

## Ponds & Streams

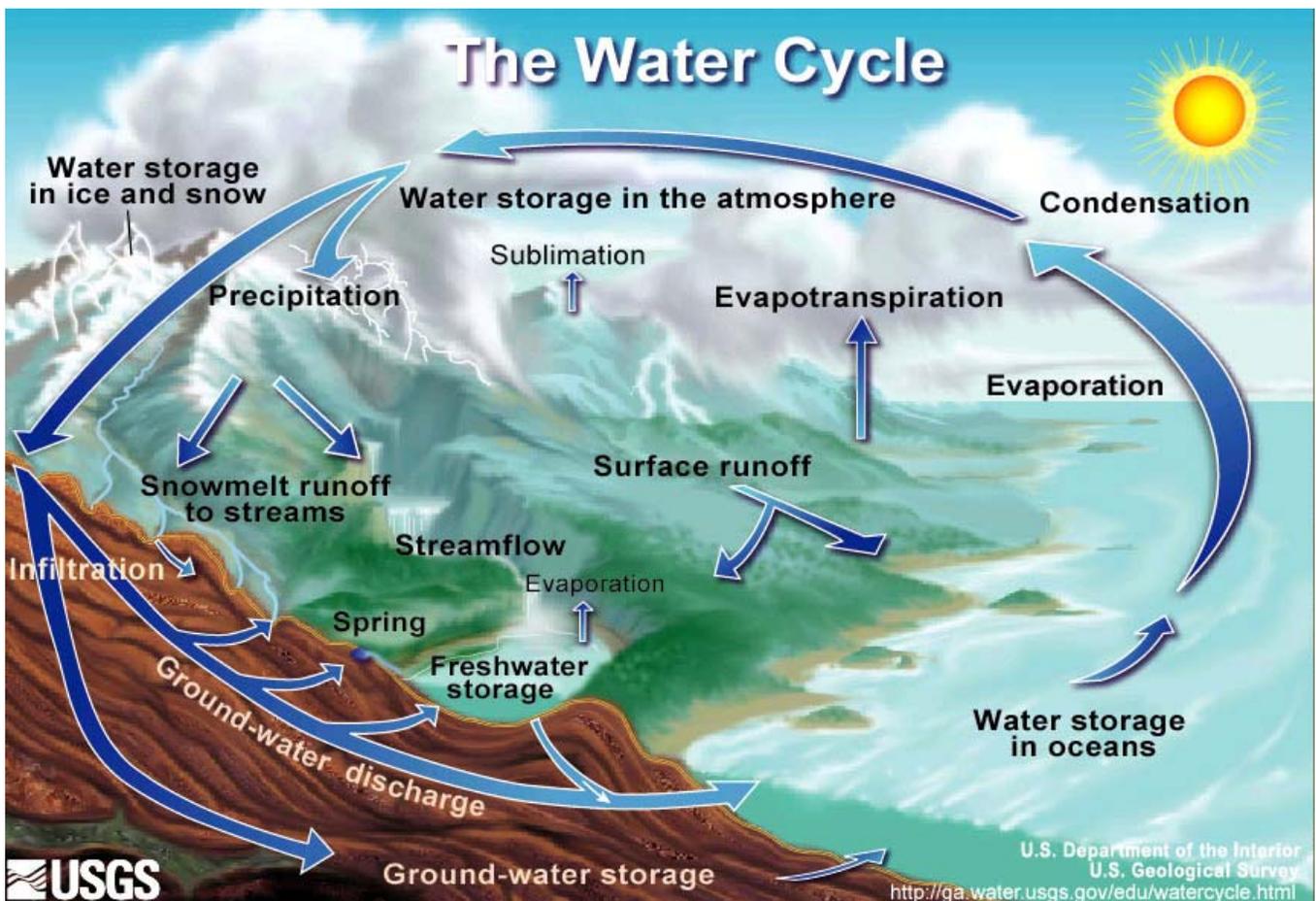
### What They Are, What Lives There, and What We Can Do To Protect Them

Water.

We drink it. We wash ourselves with it. We clean our clothes and homes with it. We water our flowers and crops with it. We swim and fish and boat in it. We transport many of our goods on it. We can even use it to generate electricity. Water - we can't live without it, and neither can all other creatures.

But do we think much about it? Do we understand where it comes from and how it cycles? Do we know how it gets polluted and how it gets clean? Do we realize how we can protect it and how we can conserve our supplies?

Rain falls from the sky. But how did the water to make the rain get up there? Where does the water go once raindrops hit the earth? How does the water get back up in the sky to rain again?



Water cycles, moving from the air to the land and back to the air again.

Rain can hit the earth and be directly evaporated back up into the air. Rainfall can end up as surface water in our oceans, rivers, streams, wetlands, lakes, and ponds. It also soaks into our soils where it is used by plants, then sent back into the air. The rainwater can also infiltrate deep under the soil to our groundwater supply, where it seeps back out into springs and creeks – or where we can pump it from wells.

Here in Pennsylvania, we have over 45,000 miles of rivers and streams – more than one quarter of which are impaired, and nearly 30,000 miles of lakes, reservoirs, and ponds. That’s a lot of water!

Ponds are part of the “lentic” ecosystem of still waters – like lakes, marshes, and pools. Ponds are different from lakes in that sunlight reaches the bottom of ponds, but does not reach the bottom of lakes. Ponds typically have warmer water than do streams. Large plants, fish, insect larvae or nymphs, and microscopic plants and animals adapted to live in still waters are found in healthy ponds and lakes.

Some are adapted to life at the water surface, others live on the bottom or in the open water in between. Some live near the shore where the water is shallow and warm, and others need to be in the middle where the water is deeper and cooler.

Some animals and plants need to live near the edge of the pond or lake where they find ample food and safe places for shelter.



thefeltsource.com

Streams are part of the “lotic” ecosystem of flowing waters – like springs and rivers. Streams Depending upon the stream channel bottom, the water will be shallow flowing quickly and turbulently, or be deeper flowing slowly and calmly. Sunlight will reach the bottom of the channel, but branches of trees and shrubs along the streambanks will shade the water and help keep the temperature lower.

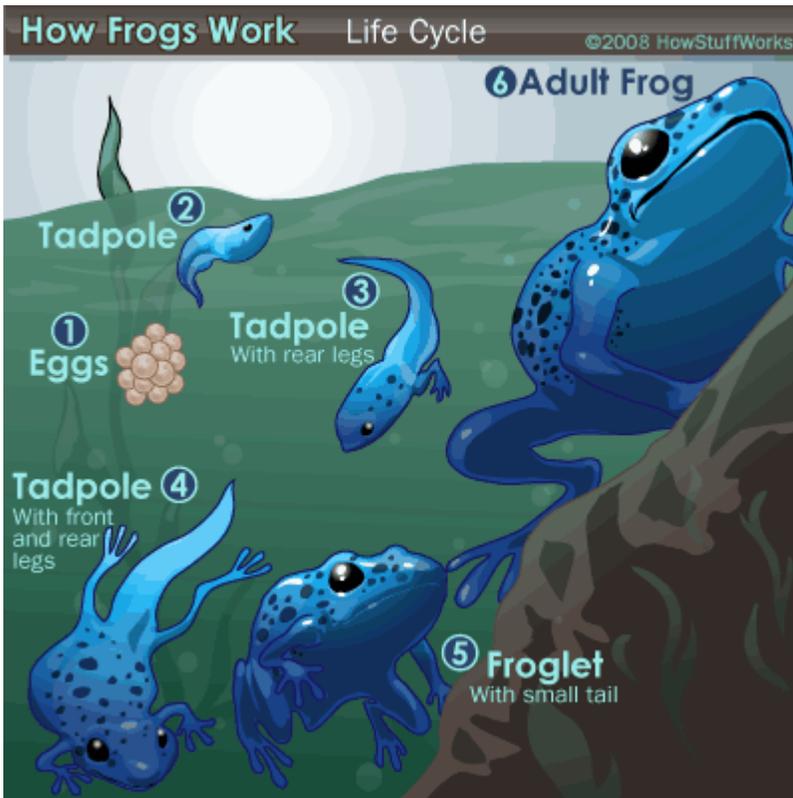
Rivers are wider and deeper than streams, and they also flow more slowly. Around here, streams are found where land is steeper, so water flows downhill faster than in rivers.

Animals and plants found in streams are adapted to shallow, quickly flowing water that contains a lot of oxygen. They can live on the bottom, where the current is slower, or they can live in the open water. They can live in the fast-flowing, turbulent riffles, the slower moving runs, or the deeper pools. Aquatic insect larvae or nymphs may live at the bottom of a stream, but the adults hatch and live outside of the water on land.



scientificillustrator.com/art

The types of animals and plants living in streams and ponds tell us a lot about how clean the water is. Some are adapted to live in polluted waters, while others cannot tolerate pollution at all. This is one reason we study the organisms that live in ponds and streams.



[www.freewebs.com/](http://www.freewebs.com/)

### Frog or Toad Life Cycle



[www.eNature.com/](http://www.eNature.com/)  
**Eastern Toad**



[www.eNature.com/](http://www.eNature.com/) **American Bull Frog**



[www.eNature.com/](http://www.eNature.com/)

**Northern Leopard Frog**



[www.vistingnature.com/](http://www.vistingnature.com/)

**Green Frog**

### Frogs & Toads

Frogs and toads are amphibians, meaning they spend part of their life cycle in the water. Eggs are laid there, then hatch into tadpoles which live there while growing into adults with lungs, legs, and no tails.

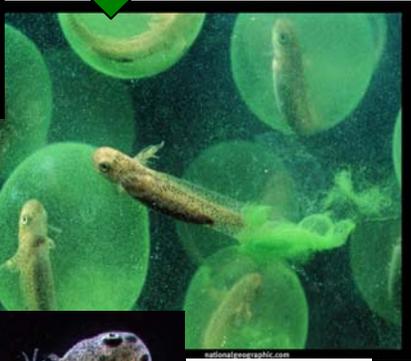
Adults may live near water, but spend part of their time on land. Even with lungs, they can absorb oxygen through their thin skin, which must always be moist. This also makes them vulnerable to pollutants and a good water quality indicator.

They are predators, eating insects, worms, and other small creatures. There are 17 frog and toad species in Pennsylvania.

Egg masses are laid in water



Algae hide the eggs until they hatch



Eggs hatch into larvae



Larvae grow legs

Larvae develop lungs and become adults



[www.fs.fed.us/](http://www.fs.fed.us/) [www.nature.com/](http://www.nature.com/)

## Salamanders

Like frogs and toads, salamanders are amphibians. They lay eggs in water and have aquatic larvae similar to tadpoles. Many species of adults stay near clean streams or springs.

In addition to their lungs, salamanders have the ability to breathe through their delicate skin. They are prone to diseases and very sensitive to pollution and habitat destruction, making them good indicators of stream health.

And like frogs and toads, they are carnivores. Pennsylvania is home to 22 salamander species.

## Salamander Life Cycle



[www.fish.state.pa.us/](http://www.fish.state.pa.us/)

Spotted Salamander



Red Eft (subadult) & Red-spotted Newt

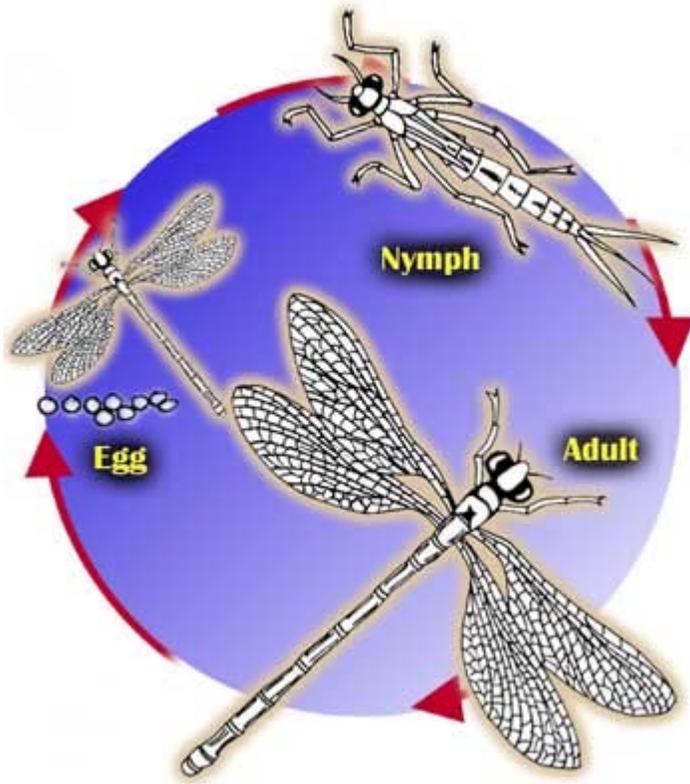


[www.fish.state.pa.us/](http://www.fish.state.pa.us/)

Northern Dusky Salamander



[www.npwrc.usgs.gov/](http://www.npwrc.usgs.gov/)



[www.kidfish.bc.ca/](http://www.kidfish.bc.ca/)

### Damselfly Life Cycle

### Damselflies

Damselflies spend their nymph stage in ponds, lakes, or streams. Nymphs can tolerate some pollution. While they have three “tails” like mayflies, theirs look more like little paddles.

Damselflies are thinner than dragonflies. When at rest, adult damselflies fold their wings up across their backs. Dragonflies hold their wings out to the sides.

Both damselflies and dragonflies are predators with excellent eyesight, eating many harmful insects such as mosquitoes.



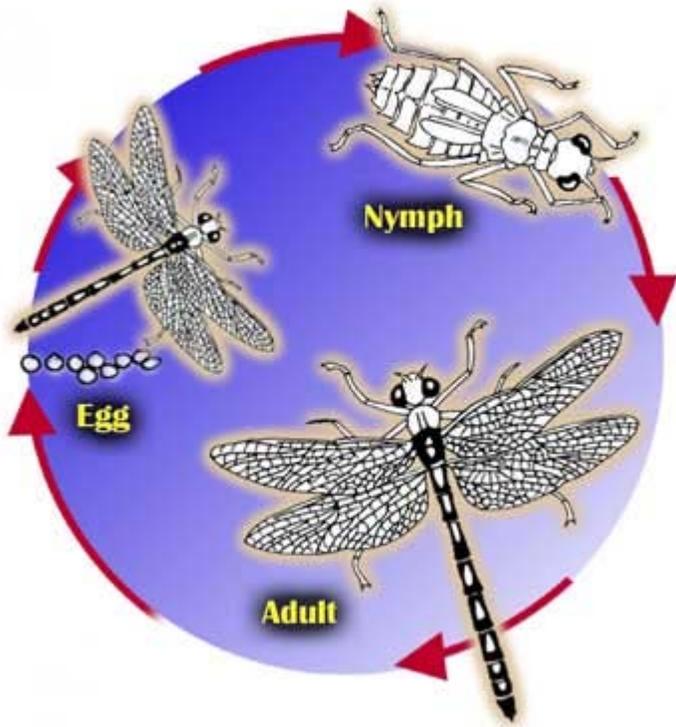
[www.nature.ca/](http://www.nature.ca/)



[www.augsburg.edu/](http://www.augsburg.edu/)

### Black-winged Damselfly

## Dragonflies



[www.kidfish.bc.ca/](http://www.kidfish.bc.ca/)

### Dragonfly Life Cycle



[www.austmus.gov.au/](http://www.austmus.gov.au/)



[www.cirrusimage.com/](http://www.cirrusimage.com/)

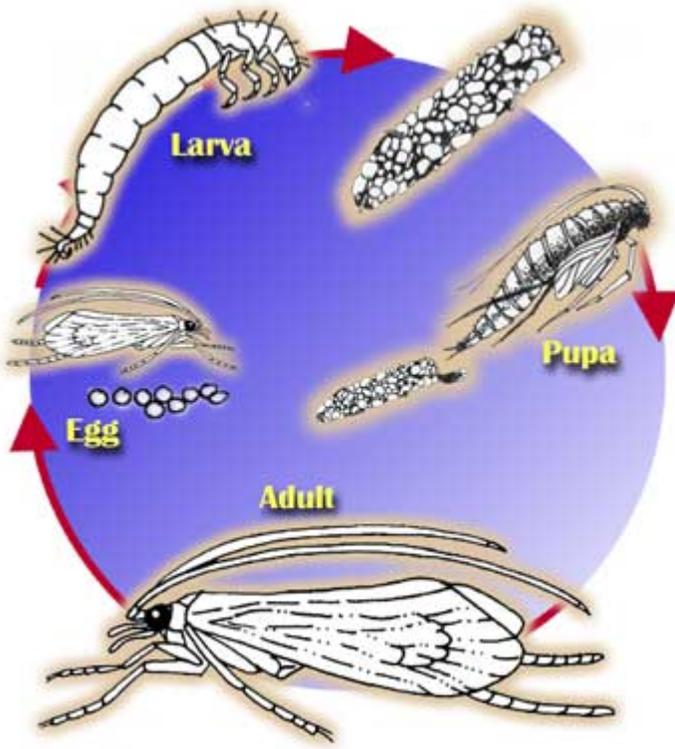
### Twelve-spotted Skimmer Dragonfly

## Caddisflies

Like mayfly and stonefly adults, caddisfly adults live out of the water for a short time, but their young live in streams for months.

Many caddisfly larvae build cases from stones or sticks to protect their soft bodies. A few build only nets to catch their food, and some are free-living. All are important food for fish.

Pennsylvania has 320 species of caddisflies. Certain types are very sensitive to polluted waters, yet others are very tolerant. Scientists are now determining which are the best indicators of good quality water.



[www.kidfish.bc.ca/](http://www.kidfish.bc.ca/)

### Caddisfly Life Cycle



[www.fulton.k12.mo.us/](http://www.fulton.k12.mo.us/)



[www.naturalresources.nsw.gov](http://www.naturalresources.nsw.gov)



[www.extension.umn.edu/](http://www.extension.umn.edu/)

### Northern Caddisfly

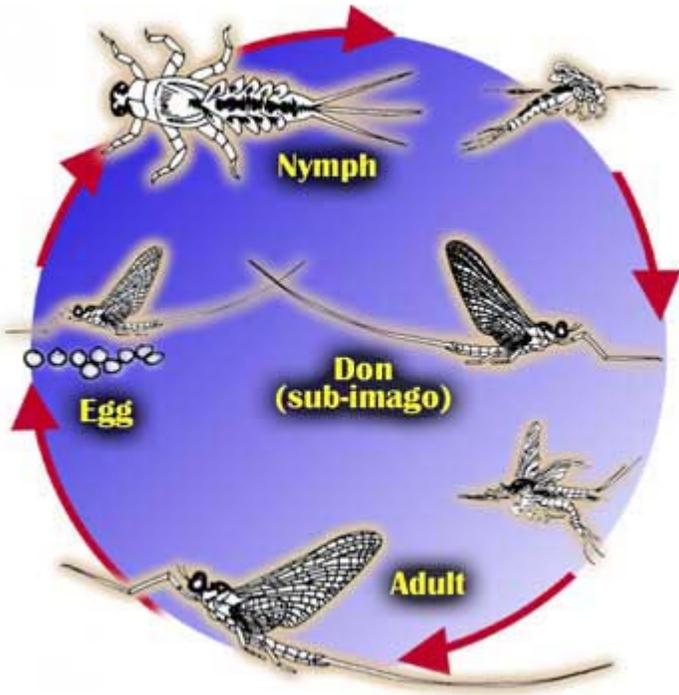
## Mayflies

Adults live anywhere from a few hours to a few days, but the nymph stage lasts months.

Nymphs, which appear to have three tails, live in flowing water that has lots of oxygen. They cannot tolerate much pollution. As clingers, crawlers, or swimmers, most eat vegetative matter, and all are important food for fish.

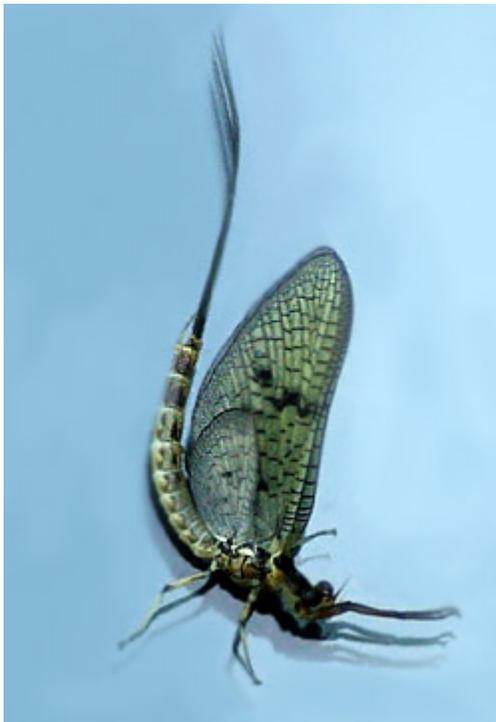
Mayfly nymphs of the same species living in the same stream will hatch at the same time, creating an impressive sight as hundreds split their skins, dry their wings, and leave the water.

Pennsylvania has 230 species of mayflies.



[www.kidfish.bc.ca/](http://www.kidfish.bc.ca/)

## Mayfly Life Cycle



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[www.sportfishingbc.com/](http://www.sportfishingbc.com/)



[www.en.wikipedia.org/](http://www.en.wikipedia.org/)

## Black Quill Mayfly

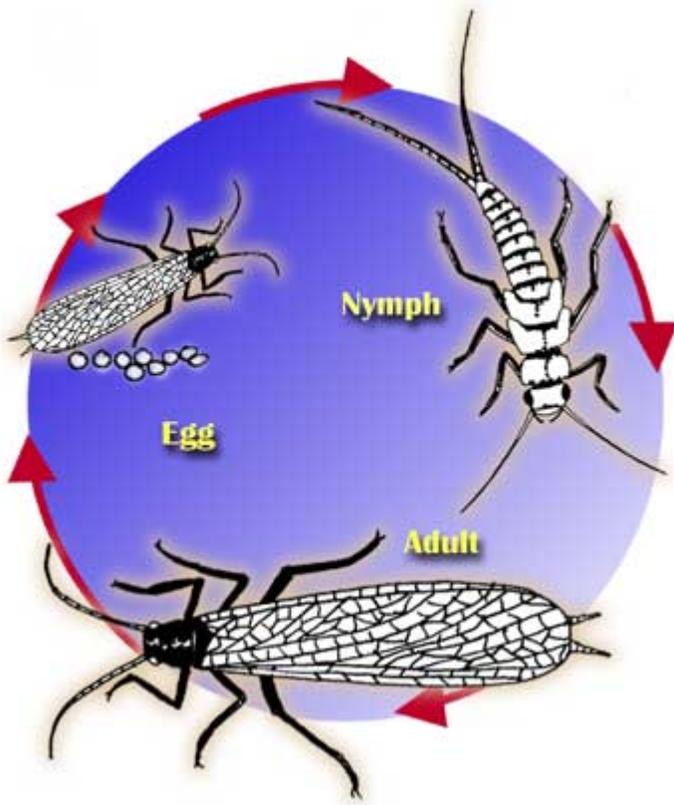
## Stoneflies

Stoneflies are very ancient insects. Their young live under water and are sensitive to pollution, but adults live on land.

Sometimes confused with mayfly nymphs, stonefly nymphs have long antennae and two "tails." As predators, they have wide heads and large mouth parts.

Their claws and flattened bodies allow them to crawl on stream bottoms in fast moving water. As with caddisflies and mayflies, stonefly young are an important fish food supply.

Pennsylvania has 134 stonefly species.



[www.kidfish.bc.ca/](http://www.kidfish.bc.ca/)

### Stonefly Life Cycle



[www.eol.org/](http://www.eol.org/)



[whatsthatbug.com/](http://whatsthatbug.com/)

### Yellow Sallie Stonefly