EPHEMEROPTERA: MAYFLIES

**Larvae** (nymphs): elongated body, may be cylindrical or flattened, 3-20 mm (0.1-0.8 in.); tip of abdomen with three (sometimes two) long slender cerci (“tails”); developing forewing pads visible; plate-like, feathery, or fringed gills at sides of abdomen; some types have larger fore-gills that form a shield like cover over other gills; conspicuous eyes; slender antennae

- **Heptageniidae** (flathead mayfly)
- **Isonychiidae** (brush-legged mayfly)
- **Leptophlebiidae** (prong gill mayfly)
- **Baetidae** (small minnow mayfly)
- **Ephemeridae** (common burrower mayfly)
- **Caenidae** (little squaregill mayfly)
**MOLLUSCA: MUSSELS & SNAILS**

**Freshwater mussels, Margaritiferidae (Margaritifa spp), Unionidae (Anodonta & Gonidea spp.):** bivalved shell with two oblong halves; can reach >15 cm (6 in.); more common in larger rivers with softer substrate

- **Gonidea angulata** (western ridged mussel)
- **Anodonta nuttalliana** (winged floater)
- **Margaritifera falcata** (western pearlshell)

**Juga snails:** dark reddish-brown to black shell, smooth or ridged; pale lines may spiral with coils; 10-30 mm (0.4-1.2 in.)

---

**PLECOPTERA: STONEFLIES**

**Larvae (nymphs):** elongate, slightly flattened body with “roachlike” appearance; 5-35 mm (0.2-1.4 in.); long slender antennae; two pairs of wing pads visible on older larvae; tip of abdomen has two “tails” (cerci); fingerlike or filamentous gills may be visible on bases of the legs, thorax, or underside of abdomen

- **Pteronarcyidae** (giant stonefly)
- **Perlidae** (golden stonefly)
- **Capniidae** (snowfly)
- **Nemouridae** (forestfly)
- **Peltoperlidae** (roachfly)

---

**TRICHOPTERA: CADDISFLIES**

**Larvae:** elongate, caterpillar-like body; antennae reduced & inconspicuous; no wing pads; tip of abdomen has pair of short, clawed, anal prolegs, but no “tails” (cerci); 2-40 mm (0.08-1.6 in.); filamentous gills may be present in some types; some are free-living & spin silken nets, others build elongated, cylindrical, coiled, or saddle-shaped portable cases from stones, twigs, leaves, & other organic material; cases may persist in dry channels

- **Glossosomatidae** (saddle case-maker)
- **Limnephilidae** (Northern caddisfly)
- **Hydropsychidae** (net-spinning caddisfly)
- **Helicopsychidae** (snail case-maker)
- **Philopotamidae** (finger-net caddisfly)
- **Rhyacophilidae** (green rockworm)
- **Leptoceriade** (longhorned case-maker)
**ODONATA: DRAGONFLIES & DAMSELFIES**

**Larvae** (nymphs): **dragonflies** = stout, cylindrical to flattened body; abdomen ends in 3 short stiff points; **damselflies** = slender elongated body with 3 flattened leaf-like gills at tip of abdomen; both have large eyes, wing pads, long extendable “lower lip” (labium) that masks the lower part of head when not in use

- **Gomphidae** (clubtail dragonfly)
- **Calopterygidae** (broadwinged damselfly)
- **Aeshnidae** (darners)
- **Lestidae** (spreadwing damselfly)
- **Macromiidae** (river skimmer)
- **Coenagrionidae** (narrowwinged damselfly)
- **Cordulegastridae** (spiketail)
- **Labiidae** (broadbill)

**Adults**: body shapes vary; often oval and slightly flattened, some types cylindrical; forewings form hard smooth shiny covers (elytra) when folded, meet in straight line down the back, covering membranous hindwings and most of abdomen; legs may be flattened or fringed with swimming hairs; 1-40 mm (0.04-1.6 in.)
HEMIPTERA: AQUATIC TRUE BUGS

**Larvae (nymphs) & adults**: body slender, oval to elongate, may be flattened; 1-65 mm (0.04-2.6 in.); cone- or needle-like beak arises from front of head, folded under body when not in use; have developing wing pads (nymphs) or wings (adults); **adult** forewings thickened & leathery at the base, membranous at the tips, cross at tips when folded; legs may be flattened like oars or fringed with swimming hairs.

**Gerridae** (water strider, nymph)

**Nepidae** (water scorpion, adult)

**Notonectidae** (backswimmer, adult)

**Corixidae** (water boatman, adult)

**Belostomatidae** (giant water bug, nymph)

DIPTERA: AQUATIC & SEMI-AQUATIC TRUE FLIES

**Chironomidae** (non-biting midge, pupa & larvae)

**Tipulidae** (crane fly, larvae)

**Dixidae** (dixid midge, larva)

**Athericidae** (watersnipe fly, larva)

**Culicidae** (mosquito, larva)

**Ceratopogonidae** (biting midge, larva)

**Blepharicidae** (netwinged midge, larva)

ADDITIONAL GROUPS OF AQUATIC INVERTEBRATES

**Class Oligochaeta** (aquatic earthworm)

**Subclass Hirudinea** (leeches)

**Class Turbellaria** (flatworms)

**Phylum Nematomorpha** (horsehair worm)

**Order Isopoda** (aquatic sowbug)

**Order Decapoda** (crayfish)

**Order Amphipoda** (scud, side swimmer)

**Order Megaloptera, Family Corydalidae** (dobsonfly/fishfly larva, left) & **Family Sialidae** (alderfly larvae, right)

To read the complete report, “Macroinvertebrates as Indicators of Stream Duration”, visit www.xerces.org/aquatic-invertebrates/

All photos copyrighted by The Xerces Society, unless otherwise noted.
The Xerces Society for Invertebrate Conservation, 4828 SE Hawthorne Blvd., Portland OR 97215, 503-232-6639