

Wildlife Express!



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Madness!





Let's Look At ... Caddisflies

Can you think of an insect that lives most of its life in water and builds a home for protection? It's the caddisfly.

In North America, there are over 1,200 different kinds of caddisflies, and worldwide there are over 7,000! Many species of caddisflies look similar and telling them apart can be difficult.

Caddisflies are insects that have four stages in their life cycle. They lay their eggs in water. The eggs hatch, and caterpillar-like **larvae** (LAR-vee) crawl out. The larvae turn into **pupae** (PYU-pee),

and the pupae into adults. Only the adults can survive out of water.

Caddisfly larvae are builders. They make a silk from the spit in their mouths. Some caddisflies use the silk to spin webs or tunnels. These caddisflies are predators. They trap very small animals in the sticky webs.

Most caddisflies are not predators. They eat dead and sometimes living plants. These caddisflies use the silk as glue. As they spin silk, they mix in sand, twigs or grass. This makes a case, or shell, around their soft bodies. The case is held in place by a pair of hooks on the tip of the insect's body. As the insect grows, it just adds onto the case.

The case protects the caddisfly. It looks like a little twig or rock in the water. This **camouflages** (KAM-e-flazh-es) the caddisfly and makes it harder for predators to see it.

Caddisfly larvae need oxygen to survive. They use the same thing fish use to get oxygen out of the water – gills. Caddisflies do not have gills on their heads like fish do. Their gills are on the bottoms or tips of their bodies. Adults do not live in water, so they do not have gills. Air enters and leaves their bodies through **spiracles** (SPIR-i-kels). Spiracles are holes in the insects' bodies.

Caddisfly adults look very different from the larvae. They look like moths that have lost the scales on their wings. Long, silky hairs cover caddisfly wings. Adults are brown to yellowish-brown in color. They have big eyes and long **antennae** (an-TEN-ee). When resting, caddisflies place their wings like a tent over their bodies.

Caddisfly adults do not live long. Once they leave the water, most never eat again. They breed, lay their eggs and die.

Adult caddisflies are **nocturnal** (nok-TURN-l) or active mostly at night. During the day, they hide in cool, moist places around riverbanks, lakes and ponds. At night, caddisflies often swarm around lights.

You might think that caddisflies would not be an important insect, but they are. They are fish food and are important links in food webs. They also are used to judge whether a stream is polluted. Caddisflies have a hard time living in polluted water.

Caddisflies are very interesting insects. Look for caddisfly cases next time you are wading in a stream or pond. They might tell you something about your favorite swimming hole.



Caddisfly homes

Aquatic Insects

Aquatic insects have some things in common with all insects. They have six legs. They have no bones but are covered by an **exoskeleton** (ek-so-SKEL-et-en), a shell similar to your fingernails. They also have three main body parts: **heads**, **thoraxes** (THOR-aks-es) and **abdomens** (AB-de-mens).

To be called aquatic insects, insects must spend part of their lives in water. They may live beneath the water surface or skim along the top. Some examples of aquatic insects are mosquitoes, dragonflies and caddisflies. Aquatic insects come in many shapes and sizes, and they all have some interesting ways of dealing with living in and on water.

If you were an insect living underwater, how would you breathe? Insects are animals, so they need oxygen to survive. Many aquatic insects have gills, just like fish. The gills may be attached to the outside of the insect's body or found inside the body. Some insects have tubes sticking out of their abdomens. They stick the tube above the water and breathe the same air you do. They may even stick the tube into plants underwater. They get oxygen straight from the plants that make it! Other aquatic insects, like diving beetles, grab bubbles of air and pull them underwater. The beetles carry the bubble in their back legs as they swim underwater. Once they have used all the air in the bubble, they go up and grab another bubble.

To get around underwater, many insects have legs and feet that are shaped like paddles. The two back pairs of legs on the giant water bug are wide, flat and hairy. The legs are perfect oars to push the bug through the water. Some aquatic insects are jet propelled. They force water out of their abdomens and shoot through the water. Insects that do not swim usually have hooks on their bodies that help them cling to rocks and plants. The hooks help keep them from being swept away by water currents. Have you ever seen an insect skate on top of the water? These insects have hairs and wax on their feet and legs that keep them from sinking into the water. Instead, they glide along the surface.

These are just a few ways insects deal with living in water. Can you think of others?



Wonderful Wetlands

Wetlands are like the rainforests of North America. You can find more plants and animals living in them than any other place.

Wetlands are areas where land and water meet. By their name, you may think wetlands would be covered by water. Well, they may be, but wetlands are not always wet. Areas need more than just water to be called wetlands. They need three things: water, soils that hold onto water and water loving plants. If one of these is missing, the area is not called a wetland.

There are many different kinds of wetlands. In Idaho, you may hear wetlands called **riparian** (ri-PAR-ee-en) areas. This is the green area between the water's edge and the start of drier plants like sagebrush or forests. Wetlands around flowing water, like rivers and streams, are called marshes and swamps. Marshes have grass-like plants. Cattails are found in marshes. Swamps are wetlands with woody plants. Cottonwood trees and willows are found in Idaho's swamps.

Idaho also has wetlands called bogs and fens. Bogs and fens are very old. In Idaho, they are from 4,000 to 60,000 years old! They also take a long time to form. They grow only one inch every 100 years. Peat moss and other mosses are found in bogs and fens. Many plants have a difficult time living in bogs. The soil is high in acid and low in nutrients, so plants need other ways to get the things they need to live. Two plants, sundews and bladderworts, eat meat. These plants capture insects in long, hairy, sticky leaves.

Playas (PLY-as) and potholes are also found in Idaho. Playas are found mostly in southern Idaho, and they are often dry. They may hold water for just a few weeks. These small lakes are important to wildlife. Many toads lay their eggs in playas, and birds use them as places to rest during spring migrations.

Wetlands are very important. They clean water. The slower water moves, the less dirt and pollution it can carry. Wetland plants slow down water, and dirt and pollution are filtered out.

Wetlands are needed for the survival of wild animals. Seventy-five out of 100 wild animals in Idaho use wetlands at some time in their lives. Wetlands offer wildlife the food and shelter they need.

Wetlands also help to feed people. Wetlands are our grocery stores. Have you ever eaten rice? Then you have eaten a wetland plant. Shrimp, fish and clams are other important foods that come from wetlands.

Wetlands, they sure are more than just wet dirt.



Bone Free Critters

Animals with no bones? You bet! Animals that do not have bones are called **invertebrates** (in-VERT-e-brets). There are more invertebrates living on earth than any other animals. They make up 98 percent of all animals on earth.

Invertebrates come in many shapes and sizes. Crabs, spiders, insects, snails, clams, worms, sea stars, mites and jellyfish are all invertebrates. Most invertebrates are small, but one invertebrate is huge. The largest invertebrate lives in the ocean. It's the giant squid. They can be over 40 feet long! The smallest invertebrate cannot be seen with human eyes. You need a microscope to see **protozoan** (prot-e-ZO-en). They are one, single cell.

Unlike people, invertebrates do not have a backbone to support their bodies. They may have a hard exoskeleton, like a beetle, or they may be covered with a soft skin. Invertebrates that are covered with a soft skin still need to protect themselves. They may hide under rocks and logs or make a hard shell to protect their bodies. Can you think of an invertebrate that does this?

Invertebrates are everywhere. Look around your house and yard. The number of invertebrates you find might surprise you.

Critter Condos

Do you live in a condo? How about an apartment or house? Animals need homes, too.

Many critters build their own homes. All animals need homes of some kind. Animals need protection from weather and predators. They also need safe places to raise their babies. Animals' homes may be as small as a caddisfly's case or as big as a bear den.

Animals use an amazing variety of materials to build their homes. Some animals use their own spit. Paper wasps mix chewed up wood with their spit to make a paper paste. They use this paste to make their nests. Their nests are full of cells. The cells give the queen a place to lay her eggs and a place for the colony to live and store food.



Caddisflies are animals that make and take their homes wherever they go. Snails and clams also do this with the shells they make. Can you think of another animal that has its home on its back?

Some animals make burrows. They dig in the ground and make a tunnel with a room at the end.

Badgers and ground squirrels are animals that make burrows. Pocket gophers make large underground homes. A gopher's home, with all its tunnels and rooms, can be bigger than a football field! Their homes have an upstairs and a downstairs. Upstairs is the gopher's grocery store. The gopher tunnels along and eats plants and roots. The downstairs tunnels of a pocket gopher's home may be six feet under the ground.

Downstairs is where the pocket gopher sleeps, stores its food and goes to the bathroom. They have bathrooms in their homes, just like you!

Beavers are amazing builders. Have you ever seen a beaver dam? The dam holds water from a stream and makes a deeper lake. Beavers build their homes, called a lodges, in the middle of the pond that they made. Their home is well protected from predators by the water surrounding it.

Animal homes might be a small condo, like a hummingbird nest, or a large mansion, like the gopher's tunnels and burrows. They are everywhere and are made of many different things, but they all give animals the shelter they need.



Backbone Connected To ...

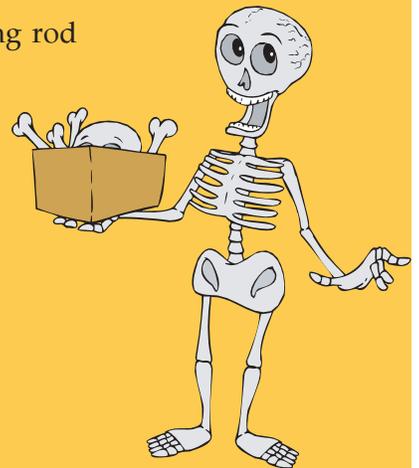
Vertebrates (VERT-e-brets) are animals that have a flexible, supporting rod running down their bodies. In most vertebrates, this rod is a backbone.

You can probably think of a vertebrate. Whales, dogs, fishes, birds, snakes, frogs, monkeys, mice and you are examples of vertebrates.

Almost all of the world's largest animals are vertebrates.

All vertebrates that live on land have the same bones in their skeletons. They all have arm and leg bones, ribs, backbones, and toe and finger bones. Each animal's bones might be a bit different to help it with its special way of life. The finger bones of bats are longer than most vertebrates. These long bones allow bats to use their hands like wings and fly.

Vertebrates can be found on land, in the sea and in the air. With their bodies supported by skeletons, vertebrates have no problem living in almost any habitat. Look for vertebrates around your house. It shouldn't be hard. All you need to do is look in a mirror!



Water Woes

Water – it can be a matter of life or death. We, along with many other living things, need water everyday to survive. It is so important to have clean water, but some times water might not be as clean as it looks. When water is unfit to use, it is considered polluted.

There are two different kinds of water pollution. **Point pollution** is pollution that is put right into the water. You can usually point right at it. **Nonpoint pollution** is pollution that has run into the water from another place. An oil spill from a boat would be point pollution. Fertilizer running off a lawn and into a stream would be nonpoint pollution.

Sometimes polluted water is easy to see. Dirty, brown water is often polluted by soil and fine, light dirt, called silt. Silt can be harmful to animals living in the water. Silt falls out of the water and settles in the rocks at the bottoms of rivers and streams. Silt can suffocate insects, like caddisflies, living on the rocks. Fish also have a harder time getting oxygen out of silty water.

Is hot water pollution? It can be if the water is not supposed to be hot. Some factories take water out of rivers to cool their equipment. Cold water from the river runs over hot machines and cools them. The now hot water is then put back in the river. The change in temperature can be harmful to the plants and animals living in the river. Some rivers have "dead zones" where hot water or chemicals are poured into the river. Nothing grows in dead zones.

The government has passed many laws that help protect our water from pollution. These laws have helped to clean up polluted water across the United States. There are things you can do, too. Don't pour anything down a storm drain. These are the grated holes you see along streets. Usually storm drains run right into a river or stream. In Idaho's capital city, Boise, the storm drains run into the Boise River. If someone puts motor oil down a storm drain, that oil goes right into the river. Imagine swimming in that. Yuck!

Water is too important to us to pollute. Think about ways you might help protect water where you live.



Above: This frog has more legs than it needs. This could have been a result of pollution.



camouflaged grasshopper

Now You See Me, Now You Don't

Have you ever seen a stick crawl? How about a leaf fly or rock blink? You might have if you were seeing an animal **camouflage** (KAM-e-flazh) itself.

Camouflage means to blend in with your surroundings and hide. It is a type of disguise (dis-GIIZ). Camouflage may be a certain color, pattern of colors, or a special shape that fools the eye. Camouflage may help an animal to hide, or it may help a hunter to sneak up on its prey.

Insects are animals that use camouflage a lot. Caddisflies make cases out of twigs and gravel. The cases blend into the rocks and plants and help hide caddisflies from hungry trout. Many insects look like leaves or twigs. No matter how hungry a bird is it might miss the green, leaf-shaped insect.

Toads and turtles also use camouflage. Their colors and shapes may look like rocks. This makes it easier for them to sneak up on insects to eat. It also makes it harder for predators to see them.

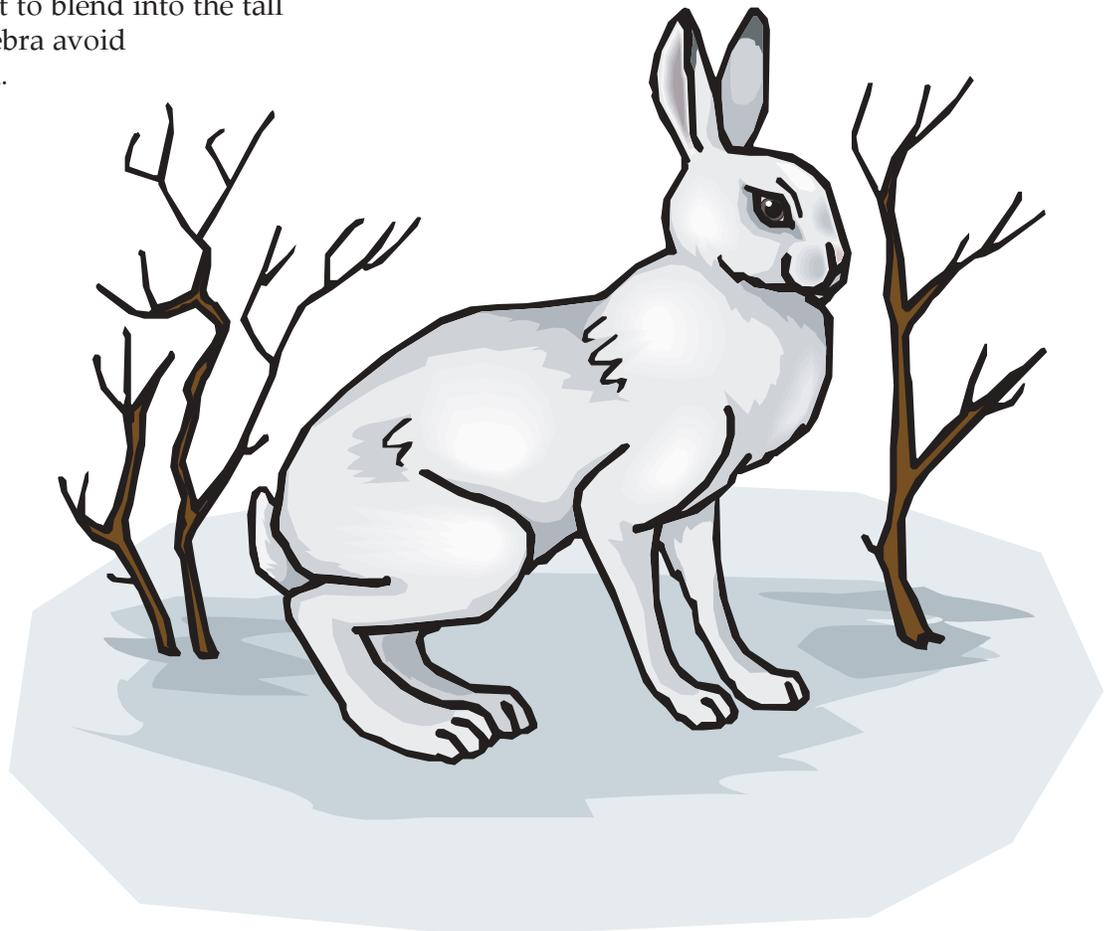
Many animals change their colors with the seasons. Animals that change color to match their background are using **cryptic** (KRIP-tik) coloration. This is what weasels and snowshoe hares do. When snow starts to fall, their coats gradually turn white to match.

Animals may even change colors and patterns through out their lives. Deer fawns are born with tan coats that have white spots. The spots match the sun and shade that dapple the tall grasses where the fawns hide. As long as the fawns do not move, predators will have a difficult time seeing them. As deer fawns grow older and can run faster to escape danger, the spots fade away.

Do you think zebras are camouflaged? They are not camouflaged for our eyes. Their black and white stripes stick out against the grasses of Africa, but that is not true for lions' eyes. Lions are color blind to red and green. Grasses and trees look like shades of gray.

The zebras' stripes help it to blend into the tall grasses. This helps the zebra avoid becoming the lion's meal.

Whether hunter or hunted, camouflage helps animals to survive.





Nature's Red Flags

Have you ever heard anyone say, 'that put up a red flag'? That person meant that they got a clue that something was wrong. Nature has red flags, too. Nature's red flags are called **indicator species** (in-de-KAAT-er) **species**.

Indicator species may be animals or plants. These plants and animals are the first to react if their habitats change. By keeping an eye on them, scientists get hints about the health of an ecosystem.

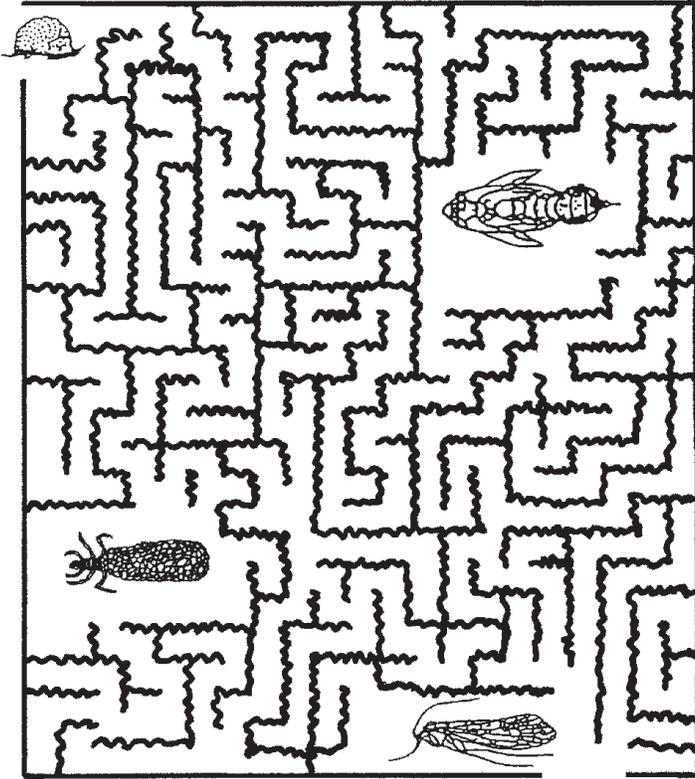
Caddisflies and other aquatic insects are indicator species of water pollution. Some species are more sensitive than others and will die quickly in polluted water. Scientists look at streams and count how many and what types of insects they find. The fewer the number of caddisflies, the more polluted the water. Scientists use aquatic insects as tools to see if a stream is unhealthy.

Frogs are also animals that are affected by pollution and chemical changes. Frogs have thin skins. They can breathe through their skin. Oxygen can pass right through it! But that also means chemicals and other harmful things can enter their bodies through their skin, too.

Indicator species can be helpful. They give clues that something is wrong in nature. Often before scientists can see the problem themselves. This extra amount of time is important. It might mean saving an ecosystem, before it is gone forever.

A Mazing Life Cycle

Follow the maze to discover the caddisfly's life cycle.



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WE WOULD LIKE TO HEAR FROM YOU !

If you have a letter, poem or question for Wildlife Express, it may be included in a future issue! Send it to the address printed above!

Home On The Range

Each month we will show you the geographical range or distribution of our featured animal. Caddisflies are found throughout the entire United States.



Express Yourself!

Wetland Cinquain

Wetlands

Home to many things

Cleans and purifies water

Caddisflies, ducks, wonderful things

Moist earth

Ask your teacher for a list of animals that will appear in *Wildlife Express* this year and send us a poem about your favorite. We'll put one in each issue with your name and school. Send them to our address listed above.