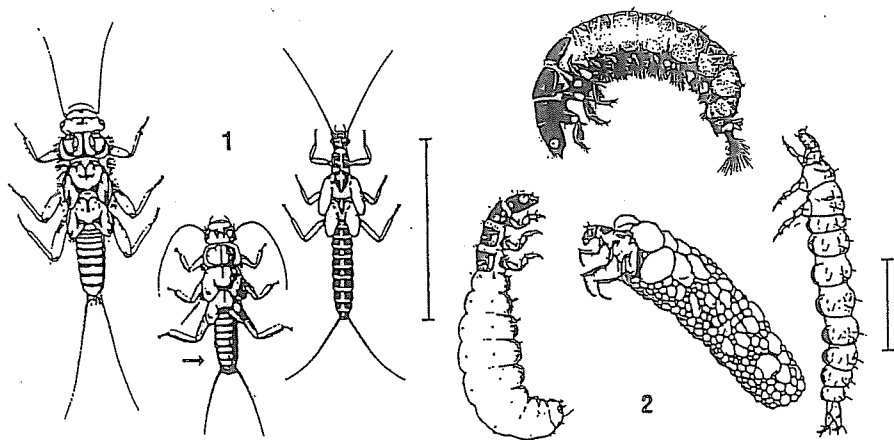


Stream Insects & Crustaceans

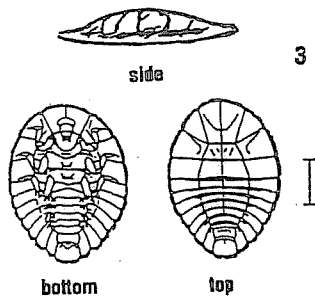
GROUP ONE TAXA

Pollution sensitive organisms found in good quality water.

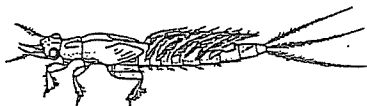


1 Stonefly: Order Plecoptera. 1/2" - 1 1/2", 6 legs with hooked tips, antennae, 2 hair-like tails. Smooth (no gills) on lower half of body. (See arrow.)

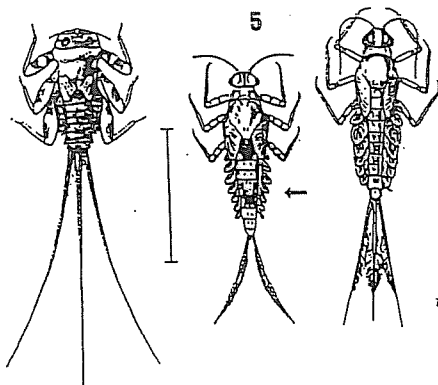
2 Caddisfly: Order Trichoptera. Up to 1", 6 hooked legs on upper third of body, 2 hooks at back end. May be in a stick, rock or leaf case with its head sticking out. May have fluffy gill tufts on underside.



3 Water Penny: Order Coleoptera. 1/4", flat saucer-shaped body with a raised bump on one side and 6 tiny legs and fluffy gills on the other side. Immature beetle.



4 Riffle Beetle: Order Coleoptera. 1/4", oval body covered with tiny hairs, 6 legs, antennae. Walks slowly underwater. Does not swim on surface.



5 Mayfly: Order Ephemeroptera. 1/4" - 1". brown, moving, plate-like or feathery gills on sides of lower body (see arrow), 6 large hooked legs, antennae, 2 or 3 long, hair-like tails. Tails may be webbed together.

6 Gilled Snail: Class Gastropoda. Shell opening covered by thin plate called operculum. When opening is facing you, shell usually opens on right.

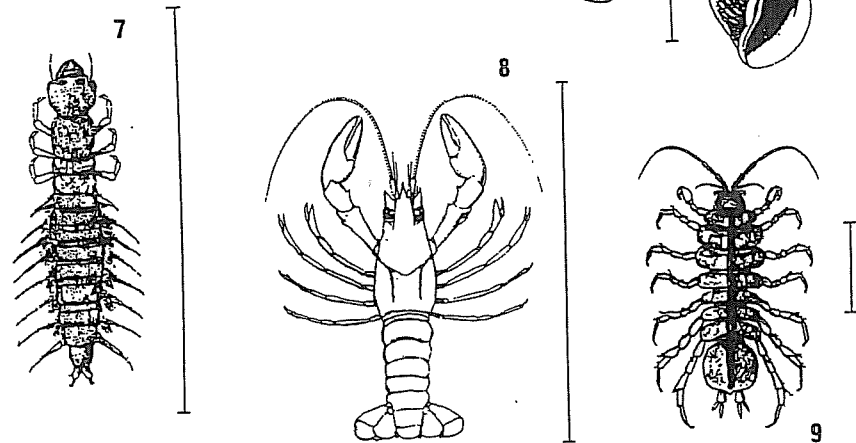
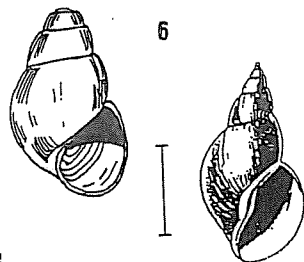
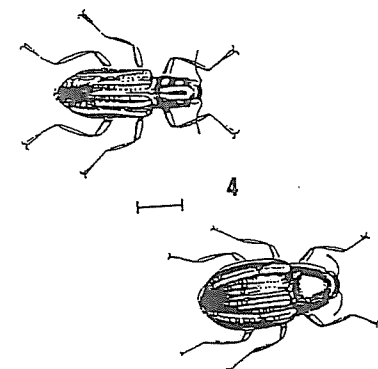
7 Dobsonfly (Hellgrammite): Family Corydalidae. 3/4" - 4", dark-colored, 6 legs, large pinching jaws, eight pairs feelers on lower half of body with paired cotton-like gill tufts along underside, short antennae, 2 tails and 2 pairs of hooks at back end.

GROUP TWO TAXA

Somewhat pollution tolerant organisms can be in good or fair quality water.

8 Crayfish: Order Decapoda. Up to 6", 2 large claws, 8 legs, resembles small lobster.

9 Sowbug: Order Isopoda. 1/4" - 3/4", gray oblong body wider than it is high, more than 6 legs, long antennae.



Bar lines indicate relative size

Save Our Streams

Izaak Walton League of America
707 Conservation Lane
Gaithersburg, MD 20878-2983
1(800)BUG-IWLA

GROUP TWO TAXA CONTINUED

10 Scud: Order Amphipoda. 1/4", white to grey, body higher than it is wide, swims sideways, more than 6 legs, resembles small shrimp.

11 Alderfly Larva: Family Sialidae. 1" long. Looks like small hellgrammite but has 1 long, thin, branched tail at back end (no hooks). No gill tufts underneath.

12 Fishfly Larva: Family Corydalidae. Up to 1 1/2" long. Looks like small hellgrammite but often a fighter reddish-tan color, or with yellowish streaks. No gill tufts underneath.

13 Damselfly: Suborder Zygoptera. 1/2" - 1", large eyes, 6 thin hooked legs, 3 broad oar-shaped tails, positioned like a tripod. Smooth (no gills) on sides of lower half of body. (See arrow.)

14 Watersnipe Fly Larva: Family Athericidae (Atherix). 1/4" - 1", pale to green, tapered body, many caterpillar-like legs, conical head, feathery "horns" at back end.

15 Crane Fly: Suborder Nematocera. 1/3" - 2", milky, green, or light brown, plump caterpillar-like segmented body, 4 finger-like lobes at back end.

16 Beetle Larva: Order Coleoptera. 1/4" - 1", light-colored, 6 legs on upper half of body, feelers, antennae.

17 Dragon Fly: Suborder Anisoptera. 1/2" - 2", large eyes, 6 hooked legs. Wide oval to round abdomen.

18 Clam: Class Bivalvia.

GROUP THREE TAXA

Pollution tolerant organisms can be in any quality of water.

19 Aquatic Worm: Class Oligochaeta. 1/4" - 2", can be very tiny; thin worm-like body.

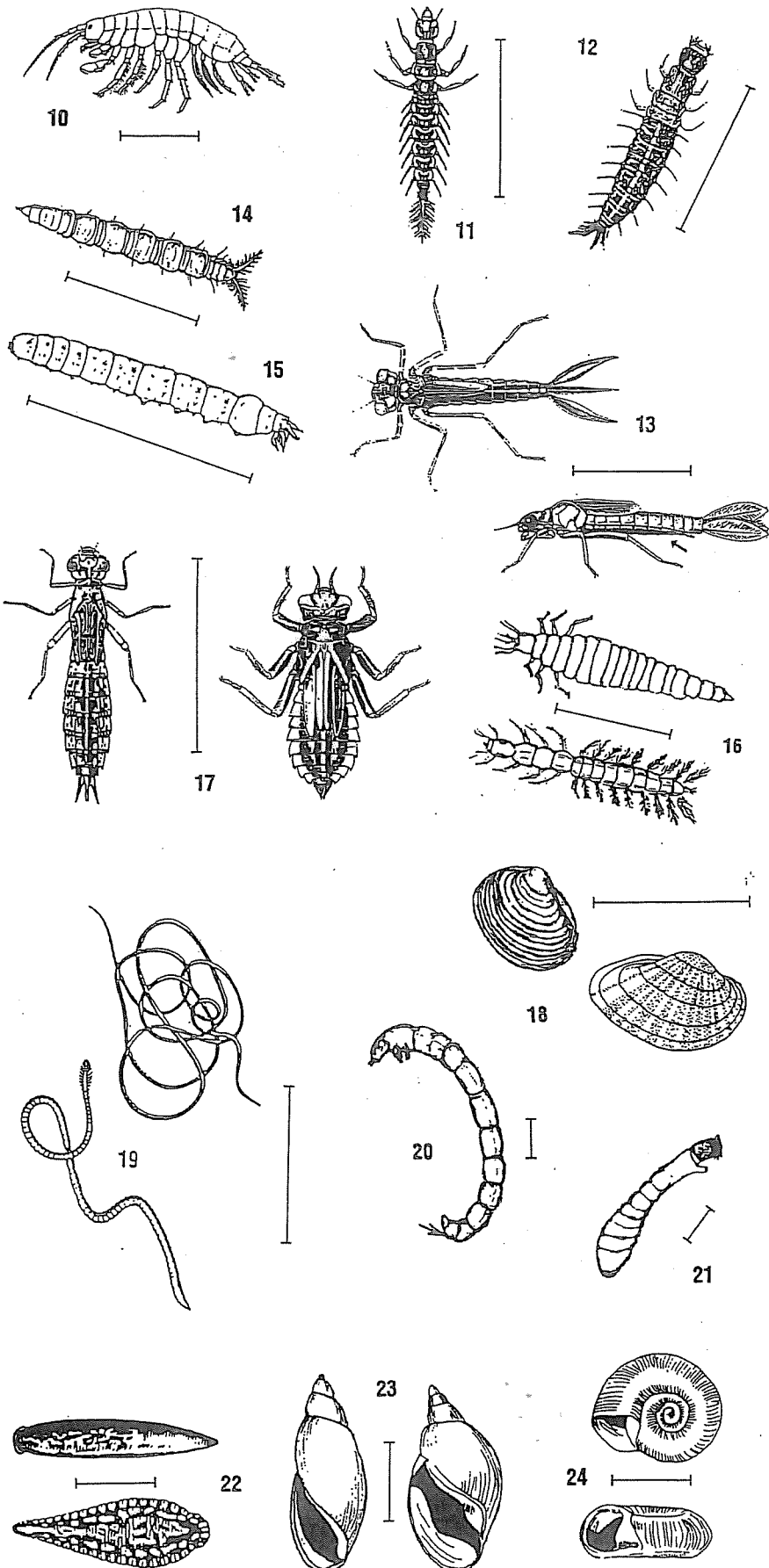
20 Midge Fly Larva: Suborder Nematocera. Up to 1/4", dark head, worm-like segmented body, 2 tiny legs on each side.

21 Blackfly Larva: Family Simuliidae. Up 1/4", one end of body wider. Black head, suction pad on other end.

22 Leech: Order Hirudinea. 1/4" - 2", brown, slimy body, ends with suction pads.

23 Pouch Snail and Pond Snails: Class Gastropoda. No operculum. Breathe air. When opening is facing you, shell usually opens on left.

24 Other Snails: Class Gastropoda. No operculum. Breathe air. Snail shell coils in one plane.



Bar lines indicate relative size



True flies continued



Crane fly

Order **Diptera**; (family *Tipulidae*): No legs, no visible head; plump body with lobes along the segments; may have structures that look like tentacles, lobes or one bulb at the end of the body. (S-VL)



Black fly

Order **Diptera**; (family *Simuliidae*): Body has a bowling-pen shape (lower is wider than the upper); there are multiple brushes/fans on the head and a ring of hooks on the abdomen. (VS-M)



Watersnipe fly

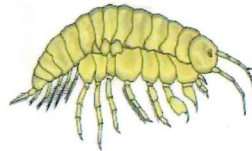
Order **Diptera**; (family *Athericidae*): Plump body, looks very much like a caterpillar; on the underside there are structures that look similar to legs but are not segmented; the tail is forked and fringed with hairs. (S-L)

Non-Insect Groups



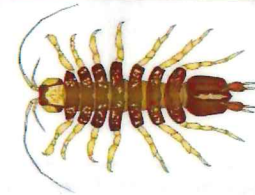
Crayfish

Class **Crustacea**; (order *Decapoda*): Five pairs of legs, the first two usually have large claws; large flipper-like structure at the end of the abdomen. (M-VL) (M)



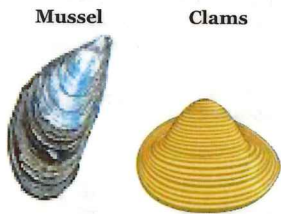
Scud/Sideswimmer

Class **Crustacea**; (order *Amphipoda*): Seven pairs of legs, the first two may be claw-like; body is somewhat higher than it is wide. Usually swims with a sideways motion. (S-M)



Aquatic sowbug

Class **Crustacea**; (order *Isopoda*): Seven pairs of legs, the first two may be claw-like; very long antenna; body is wider than it is high, giving the animal a fairly flattened appearance. (S-M)



Clams and Mussels

Class **Bivalvia**: Fleshy body enclosed between two-hinged shells; the shape and ridge spacing of the shells can determine different kinds. **Mussels** are usually larger than **Clams** and have dark colored oblong shells. (VS-VL) (M)



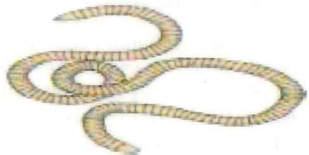
Operculate snails

Class **Gastropoda**; (sub-class *Prosobranchia*): Fleshy body enclosed by a single shell, which is usually coiled in an upward spiral. The opening of the shell is covered by an operculum (door). (VS-L) (M)



Non-operculate snails

Class **Gastropoda**; (sub-class *Pulmonata*): Fleshy body enclosed by a single shell, which is sometimes coiled upward but also may lie flat or have a conical shape. The opening of the shell is not covered by an operculum. (VS-L) (M)



Aquatic worms

Phylum **Annelida**; (class *Oligochaeta*): Body is long with numerous segments along its entire length; has no visible head or tail. (VS-VL)



Leeches

Phylum **Annelida**; (class *Hirudinea*): Body is long and thin or slightly widened; 34-segments along its length, but there appears to be many more. (S-VL)



Flatworms

Class **Turbellaria**: Soft elongate body without segment; head triangular shaped with eyes on top, which give the animal a cross-eyed appearance. (VS-L)

Learn more at: <http://www.dep.wv.gov/sos>

Sizes illustrated not proportional

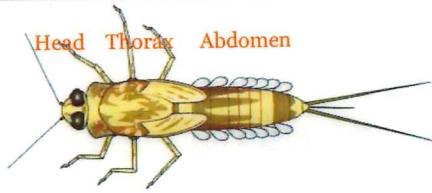


Instructions: Identification is easier when viewed in the same orientation as the illustrations. Most illustrations are drawn in top and side views. **Note:** water penny is shown in an underside view. Use **morphological** features as your basis for identification; the size and color are often variable and influenced by environmental factors. The (M) indicates that multiple kinds may be collected from within the order or class.

Size categories (size range in mm)

> 50 Very large (VL); 50 - 30 Large (L); 29 -10 Medium (M); 10 - 5 Small (S); < 5 Very small (VS)

Note: This field guide will help you identify common aquatic invertebrate classes, orders, and a few families. You should always use to a more complete guide for verification and family level identification. With practice, you will be able to identify a wide variety of families in the field.



Small minnow mayfly (family *Baetidae*)

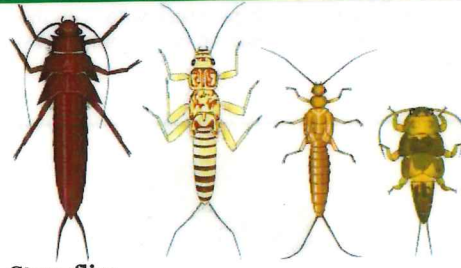
What is an insect? An insect is an invertebrate (an animal with no spine) that has three-pairs of legs (except Diptera) and three body divisions; the head is the location of the mouth, antenna and eyes; the thorax is the attachment site for the legs and wing pads; and the abdomen, which often has a variety of structures attached including filaments gills and tails. Gills are usually leaf-like, plate-like, or thin filaments. Tails can be long and thin, hairy, webbed or paddle-like. Most of the **benthic macroinvertebrates** you will encounter during stream surveys are aquatic larva or nymphs of insects. Most adult stages are not aquatic (beetles are the exception). The majority of the insects are described and illustrated on page one and the top of page two; non-insect group descriptions and illustrations begin on page two. Additional instruction is provided at the bottom of page two.

Insect Groups



Mayflies

Order **Ephemeroptera**: Three-pairs of legs with a single hook at the end; three sometimes two tail filaments; gills attached to the abdomen, which may sometimes be covered and difficult to see. Mayflies exhibit several types of movements (or habits); swimmers, clingers, crawlers and burrowers. (VS-M) (M) Shown above left-right, family *Heptageniidae*, *Isonychiidae* and *Ephemerellidae*.



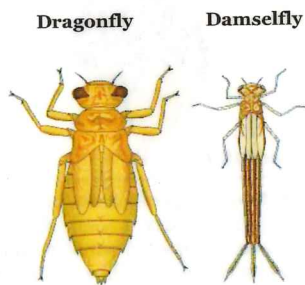
Stoneflies

Order **Plecoptera**: Three-pairs of legs with two-hooks at the end; two tail filaments; no gills attached to the abdomen but some kinds may have gills near the top of the abdomen; gills if visible, mostly on the legs and thorax. (S-VL) (M) Shown above left-right, family *Pteronarcyidae*, *Pertidae*, *Capniidae* and *Peltoperlidae*.



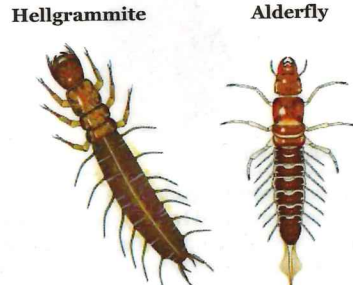
Case-building caddisflies

Order **Trichoptera**: Grub-like soft body and a hard head; Three-pairs of legs located on the upper third of the body; tail is small and usually forked, sometimes fringed with hairs; gills are scattered on the underside of the abdomen. The case (retreat) is a relatively solid structure made of a variety of streambed materials held together by silk. (VS-L) (M) Shown above left-right, family *Brachycentridae*, *Limnephilidae* and *Glossomatidae*.



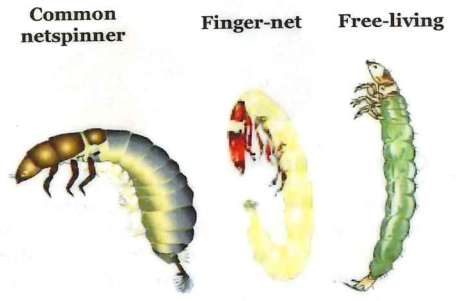
Dragonflies and Damselflies

Order **Odonata**: Three-pairs of legs; large eyes; long spoon-like jaws; no tails on the abdomen. Dragonflies (sub-order *Anisoptera*) have a broad shaped abdomen, while the Damselfly (sub-order *Zygoptera*) abdomen is much narrower and gills are attached to the end of the abdomen, resembling tails. (M-VL) (M)



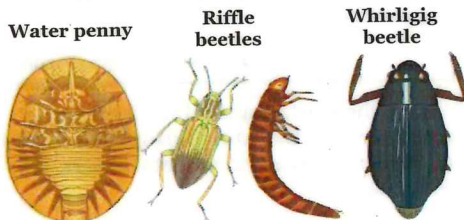
Fishflies and Alderflies

Order **Megaloptera**: Three-pairs of legs; large pinching jaws; eight-pairs of filaments attached to the sides of the abdomen. **Fishflies** (family *Corydalidae*) also called **Hellgrammites** have a two-hooked tail, whereas **Alderflies** (family *Sailidae*) have a single tapered tail and are usually much smaller and lighter in color. (M-VL)



Net-spinning caddisflies

Order **Trichoptera**: Similar characteristics as above but the abdomen usually has more abundant gills, especially the **common netspinner** (family *Hydropsychidae*). The net-spinner's retreat is made of a variety of streambed materials loosely held together by fine strands of silk. **Note**: The **free-living caddisfly** (family *Rhyacophilidae* (right)) does not build a case or net. (S-L) (M) Shown above middle, family *Philopotamidae*.



Beetles

Order **Coleoptera**: Three-pairs of legs; body usually covered by a hard exoskeleton. The Most common kinds collected are the **water penny** (family *Psephenidae*) and **riffle beetles** (family *Elmidae*). (VS-L) (M) Shown above right, family *Gyrinidae*.

True flies

Order **Diptera**: Usually the body is segmented with some type of visible features either along the body, or at the head or tail regions (i.e. head, tails, prolegs, whelps etc.). **Note**: This order is the only aquatic insect without fully developed legs in the larval stages.

Dipterans are very diverse order with many aquatic varieties. Several common kinds are described here.



Non-biting midge

Order **Diptera**; (family *Chironomidae*): Segmented body with a visible head; two leg-like projections at the front and rear. Sometimes they are bright **red** in color. (VS-M)