

# Wildlife Express!

Volume 27/Issue 9

Aquatic Insects

May 2014



## Aquatic Insects



©2004 Cirrus Digital Imaging

# Aquatic Insects

**A**quatic insects have some things in common with all insects. They have six legs. They have no bones but are covered by an exoskeleton, a shell similar to your fingernails. They also have three main parts to the body: head, thorax and abdomen.

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. 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.

Aquatic insects are sometimes seen more as pests than having important roles to play on our planet. They may sometimes bother people, but aquatic insects help to keep our plant healthy. They are food for fish, birds, bats, spiders and even other insects. They help connect the links in food chains and webs. If there were no aquatic insects, what would the trout that you catch find to eat in the river? When you think about it, we are connected to aquatic insects in our human food webs.

Aquatic insects are amazing! Look inside this issue to learn more about some aquatic insects that call Idaho home. Then go exploring and look for them next time you are around a pond or stream.



©2014 Simon J. Tonge

# Toothed Dragons

**T**oothed dragons are flying around Idaho! Actually they are just dragonflies and damselflies. Dragonflies and damselflies are in the insect order Odonata. Odonata comes from the Greek word for “toothed.” Dragonflies have chewing mouth parts that have a serrated edge; they look a bit like teeth.

Dragonflies lay their eggs in water. The eggs hatch out into something called a naiad (NI-add). The naiad gets bigger and bigger until one day it crawls out of the water. The back on the naiad splits open, and out crawls the adult! Some species stay in the naiad stage for up to five years.

An amazing part of a dragonfly is the mouth. They have a powerful set of mandibles that are used to chop-up their prey, but the really amazing part is the labium (LAY-bee-um). It is sort of like a lower jaw. When a dragonfly is immature and living in water, it likes to eat slimy things. Tadpoles, small fish and other insects are all on the menu. To help

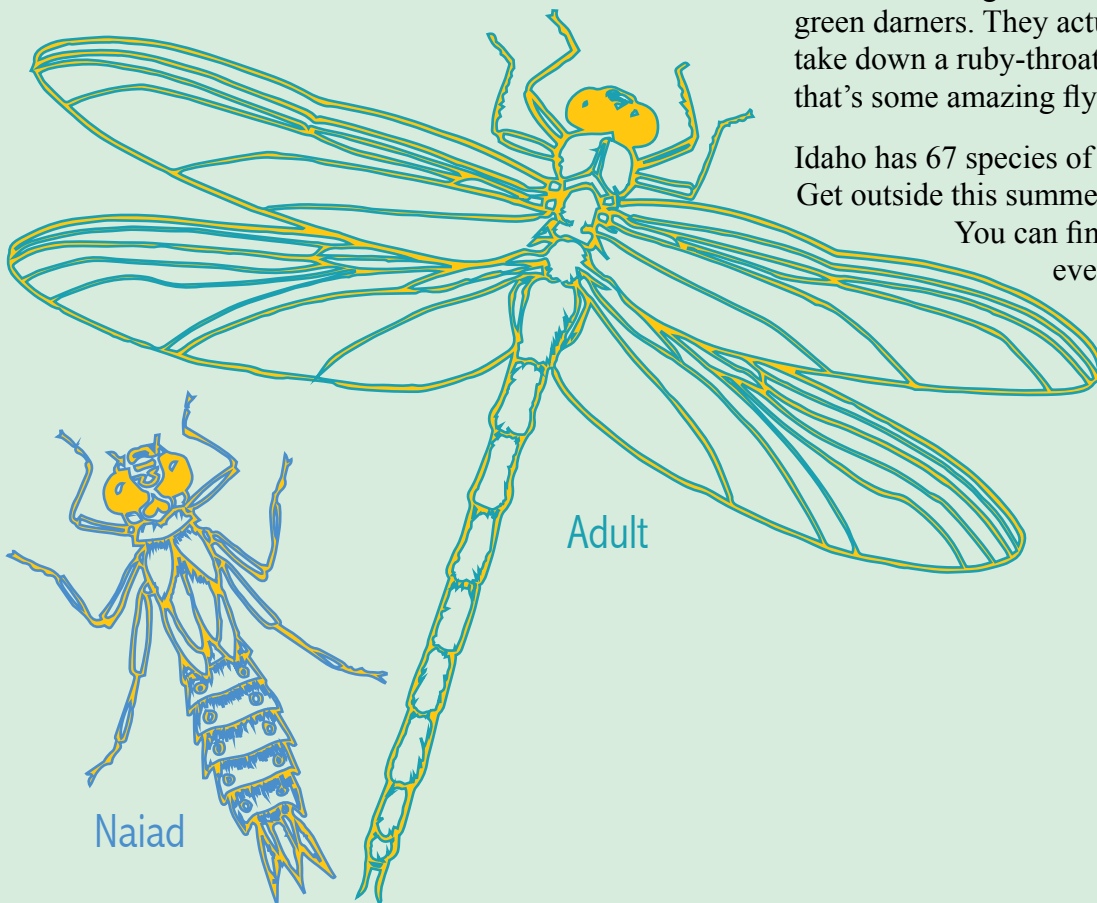
the dragonfly grab its slimy prey, the dragonfly can shoot the labium out to almost its body length. The labium has hooks on it so the prey can be dragged back to the mouth. As adults, dragonflies eat other flying insects. The adult dragonfly’s legs point forward like a basket. The basket is used to scoop insects right out of the air. Once a dragonfly has food in its grasp, dinner is served!

Have you ever sat along a pond on a summer day and watched dragonflies zip and buzz around you? Some might swoop down a little too close for your comfort! What you are witnessing is a battle over territory or space. It’s the males, not the females, madly buzzing around the pond. Some dragonflies are very territorial. They will try and chase off anything that gets too close. They will chase off dragonflies, birds, and even humans!

The largest dragonfly in Idaho is the green darner. The adults can reach a size of just over three inches. This dragonfly is a strong flyer. A group of bird watchers along the Eastern Coast of America saw an amazing event during the fall migration of green darners. They actually saw a green darner take down a ruby-throated hummingbird. Now that’s some amazing flying!

Idaho has 67 species of dragonflies and damselflies. Get outside this summer and look for them.

You can find a dragonfly just about everywhere in Idaho where there is water!





# Constructing 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; 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 crawl out. The larvae turn into pupae, 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 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. Adults do not live in water, so they do not have gills. Air enters and leaves their bodies through spiracles. Spiracles are holes in the insects' abdomens.

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. 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 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.



© Jason Neuswanger, Troutnut.com

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

## Nature's Red Flags

Have you ever heard anyone say, "That put up a red flag?" That person meant that he or she got a clue that something was wrong. Nature has red flags, too. Nature's red flags are called indicator 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.

Aquatic insects are used to detect water pollution. Some insects are more sensitive than others and die quickly in polluted water. Scientists count the number and types of insects they find in water. It is important to see if the numbers and types of insects they find change over time. Caddisflies are insects that are intolerant to water pollution. They are sensitive to changes in the water. If water quality is decreasing in a stream, the number of caddisflies will also decrease. The fewer the number of caddisflies, the more polluted the water. Scientists use aquatic insects as tools to see if a stream is unhealthy.

Indicator species give clues that something is wrong in nature. Sometimes people see changes in the "red flags" before they notice that anything else is wrong. This early warning is important. The sooner we know something is wrong, the faster we can make changes to fix the problem. It may make the difference between saving an ecosystem and losing it forever.

# Meet the Mosquito

**E**EEEE - A high-pitched whine buzzing in your ear. You may hear it while sitting around a campfire or while playing in your backyard. Just mention mosquitoes, and the skin on some people starts to itch and crawl. Whether you love them, hate them or just tolerate them, one thing's for sure, mosquitoes are interesting insects.

There are about 2,700 species of mosquitoes in the world. They may live in hot tropical forests or cold northern lands. Mosquitoes can be found from sea level to over 10,000 feet above sea level. Although they may be found in many different places, all mosquitoes need water. Mosquitoes lay their eggs in water and develop and grow in water. They have four life stages: egg, larva, pupa and adult. All life stages of a mosquito, except for the adults, are aquatic.

Male and female mosquitoes do not look the same. Females are usually larger than males and have thin antennae. Males have bushy, hairy antennae. Mosquitoes have short lives. It takes between seven to 14 days for a mosquito egg to become an adult. Adult female mosquitoes can live several weeks. Males usually live less than a week.

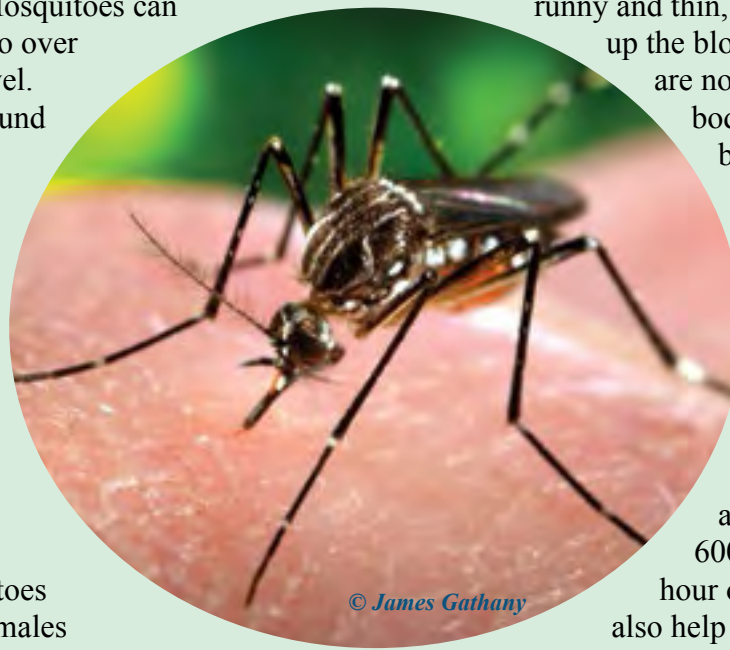
Mosquitoes eat different things at different stages of their lives. Larvae eat plants. They also filter food from water. Both male and female adult mosquitoes eat nectar. Only female mosquitoes suck blood. They need a protein found in blood to make their eggs. Mosquitoes use their senses of sight and smell to find a blood meal. They see movement and infrared light given off by warm bodies. They can also smell chemicals, like carbon dioxide, on your breath, as well as smell chemicals on your skin. A mosquito can smell you when it is over 100 feet away! Have

you ever noticed that mosquitoes seem to bite certain people more often? It's true. Everyone has a different smell. Mosquitoes do like the smell of some people over other people.

The tip of a mosquito's mouth has six needle-like parts for cutting and sucking. To suck blood, a mosquito slips the tip of its mouth into the skin. The mosquito then injects anticoagulants (an-ti-ko-AG-yu-lents) into the cut. This keeps the blood runny and thin, so the mosquito can suck up the blood. The anticoagulants are not supposed to be in your body. Your body tries to break up and get rid of the chemicals, causing an itchy bump.

Although mosquitoes may drive you crazy with their biting, they are an important part of nature. Mosquitoes are food for many animals. Some bats eat 600 mosquitoes in just one hour of hunting. Mosquitoes also help pollinate flowers when drinking nectar.

Next time you hear EEEEE, try to think of something positive about mosquitoes. They may irritate you with their biting, but they are important to have around.



# Marvelous Mayflies



© Jason Neuswanger, Troutnut.com

**M**ayflies are classified in the order Ephemeroptera. This long, funny name comes from Greek words that mean “living a day.” This is a good name for mayflies; as adults they only live for a few hours or days.

Mayfly adults are gray, brown or yellow in color. They have a slender abdomen that slants upward with two or three long “tails” at the end. Their front wings are large and shaped like a triangle. The wings look a bit like the sail on a sailboat. Their back wings are very small and often difficult to see. Some mayflies do not have back wings at all.

Adult mayflies have one thing to do as adults. They need to mate and lay eggs. Adult mayflies cannot eat. Their mouths are small and not made for eating. This is one reason why they die soon after becoming adults. Male mayflies gather in large swarms. They move in a kind of dance together looking for females. Females lay their eggs in different ways. It all depends on the type of mayfly. Some mayflies fly close to the water, dip their abdomen on the water surface and lay the eggs while flying. Other females lay their eggs in strands attached to plants and other things in the water. Some just lay their eggs and let the eggs fall where they may. The females will die as soon as their eggs are laid. The males die after mating.

Mayfly eggs may hatch very quickly. Some eggs will hatch as soon as they hit the water. Others may take a while longer. A naiad emerges from the egg. They have biting mouthparts. Most mayfly naiads are scavengers. They scrape algae from rocks in the water and eat whatever plants or tiny water animals they can find. The color of a naiad may be green or brown. Their color varies depending on what they eat! Naiads may stay in the water for up to four years. When they leave the water they molt. This mayfly is called a subimago. Subimagoes have cloudy or smoky wings. Think of them sort of like short-lived teenagers. They molt and then they are adults. The adult mayflies have clear wings. Mayflies are the only insects that molt after they have wings!

Mayflies really are marvelous. Look for mayflies in the spring and summer. They are not only seen in the month of May!

## Water Woes

**W**ater – it can be a matter of life or death. We, along with many other living things, need water every day to survive. It is so important to have clean water, but sometimes 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. An oil spill from a boat would be point pollution. Nonpoint pollution is pollution that has run into the water from another place. 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 difficult time getting oxygen out of water full of silt.

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.



# Be Outside - Fishing

## *Fishing is Fun!*

With summer vacation just around the corner, you may be thinking of things to do in the warm summer sun. How about fishing? Fishing is a great outdoor activity any time of the year, and it can be a blast!

You may have heard the saying “There is more to fishing than catching a fish.” This saying is so true. If you ask someone who fishes a lot why she likes to fish, catching a fish may not be the first thing she mentions.

Part of the fun of fishing is trying to out-smart the fish and get it to take our bait. Fish love to eat aquatic insects, so how about turning over some rocks in the stream and placing an insect that you find on your hook? You may even want to try fly fishing. When fly fishing, people use artificial insects made from yarn and feathers that look like the insects that fish eat. It is a lot of fun and sometimes tricky to get a fish to strike at an artificial fly.

Fishing is about experiencing the great outdoors and all the wonderful things that it has to offer. It is refreshing and calming to be outside. When fishing, you get to feel the warm sun on your face and listen to the trickling water. How great does it feel to dip your feet in a stream or lake on a hot day? You can't do that while playing video games in your house! Even if you are in the worst of moods, sitting outside, along a stream with a fishing pole in your hand can melt all those bad feelings away.

You don't need a lot of money to fish. If you live in Idaho and are under 14 years of age, fishing for you is free! If you are looking for fun this summer, go fishing! You may have the thrilling experience of catching a fish, but you might experience something much more. You may also be refreshed and inspired by the natural world around you.



# Aquatic Insect Word Search

Y L F S I D D A C N V O R L I  
D L L E M D I A H K T W O A S  
X M F H C V E Y I I Z X T B L  
A J C N P U P A U A U F A I L  
T I Z C O V E Q L B N H C U I  
C A N P H G S K M K Y R I M G  
K M Q W D O A R M M A T D X S  
M D I N M T A R H U G C N Y V  
R A Q I H W A F D E R O I O B  
X P Y O S L T E Z W A G X E Q  
R L R F A B D O M E N D N G D  
F A Z R L U H Z A V R A L G C  
X I L M D Y U K S K O Z W N O  
Y C N B M P W J M G O X K B O  
P I K H K F A V D K N N Q H C

## Words

ABDOMEN  
CADDISFLY  
DRAGONFLY  
EGG  
GILLS

HEAD  
INDICATOR  
LABIUM  
LARVA  
MAYFLY

MOSQUITO  
NAIAD  
PUPA  
SWARM  
THORAX

## WILDLIFE EXPRESS

Volume 27 • Issue 9 • Aquatic Insects • May 2014

Wildlife Express is published nine times a year (September-May) by the Idaho Department of Fish and Game. Classroom subscriptions and an Educator's Guide are available for \$45.00 per year and includes a classroom set of 30 copies mailed to your school each month. Subscriptions of 10 copies or less are available for \$25.00. This publication is made possible through the sale of wildlife license plates.

For more information, call or write: Wildlife Express, Idaho Department of Fish and Game, 600 South Walnut, PO Box 25, Boise, Idaho, 83707 (208) 287-2890.

Lead Writer: Adare Evans Layout: Kelly Kennedy Yokoyama Contributors: Vicky Runnoe, Lori Adams  
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!  
Look for printable copies of Wildlife Express on the web at <http://fishandgame.idaho.gov>