

Monitors reminder of physical characteristics of aquatic macroinvertebrates

Stoneflies -- Have two wirelike tails. Never have gills on their abdomen. Will do “pushups” in the ice cube trays when oxygen levels fall. Some folks say that stoneflies look “Egyptian” (scarabs?).

Mayflies -- Have three wirelike tails. There are several exceptions that only have two but these are easy to detect because they have gills on their abdomen. The most common of these exceptions is the flatheaded mayfly, which has large eyes on the top of its head. This mayfly has prominent gills that flutter in the ice tray.

Caddisflies -- Caddis are often fat and segmented. They often have a greenish color although this is often dependent on what they have been eating. There is one caddis that is bright orange or bright yellow. This one (I call it my “neon” caddis) is seldom as large as my other caddis and not fat. We differentiate the net-spinning caddis because of its much higher tolerance for water pollution.

Net-spinning Caddisflies -- Can be brown to green depending on what it has been eating. Has two “tufty” tails. Most importantly it is the only caddis to have significant gills on its abdomen (may require magnification). Does not make a case. Often this one will do the “caddisfly dance”. Ask your trainer to demonstrate.

Beetles – **Adult riffle beetles** are the only one of the critters that we observe that spends its entire life cycle underwater. They are small black beetles usually found under the net. **Water pennies** are small and copper colored. They are unlike anything else you might find. **Beetle Larvae “Elmidae”** are what I call my apostrophe or comma bug. They often have the size and shape of these punctuation marks. Some folks say they look “crunchy” and if you look real close they have rings like a raccoon’s tail and a pulsating anal gill at the posterior end. **“Other” beetle larvae** are very diverse in appearance and less common. These are best determined by using your dichotomous key in the beginning of your monitors guide.

Snails – **Gilled snails** must filter their oxygen and food from the water. They require relatively good water quality. Holding one in front of your face with the pointed or helix end pointing upwards, the opening will be to the right. **Lunged or Pouch snails** will open to the left and can exist in poorer water quality. They don’t filter out food or oxygen.

Megaloptera – That got your attention! This is the scientific name for the Order that includes **Hellgramites, Fishflies, and Alderflies**. Since they are all grouped together in the modified method you don’t really need to distinguish between. Just for your knowledge: The primary difference between **Hellgramites** and **Fishflies** is that the **Hellgramites** have cottony gills on their abdomen and **Fishflies** have a smooth abdomen. Also, a full grown Fishfly will never be as large as a full grown Hellgramite. Another common name for a Hellgramite is a Dobsonfly. **Alderflies** look similar to the others but they have a single spiky tail that looks like a stinger. **Alderflies** are less likely to be found than the other two families.

Damselflies and Dragonflies – **Damselflies** have 3 characteristic paddle shaped “tails”. In other words their three “tails” are shaped like the blade of an oar. These are actually supplemental gills and not true tails. Damselflies are fragile or “spindly” looking and have large eyes.–

Dragonflies are mainly identified by the shape of their bodies. They range from slightly oval shapes to round. On close inspection you will notice a hinged lower jaw that projects back along the underside of the thorax.

Sowbug – The Sowbug is an isopod and a crustacean. It is closely related to the terrestrial roly-poly bug or pill bug. It had many more than the six legs of the insects. It is often gray in color but that can vary.

Scud – The Scud is an amphipod and also a crustacean. It looks like a shrimp and swims sideways. In clear water the scud will often be translucent.

True Flies – These critters are characterized by having no legs in their juvenile form and being somewhat like a grub worm or maggot. **Atherix (Watersnipe)** come to a point at one end and have “feathery” projections on the posterior end (hairy antlers). **Craneflies** have a distinct maggot like appearance and can be almost as long as your index finger. There is one family that can pump one end of itself into a golfball shape. **Horseflies** are found less often and come to a point on both ends. There are other rare types that can be mistaken for large midges or small worms.

Midges – These are usually the very smallest of the critters and almost always will be found under the net when they are present. They do not vary in width from one end to the other. One type of midge can be coral red.

Blackflies – These are also mostly found under the net when present. Usually very small, they have a distinctive “bowling pin” or “club” shape. When they are placed in the ice cube tray they usually attach themselves to the wall of their space. They have suckers on both ends and can march along in the fashion of an inchworm. If populations increase significantly you should suspect a new source of nutrients to the stream.

Aquatic Worm – Looks very similar to an earthworm except lighter pink and smaller.

Planaria or Flatworms – These are different terms for the same organism. Gray to brown, unsegmented, soft, flat, eye spots on top of head. Undulating motion.

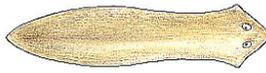
Leeches – Flattened body similar to Flatworms but segmented. No eye spots but suckers at both ends of underside.

Stream Insects and Crustaceans ID Card

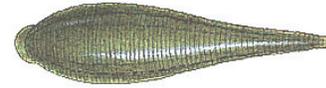
Lines under picture indicate the relative size of organisms



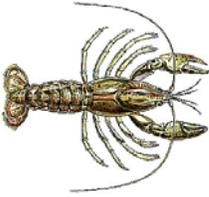
Aquatic Worm:
Class Oligochaeta
 $\frac{1}{4}$ " - 2", can be very tiny;
thin, wormlike body, tolerant of
impairment



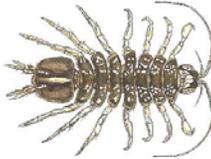
Flat Worm:
Family Planaridae
Up to $\frac{1}{4}$ ", soft body,
may have distinct head with
eyespots, tolerant of impairment



Leech:
Order Hirudinea
 $\frac{1}{4}$ " - 2", segmented body,
suction cups on both ends,
tolerant of impairment



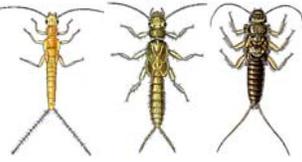
Crayfish: Order Decapoda
Up to 6", 2 large claws, 8 legs, resembles
a small lobster, somewhat tolerant of
impairment



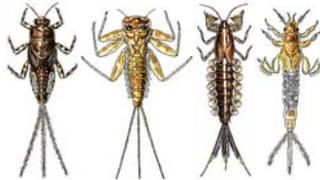
Sowbug: Order Isopoda
 $\frac{1}{4}$ " - $\frac{3}{4}$ ", gray oblong body wider
than it is high, more than 6
legs, long antennae, somewhat
tolerant of impairment



Scud: Order Amphipoda
 $\frac{1}{4}$ ", white to gray, body
higher than it is wide,
swims sideways, more than
6 legs, resembles small
shrimp, somewhat tolerant
of impairment



Stonefly: Order Plecoptera
 $\frac{1}{2}$ " - 1 $\frac{1}{2}$ ", 6 legs with hooked
tips, antennae, 2 hair-like tails,
no gills on abdomen, very
intolerant of impairment



Mayfly:
Order Ephemeroptera
 $\frac{1}{4}$ " - 1", plate-like or feathery gills
on abdomen, 6 hooked legs, 2 or 3
long hair-like tails, tails may be
webbed together, very intolerant
of impairment



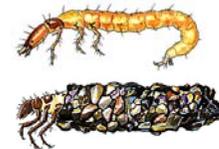
Dragonfly and Damselfly:
Order Odonata
 $\frac{1}{2}$ " - 2", large eyes, 6 hooked legs,
large protracting lower jaw, 3
broad oar-shaped tails OR wide
oval to round abdomen, somewhat
tolerant of impairment



Hellgrammite, Fishfly, and Alderfly:
Order Megaloptera
 $\frac{3}{4}$ " - 4", 6 legs, large pinching jaws, 8
pairs of feelers along abdomen, 2 hooks
on tail end OR 1 single spiky tail,
somewhat tolerant of impairment



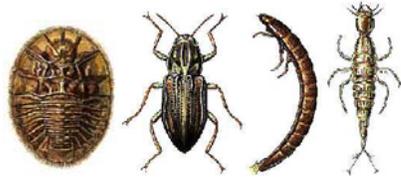
Common Netspinners:
Family Hydropsychidae
Up to $\frac{3}{4}$ ", 6 hooked legs on
upper 1/3 of body, 2 hooks at
back end, underside of
abdomen with white tufts of
gills, somewhat tolerant of
impairment



Most Caddisfly:
Order Trichoptera
Up to 1", 6 hooked legs on
upper 1/3 of body, may be in
stick, rock or leaf case, no
gill tufts on abdomen,
intolerant of impairment

Stream Insects and Crustaceans ID Card

Lines under picture indicate the relative size of organisms



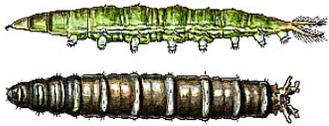
Beetles: Order Coleoptera
 $\frac{1}{4}$ " - 1", disk-like oval body with 6 small legs and gill tufts on underside OR small black beetle crawling on streambed OR comma-like brown "crunchy" body with 6 legs on upper 1/3 and possibly gill tuft on back end, OR (miscellaneous body form - rare), somewhat tolerant of impairment



Midges:
Family Chironomidae
 Up to $\frac{1}{4}$ ", distinct head, worm-like segmented body, 2 leg-like projections on each side, often whitish to clear, occasionally bright red, tolerant of impairment



Black Fly: Family Simuliidae
 Up to $\frac{1}{4}$ ", end of body wider (like bowling pin), distinctive head, sucker on end, tolerant of impairment



Most True Flies:
Order Diptera
 $\frac{1}{4}$ " - 2", bodies plump and maggot-like, may have caterpillar like "legs" along body, may have lobes or conical tails on end, tolerant of impairment



Gilled Snails:
Class Gastropoda
 Up to $\frac{3}{4}$ ", shell opening covered by a thin plate called an operculum, with helix pointed up shell opens to the right, intolerant of impairment

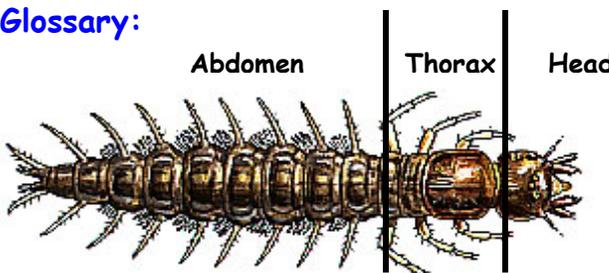


Lunged Snails:
Class Gastropoda
 Up to $\frac{3}{4}$ ", no operculum, with helix pointed up shell opens to the left, tolerant of impairment



Clams:
Class Bivalvia
 Up to $\frac{3}{4}$ ", fleshy body enclosed between two clamped together shells (if clam is alive, shells cannot be pried apart without harming clam), somewhat tolerant of impairment

Glossary:



Tails: There are many different kinds of macroinvertebrate tails. The thin thread-like tails found on stoneflies and mayflies are called cerci. The oar-shaped tails found on a damselfly are not really tails - they are actually gills called caudal lamellae!



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These sheets are modified from the National Izaak Walton League of America SOS Program Stream Insects & Crustaceans ID Card.
<http://www.iwla.org/SOS/index.html>