f i s h f l y

Genus: *Nigronia*
Family: Corydalidae
Order: Megaloptera

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

nymph

adult

Key Features to Look For:
- Elongate body with a pair of long thin appendages on each section of the abdomen
- Large pinching mouth parts
- Set of hooks at the end of the abdomen
- Can be up to 2 inches and do not have gills at the base of the abdominal projections

Key behaviors:
- Very mobile, will be very active crawling or wiggling in the tray.
- Will curl the abdomen around your finger if picked up.
- May cling to the net.

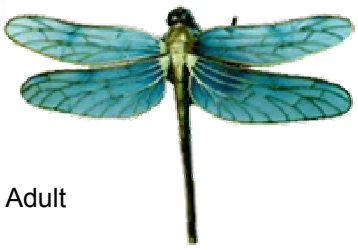
Habitat: Prefer soft sediments in streams and lakes.

d r a g o n f l y

Order: Odonata

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

Nymph



Adult

Key Features to Look For:
- Very large eyes
- Extendable lower jaw
- Two sets of wing pads
- Nymph has robust body shape
- Nymph has three short spike-like tails
- Nymph can be up to 2 inches in length

Key behaviors:
- Very mobile.
- Moves quickly with jet propulsion or walk.

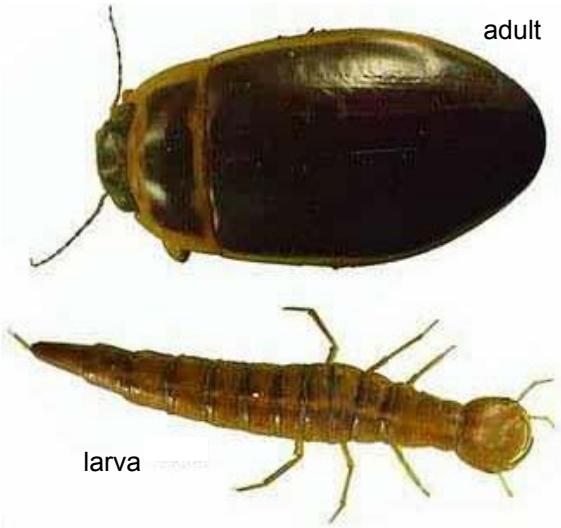
Points of note:
Dragonfly nymphs can be very common when conditions are appropriate. There are several types of dragonflies found in riffle areas.

Habitat: The majority of species live in slow-moving or standing water. Dragonfly larvae can be found in vegetation, undercut banks or snag areas.

Water beetle

Family: Dytiscidae
Order: Coleoptera

Sensitivity to pollution = moderately sensitive



Key Features to Look For:
- They are black, brown, or greenish
- 0.08 to 1.57 in. (3–40 mm) long
- Smooth oval bodies and
- Hairy oar-like hind legs

Key behaviors:
- Scurry around the bottom of the tray.
- Can get caught on net.

Points of note:
- Both adults and larvae are carnivorous. The larvae have a particularly fierce appearance with sickle-shaped mandibles, or jaws. These mandibles have holes at their tips through which the larva secretes digestive enzymes when it catches its prey. So to a great extent digestion is external, the body fluids of its victim being sucked up via the holes and the channels in the mandibles.

Habitat: Both the adults and larvae are entirely aquatic, and are common in still, fresh waters such as ponds and lakes.

backswimmer

Genus*: Notonecta*
Family: Notonectidae
Order: Hemiptera

Sensitivity to pollution = moderately sensitive

Key Features to Look For:
- Backswimmers are aquatic insects with a boat shaped back and paddle-like legs
- Their hind legs are much longer than their middle and front legs
- The hind legs are about 1.3 cm in length

Key behaviors:
- Backswimmers swim upside-down on their backs just under the surface of the water. They swim by moving their long hind legs like the oars of a boat.

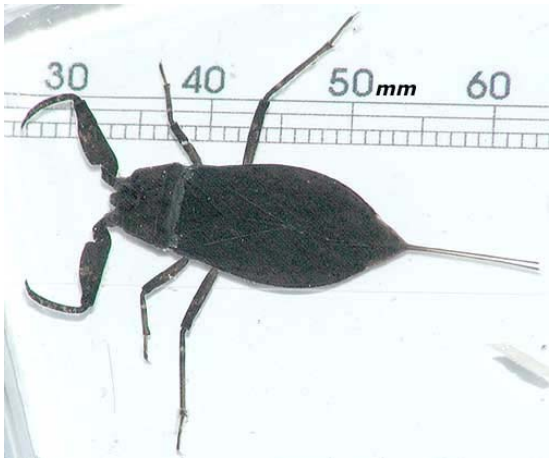
Points of note:
- The backswimmer obtains air from the surface of the pond through a row of hair fringes. These hair fringes pierce the surface, thereby breaking the water tension. This allows air to move beneath the surface of the water and it is collected by the backswimmer. The air is stored beneath the wings and is used as needed.

Habitat: They are common in freshwater ponds.

Water scorpion

Genus: *Ranatra*
Family: Dytiscidae
Order: Nepidae

Sensitivity to pollution = moderately sensitive



Key Features to Look For:
- They have long, slender, sticklike, bodies (up to 40 mm)
- Well-developled raptorial front legs used for grasping prey
- Have large compound eyes
- The prominent beak pierces prey items, injecting a saliva that serves to both anesthetize and initiate digestion
- There is a pair of long breathing tubes at the tip of the abdomen

Points of note:
- Predator of tadpoles, small fish and other aquatic insects.

Habitat: These insects are quite common in southern Ontario, and can be found in the vegetation along quiet waters of rivers and streams, as well as in pools and ponds.

damselflies

Order: Odonata

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

Nymph

Adult

Key Features to Look For:
- Very large eyes
- Extendable lower jaw
- Two sets of wing pads
- Nymphs have a slender body shape
- Nymphs are three long thin or feather-like tails

Key behaviors:
- Very mobile.
- Move by wiggling side to side.

Points of note:
There are several types of damselflies found in riffle areas.

Habitat: The majority of species live in slow-moving or standing water. Typically found in medium-quality, slowly moving water.

Freshwater shrimp

Genus*: Gammarus*

Sensitivity to pollution = moderately sensitive

Key Features to Look For:

- Length 1mm
- Body is laterally flattened
- Resembles salt water shrimps

Key behaviors:

- It swims on its side.

Points of note:

- Often found under stones and around the bases of rooted water plants.
- Widespread and common.

Habitat: Intolerant of polluted waters or ones with low oxygen content; favours fast-flowing streams and rivers but also found near inflows or outflows in stream-fed lakes.

Fly larva

Order: Diptera

Sensitivity to pollution = not sensitive

larva

adult

Key Features to Look For:

- There are many types of Fly Larvae (plural of larva), but they are all generally grub- or worm-like. Some common groups include:
    - Black Fly larvae, which are dumb-bell shaped and soft. They like to attach themselves to rocks and wood
    - Crane Fly larvae, which are large and fleshy with very short “tentacles” for breathing
- Up to 50 mm long

Key behaviors:

- Attach to the bottom of the tray and move like inch-worms.

Points of note:

- Fly larvae experience a complete metamorphosis (moulting through their life cycle) that includes eggs, larvae, pupae and adults.

Habitat: Fly Larvae are found in streams and ponds, in water in the holes of tree trunks - anywhere water collects. The larvae of one species of fly lives in pools of crude oil.

scuds

Genus: *Amphipoda*

Sensitivity to pollution = not sensitive
LEAST WANTED

Key Features to Look For:

- Their bodies are flattened from side to side, or laterally
- Eyes and antennae are easily seen on the head
- Scuds are tan to white in color.

Key behaviors:

- Swim on their sides very fast.

Points of note:

- These crustaceans are an important food source for many fish.

Habitat: Scuds are usually found among vegetation, and occasionally in sandy or silty areas of shallow waters.

Freshwater clam

Order: Unionoida

Sensitivity to pollution = not sensitive

Key Features to Look For:
- Two hinged shells

Key behaviors:
- Does not move in the tray.
- Closes up when it is picked up.

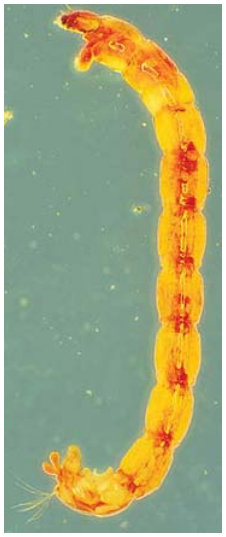
Points of note:
- Mussels are common and sometimes abundant.

Habitat: Often found in large rivers.

bloodworm

Order: Chironomidae

Sensitivity to pollution = not sensitive
LEAST WANTED



Key Features to Look For:
- Their body has a one pair of prolegs located on the thorax, just beneath the head
- A pair of prolegs at the end of the abdomen
- Tufts of hairs or gills

Key behaviors:
- Wriggles around from side to side in the tray.

Points of note:
- Bloodworms are bright red in color because they contain hemoglobin that stores oxygen within their bodies.

Habitat: Most species are bottom dwelling, and many live within tubes or loosely constructed silk line cases in the substrate.

isopod

Genus: *Caecidotea*
Order: Isopoda

Sensitivity to pollution = not sensitive
LEAST WANTED

Key Features to Look For:
- 0.5–2 cm
- Relatively flat
- Has long antennae and seven pairs of legs

Key behaviors:
- Crawls slowly amongst the debris.

Points of note:
Sow bugs are crustaceans, not bugs as their name suggests.

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

leech

Order: Hirudinea

Sensitivity to pollution = not sensitive
LEAST WANTED

Key Features to Look For:
- <5–8 cm
- Worm-like
- Brown and slimy
- Flattened, with sucker at each end

Key behaviors:
- Stick to the bottom of the tray and move like inch-worms.

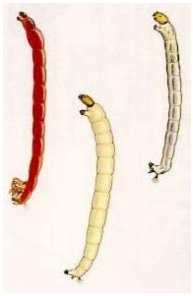
Points of note:
- Some attach suckers to prey and drink blood; others gather detritus.

Habitat: Indicators of low dissolved oxygen.

midge

Order: Diptera

Sensitivity to pollution = not sensitive
LEAST WANTED



larva

adult

Key Features to Look For:
- <1.25 cm
- Have a worm-like body and distinct head
- Often C-shaped
- Sometimes bright red

Key behaviors:
- Swim by violent side to side wiggling.

Points of note:
Most filter-feed or gather detritus; a few prey on other insect larvae. Look carefully for midge larvae, they are extremely small.

Habitat: Can survive in water with low oxygen concentrations.

Black fly

Order: Diptera

Sensitivity to pollution = not sensitive
LEAST WANTED

larva

adult

Key Features to Look For:
- Black flies can be recognized by their distinct head
- Feathery antennae
- Pair of prolegs just beneath the head
- Swollen or bulbous abdomen

Key behaviors:
- Attach to the bottom of the tray and move like inch-worms.

Points of note:
- Filter small particles of organic matter from the current.
- Look carefully for black fly larvae; they are extremely small.

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

mosquito

Order: Diptera

Sensitivity to pollution = not sensitive

larva

adult

Key Features to Look For:
- Female: mouth parts form long piercing-sucking proboscis
- Male: feathery antenna, mouth parts not suitable for piercing skin
- Larvae siphon tube for breathing, brushes by mouth for filtering food
- Up to ½ inch
- All Diptera adults have two wings, but mosquitoes have scales on their wings

Key behaviors:
- Female: blood meals at dusk and into the evening, some are diurnal.
- Male: only eat flower nectar or other suitable sugar source.
- Larva: hang upside down from water surface and molt 4 times.

Points of note:
- Transfer diseases to people and animals.

Habitat: Swamps, sluggishly moving streams or ditches. Will lay their eggs in any standing water.

Freshwater mussel

Genus*: Elliptio complanata*
Family: Costata

Sensitivity to pollution = not sensitive

Key Features to Look For:
- Up to 7 inches (17.8 cm) in length
- Shell is green to yellowish brown in younger individuals and becomes chestnut or dark brown as the shell matures
- Inner shell is white, bluish white, and often salmon-colored and moderately thick

Key behaviors:
- Does not move in the tray.
- Closes up when it is picked up.

Points of note:
- Like other bivalve mollusks, the Eastern Elliptio is a filter feeder. It takes in large quantities of water through an incurrent siphon, filters out particles (including digestible organic matter), and passes the "purified" water out through another opening. When present in high numbers, the species helps keep water clear and of high quality, much to the benefit of other aquatic organisms, from plankton to fish to River Otters.

Habitat: Lives in sand, mud, or fine gravel in medium to large rivers where the flow of water are slow to moderate.

Ramshorn snail

Order: Gastropoda

Sensitivity to pollution = not sensitive

Key Features to Look For:
- 0.5–2 cm
- flat or cone-shaped shell surrounding soft body

Key behaviors:
- Move slowly at the bottom of the tray.

Points of note:
- Scrape algae and bacteria from surfaces of submerged rocks to feed.

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

Waterboatman

Genus: *Sigara*
Family: Corixidae
Order: Hemiptera

Sensitivity to pollution = not sensitive

Key Features to Look For:
- These swift and agile swimmers and divers get their common name because of the strikingly synchronous rowing actions of the middle and hind pairs of legs

Points of note:
- Corixids carry a temporary and replaceable air supply between the wings and abdomen; this air store can act as a physical gill, allowing the insects to extract oxygen from the water, and permitting them to forage near the bottom of water bodies for quite long periods.
- In this way, the corixids seem to avoid competition with some of the larger water "bugs", such as backswimmers or belostomatids, that spend much of their time foraging at or near the surface.

Habitat: *Sigara* are the common water boatmen found in local streams.

snail

Order: Gastropoda

Sensitivity to pollution = not sensitive
LEAST WANTED

Key Features to Look For:
- 0.5–2 cm
- Flat or cone-shaped shell surrounding soft body

Key behaviors:
- Move slowly at the bottom of the tray.

Points of note:
- 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 worm

Order: Oligochaeta

Sensitivity to pollution = not sensitive
LEAST WANTED

Key Features to Look For:
- Aquatic oligochaetes have thin, elongated, segmented bodies
- The head cannot be easily identified from the rest of the body
- The color of live aquatic worms will vary from beige to tan to red
- Usually <7.5 cm; long, thin, segmented worms with no legs

Key behaviors:
- Wriggles around from side to side in the tray.

Points of note:
- Tolerant of pollution; high numbers indicate poor water quality.

Habitat: Most aquatic oligochaetes are commonly found in silty substrates and among the debris and detritus found in streams.

Water strider

Genus: *Gerris*
Family: Gerridae
Order: Hemiptera

Sensitivity to pollution = not sensitive

Key Features to Look For:
- The terminal segments of their legs are modified for water "skating"
- They have dense patches of unwettable hairs which allow the animals to be supported by the surface tension of the water
- They are thought to steer with their hind legs. The antennae are used to detect vibrations and ripples in the surface film

Key behaviors:
- Large individuals may "jockey" for position on the surface of the water.

Points of note:
- The gerrids are mostly univoltine (i.e., one generation per year), although some species produce 2 generations.
- The young take about 5 weeks to mature, moving through 5 larval instars; adults may live for an entire season, and some overwinter under leaves and debris above the waterline, near the shore of ponds or rivers.

Habitat: These are semi-aquatic insects, living on the surface of ponds, or the still water at the margins of streams.

flatworm

Genus: *Cura, Dugesia*
Order: Tricladida
Family: Planariidae

Sensitivity to pollution = not sensitive

Key Features to Look For:
- 15-18 mm long at most
- Has a uniform greyish or brownish colour
- Flat body
- No legs

Key behaviors:
- They are clingers and gliders.
- They are predators (engulfers) and they prey on small living invertebrates.

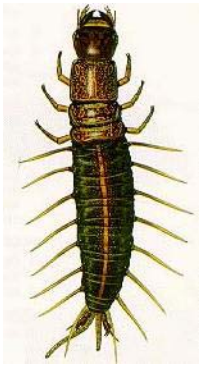
Points of note:
- Most samples of stream invertebrates will include flatworms, but generally, these will be specimens in rather poor condition.
- Flatworms are fragile and easily damaged. The common methods of killing and preserving aquatic insects (70% ethanol, Kahle¹s solution) are not suitable for flatworms, which should be fixed in nitric acid, or a hot solution of mercuric chloride, before preservation.

Habitat: Flowing and standing water, under rocks and debris.

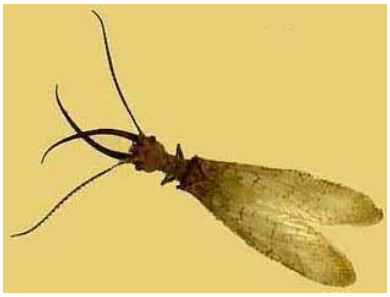
dobsonfly

Genus: *Corydalus*
Family: Corydalidae
Order: Megaloptera

Sensitivity to pollution = not sensitive
MODERATELY WANTED



nymph



adult

Key Features to Look For:
- Elongate body with a pair of long thin appendages on each section of the abdomen
- Large pinching mouth parts
- Set of hooks at the end of the abdomen
- Can be extremely large, up to 4 inches and a tuft of fluffy gills at the base of each abdominal projection

Key behaviors:
- Very mobile, will be very active crawling or wiggling in the tray.
- Will curl the abdomen around your finger if picked up.
- May cling to the net.

Points of note:
Large *Corydalus* are capable of inflicting a painful pinch with their mandibles. Please use care when handling these organisms.

Habitat: Prefer soft sediments in streams and lakes.

Whirligig beetle

Genus*: Gyrinus*
Family: Gyrinidae
Order: Coleoptera

Sensitivity to pollution = not sensitive

Key Features to Look For:
- The adults of Gyrinus are small (3 - 7 mm long), with shiny black eleytra (wing covers), and yellow-to-orange underparts and legs
- All gyrinid adults have compound eyes that are divided into upper and lower parts, presumably giving them the ability to detect prey above and below the water surface at the same time
- They use their antennae to detect movements in the surface film

Key behaviors:
- They tend to form large groups, swimming together in whirling circles over the surface.

Points of note:
- Adults overwinter under leaves and debris along the shores of streams and lakes.
- A single generation is produced each year

Habitat: Whirligig beetles are common sight, especially in late summer and early fall, on lakes and ponds, and quiet pools in streams and rivers, throughout North America.