

# Some general information about North American aquatic insects

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Truly aquatic insects are those that spend some part of their life-cycle closely associated with water, either living beneath the surface or skimming along on top of the water. Aquatic insects can be found in the following taxonomic Orders;

[Collembola, the Springtails.](#)

[Ephemeroptera, the Mayflies.](#)

[Odonata, the Dragonflies.](#)

[Plecoptera, the Stoneflies.](#)

[Hemiptera, the true Bugs.](#)

[Neuroptera/Megaloptera, the Dobsonflies, Alderflies, and Spongillaffies.](#)

[Trichoptera, the Caddisflies.](#)

[Lepidoptera, the butterflies and Moths.](#)

[Coleoptera, the Beetles.](#)

[Diptera, the true Flies.](#)

On this page you will find a brief description of each of these orders along with some images where possible. If there is a highlighted word in the text, click it to see an image of the insect. Unless otherwise noted, these images were scanned from [Merritt and Cummins](#).

## Collembola

The springtails are very small insects that have been around for a very long time. This is one of the oldest insect orders with fossil remains known from the Devonian period over 345 million years ago . The [Collembola](#) are strange-looking little insects that can sometimes be found in large numbers jumping around on the surface of the water where there is vegetation or organic detritus like leaves washed against the shore. These insects have evolved a jumping device composed of a furcula and tenaculum which allows them to leap many times their own length.

## Ephemeroptera

The Mayflies are well known to fly fisherman because they are one of the favorite foods of trout when they emerge as adults. Most of their lives are spent as [nymphs](#) living sometimes for several years under the water before emerging as adults to mate and lay eggs in a few hours or at most a few days. This is where the order got it's name, from the "ephemeral" nature of the insects' adult life. Mayflies are the only insects known to molt after reaching a winged form. After emerging from the water they live briefly as a winged form called a subimago which molts again to the [adult form](#).

## Odonata

The Odonates are the insects commonly known as dragonflies and damselflies. They are all predators, both as nymphs and adults, and the adults can significantly reduce mosquito populations by scooping them out of the

air with their basketlike arrangement of legs. Odonate larvae have unusual mouthparts that can be extended to capture prey. These are ancient insects that have been around since before the age of the dinosaurs. Some Odonate fossils from the Carboniferous period had wingspans of over a meter! These insects were larger than many modern hawks!

## Plecoptera

The Plecoptera are called stoneflies, likely due to the fact that nymphs are very common beneath the stones of rivers and streams. Another ancient order, the stoneflies prefer colder, fast running water, and are one of the most common orders you will find in the small tributary streams of the Connecticut River. The [nymphs](#) of stoneflies look very much like the [adults](#) with the exception of the wings, which are not present in the nymph.

## Hemiptera

The Hemiptera you find in the river are surely the insects you want to treat with the most respect because many of them are capable of inflicting a very painful bite. They range in size from tiny insects called Water-measurers in the family Hydrometridae to the huge Belostomatidae, or Giant Water Bugs, which can reach 7 centimeters or more in length. The majority of aquatic Hemipterans are predators and this can be seen from their raptorial forelegs and sharp piercing mouthparts. The most formidable of these insects is a small round bug called a Creeping Water Bug. The bite of this bug is easily as painful as a hornet sting and probably more. Others you might find include the Water Scorpions, Backswimmers, Water Boatmen, and Water Striders. All of these insects are common in the Connecticut River, usually in places where the water is slow-moving and emergent vegetation is present.

## Megaloptera and Neuroptera

These large insects, commonly known as alderflies or dobsonflies, can be quite striking both as larvae and as adults. The immature form of the dobsonfly is what fishermen call a "hellgramite". These fierce larvae can be over three inches long and are equipped with strong mandibles with which they can deliver quite a pinch. They are common in rocky, fast moving areas of the river where they live by hunting down and eating other aquatic animals. When they become adults they still look formidable because many of the adult males have [grossly exaggerated jaws](#). These however are mainly for show and cannot be used to pinch like the jaws of the larvae can.

## Trichoptera

The common name of the Trichoptera is "caddisfly" which means case-bearer. Many of these insects build cases to live in from various materials they find in the river such as stones, twigs, leaves or sand. Here is a picture of just some of the [cases that you might find](#) while exploring the river. The average size of these cases is about 1.5 centimeters in length.

## Lepidoptera

There are only a few Lepidoptera, the butterflies and moths, that are truly aquatic. Most that will be found in the Connecticut River are Noctuid moths that live as larvae in the stems of aquatic plants. Many beautiful butterflies and moths will, however, be found associated with the river and it always pays to keep an eye out for them as they can be one of nature's most rewarding sights.

## Coleoptera

Coleoptera is latin for "shield-wing" and if you've ever looked closely at a beetle you know how they acquired their name. Beetles have the front wings modified into hardened covers which shield the rear wings from damage. Flying beetles use only their rear wings to fly, the front wings just open in order to get out of the way. There are more species of beetles in the world than there are of any other group of animals or plants. To date more than 300,000 species of beetle have been described. The aquatic beetles are very diverse and interesting. Predaceous diving beetles are common in the river, some nearly an inch long. These are generally harmless to humans but all insects should be handled with care because some can deliver painful bites. The whirligig beetles are very common and can often be found swimming together on the surface of calm water in large groups. These beetles have an interesting adaptation to living on the water surface. They have evolved to be "four-eyed", with one pair of eyes above the water and another below. If you look carefully you can see that in this [picture of a Gyrinid](#), or whirligig beetle. Other beetles that might be found in the river are Elmids, or [riffle beetles](#), Psphehid, or [water-penny beetles](#), and the little heart-shaped Haliplids, or crawling water beetles. Look how different a [Haliplid larva](#) is from a [Haliplid adult](#)!

## Diptera

Diptera means "two wings" and this name refers to the true flies. Some of Humankind's least favorite insects are aquatic Diptera, mainly the ones that like to feed on our blood. These include the Tabanids, which are the horseflies and deerflies, the Culicids, or mosquitos, and the Simuliids, the biting blackflies. Since many of these insects transmit diseases like Malaria and Dengue fever a great deal of effort has gone into research on controlling them. While a great deal of progress has been made, flies still cause more people to become sick than any other source of disease.

Some of the interesting adaptations flies have used to colonize the aquatic habitat include [breathing tubes](#), silken tunnels, and [ventral suction cups](#).



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**Smith, Douglas G.** 1995. Keys to the Freshwater Macroinvertebrates of Massachusetts. Published by D. G. Smith, Amherst, MA. *Note: this book can be ordered for the very reasonable price of \$22.50, shipping included (Mass. residents should also add 5% sales tax). If interested contact [Doug Smith](#) at (413)-545-1956 .*

**Thorpe, J. H. and A. P. Covich (Eds.).** 1991. Ecology and Classification of North American Freshwater Invertebrates. New York: Academic Press, Inc.