

Macroinvertebrate Survey of Ramapo River, 25 August 2015  
Trout Unlimited East Jersey Chapter

Report Prepared September 2015

by

Michael J. Sebetich, Ph.D.

Introduction

In 2015 we sampled macroinvertebrates at two locations on the Ramapo River, twice. In spring on 22 May 2015, the samplers were Fred Madura, Walter Nahadil, Lou Falone and Michael Sebetich. In summer on 25 August, the samplers were Walter Nahadil and Michael Sebetich. We used the kick net method recommended by USEP for sampling riffles of wadeable streams. One sampling location was in the riffle approximately 200 meters upstream of the Halifax Road Bridge, Mahwah, Bergen County, NJ. The other location was approximately 100 meters downstream of the Glen Gray Bridge, Oakland, Bergen County, NJ.

Using USEPA protocol, on 22 May, we took four kick net samples at both riffle locations. The organisms were picked from the net and preserved in formaldehyde for later identification and analysis. Using the same protocol, on 25 August we took two kick net samples at both locations, and the organisms were preserved in ethyl alcohol for later identification. The identifications and counting were done by M. Sebetich. The organisms were identified to the taxonomic Order, and a few to Genus.

When we sampled on May 22 the Ramapo River discharge and temperature were normal. However, prior to the August sampling, there had been no precipitation in northern New Jersey for weeks, and the river discharge was very low and the water temperature was 74F.

Results of May 22, 2015

In May, mayfly nymphs were prominent at both sites (Table 1). Mayflies comprised 41.6% of the total at Halifax Road and 31.8% at Glen Gray Bridge. These are higher percentages than those in the August samples.

Caddisfly larvae dominated at Glen Gray (41.5%), but made up only 11.3% of the total at Halifax Road.

Crustaceans, scuds and sowbugs, were a major component of the samples. At Both Halifax and Glen Gray. Amphipod scuds comprised 30.8% (Halifax) and 19.8% (Glen Gray) of the total number of organisms sampled. Sowbugs made up 12.4% of total at Halifax, but zero percentage in the Glen Gray samples.

Table 1. Macroinvertebrates sampled in Ramapo River, 22 May 2015.

Taxonomic Order	Common Name	Halifax RD Bridge		Glen Gray Bridge	
		No. individuals	%	No. individuals	%
Ephemeroptera	mayfly	165	41.6	121	30.8
Trichoptera	caddisfly	45	11.3	163	41.5
Coleoptera	beetle (water penny)	1	0.25	24	6.1
Diptera	blackfly	2	3.0	3	0.88
Megaloptera	hellgrammite	0	0	0	0
Amphipoda	scud	122	30.8	78	19.8
Isopoda	sowbug	49	12.4	0	
Decapoda	crayfish	numerous		numerous	
Hirudinea (Class)	leech	2	0.50	0	
Bivalvia Clams	clam	many		many	
Coleoptera (beetle)	unidentified	0		4	1.0
<b>Total</b>		<b>396</b>		<b>393</b>	

The Ramapo River always has a high density of crayfish and small clams. No attempt was made to quantify them.

Midges (Diptera) larvae were also present in substantial numbers, but no attempt was made to quantify, because it was too difficult to sample them properly. Their small size enables them to pass through the mesh openings of the net, and even when observed, they are too tiny to pick up with forceps or fingers. As you fish, keep in mind that tiny midge larvae are always

present on rocks in Ramapo River (as well as all other rivers in New Jersey), and that they provide a major diet for trout.

### Results of August 25, 2015

Two kick net samples taken at each site on August 25, whereas four kick net samples were taken on May 22. A comparison of data Tables 1 and 2 shows that approximately twice as many individual organisms were collected in May. However, the written analysis and discussion of fishing ideas of the August sampling is more extensive.

Table 2. Macroinvertebrates sampled in Ramapo River, 25 August 2015.

Taxonomic Order	Common Name	Halifax RD Bridge		Glen Gray Bridge	
		No. individuals	%	No. individuals	%
Ephemeroptera	mayfly	32	16.2	52	28.3
Trichoptera	caddisfly	131	66.5	114	61.9
Coleoptera	beetle (water penny)	2	1.0	17	9.2
Diptera	blackfly	0		0	
Megaloptera	hellgrammite	0		0	
Amphipoda	scud	60	3.0	1	0.5
Isopoda	sowbug	5	2.5	0	
Decapoda	crayfish	numerous		numerous	
Hirudinea (Class)	leech	12	6.1	0	
Tricladida	planaria (flatworm)	9	4.6	0	
Bivalvia Clams	clam	many		many	
Diptera	midge	many		many	
Total			197		184

---

Caddisfly larvae dominated at both sampling sites; 66.5% at Halifax Road and 61.9% at Glen Gray Bridge. The genera were not identified, but there was a clear difference in color. At Halifax Road, 93 individuals were dark (greenish) and 38 light (cream). At Glen Gray Bridge, 53 were dark and 61 light. This information may be useful in selecting fly patterns for fishing. Caddisfly larvae tolerate moderate water pollution and they are found in all streams that this author has investigated.

Mayfly larvae were the second most numerous group sampled. At Halifax Road mayflies made up 16.2% and at Glen Gray Bridge they comprised 28.3% of the total individuals sampled. No effort was made to identify to genus or species, but based on size and shape there were probably two or three species in the collections. *Isonychia* (slate drake dun dry fly; leadwing coachman wet fly; zugbug nymph), the largest of the nymphs, was one of the genera in our samples. The *Isonychia bicolor* nymph has a pale cream dorsal stripe along most of its back. Other mayfly nymphs were very small, and while others were intermediate in size. This suggests that nymph imitations of various hook sizes (20 – 14) should be considered when fly-fishing the Ramapo. Mayfly larvae have a wide range of pollution tolerance depending on species, and it is common to observe several species in the Ramapo River.

Water penny beetle larvae were common to both sampling sites. They cling tightly to rock surfaces and are not a major part of fish diet nor are they considered fly patterns by fishermen. The larvae crawl out of the water to pupate and develop into terrestrial adults. Water pennies are indicative of moderate water quality.

Diptera (midges) also populate all of our local streams, and are a major source of food for trout. We probably saw more midge larvae than any other type of insect in our sampling, but the reasons that we do not have a number for midges on the two data tables is that they are so small that they fall and crawl through the mesh openings of the sampling nets and most are too tiny to pick up. Notably, we saw and actually picked up a few red midges, the kind that we have patterns of in our fly boxes. Based on our observations, a fly fisherman should have an assortment of small midge patterns, and this goes for all streams.

Three major kinds of crustaceans were sampled: Scuds (amphipods), sowbugs (isopods) and crayfish. All of these organisms are eaten by trout and other fish. Most of the scuds and sowbugs were collected at the Halifax Road site. Neither scuds or sowbugs were present in abundance in September. However, the Ramapo River always has a high density of crayfish which can easily be seen scurrying backwards when disturbed. We did not retain or count crayfish that were collected in the sampling net. Crustacean patterns and wooly buggers fished near the bottom may attract fish.

Twelve leeches were collected at the Halifax Road site and none at Glen Gray Bridge. Wooly bugger patterns, some of which imitate leeches, have been fished successfully by many

people on the Ramapo River. It is advisable to have an assortment of wooly bugger patterns and colors for fishing the Ramapo.

Nine flatworms (*Planaria*) were sampled at the Halifax Road site, but none at Glen Gray. Flatworms are very tolerant of low water quality.

Stoneflies are the most sensitive macroinvertebrates to water pollution (low dissolved oxygen concentration; high organic concentration; high water temperature) and are the best indicators of high water quality, but no stonefly larvae were collected during our samplings. However, we have undocumented evidence that stonefly larvae have been seen on the Ramapo River in years past. We urge our TU members to look for stonefly larvae on rocks in the oxygenated riffles of Ramapo River, and if possible collect a few for positive identification. Many stonefly nymphs can be removed from rocks using your fingers (forceps if handy) and placed in a small plastic or glass container filled with clear alcohol (denatured alcohol; rubbing isopropyl alcohol; any cheap gin).

Based on these May and August 2015 results, the water quality of Ramapo River is fair. We will continue to sample macroinvertebrates in the Ramapo River in 2016. If you are interested in helping, contact Mike Sebetich (551-206-2453; [msebetich@optonline.net](mailto:msebetich@optonline.net)). This is a good way to learn more about the stream ecosystem and perhaps to indirectly increase your ability to catch trout.