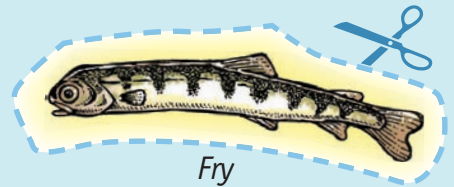
Life Cycle Match



Fertilized Egg



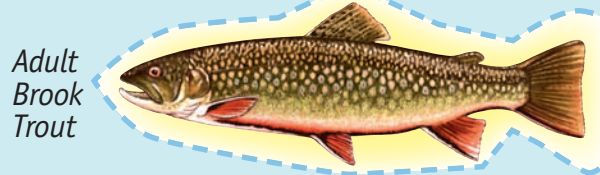
Sac Fry



Fry



Fingerling



Adult
Brook
Trout

*To learn
more, visit:*

Pennsylvania Trout In the Classroom
www.patrountintheclassroom.org

Habitat and the Brook Trout

www.fishandboat.com/anglerboater/2000/marap00/habtrout.htm

Approved Trout Waters

www.fishandboat.com/fishpub/summary/troutwaters.html

Pennsylvania Trout Stocking Schedules

www.fishandboat.com/stock.htm

Pennsylvania Cooperative Nurseries

www.fishandboat.com/coopnurs.htm

