Caddisfly

Beneath the water's WHAT LIVES IN

By Lusha Tronstad

Most of us envision pristine waters filled with fish when we think of streams and rivers.

While fish are important, they are in the minority of animal populations in streams. The primary inhabitants are usually aquatic invertebrates. We don't typically notice these animals because they are small, but if you look for them, you will find them.

Invertebrates are animals without a backbone (such as dragonflies, mussels, shrimp, and others). Many spend most of their lives (weeks to over 100 years) in the water as larvae or nymphs. Many then emerge from the water as winged adults to mate and die within a few days or weeks.

Aquatic invertebrates play a number of roles in waterways, including helping keep streams clean and as a food source for many other animals.

Keeping Things Clean

Some invertebrates filter particles out of the water and increase clarity. These filtering insects can strain a variety of particle sizes from the water, and some caddisflies can remove tiny particles, such as bacteria. Other invertebrates clean sediment at the bottom of the stream and break down leaves, sticks, and other organic matter that accumulate. Aquatic invertebrates, such as mayflies, eat algae and help control how much algae grows on the stream bottom. Too much algae in a stream can be bad. Oxygen concentrations can drop when the algae dies, resulting in fish kills.

Invertebrates as Food

Aquatic invertebrates are food for animals in and outside the water. Most fish feed heavily on aquatic invertebrates for at least part of their lives. Amphibians, such as frogs, toads, and salamanders, eat aquatic invertebrates inside and outside the stream. Many birds eat adult insects that have emerged from streams. In fact, studies have shown birds tend to be more abundant when there are more aquatic invertebrates in the water.

Aquatic Invertebrates in Wyoming

Biologists estimate 11,000 species of aquatic invertebrate live in the United States, and Wyoming is home to at least 700 species known thus far. These 700 species are mainly made of five major groups: insects (6 legs), mites (8 legs), crustaceans (at least 10 legs), mollusks (with shells), and annelids (without legs).

Insects are the most diverse group and tend to be the dominant inhabitants of streams. There are nine families of aquatic insects in

Dragonfly

surface: OUR STREAMS?

Wyoming, and seven of them are common.

Mayflies and stoneflies look similar. Mayflies have gills on their abdomens, have two or three tails, and have a single claw on each leg. Stoneflies lack gills on their abdomen, have only two tails, and have two claws on each leg. Dragonflies and damselflies both prefer slower water. Dragonflies are usually stouter than damselflies as nymphs, and adults hold their wings horizontally while resting (damselflies hold their wings together behind their backs).

True bugs and beetles look similar and live in the water as larvae and adults. These insects can be distinguished by their mouth parts and wing coverings. True bugs have piercing (needle-like) mouthparts whereas beetles have chewing mouthparts. The wings on true bugs look leathery, and beetles have a hard and shiny covering over their wings (see photo page 10).

Caddisflies are unique and my personal favorite as a child. I called them "rock rollers" because they construct portable houses made of pebbles, sand, leaves, or wood stuck together with the silk they secrete.

Finally, true flies do not have legs and look like the grub you use to bait a fishing hook.

Why does all this matter? Being familiar with aquatic invertebrates can be helpful whether a landowner, fisherman, or outdoors enthusiast. Aquatic invertebrates are regularly used to estimate water quality, because they are abundant, there are many different species, they are easy to collect, they live in the stream most of their lives, and they move short distances.

Most importantly, aquatic invertebrates are used to monitor water quality because they are sensitive to changes in streams, such as pollution, invasive species, and habitat disruptions. Mayflies, stoneflies, and caddisflies are generally the most sensitive to changes in water quality and are frequently used to assess streams.

You can easily track a stream's water quality by periodically picking up rocks and looking at how many different kinds of mayflies, stoneflies, and caddisflies you see. Water quality in streams is generally considered excellent when at least six different kinds of mayflies, stoneflies, and caddisflies are seen, good when you see between two and five, and poor when you see only one or none of these insects.

Being able to identify aquatic invertebrates may help catch more fish. Many artificial flies are tied to imitate certain invertebrates and stages in their lives. By identifying what invertebrates live in a stream, a fly can be chosen that mimics these animals. For example, if fishing on the Middle Fork of the Powder River and you notice common stoneflies are hatching

Mite

Crustacean, scud

and the fish are feeding on them, you might switch to a fly similar to a Stimulator (mimics the medium-size adults with orange bellies) and have a great day fishing.

Next time you are standing next to a stream, pick up a rock and see what is living under the water. Remember that most of these invertebrates will not hurt you and cannot break your skin (the exception is a large true bug or beetle, but this seldom happens).

As a biologist and an avid outdoorsman, I can't stay out of streams. There are so many invertebrates in this great state that I am always learning something new. Aquatic invertebrates are wonderful creatures to teach children about. My children love picking up rocks and identifying what is clinging to them. If interested in learning more about the aquatic invertebrates in Wyoming, I encourage you to get your feet wet.

Want to find out more about our aquatic invertebrates?

'Wyoming's Stream Macroinvertebrates' is a new 182-page, color, water- and tear-resistant guide featuring information on over 70 families of common macroinvertebrates living in Wyoming streams, including identifying features, habitat preferences, life cycle information, and more.

With this resource, you will be able to:

- Learn how to identify major groups of insects and invertebrates found in Wyoming,
- Determine water quality of your favorite stream,
- Teach lessons on food webs, biodiversity, and trophic levels,
- And much more!

Available for $13 at wyomingbiodiversity.org/shop/ (one free copy can be requested by educators)

A caddisfly with its "portable house" stuck together with silk it secretes.

Lusha Tronstad *is the invertebrate zoologist at the Wyoming Natural Diversity Database (WYNDD) where she collects and maintains data on rare animals across the state. She is an expert on aquatic invertebrates, but she has experience identifying all types of spineless wildlife. She spends summers collecting caddisflies, mayflies, bees, snails, and any other invertebrates that cross her path. Lusha and her family live near Laramie and raise sheep, chickens, horses, and vegetables. She is an avid outdoorsman and goes fishing every chance she gets. Learn more about WYNDD at http://www.uwyo.edu/wyndd/*

Mollusk, snail

Mollusk, bivalve

Annelid, leech

Insect, stonefly

Insect, beetle

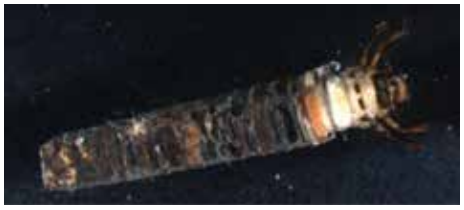
Insect, true bug

Insect, dragonfly

Pick up a rock and see what is living under the water next time you are standing next to a stream.

Insect, damselfly

Insect, mayfly



Insect, caddisfly

Insect, true fly