Macroinvertebrate Study of the West Branch of the

Lackawaxen River, Wayne County, Pennsylvania

Introduction

A second macroinvertebrate sampling effort of the West Branch of the Lackawaxen River was conducted on October 7, 2000. The purpose of this collection was to obtain Fall samples of the macroinvertebrate community and determine what differences occurred between this sampling event and the one conducted on April 14, 2000 at more upstream sites. Also, all samples were collected within waters leased by the Creamton Flyfishing Club to better determine the health of the river within the leased stretch.

Methods

Macroinvertebrate samples were collected at four sites in the same manner as was followed for the April collection, the only difference being that they were collected from different sites. All sites for this sampling event were within the leased waters, with Baird's Pool being the only site sampled during both the April and October events. The same type of macroinvertebrate data that was presented in the April report is also presented in this report. In addition to the macroinvertebrate samples, water temperature, dissolved oxygen, pH, conductivity and alkalinity were measured in the field at each site.

Results and Discussion

Water Quality Parameters

Site	Water temp. (^{o}F)	Dissolved oxygen (mg/L)	pH (µS/cm)	Conductivity (mg/L)	Alkalinity
Corner Pool	50	10.7	7.6	67	28
Church Pool	50	10.5	7.6	73	28
Mead's Bridge	50	10.9	7.9	77	30
Baird's Pool	50	10.0	7.4	74	n/a

Macroinvertebrate Data

Site 1: immediately upstream of Corner Pool – Of the four sites sampled, the macroinvertebrate community at Corner Pool had the lowest number of total (20) and EPT (12) taxa. The community was dominated by a mayfly (Ephemerella subvaria) and caddisfly (Marilla), both of which are very sensitive to pollution, indicating that habitat conditions most likely contributed to lower diversity at this site. A deficiency in the variety of substrate material, a narrower channel, and the long riffle/run reach upstream of the pool appears to have an impact on the variety in habitat needed for the development of a more diverse community. Four taxa each of mayflies and stoneflies, and five taxa of caddisflies were collected at this site, which included the appearance of the caddisfly Glossosoma, a very pollution sensitive organism which was not collected at any of the sites in April.

Site 2: just downstream of the tributary that enters at Church Pool - A total of 27 taxa with 17 of them belonging to the EPT group were collected at Church Pool. The largest diversity of mayflies was collected at this site (7) along with six taxa of caddisflies and four of stoneflies. The mayfly Ephemerella subvaria, and the caddisflies Marilla and Macrostemum dominated the community. The diverse EPT community at this site indicates that water quality conditions are largely unaffected at Church Pool, and that the tributary entering just upstream of the collection site also has no detrimental impact on conditions. In fact, the tributary may actually be improving conditions by adding a fresh supply of flow as well as some macroinvertebrates that get washed down. Although the substrate material at this site consisted primarily of larger cobbles and boulders which were well embedded by gravel, habitat conditions are still suitable

enough to support a community overwhelmingly dominated by pollution sensitive organisms. The wider river with a more diverse current speed and depth regime provides better habitat than that found at Site 1, which is reflected in the more diverse macroinvertebrate community found at this site.

Site 3: approximately 50 m upstream of Mead's Bridge – A total of 27 taxa with 16 of them belonging to the EPT group were collected just upstream of Mead's Bridge. Though not as many mayflies were collected at this site as at Site 2, a greater diversity of stoneflies and caddisflies were collected. All five taxa of stoneflies collected during this sampling event were observed at this site, as was a diverse collection of caddisflies, including the new caddisfly Glossosoma. The mayflies Ephemerella subvaria and Stenonema vicarium, and the caddisflies Marilla and Macrostemum dominated the community. Chironomids (midges) were also dominant at this site. The diverse EPT community at this site indicates that water quality conditions are unaffected by the surrounding environment. In addition, the presence of a diverse stonefly community, which requires the high dissolved oxygen levels measured at this site, further indicates that water quality and habitat conditions are suitable for the establishment and dominance of pollution sensitive organisms.

Site 4: just downstream of Baird's Pool – A total of 26 taxa with 17 of them belonging to the EPT group were collected below Baird's pool. As at Sites 2 and 3, a diverse group of EPT's overwhelmingly dominated the macroinvertebrate community. Three mayflies, Ephemerella subvaria, Stenonema vicarium and Isonychia bicolor, and two caddisflies, Marilla and Macrostemum dominated the community. Pollution sensitive water pennies (Psphenus) were also dominant. The newly collected caddisfly Glossosoma was also collected at this site. Greater numbers of total and EPT taxa were collected during this sampling event than in April. This probably does not indicate an improvement in conditions since April, but rather reflects that the entire macroinvertebrate community can be and is not always observed during any one sampling event.

Summary

The diverse group and large numbers of EPT's collected at the four sites sampled within the leased waters during this sampling event, indicates that surrounding land uses and any pollution inputs that may occur have no significant impact on overall water quality and habitat conditions of the river. Any inputs of pollution that may occur are probably insignificant and do not change water quality or habitat conditions, which if altered would have an impact on the macroinvertebrate community. During storm events when inputs are more likely to occur, they probably are quickly neutralized and carried downstream.

Overall, a more diverse macroinvertebrate community was found to inhabit the stretch of leased water, than was found at sites upstream during the April collection. Though water quality conditions between the leased stretch and upstream reaches are probably similar, suitable habitat conditions for the development of a more diverse community are likely more prevalent within the leased waters, accounting for the greater diversity observed at those sites. Many of the pollution tolerant organisms that were found during the April collection at upstream sites, were not collected at any of the sites within the leased waters. In addition, the much greater diversity of EPT's collected at the four sites sampled in October, indicates that conditions within the leased waters are more suitable for developing and sustaining pollution sensitive organisms.

List of macroinvertebrates collected at four sites on the West Branch of the Lackawaxen River on October 7, 2000. Information included in this list includes each organisms' Family, genus (and some species), abundance at each site, Hilsenhoff score (HS) and fly tying info for the mayflies, stoneflies, and caddisflies. Note: R=rare (1 or 2 organisms), C=common (3-10 organisms), A=abundant (11-50 organisms) and D=dominant (51+ organisms).

Lackawaxen River Macroinvertebrate Data

				Corner	**Church**	**Mead's**	**Baird's**

Family	Genus	Pool	Pool	Bridge	Pool	HS	Fly tying info
				-			
Mayflies (Ephemeroptera)							
Baetidae	Baetis tricaudatus	C	C	-	A	6	Blue-winged Olive
Ephemerillidae	Ephemerella subvaria	D	D	D	D	2	Hendrickson
Ephemeridae	Ephemera guttulata	-	R	-	C	4	Green Drake
Heptageniidae	Epeorus pleuralis	-	A	-	-	3	Quill Gordon
	Stenonema vicarium	A	A	D	D	3	March Brown
Leptophlebiidae	Paraleptophlebia adoptia	C	A	A	C	4	Blue Quill
Oligoneuriidae	Isonychia bicolor	-	C	C	D	4	Isonychia
Stoneflies (Plecoptera)							
Perlidae	Acroneuria abnormis	R	R	C	C	3	Brown/yellow Stonefly
	Agnetina capitata	A	A	A	A	3	Brown/yellow Stonefly
	Paragnetina media	-	C	A	C	3	Brown/yellow Stonefly
Perlodidae	Isoperla	C	R	R	R	2	Little Yellow Stonefly
Pteronarcyidae	Pteronarcys	R	-	R	-	0	Large Black Stonefly
Caddiesflies (Trichoptera)							
Hydropsychidae	Macrostemum	A	D	D	D	5	Spotted Sedge
Philopotamidae	Chimarra	-	-	-	A	3	Little Black Sedge
	Dolophilodes	A	A	A	R	3	Medium Evening Sedge
Polycentropodidae	Polycentropus	-	-	-	R	6	Brown Checkered Summer Sedge
Limnephilidae	Goera	-	A*	A*	-	4	Grey Sedge
	Pycnopsyche	R	R	-	-	4	Great Brown Autumn Sedge