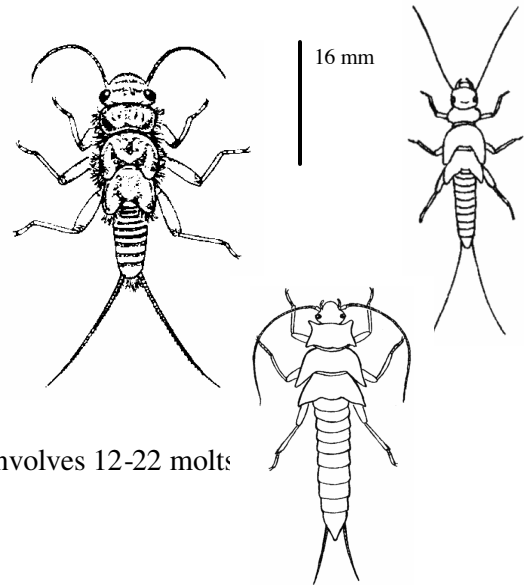


# Group 1 ~ Intolerant to Pollution

(Average Actual Size)

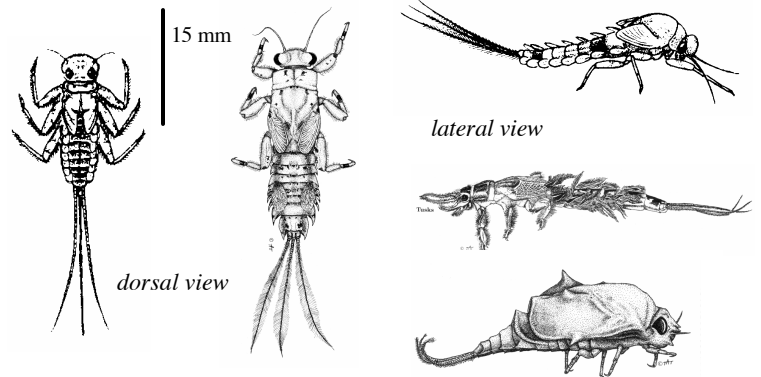
## Stonefly nymph

<b>Order</b>	Plecoptera
<b>Where to find</b>	Underside of rocks, in debris, in algal mats
<b>Body shape</b>	Elongated, resembles adult
<b>Size</b>	5 - 35 mm
<b>Feeding Group</b>	Predator or shredder
<b>Lifecycle</b>	Incomplete metamorphosis Larval development: 3 months to 3 years, involves 12-22 molts
<b>Distinguishing Characteristics</b>	Abdomen ends in two hair-like tails No gills visible on abdomen 2 tarsal claws Antennae long (longer than head) Only found crawling on surfaces, <u>not</u> swimming <i>*Distinguished from mayfly by two tails and lack of feathery gills</i>



## Mayfly nymph

<b>Order</b>	Ephemeroptera
<b>Where to find</b>	Underside of rocks and logs, some species free-swimming
<b>Body shape</b>	Elongated and flattened, resemble adults
<b>Size</b>	3 - 30 mm
<b>Feeding Group</b>	Gathering collector
<b>Lifecycle</b>	Incomplete metamorphosis, with additional sub-adult stage unique to mayflies Larval development lasts 3 months to 3 years Adults often form large mating swarms over water following emergence
<b>Distinguishing Characteristics</b>	Abdomen usually ends in three filamentous, hair-like tails (some species have two) Tails may appear webbed Tails are fragile and may break off during collection, examine carefully Feathery gills line sides of abdomen Often swim in collection bin – rather than crawling <i>*Distinguished from stoneflies by presence of three tails and feathery gills</i>

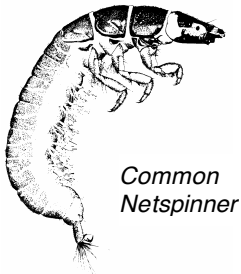


# Group 1 ~ Intolerant to Pollution

(Average Actual Size)

## Caddisfly larva

<b>Order</b>	Trichoptera	
<b>Where to find</b>	Underside of rocks, on plant materials	
<b>Body shape</b>	Usually cylindrical and “C”-shaped, 6 legs near head	
<b>Size</b>	2 - 40 mm	
<b>Feeding Group</b>	Shredder	
<b>Lifecycle</b>	Complete metamorphosis, which occurs while sealed in “cases” or “houses”	
<b>Distinguishing Characteristics</b>	Often found in “houses” made of pebbles, wood, sticks, leaves, sand, or shells Cases constructed using glue-like secretion from end of abdomen; leave holes in ends of “houses” to serve as breathing tubes prior to metamorphosis Abdomen ends in 2 prolegs, each with a claw May have darker, harder plates on top of thorax Move with characteristic wiggling – back and forth then up and down through the water	



Common Netspinner

**Special Family of Interest** – Hydropsychidae or “Common Netspinner Caddisfly” – do not build cases; they build fine mesh nets to filter food from the water current – are slightly more tolerant to pollution, especially organic wastes or nutrients, which they utilize for food – have hair-like gills all along their abdomen, and are often green in color – important to distinguish family for use in multi-metric biotic index on pages 97-98.

## Dobsonfly larva (Hellgrammite)

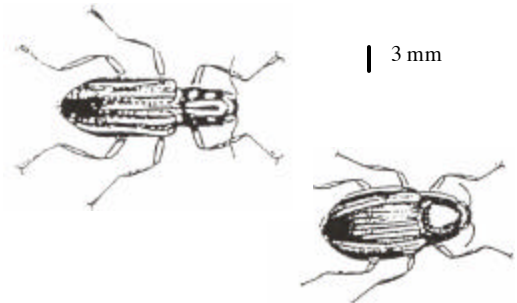
<b>Order</b>	Megaloptera	
<b>Family</b>	Corydalidae	
<b>Where to find</b>	Soft substrate; soft, rotting logs and stumps; between rocks	
<b>Body shape</b>	Large, long and slightly flattened	
<b>Size</b>	10 - 90 mm	
<b>Feeding Group</b>	Predator	
<b>Lifecycle</b>	2 – 5 years	
<b>Distinguishing Characteristics</b>	Large pinchers on head; 7 - 8 pairs of lateral filaments on abdomen; these are not legs 3 pairs of legs on middle portion of body (thorax) with tiny pinchers at the end of each Abdomen ends in pair of <u>short</u> , spiny prolegs, each with 2 hooks	

# Group 1 ~ Intolerant to Pollution

(Average Actual Size)

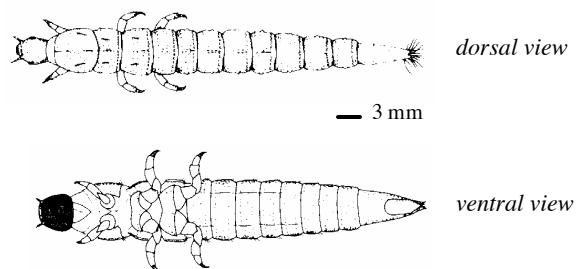
## Riffle Beetle (adult)

<b>Order</b>	Coleoptera
<b>Family</b>	Elmidae
<b>Where to find</b>	Crawling on stream bottom; often collected with kick seine in riffles
<b>Body shape</b>	Oblong, oval, hard
<b>Size</b>	1 – 6 mm
<b>Feeding Group</b>	Gatherer collector
<b>Lifecycle</b>	Complete metamorphosis Both adults and larvae are aquatic
<b>Distinguishing Characteristics</b>	Tiny Black in color Walks very slowly underwater Hardened, stiff appearance of entire body True “beetle” appearance with 6 legs Adult found more often than larvae



## Riffle Beetle (larva)

<b>Order</b>	Coleoptera
<b>Family</b>	Elmidae
<b>Where to find</b>	Crawling on stream bottom
<b>Shape</b>	Elongate, hard-bodied
<b>Size</b>	Usually 1- 6 mm
<b>Feeding Group</b>	Gatherer collector or grazer
<b>Lifecycle</b>	Complete metamorphosis Both adults and larvae are aquatic
<b>Distinguishing Characteristics</b>	Hardened, stiff appearance of entire body Resemble tiny torpedoes with circular rings around body Grey or brown in color

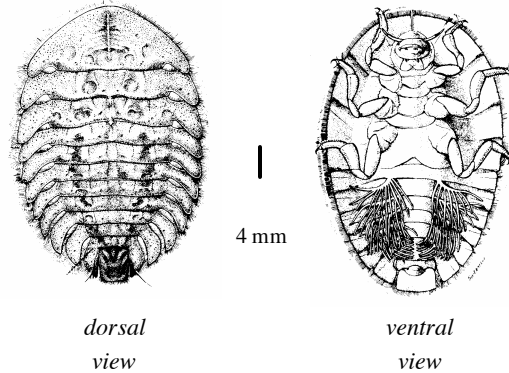


# Group 1 ~ Intolerant to Pollution

(Average Actual Size)

## Water penny beetle larva

<b>Order</b>	Coleoptera
<b>Family</b>	Psephenidae
<b>Where to find</b>	Stones and other substrate
<b>Body shape</b>	Disk (flat)
<b>Size</b>	3 - 5 mm
<b>Feeding group</b>	Grazer
<b>Lifecycle</b>	Complete metamorphosis; Lifecycle from 21 to 24 months
<b>Distinguishing Characteristics</b>	Round – resemble pennies Brown, black, or tan colored Often difficult to remove – resemble suction cups 3 pairs of tiny legs on underside of body



## Right-Handed (Gilled) snail

<b>Phylum</b>	Mollusca
<b>Class</b>	Gastropoda
<b>Order</b>	Mesogastropoda
<b>Where to find</b>	Grazing on a variety of substrates
<b>Body shape</b>	Hard, spiraled shell
<b>Size</b>	2 - 70 mm
<b>Feeding group</b>	Grazer
<b>Distinguishing Characteristics</b>	With point held up, opening (aperture) is on your right and faces you (right = good = gilled) Respire via gills, so require oxygenated water Plate-like covering over shell opening Shells coiling in one plane are counted as Left-Handed (Pouch) Snails (see page 95) Only <u>live</u> snails may be counted in determining water quality

