



Supplementary Information

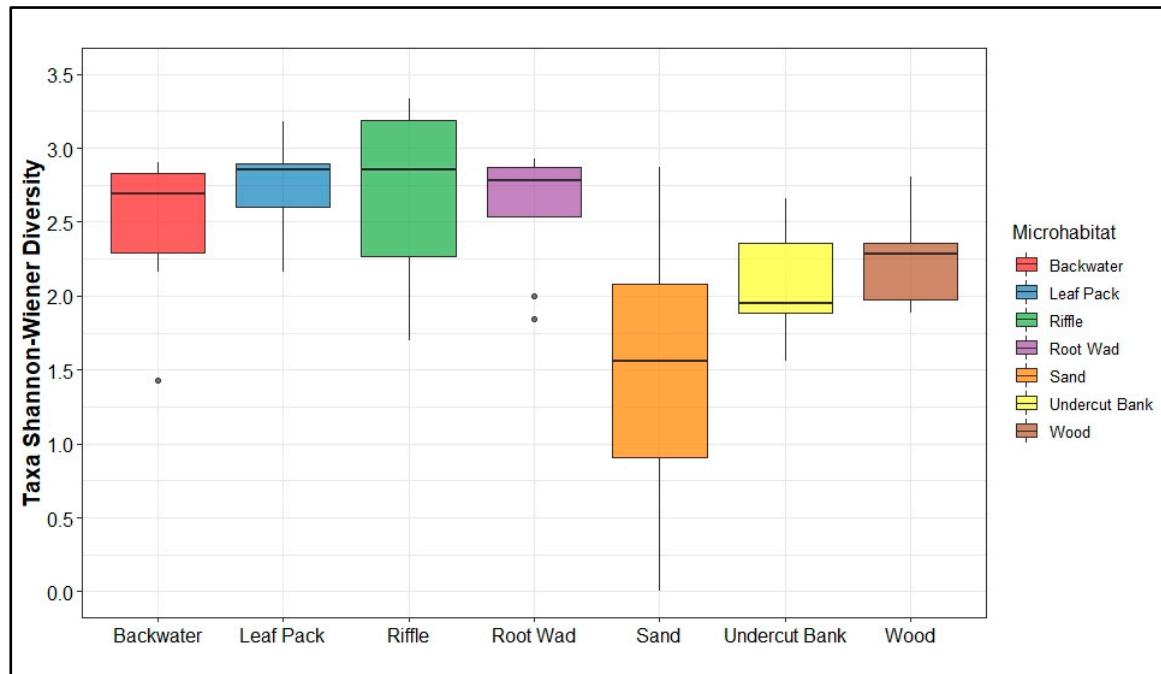


Figure S1. Box plots of taxa diversity across all microhabitats. Taxa diversity was lowest in sand compared to the other microhabitats although not significantly lower than taxa diversity in undercut banks and wood (Kruskal-Wallis $p<0.05$; Dunn test of comparisons $p<0.05$). The number of samples for each microhabitat = 10 except for Leaf Pack (6), Undercut Bank (7), and Woody Debris (9).

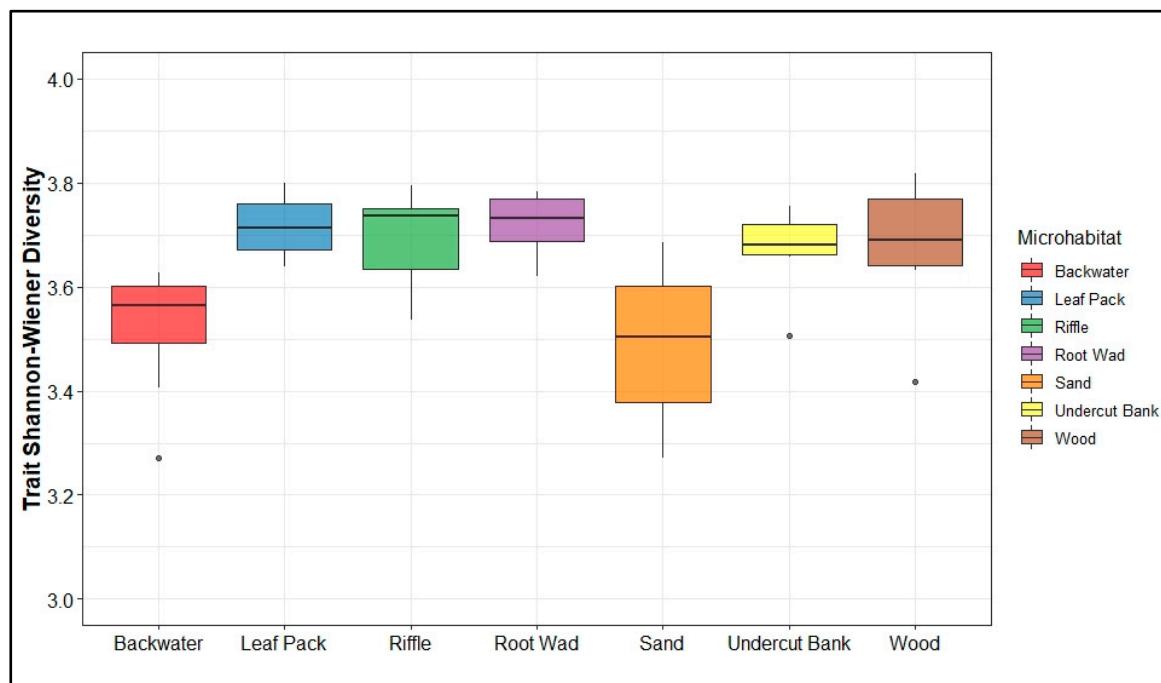


Figure S2. Box plots of trait diversity across all microhabitats. Trait diversity was similar in the leaf pack, riffle, root wad, undercut bank, and woody debris microhabitats and higher than trait diversity in backwater and sand microhabitats (Kruskis-Wallis $p<0.05$; Dunn test of comparisons $p<0.05$). The number of samples for each microhabitat = 10 except for Leaf Pack (6), Undercut Bank (7), and Woody Debris (9).

Table S1. Stream sites in Piedmont, North Carolina. The first 10 sites listed were used to collect reach scale data.

Stream	Site	Drainage Area (mi ²)	2014 % Impervious Cover	2015 EMHAP	Latitude	Longitude
L Indian Cr	LIC	12.0	8.06	169.7	35.509	-81.413
Rocky Cr M	RCM	38.3	4.84	168.0	36.016	-80.908
Leeper's Cr	LC	53.1	10.9	165.7	35.415	-81.061
Rocky Cr J	RCJ	42.5	4.81	165.7	36.010	-80.880
Long Cr	LCM	32.4	65.2	163.3	35.299	-80.979
L Hunting Cr	LHC	54.5	9.11	160.3	36.020	-80.767
Indian Cr	IC	5.67	6.17	156.0	35.510	-81.409
Pott Cr	PC	21.1	6.68	148.0	35.551	-81.318
Beaverdam	BC	22.8	10.2	145.0	35.405	-81.246
Clear Cr	CC	12.8	24.0	137.3	35.209	-80.573
Sugar Cr	MC27	64.7	63.0	109.7	35.090	-80.899
Long Cr	MC14A	31.9	35.06	108.3	35.300	-80.973
Steele Cr	MC47A	7.04	57.3	104.7	35.105	-80.954
Goose Cr	MY9	8.68	10.99	104.3	35.130	-80.631
West Rocky R	MY1B	33.4	8.85	101.0	35.468	-80.790
McKee Cr	MY7B	5.8	15.99	99.7	35.254	-80.648
Little Sugar Cr	MC29A1	12.0	78.19	98.0	35.203	-80.837
Little Sugar Cr	MC49A	49.4	78.5	96.0	35.085	-80.882
Sixmile Cr	MC51	20.5	33.91	95.0	35.010	-80.828
McDowell Cr	MC2	6.8	48.02	88.7	35.442	-80.878
Briar Cr	MC33	18.9	48.53	85.0	35.254	-80.648
McMullen Cr	MC42	7.06	39.02	82.7	35.141	-80.820
McDowell Cr	MC2A1	10.2	42.78	82.3	35.407	-80.891
McDowell Cr	MC4	26.5	32.26	79.0	35.389	-80.921
Clarke Cr	MY10	21.8	10.99	73.7	35.414	-80.752
Mallard Cr	MY11B	34.7	38.95	71.3	35.332	-80.716
Coffey Cr	MC25	8.7	39.33	66.3	35.146	-80.927
Irvins Cr	MC36	2.72	53.09	66.3	35.134	-80.717
Fourmile Cr	MC40A	18.0	33.45	59.3	35.077	-80.822
Paw Cr	MC17	10.4	38.81	58.3	35.240	-80.974

Table S2. Environmental data from stream sites in Piedmont, North Carolina.

Stream	Site	Canopy	Discharge (m ³ /sec)	Temp	DO	Cond	pH	Taxa Rich	Taxa Abund	Trait Rich
L Indian Cr	LIC	75.42	0.0378	21.8	8.64	58	6.75	73	900	57
Rocky Cr M	RCM	63.33	0.3568	19.6	8.91	45	6.75	86	863	58
Leeper's Cr	LC	67.25	0.2093	21.4	9.48	74	7.09	67	766	57
Rocky Cr J	RCJ	65.83	0.3650	18.5	8.73	52	6.59	94	1491	58
Long Cr	LCM	65.00	0.1026	25.3	7.64	171	7.18	56	1415	55
L Hunting Cr	LHC	66.58	0.4365	22.8	8.13	79	7.02	81	1074	58
Indian Cr	IC	75.25	0.5975	21.5	8.95	65	7.02	68	581	57
Pott Cr	PC	88.17	0.0906	22.3	5.22	65	6.28	75	2033	56
Beaverdam Cr	BC	81.00	0.0147	19.9	6.77	84	6.69	83	557	57
Clear Cr	CC	86.17	0.0608	21.7	7.99	119	7.17	43	683	54

Sugar Cr	MC27	13.17	1.0922	24.5	9.22	413	7.46	10	28	47
Long Cr	MC14A	76.83	0.3656	24.9	9.01	190	6.99	32	306	55
Steele Cr	MC47A	54.75	0.1236	24.5	6.77	263	7.11	25	272	55
Goose Cr	MY9	88.25	0.0466	20.1	8.62	112	7.02	33	204	55
West Rocky R	MY1B	37.92	0.1755	24.8	6.98	152	6.71	45	483	57
McKee Cr	MY7B	91.92	0.0222	23.9	5.1	178	6.69	36	291	53
Little Sugar Cr	MC29A1	19.67	0.1613	27.3	7.74	275	6.93	24	304	54
Little Sugar Cr	MC49A	17.50	1.0609	24.1	7.52	500	7.39	31	299	54
Sixmile Cr	MC51	85.33	0.1741	10.71	8.79	263	7.32	32	229	54
McDowell Cr	MC2	93.33	0.0467	27.2	6.67	131	6.95	29	214	52
Briar Cr	MC33	50.33	0.0819	32	8.75	165	7.26	22	180	53
McMullen Cr	MC42	59.50	0.0258	18.1	7.47	144	7.13	18	115	48
McDowell Cr	MC2A1	55.25	0.1545	26.5	7.02	111	6.75	21	220	54
McDowell Cr	MC4	90.25	0.3737	23.7	7.91	123	7.02	39	324	54
Clarke Cr	MY10	83.17	0.2397	28.2	6.17	222	7.06	31	224	53
Mallard Cr	MY11B	77.92	0.3798	14.4	8.08	239	6.99	31	188	54
Coffey Cr	MC25	74.50	0.1821	20.9	7.07	106	7.09	24	119	54
Irvins Cr	MC36	70.42	0.0129	15	6.59	154	6.93	21	69	56
Fourmile Cr	MC40A	88.25	0.0542	19.8	6.32	173	7.13	25	348	53
Paw Cr	MC17	92.17	0.1009	24.5	6.31	292	7	27	142	52

Table S3. List of taxa collected from the 30 study sites. The * indicates taxa whose traits are unknown or partially known and removed from the analysis.

Class	Order	Family	Genus Species	Taxa with traits unknown
Bivalvia	Veneroica	Corbiculidae	<i>Corbicula fluminea</i>	*
Bivalvia	Veneroica	Sphaeriidae	<i>Sphaerium</i> spp.	*
Crustacea	Amphipoda	Gammaridae	<i>Gammarus</i> spp.	*
Crustacea	Isopoda	Asellidae	<i>Asellus</i> spp.	*
Gastropoda	Basommatophora	Ancylidae	<i>Ferrissia</i> spp.	*
Gastropoda	Basommatophora	Lymnaeidae	<i>Pseudosuccinea columella</i>	*
Gastropoda	Basommatophora	Lymnaeidae	<i>Stagnicola</i> spp.	*
Gastropoda	Basommatophora	Physidae	<i>Physa</i> spp.	*
Gastropoda	Basommatophora	Planorbidae	<i>Helisoma anceps</i>	*
Gastropoda	Basommatophora	Planorbidae	<i>Menetus dilatatus</i>	*
Gastropoda	Neotaenioglossa	Pleuroceridae	<i>Elimia</i> spp.	*
Hirudinea	Arhynchobdellida	Erpobdellidae	<i>Erpobdella/Mooreobdella</i> spp.	*
Hirudinea	Rhynchobdellida	Glossiphoniidae	<i>Helobdella triserialis</i>	*
Insecta	Coleoptera	Dryopidae	<i>Helichus</i> spp.	
Insecta	Coleoptera	Dytiscidae	<i>Acilius fraternus</i>	
Insecta	Coleoptera	Dytiscidae	<i>Neoporush</i> spp.	
Insecta	Coleoptera	Elmidae	<i>Ancyronyx variegatus</i>	
Insecta	Coleoptera	Elmidae	<i>Dubiraphia vittata</i>	
Insecta	Coleoptera	Elmidae	<i>Macronychus glabratus</i>	
Insecta	Coleoptera	Elmidae	<i>Promoresia elegans</i>	
Insecta	Coleoptera	Elmidae	<i>Stenelmis</i> spp.	
Insecta	Coleoptera	Gyrinidae	<i>Dineutus</i> spp.	*
Insecta	Coleoptera	Haliplidae	<i>Peltodytes</i> spp.	
Insecta	Coleoptera	Hydrophilidae	<i>Berosus</i> spp.	*
Insecta	Coleoptera	Hydrophilidae	<i>Helophorus</i> spp.	*
Insecta	Coleoptera	Hydrophilidae	<i>Hydrochus</i> spp.	*
Insecta	Coleoptera	Hydrophilidae	<i>Laccobius</i> spp.	*
Insecta	Coleoptera	Hydrophilidae	<i>Sperchopsis tessellatus</i>	*

Insecta	Coleoptera	Hydrophilidae	<i>Tropisternus</i> spp.	*
Insecta	Coleoptera	Psephenidae	<i>Ectopria nervosa</i>	
Insecta	Coleoptera	Psephenidae	<i>Psephenus herricki</i>	
Insecta	Coleoptera	Ptilodactylidae	<i>Anchytarsus bicolor</i>	*
Insecta	Diptera	Athericidae	<i>Atherix lantha</i>	
Insecta	Diptera	Ceratopogonidae	<i>Atrichopogon</i> spp.	
Insecta	Diptera	Ceratopogonidae	<i>Palpomyia complex</i>	
Insecta	Diptera	Chironomidae	<i>Ablabesmyia annulata</i>	
Insecta	Diptera	Chironomidae	<i>Ablabesmyia mallochi</i>	
Insecta	Diptera	Chironomidae	<i>Ablabesmyia rhamphae</i>	
Insecta	Diptera	Chironomidae	<i>Ablabesmyia</i> spp.	
Insecta	Diptera	Chironomidae	<i>Brillia</i> spp.	
Insecta	Diptera	Chironomidae	<i>Chironomus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Cladotanytarsus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Clinotanypus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Corynoneura</i> spp.	
Insecta	Diptera	Chironomidae	<i>Cricotopus annulator</i> (complex)	
Insecta	Diptera	Chironomidae	<i>Cricotopus bicinctus</i>	
Insecta	Diptera	Chironomidae	<i>Cricotopus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Cryptochironomus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Cryptotendipes</i> spp.	
Insecta	Diptera	Chironomidae	<i>Dicrotendipes fumidus</i>	
Insecta	Diptera	Chironomidae	<i>Dicrotendipes neomodestus</i>	
Insecta	Diptera	Chironomidae	<i>Dicrotendipes</i> spp.	
Insecta	Diptera	Chironomidae	<i>Diplocladius cultriger</i>	
Insecta	Diptera	Chironomidae	<i>Endochironomus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Eukiefferiella</i> spp.	
Insecta	Diptera	Chironomidae	<i>Glyptotendipes</i> spp.	
Insecta	Diptera	Chironomidae	<i>Goeldichironomus</i> spp.	
Insecta	Diptera	Chironomidae	<i>Labrundinia pilosella</i>	

Insecta	Diptera	Chironomidae	<i>Larsia</i> spp.
Insecta	Diptera	Chironomidae	<i>Microtendipes</i> spp.
Insecta	Diptera	Chironomidae	<i>Nanocladius</i> spp.
Insecta	Diptera	Chironomidae	<i>Natarsia</i> spp.
Insecta	Diptera	Chironomidae	<i>Nilotanypus</i> spp.
Insecta	Diptera	Chironomidae	<i>Nilothauma</i> spp.
Insecta	Diptera	Chironomidae	<i>Orthocladius dubitatus</i>
Insecta	Diptera	Chironomidae	<i>Orthocladius</i> spp.
Insecta	Diptera	Chironomidae	<i>Parachironomus</i> spp.
Insecta	Diptera	Chironomidae	<i>Parakiefferiella</i> spp.
Insecta	Diptera	Chironomidae	<i>Paralauterborniella nigrohalteralis</i>
Insecta	Diptera	Chironomidae	<i>Paramerina</i> spp.
Insecta	Diptera	Chironomidae	<i>Parametriocnemus</i> spp.
Insecta	Diptera	Chironomidae	<i>Paratanytarsus</i> spp.
Insecta	Diptera	Chironomidae	<i>Paratendipes</i> spp.
Insecta	Diptera	Chironomidae	<i>Phaenopsectra</i> spp.
Insecta	Diptera	Chironomidae	<i>Polypedilum fallax</i>
Insecta	Diptera	Chironomidae	<i>Polypedilum flavum</i>
Insecta	Diptera	Chironomidae	<i>Polypedilum halterale</i>
Insecta	Diptera	Chironomidae	<i>Polypedilum illinoense</i>
Insecta	Diptera	Chironomidae	<i>Polypedilum scalaenum</i>
Insecta	Diptera	Chironomidae	<i>Polypedilum</i> spp.
Insecta	Diptera	Chironomidae	<i>Procladius</i> spp.
Insecta	Diptera	Chironomidae	<i>Pseudochironomus</i> spp.
Insecta	Diptera	Chironomidae	<i>Rheocricotopus robacci</i>
Insecta	Diptera	Chironomidae	<i>Rheotanytarsus</i> spp.
Insecta	Diptera	Chironomidae	<i>Robackia demejerei</i>
Insecta	Diptera	Chironomidae	<i>Stelechomyia perpulchra</i>
Insecta	Diptera	Chironomidae	<i>Stenochironomus</i> spp.
Insecta	Diptera	Chironomidae	<i>Stictochironomus</i> spp.

Insecta	Diptera	Chironomidae	<i>Sublettea coffmani</i>
Insecta	Diptera	Chironomidae	<i>Tanytarsus</i> spp.
Insecta	Diptera	Chironomidae	<i>Thienemanniella</i> spp.
Insecta	Diptera	Chironomidae	<i>Thienemannimyia</i> group
Insecta	Diptera	Chironomidae	<i>Tribelos jucundum</i>
Insecta	Diptera	Chironomidae	<i>Tvetenia discoloripes</i> (group)
Insecta	Diptera	Chironomidae	<i>Xylotopus par</i>
Insecta	Diptera	Chironomidae	<i>Zavrelimyia</i> spp.
Insecta	Diptera	Culicidae	<i>Anopheles</i> spp. *
Insecta	Diptera	Dixidae	<i>Dixella indiana</i> *
Insecta	Diptera	Empididae	<i>Hemerodromia</i> spp.
Insecta	Diptera	Simuliidae	<i>Simulium</i> spp.
Insecta	Diptera	Syrphidae	<i>Eristalis</i> spp. *
Insecta	Diptera	Tabanidae	<i>Chrysops</i> spp. *
Insecta	Diptera	Tipulidae	<i>Antocha</i> spp.
Insecta	Diptera	Tipulidae	<i>Hexatoma</i> spp.
Insecta	Diptera	Tipulidae	<i>Limonia</i> spp.
Insecta	Diptera	Tipulidae	<i>Pilaria</i> spp.
Insecta	Diptera	Tipulidae	<i>Pseudolimnophila</i> spp.
Insecta	Diptera	Tipulidae	<i>Tipula</i> spp.
Insecta	Ephemeroptera	Baetidae	<i>Acentrella nadineae</i>
Insecta	Ephemeroptera	Baetidae	<i>Acentrella parvula</i>
Insecta	Ephemeroptera	Baetidae	<i>Baetis flavistriga</i>
Insecta	Ephemeroptera	Baetidae	<i>Baetis intercalaris</i>
Insecta	Ephemeroptera	Baetidae	<i>Baetis pluto</i>
Insecta	Ephemeroptera	Baetidae	<i>Centroptilum</i> spp.
Insecta	Ephemeroptera	Baetidae	<i>Heterocloeon curiosum</i>
Insecta	Ephemeroptera	Baetidae	<i>Labiobaetis propinquus</i>
Insecta	Ephemeroptera	Baetidae	<i>Paracloeodes fleeki</i>
Insecta	Ephemeroptera	Baetidae	<i>Paracloeodes minutus</i>

Insecta	Ephemeroptera	Baetidae	<i>Paracloeodes</i> spp.
Insecta	Ephemeroptera	Baetidae	<i>Plauditus cestus</i>
Insecta	Ephemeroptera	Baetidae	<i>Plauditus dubius</i> (group)
Insecta	Ephemeroptera	Baetiscidae	<i>Baetisca carolina</i>
Insecta	Ephemeroptera	Caenidae	<i>Brachycercus</i> spp.
Insecta	Ephemeroptera	Caenidae	<i>Caenis</i> spp.
Insecta	Ephemeroptera	Caenidae	<i>Cerobrachys</i> spp.
Insecta	Ephemeroptera	Ephemerellidae	<i>Serratella serratoides</i>
Insecta	Ephemeroptera	Ephemerellidae	<i>Telagonopsis deficiens</i>
Insecta	Ephemeroptera	Ephemeridae	<i>Ephemera blanda</i>
Insecta	Ephemeroptera	Ephemeridae	<i>Ephemera</i> spp.
Insecta	Ephemeroptera	Ephemeridae	<i>Hexagenia</i> spp.
Insecta	Ephemeroptera	Heptageniidae	<i>Epeorus vitreous</i>
Insecta	Ephemeroptera	Heptageniidae	<i>Heptagenia marginalis</i>
Insecta	Ephemeroptera	Heptageniidae	<i>Leucrocuta</i> spp.
Insecta	Ephemeroptera	Heptageniidae	<i>Stenonema modestum</i>
Insecta	Ephemeroptera	Heptageniidae	<i>Stenacron carolina</i>
Insecta	Ephemeroptera	Heptageniidae	<i>Stenacron interpunctatum</i>
Insecta	Ephemeroptera	Heptageniidae	<i>Stenacron pallidum</i>
Insecta	Ephemeroptera	Isonychiidae	<i>Isonychia</i> spp.
Insecta	Ephemeroptera	Leptohyphidae	<i>Tricorythodes</i> spp.
Insecta	Ephemeroptera	Leptophlebiidae	<i>Habrophlebiodes</i> spp.
Insecta	Heteroptera	Corixidae	<i>Sigara</i> spp.
Insecta	Heteroptera	Nepidae	<i>Ranatra</i> spp. *
Insecta	Heteroptera	Notonectidae	<i>Notonecta</i> spp. *
Insecta	Lepidoptera	Pyralidae	<i>Petrophila</i> spp.
Insecta	Megaloptera	Corydalidae	<i>Corydalus cornutus</i>
Insecta	Megaloptera	Corydalidae	<i>Nigronia fasciatus</i>
Insecta	Megaloptera	Corydalidae	<i>Nigronia serricornis</i>
Insecta	Megaloptera	Sialidae	<i>Sialis</i> spp.

Insecta	Odonata	Aeshnidae	<i>Basiaeschna janata</i>
Insecta	Odonata	Aeshnidae	<i>Boyeria vinosa</i>
Insecta	Odonata	Calopterygidae	<i>Calopteryx</i> spp.
Insecta	Odonata	Coenagrionidae	<i>Argia</i> spp.
Insecta	Odonata	Coenagrionidae	<i>Enallagma</i> spp.
Insecta	Odonata	Coenagrionidae	<i>Ischnura</i> spp.
Insecta	Odonata	Cordulegastridae	<i>Cordulegaster</i> spp.
Insecta	Odonata	Corduliidae	<i>Epitheca</i> spp.
Insecta	Odonata	Corduliidae	<i>Somatochlora</i> spp.
Insecta	Odonata	Gomphidae	<i>Gomphus</i> spp.
Insecta	Odonata	Gomphidae	<i>Hagenius brevistylus</i>
Insecta	Odonata	Gomphidae	<i>Lanthus</i> spp.
Insecta	Odonata	Gomphidae	<i>Ophiogomphus</i> spp.
Insecta	Odonata	Gomphidae	<i>Progomphus obscurus</i>
Insecta	Odonata	Gomphidae	<i>Stylogomphus albistylus</i>
Insecta	Odonata	Libellulidae	<i>Libellula</i> spp. *
Insecta	Odonata	Macromiidae	<i>Macromia georgina</i>
Insecta	Odonata	Macromiidae	<i>Macromia</i> spp.
Insecta	Plecoptera	Capniidae	<i>Allocapnia</i> spp.
Insecta	Plecoptera	Leuctridae	<i>Leuctra</i> spp.
Insecta	Plecoptera	Peltoperlidae	<i>Tallaperla</i> spp. *
Insecta	Plecoptera	Perlidae	<i>Acroneuria abnormis</i>
Insecta	Plecoptera	Perlidae	<i>Acroneuria arenosa</i>
Insecta	Plecoptera	Perlidae	<i>Agnetina annulipes</i>
Insecta	Plecoptera	Perlidae	<i>Eccoptura xanthenes</i>
Insecta	Plecoptera	Perlidae	<i>Paragnetina fumosa</i>
Insecta	Plecoptera	Perlidae	<i>Paragnetina ichusa/media</i>
Insecta	Plecoptera	Perlidae	<i>Perlesta</i> spp.
Insecta	Plecoptera	Pteronarcyidae	<i>Pteronarcys biloba</i>
Insecta	Plecoptera	Pteronarcyidae	<i>Pteronarcys dorsata</i>

Insecta	Plecoptera	Pteronarcyidae	<i>Pteronarcys proteus</i>
Insecta	Trichoptera	Brachycentridae	<i>Brachycentrus nigrosoma</i>
Insecta	Trichoptera	Brachycentridae	<i>Brachycentrus spinae</i>
Insecta	Trichoptera	Hydropsychidae	<i>Hydropsyche bronta</i>
Insecta	Trichoptera	Hydropsychidae	<i>Hydropsyche morosa</i>
Insecta	Trichoptera	Hydropsychidae	<i>Hydropsyche sparna</i>
Insecta	Trichoptera	Hydropsychidae	<i>Cheumatopsyche</i> spp.
Insecta	Trichoptera	Hydropsychidae	<i>Hydropsyche betteni</i>
Insecta	Trichoptera	Hydropsychidae	<i>Hydropsyche venularis</i>
Insecta	Trichoptera	Hydroptilidae	<i>Hydroptila</i> spp.
Insecta	Trichoptera	Hydroptilidae	<i>Leucotrichia pictipes</i>
Insecta	Trichoptera	Leptoceridae	<i>Ceraclea ancylus</i>
Insecta	Trichoptera	Leptoceridae	<i>Ceraclea transversa</i>
Insecta	Trichoptera	Leptoceridae	<i>Nectopsyche exquisita</i>
Insecta	Trichoptera	Leptoceridae	<i>Oecetis persimilis</i>
Insecta	Trichoptera	Leptoceridae	<i>Oecetis</i> spp.
Insecta	Trichoptera	Leptoceridae	<i>Setodes</i> spp.
Insecta	Trichoptera	Leptoceridae	<i>Triaenodes ignitus</i>
Insecta	Trichoptera	Limnephilidae	<i>Pycnopsyche guttifer</i>
Insecta	Trichoptera	Limnephilidae	<i>Pycnopsyche lepida</i>
Insecta	Trichoptera	Limnephilidae	<i>Pycnopsyche scabripennis</i>
Insecta	Trichoptera	Philopotamidae	<i>Chimarra</i> spp.
Insecta	Trichoptera	Philopotamidae	<i>Dolophilodes distincta</i>
Insecta	Trichoptera	Polycentropodidae	<i>Polycentropus</i> spp.
Insecta	Trichoptera	Psychomyiidae	<i>Lype diversa</i>
Insecta	Trichoptera	Psychomyiidae	<i>Psychomyia flavida</i>
Insecta	Trichoptera	Psychomyiidae	<i>Psychomyia nomada</i>
Insecta	Trichoptera	Rhyacophilidae	<i>Rhyacophila formosa</i>
Insecta	Trichoptera	Rhyacophilidae	<i>Rhyacophila fuscula</i>
Insecta	Trichoptera	Thremmatidae	<i>Neophylax oligius</i>

Oligochaeta	Haplotaixida	Naididae	<i>Nais</i> spp.	*
Oligochaeta	Haplotaixida	Naididae	<i>Pristina</i> spp.	*
Oligochaeta	Haplotaixida	Tubificidae	<i>Branchiura sowerbyi</i>	*
Oligochaeta	Haplotaixida	Tubificidae	<i>Limnodrilus hoffmeisteri</i>	*
Oligochaeta	Haplotaixida	Tubificidae	<i>Limnodrilus</i> spp.	*
Oligochaeta	Haplotaixida	Tubificidae	<i>Tubifex</i>	*
Oligochaeta	Lumbriculida	Lumbriculidae	Lumbriculidae	*

Table S4. Aquatic insect traits with abbreviations used in this study [11].

Trait Group	Trait	Trait state	Abbreviation
Life History	Voltnism	Multivoltine	MV
		Semivoltine	SV
		Univoltine	UV
	Development	Fast seasonal	FSE
		Nonseasonal	NSE
		Slow seasonal	SSE
	Synchronization emergence	Poorly synchronized	PSY
		Well synchronized	WSY
	Adult Life Span	Long	LLF
		Short	SLF
		Very short	VSLF
	Adult ability to exit	Absent	EAB
		Present	EPR
	Survive desiccation	Absent	SAB
		Present	SPR
Mobility	Female Dispersal	High	HDIS
		Low	LDIS

	Flying strength	Strong	SFLY
		Weak	WFLY
Occurrence Drift		Abundant	ADRF
		Common	CDRF
		Rare	RDRF
	Max crawling rate	High	HCW
		Low	LCW
		Very low	VLCW
	Swim ability	None	NSW
		Strong	STSW
		Weak	WKSW
Morphology	Attachment	Both	BATT
		None	NATT
		Some	SATT
	Armoring	Good	GARM
		None	NARM
		Poor	PARM
	Shape	Not Streamlined	NOSTR
		Streamlined	STR
	Respiration	Gills	GIL
		Plastron, spiracle	PLA
		Tegument	TEG
	Size at maturity	Large (>16 mm)	LG
		Medium (9-16 mm)	MD
		Small (<9 mm)	SM

Ecology	Rheophily	Depositional and Erosional	DE
		Depositional only	DEP
		Erosional	ERO
	Thermal Preference	Cold stenothermal	CLD
		Cool eurythermal	COL
		Warm eurythermal	WRM
	Habit	Burrow	BRW
		Climb	CLB
		Cling	CLG
		Sprawl	SPL
		Swim	SWM
	Trophic Habit	Collector-filterer	CF
		Collector-gatherer	CG
		Herbivore-scraper	HB
		Predator	PD
		Shredder	SH

Table S5. Taxa associated with microhabitats.

Backwater	Indicator Value	p Value
<i>Procladius</i> .spp.	0.768	0.0001
<i>Cryptotendipes</i> .spp.	0.610	0.0006
<i>Gomphus</i> .spp.	0.599	0.0006
<i>Paratendipes</i> .spp.	0.552	0.0026
<i>Hexagenia</i> .spp.	0.512	0.0051
<i>Tribelos.jucundum</i>	0.510	0.0073
<i>Ablabesmyia.annulata</i>	0.487	0.0156
<i>Centroptilum</i> .spp.	0.461	0.0197
<i>Cladotanytarsus</i> .spp.	0.443	0.0195

<i>Chironomus</i> .spp.	0.432	0.0194
Leaf Pack	Indicator Value	p Value
<i>Polypedilum.illinoense</i>	0.629	0.0004
<i>Helichus</i> .spp.	0.440	0.0213
Riffle	Indicator Value	p Value
<i>Isonychia</i> .spp.	0.750	0.0001
<i>Corydalus.cornutus</i>	0.723	0.0001
<i>Stenacron.interpunctatum</i>	0.702	0.0002
<i>Chimarra</i> .spp.	0.698	0.0001
<i>Ophiogomphus</i> .spp.	0.681	0.0002
<i>Acentrella nadineae</i>	0.675	0.0001
<i>Stenonema.modestum</i>	0.674	0.0002
<i>Baetis.intercalaris</i>	0.621	0.0001
<i>Ceraclea.ancylus</i>	0.603	0.0036
<i>Polypedilum.flavum</i>	0.599	0.0006
<i>Hydropsyche.sporna</i>	0.595	0.0015
<i>Leucrocuta</i> .spp.	0.587	0.0009
<i>Cheumatopsyche</i> .spp.	0.553	0.0015
<i>Psephenus.herricki</i>	0.547	0.0007
<i>Thienemannimyia</i> .group	0.547	0.0011
<i>Heptagenia.marginalis</i>	0.545	0.0017
<i>Hexatoma</i> .spp.	0.542	0.0036
<i>Stenelmis</i> .spp.	0.527	0.0036
<i>Antocha</i> .spp.	0.524	0.0026
<i>Simulium</i> .spp.	0.520	0.0055
<i>Cricotopus.annulator</i>	0.511	0.0047
<i>Lanthus</i> .spp.	0.510	0.0041
<i>Nanocladius</i> .spp.	0.505	0.0036
<i>Rheotanytarsus</i> .spp.	0.496	0.0051
<i>Neophylax.oligius</i>	0.472	0.0359

<i>Rhyacophila.fuscula</i>	0.446	0.0209
<i>Nigronia.serricornis</i>	0.431	0.0309
<i>Baetis.flavistriga</i>	0.425	0.0084
<i>Parametriocnemus.spp.</i>	0.421	0.0448
<i>Stenacron.carolina</i>	0.421	0.0315
<i>Hydroptila.spp.</i>	0.418	0.0476
<i>Leuctra.spp.</i>	0.401	0.0288
<i>Hydropsyche.betteni</i>	0.382	0.0356
Root Wad Indicator Value p Value		
<i>Triaenodes.ignitus</i>	0.743	0.0001
<i>Labrundinia.pilosella</i>	0.504	0.0058
<i>Calopteryx.spp.</i>	0.469	0.0083
Woody Debris Indicator Value p Value		
<i>Pycnopsyche.guttifer</i>	0.397	0.0476
Backwater+Leaf Pack Indicator Value p Value		
<i>Polypedilum.scalaenum</i>	0.478	0.0122
Backwater+Riffle Indicator Value p Value		
<i>Tanytarsus.spp.</i>	0.416	0.0411
Backwater+Root Wad Indicator Value p Value		
<i>Ablabesmyia.mallochi</i>	0.475	0.01
Backwater+Sand Indicator Value p Value		
<i>Cryptochironomus.spp.</i>	0.513	0.0069
Leaf Pack+Riffle Indicator Value p Value		
<i>Rheocricotopus.robacki</i>	0.602	0.0004
<i>Acroneuria.abnormis</i>	0.496	0.0050
<i>Perlestas.spp.</i>	0.480	0.0132
<i>Corynoneura.spp.</i>	0.479	0.0166
<i>Nilotanypus.spp.</i>	0.475	0.0135
<i>Brillia.spp.</i>	0.431	0.0431
Leaf Pack+Woody Debris Indicator Value p Value		

<i>Paragnetina.fumosa</i>	0.522	0.0045
Riffle+Woody Debris	Indicator Value	p Value
<i>Macronycthus.glabratus</i>	0.501	0.0068
Root Wad+Woody Debris	Indicator Value	p Value
<i>Boyeria.vimosa</i>	0.59	0.0011
Backwater+Root Wad+Undercut Bank	Indicator Value	p Value
<i>Macromia.georgina</i>	0.413	0.0486

Table S6. Traits associated with microhabitats.

Leaf Pack	Indicator Value	p Value
PLA	0.427	0.0266
Riffle	Indicator Value	p Value
LDIS	0.913	0.0001
TEG	0.893	0.0001
RDRF	0.855	0.0001
WFLY	0.853	0.0001
PARM	0.848	0.0001
HCW	0.846	0.0001
STR	0.844	0.0001
EAB	0.838	0.0001
SAB	0.835	0.0001
SSE	0.830	0.0001
WSY	0.829	0.0001
COL	0.828	0.0001
CLG	0.817	0.0001
NOSTR	0.813	0.0001
NATT	0.812	0.0001
DE	0.811	0.0001
STSW	0.809	0.0001
NSW	0.806	0.0001
UV	0.806	0.0001
PSY	0.804	0.0001
WKSW	0.804	0.0001
SWM	0.803	0.0001
NARM	0.795	0.0001
SLF	0.791	0.0001
ERO	0.786	0.0001
GIL	0.778	0.0001
SM	0.778	0.0001
SV	0.771	0.0001
PD	0.770	0.0001
MD	0.764	0.0001
CF	0.757	0.0001
HB	0.757	0.0001
SATT	0.755	0.0001
VSLF	0.750	0.0001
CDRF	0.739	0.0001
LCW	0.737	0.0001
VLCW	0.731	0.0001
FSE	0.720	0.0001

SFLY	0.710	0.0001
HDIS	0.703	0.0001
LG	0.702	0.0003
EPR	0.685	0.0003
SH	0.671	0.0001
CG	0.655	0.0001
LLF	0.634	0.0002
SPR	0.574	0.0002
Root Wad	Indicator Value	e Value
CLB	0.716	0.0001
Leaf Pack+Riffle	Indicator Value	e Value
ADRF	0.697	0.0001
MV	0.647	0.0001
CLD	0.610	0.0002
Backwater+Leaf Pack+Riffle	Indicator Value	e Value
BRW	0.656	0.0001
DEP	0.616	0.0001
Backwater+Riffle+Root Wad	Indicator Value	e Value
SPL	0.56	0.0006
Riffle+Root Wad+Woody Debris	Indicator Value	e Value
NSE	0.48	0.0094