

Macroinvertebrate Fact Sheet

Stonefly Larvae

- Order Plecoptera
- Long, thin antennae protrude from the front of the head
- Three pairs of segmented legs, with two claws on the end of each of the legs
- If gills are present, they are located on the bottom of the thorax
- Two long, thin tails grow out of the rear of the abdomen
- Elongated body
- Their name is such because larvae are often found among stones in streams
- Closed breathing system
- Move their bodies up and down or from side to side, to increase the amount of water moving over the gill surface. This makes up for low dissolved oxygen or too little current
- The larval stage usually lasts for 10-11 months before they crawl out of the water and transform into adults
- Usually live in small, cool, swift streams
- Larvae live in the water and adults live on the land
- Adults have wings but larvae do not
- Larvae often eat midges and blackflies
- Stonefly larvae break down plant parts that fall into rivers and streams, so that other organisms can eat them later
- Other invertebrates, fish, salamanders, and birds eat stoneflies
- Pollution intolerant

Alderfly Larvae

- Order Megaloptera, Family Sialidae
- 10 to 90 mm long
- Hardened head capsule
- Prominent mouthparts in the front of their heads are used for chewing
- Three pairs of segmented legs
- Seven or eight pairs of filaments project from the sides of the abdomen
- The abdomen ends in a single long filament
- Long and slightly flattened in shape
- Live in ponds, lakes, streams, and rivers
- Eggs are laid on objects hanging over the water. When the larvae hatch, they drop into the water.
- Newly hatched larvae float because of gas bubbles in their guts
- Eat other insects, and sometimes each other
- Not considered to be pests
- Pollution intolerant

Dobsonfly Larvae

- Order Megaloptera, Family Corydalidae
- 10 to 90 mm long
- Hardened head capsule
- Prominent mouthparts in the front of their heads are used for chewing
- Three pairs of segmented legs
- Seven or eight pairs of filaments project from the sides of the abdomen
- Abdomen ends in a pair of short, spiny prolegs with two hooks on each
- Body is long and slightly flattened in shape
- Larvae are very large and active
- Breathe through gills and the soft portions of their skin
- Live in streams and rivers, and areas with running water
- Usually eat larvae of mayflies, blackflies, caddisflies, and midges
- Also known as hellgrammites and are used as fishing bait
- Pollution intolerant

Snipe Fly Larvae

- Order Diptera, Family Athericidae
- 12 to 18 mm long
- Undeveloped head with parallel hooks as the mouthparts
- Abdomen has 15 prolegs
- The last abdominal segment has two long, fringed appendages
- Body is a long, slightly flattened cylinder shape
- Live under stones in rivers and streams
- Eat larvae of midges and mayflies, or other aquatic invertebrates
- Pollution intolerant

Caddisfly Larvae

- Order Trichoptera
- Cylinder-shaped body
- Hardened head and a softer abdomen
- Three pairs of segmented legs
- Pair of prolegs are present with a single claw on each on the end of the abdomen
- Live in rivers, streams, ponds, and lakes
- Construct portable houses for themselves out of silk, and drag their homes around with them
- Many kinds have single or branched gills on their abdomens
- Breathe by dissolved oxygen diffusing across the soft tissue parts of their bodies. A current of water running inside their portable homes when they wiggle their bodies insures their dissolved oxygen supply
- Many catch their food (small invertebrates, plant parts, algae) in a variety of ways, including with nets constructed of silk
- Break down leaves and other material so they can be eaten by other organisms
- Moderately pollution intolerant

Mayfly Larvae

- Order Ephemeroptera
- Elongated body shape
- Well-developed eyes
- Slender antennae
- Three pairs of segmented legs with one claw on the end of each
- The abdominal segments have feathery or plate-like gills
- Either two or three long, thin tails extend from the end of the abdomen
- Many species emerge from the water as adults during the month of May
- Larvae live in stones and plants found in the water
- An important part of the food web as they eat algae and dead plants
- Eaten by fish
- When there are many mayflies in an area, it is a sign that the aquatic environment is healthy
- Moderately pollution intolerant

Riffle Beetle (Larvae and Adult)

- Order Coleoptera, Family Elmidae
- 1 to 10 mm in length
- Tube-shaped
- Dark in color and hard-shelled with a leathery appearance
- Three sets of jointed legs, each with a single claw
- The end of the abdomen has an operculum which can close over the anal gills
- Use their legs to cling onto objects
- Both the larvae and the adults typically live in streams and small rivers under stones or in small crevices
- Primarily eat algae or dead material
- Newly-emerged adults can fly, but lose this ability once they enter the water
- Adult riffle beetles can “breathe” underwater—once they are underwater they never need to come up for air again
- Moderately pollution intolerant

Water Penny Beetle Larvae

- Order Coleoptera, Family Psephenidae
- 4 to 40 mm in length
- Oval and very flat in shape
- The mouth parts and three pairs of jointed legs are only visible from the underside
- Five pairs of finely branched gills are visible from the underside
- Breathe across their body surface and through gills on their abdomen
- Live on stones in moving water
- To eat, they scrape algae with their mouths off rocks
- Grip onto rocks with the plates covering their bodies and with the hairs around the edge of their bodies
- Their grip is so strong they can be difficult to remove from surfaces
- Moderately pollution intolerant

Damselfly Larvae

- Order Odonata, Suborder Zygoptera
- 15 to 30 mm in length
- Slender, tapering body
- Large eyes and antennae
- The lower mouthpart is longer than the head
- Three sets of segmented legs with two claws on each
- Three gills resembling tails extend from the abdomen
- Do not have gills along the sides of the abdomen
- Named for their delicate appearance and feeble flight
- Live in still water
- Swim by waving their abdomens from side to side
- Capture their prey in their mouths
- Primarily eat zooplankton, flies (particularly mayflies), and mosquitoes
- Eaten by birds
- Not considered to be pests
- Moderately pollution intolerant

Dragonfly Larvae

- Order Odonata, Suborder Anisoptera
- 20 to 50 mm in length
- Long, oval, robust body
- Three sets of segmented legs with two claws on each
- Large eyes and antennae
- The lower mouthpart is longer than the head
- Two pairs of developing wing pads may be visible
- There are no visible external gills
- Three short tail-like spines may be found at the end of the abdomen
- Named for their fierce appearance and their bold, aggressive flight
- Live in still water
- Propel themselves forward in the water by expelling bursts of water behind them
- Capture their prey in their mouths—zooplankton, mayflies, and small fish
- Not considered pests because they eat mosquitoes and flies
- Eaten by birds
- Moderately pollution intolerant

Crane Fly Larvae

- Order Diptera, Family Tipulidae
- 10 to 50 mm in length
- Elongated and soft bodied
- Small, hardened head that may be retracted into the body
- True legs are absent (may have poorly developed prolegs that look like little bumps on the sides of the abdomen)
- Protrusions at the end of the abdomen

- May have gills on the end of the abdomen
- Can make the muscles on the end of their abdomen into a large knot, which they can wedge in between rocks when they catch prey in their mouths
- Live around stones and plant material in streams
- Eat dead material, algae, and other small organisms
- Break down the tree leaves, making the energy in them available to other organisms
- Are used as fish bait
- Moderately pollution intolerant

Crayfish

- Order Decapoda, Families Astacidae and Cambaridae
- Think, hard skin
- Cylindrical body
- Five pairs of legs, with pinchers on the ends of the first 2 or 3 sets
- A flipper is found on the last segment of the abdomen
- Two pairs of antennae are found on the head, with one pair being much longer than the other
- Two large compound eyes are present which may be moved around on the end of stalks
- Live in all types of aquatic environments, including streams and lakes
- Hide in crevices
- They must keep their gills wet to breathe, so they burrow to an underground level deep enough to be in the water
- To defend themselves they pinch with their claws, or while trying to run away, their leg will break off (regeneration does occur)
- Eat live and dead plants, snails, insects, small fish, and fish eggs
- Used for fish bait or food for humans
- Can live as long as 6-8 years
- Moderately pollution intolerant

Clams/Mussels

- Class Bivalva
- Mollusks with two shells that are connected at the top
- The muscular foot on the bottom front is used for movement
- The body tissue inside the shells is pinkish or grayish
- 2 to 250 mm in length
- Breathe with gills
- Found in lakes, streams, and rivers
- Bury themselves in gravel or sand
- Are filter feeders that feed on algae, bacteria, and dead material
- Keep the amount of algae down
- Food for birds, turtles, frogs, fish, and people, as well as other animals
- Pearls grow inside them
- Many have died because of pollution and man-made changes to rivers, such as dams
- Moderately pollution intolerant

Blackfly Larvae

- Order Diptera, Family Simuliidae
- Elongated and soft bodied
- True legs are absent but may have a single proleg on the thorax
- Club-shaped body that is slightly larger around on one end than on the other
- Fanlike mouth brushes may be visible
- Has tiny hooks on the end of the abdomen that may be used to anchor it to rocks
- 3 to 12 mm in length
- Oxygen is diffused through the surface of the body
- Attach to rocks or plants in rivers or streams and filter food particles from the passing water with their mouth brushes
- Eat algae, bacteria, and dead material
- Attach themselves to a rock or other surface by a sticky silk thread, which acts as a lifeline in case they are swept away by the current. They can also use it to move from spot to spot
- Fairly pollution tolerant

Scud

- Order Amphipoda
- 5 to 20 mm in length
- Body is flattened from side to side
- Resembles shrimp
- Seven pairs of legs, with the first two pairs having claws
- Two pairs of antennae
- Six pairs of short appendages are on the bottom of the end of the abdomen
- The name comes from the Norwegian word *skudda*, meaning “to push”
- Also called “sideswimmers” or “amphipods”
- Swim and move along the ground on their sides
- Breathe through gills
- Usually live on the bottom in shallow water of ponds, lakes, and streams
- Mostly eat dead material but also eat fungi, algae, and bacteria
- An important food source for many fish
- If their habitat lacks fish, there can be as many as 10,000 scuds covering one square meter of stream or lake bottom.
- Have negative phototaxis, which means that they avoid bright light, and thus are active at night
- Fairly pollution tolerant

Right-handed/Other Snails

- Class Gastropoda
- Single cone-shaped and sometimes spiraled shell
- 4 to 44 mm in length
- Right-handed snails have the shell opening on the right when the shell is pointed upward
- Mollusks
- The snail inside has a prominent head with teeth and tentacles

- It uses its muscular foot for movement and to seal the shell when it retracts into the inside
- Live in freshwater ponds, lakes, swamps, and the slow parts of streams
- Many scrape algae off rocks with their radula—a hard, many-toothed tongue
- Important because they help keep algae growth down
- Fish, amphibians, and waterfowl feed on them
- Travel on a path of slime excreted by their foot
- Fairly pollution tolerant

Midge Larvae

- Order Diptera, Family Chironomidae
- 2 to 20 mm in length
- Elongated and soft bodied
- Often curled
- True legs are absent but paired, hooked prolegs on either end may be present
- Hardened head capsule
- Dissolved oxygen diffuses over the surface of the body
- Considered to be “true flies”
- Live in all kinds of aquatic environments
- Live inside tubes they construct out of dirt particles held together by silk
- Eat bits of food that they collect from the bottom or filter from the water with a net constructed of silk
- Eaten by fish and waterfowl
- Fairly pollution tolerant

Sowbug

- Order Isopoda, Family Asellidae
- Crustacean related to the pillbug
- Seven pairs of legs, with claws on the first pair
- Brownish and often mottled in color
- Hard bodied
- Flattened from top to bottom
- 5 to 20 mm in length
- Live in crevices in shallow water
- Usually feed on particles of dead plants and animals
- Eaten by some invertebrates like crayfish and bottom-feeding fish
- Fairly pollution tolerant

Aquatic Worms

- Class Oligochaeta
- 1 to 30 mm in length
- Soft bodied, elongate, and cylinder-shaped
- The body consists of many ring-like segments (usually 40-200)
- Each segment has tiny bundles of hairs called chaetae
- Does not have suckers or eyespots

- Move by contracting their muscular body wall and by pushing on the surrounding dirt with little bundles of hairs
- Many live in the soil at the bottoms of lakes, ponds, and slow-moving rivers
- Mix the first 5 to 10 cm of sediment on lake bottoms, so organisms that live in the sediment get enough dissolved oxygen
- Many eat mud, sifting out food particles to be eaten. Others eat bacteria, protozoa, algae, and even small invertebrates
- Eaten by invertebrates and fish
- Very pollution tolerant

Leech

- Class Hirudinea
- Usually are 5 to 100 mm in length
- Soft but muscular body
- Elongated, flattened from top to bottom
- There are actual 34 segments, which may be subdivided
- The first few segments have several eyespots on them
- There are two suckers on the body—one on the front and one on the rear
- Look like flattened worms
- Usually found in shallow areas of ponds, lakes, and slow-moving rivers
- In suitable areas there may be as many as 700 per square meter of bottom
- Dissolved oxygen is absorbed over the body's surface
- Sometimes they can survive for several days without oxygen
- Some swallow their prey whole—insect larvae, aquatic earthworms, snails, and other leeches. Others attach themselves to a host and suck its blood
- In the past they were used by doctors to heal sick people
- Fish, snakes, birds, and insects eat them
- They decrease the number of fish in hatcheries
- Very pollution tolerant

Pouch/Left-Handed Snails

- Class Gastropoda
- Single cone-shaped and sometimes spiraled shell
- 4 to 44 mm in length
- Left-handed snails have the shell opening on the left when the shell is pointed upward.
- The snail inside has a prominent head with teeth and tentacles
- It uses its muscular foot for movement and to seal the shell when it retracts into the inside
- Live in freshwater ponds, lakes, swamps, and the slow parts of streams
- Many scrape algae off rocks with their radula—a hard, many-toothed tongue
- They are important because they help keep algae growth down
- Fish, amphibians, and waterfowl feed on them
- Travel on a path of slime excreted by their foot
- Very pollution tolerant

Bloodworm Midge Larvae

- Order Diptera, Family Chironomidae
- 2 to 20 mm in length
- Elongated and soft bodied
- Often curled
- True legs are absent but paired, hooked prolegs on either end may be present
- Hardened head capsule
- Dissolved oxygen diffuses over the surface of the body
- Bright red in color because of the oxygen stored in the hemoglobin of their blood
- Because they can store oxygen, they can exist in highly polluted or organically rich aquatic areas
- Live in deep waters, like the bottoms of lakes
- Live inside tubes they construct out of dirt particles held together by silk
- Eat bits of food that they collect from the bottom or filter from the water with a net constructed of silk
- Eaten by fish and waterfowl
- Very pollution tolerant