

STREAM INVERTEBRATE IDENTIFICATION SHEET

Pollution-Sensitive Organisms

—Require high dissolved oxygen levels

Stonefly nymphs (order Plecoptera)

Description: 1–4 cm; six legs, each ending in double hooks; visible antennae; two tails (never three). No gills on abdomen.

Feeding: Most species gather and eat decaying plants or animals, but some eat bacteria and others are predators.

Habitat: Swiftly moving streams with high oxygen levels.



Mayfly nymphs (order Ephemeroptera)

Description: 0.5–3 cm; six legs, each ending in a single hook; visible antennae; three long tails (sometimes two). Plate-like or feathery gills along sides of abdomen.

Feeding: Grazers or gatherers; eat algae and organic matter.

Habitat: Some cling to rocks, some burrow in mud, and others are free swimmers. Diversity of mayfly species decreases with stream degradation.



Caddisfly larvae (order Trichoptera)

Description: <2.5 cm; six legs with hooked claws; two hooks at tail end. Some species build cases of small stones or sticks, and others are free-living or spin nets attached to rocks.

Feeding: Some graze algae, others filter-feed detritus, and a few free-living species are predators.

Habitat: High-quality streams; some are tolerant of mild pollution.



Case-builder

Net-spinner

Dobsonfly larvae (order Megaloptera)—also known as “Hellgrammites”

Description: 2–10 cm; six legs; large pinching jaws; pointed feelers with feathery gills along abdomen; two tail projections, each with two hooks.

Feeding: Predators with powerful chewing mouthparts. *Caution:* If they pinch you, it hurts!

Habitat: High-quality streams.



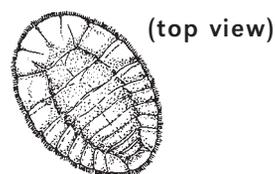
Beetle larvae and adults (order Coleoptera)

Water penny larvae

Description: 0.5–1.25 cm; broad flat saucer-shaped body; six small legs underneath.

Feeding: Graze algae and other material attached to rocks.

Habitat: Cling to rocks in cold, fast-running, high-quality streams.



(top view)



(side view)

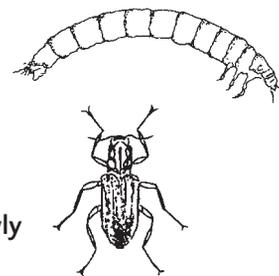
Riffle beetle larvae and adults

Description: Larvae are <1.25 cm; worm-like but hard body; six legs and small tuft of white filaments at tail end. Adults are 1–2 cm, black, and look similar to many terrestrial beetles.

Feeding: Collect and gather algae, diatoms, organic debris.

Habitat: Larvae cling to rocks in stream riffles. Adults walk slowly along stream bottom.

Notes: Unique in that larval and adult stages both are aquatic.



Moderately Tolerant Organisms
 —Can survive with moderate oxygen levels

Fly larvae (order Diptera)

Watersnipe fly larvae

Description: <3 cm; cylindrical, slightly flattened; cone-shaped abdomen; many legs with suction tips; pale to green.

Feeding: Predators.

Habitat: Moderate quality streams and rivers.

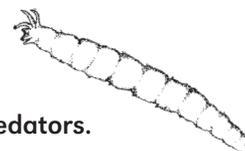


Crane fly larvae

Description: 6 cm; large, fleshy, segmented, and worm-like, with four finger-like lobes at hind end; light brown, green, or milky color.

Feeding: Most graze on algae or are gatherers, but a few are predators.

Habitat: Can be found burrowing in mud.



Blackfly larvae

Description: <0.5 cm; head has feathery gills, tail end has suction pad.

Feeding: Filter small particles of organic matter from the current.

Habitat: Live attached to submerged rocks; require swiftly flowing water.



Damselfly and Dragonfly nymphs (order Odonata)

Damselfly nymphs

Description: 0.25–5 cm; large protruding eyes; six thin legs; long, thin, abdomen with no gills; three broad “tails” that actually are gills.

Feeding: Predators.

Habitat: Typically found in medium-quality, slowly moving water.



Dragonfly nymphs

Description: 1.25–5 cm; large protruding eyes; round to oval abdomen; six hooked legs.

Feeding: Predators; eat aquatic insects, tadpoles, and small fish.

Habitat: Slowly moving water.



Alderfly larvae (order Megaloptera)

Description: <3 cm; six legs and six to eight filaments on each side of abdomen; distinguished from dobsonfly larvae by single tail projection with hairs but no hooks.

Feeding: Aggressive predators.

Habitat: High- or medium-quality water.

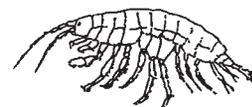


Scuds (order Amphipoda)

Description: <1.25 cm; swim rapidly on their sides and resemble shrimp; flat sides, hump-shaped back, and several pairs of legs; white, gray, or pink.

Feeding: Gather dead and decaying matter.

Habitat: Some highly sensitive to pollution; others found in moderately polluted water.



Crayfish (order Decapoda)

Description: <15 cm; look like small lobsters, with two large claws and eight smaller legs.

Feeding: Predators; use large claws to tear plant and animal prey into small chunks.

Habitat: Slow-moving streams, rivers, and ponds.



Pollution-Tolerant Organisms

—Can live in streams with low dissolved oxygen levels

Midge larvae (order Diptera)

Description: <1.25 cm; have a worm-like body and distinct head; often C-shaped; sometimes bright red.

Feeding: Most filter-feed or gather detritus; a few prey on other insect larvae.

Habitat: Can survive in water with low oxygen concentrations.

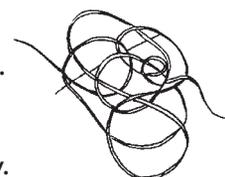


Aquatic worms (class Oligochaeta)

Description: Usually <7.5 cm; long, thin, segmented worms with no legs.

Feeding: Ingest mud and filter out organic material.

Habitat: Tolerant of pollution; high numbers indicate poor water quality.

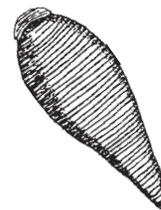


Leeches (order Hirudinea)

Description: <5–8 cm; worm-like, brown, and slimy; flattened, with sucker at each end.

Feeding: Some attach suckers to prey and drink blood; others gather detritus.

Habitat: Indicators of low dissolved oxygen.



Snails (class Gastropoda)

Description: 0.5–2 cm; flat or cone-shaped shell surrounding soft body.

Feeding: Scrape algae and bacteria from surfaces of submerged rocks.

Habitat: Some species have lungs and can live in waters with low oxygen levels, and others breathe with gills and require high oxygen concentrations.



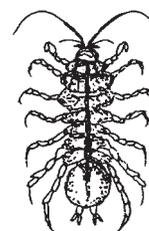
Aquatic sow bugs (order Isopoda)

Description: 0.5–2 cm; relatively flat; have long antennae and seven pairs of legs.

Feeding: Scavenge both dead and live plants and animals.

Habitat: Can tolerate high levels of decaying organic matter; typically found in muddy, slow-moving water.

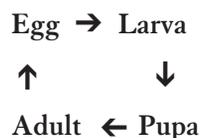
Notes: Sow bugs are crustaceans, not bugs as their name suggests.



Aquatic Insect Life Cycles—Larvae vs. Nymphs

You may be wondering why some immature organisms are called “larvae” and others are called “nymphs.” The answer has to do with the type of metamorphosis they undergo to become adults.

Insects such as blackflies go through complete metamorphosis, with four stages, and their immature forms are called larvae:



Others such as dragonflies undergo incomplete metamorphosis, with only three stages, and their immature forms are called nymphs:

