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Appendix 1



Figure A1. Adult *Abedus herberti* consuming dragonfly nymph *Oplonaeschna*.



Figure A2. 2010 mesocosm array.

Appendix 2

Table A2.1. Variable transformations and two-sample comparisons.

Variable	Transformation	Statistical test
Species richness	Square root	Hotelling's T^2
Abundance	Untransformed	Hotelling's T^2
Mesopredator richness	Untransformed	Generalized linear models
Mesopredator abundance	Natural log	Welch's t -tests

Appendix 3

Table A3.1. Mesopredators. All predatory taxa greater than 5 mm in body length. Mesopredators larger than 10 mm are indicated with an asterisk (*).

Order	Family	Genus/species
Coleoptera	Dytiscidae	<i>Agabus</i>
		<i>Berosus punctatissimus</i>
		<i>Dytiscus</i> *
		<i>Rhantus atricolor</i> *
		<i>Rhantus gutticollis gutticollis</i> *
		<i>Thermonectus nigrofasciatus</i>
		<i>Tropisternus ellipticus</i>
		<i>Ambrysus woodburyi</i>
Hemiptera	Naucoridae	<i>Ranatra</i> *
	Nepidae	
Megaloptera	Corydalidae	<i>Corydalus</i> *
		<i>Neohermes</i> *
Odonata	Aeschnidae	<i>Oplonaeschna</i> *
	Calopterygidae	<i>Hetaerina</i> *
	Coenagrionidae	<i>Argia</i> *
	Libellulidae	<i>Libellula saturata</i> *
		<i>Paltothermis lineatipes</i> *
Trichoptera	Polycentropodidae	<i>Polycentropus</i> *

Appendix 4

Table A4.1. Abiotic characteristics of final mesocosms.

Variable	2010		2011	
	Mean	SD	Mean	SD
pH	7.469	0.125	7.594	0.186
Dissolved oxygen (mg l ⁻¹)	4.500	0.000	4.688	0.458
Canopy cover (%)	89.36	7.216	0.838	0.000
Temperature (°C)	18.41	1.674	25.66	1.009

Appendix 5

Table A5.1. Invertebrate taxa. Category indicates treatments, years, or samples to which a taxon is unique: 'Initial' = taxa present in initial samples in one year and absent from the other, 'Removal' = taxa that were present in top predator removal mesocosms and not in controls within a given year, and 'Control' = taxa that were present in control mesocosms and not in top predator removal mesocosms within a given year.

Order	Family	Genus/species	Category
Coleoptera			
	Hydroporinae larvae		Removal 2010
	Dryopidae	<i>Helichus lithophilus</i>	Removal 2010
		<i>Helichus striatus</i>	Control 2010
		<i>Helichus triangularis</i>	
		<i>Posthelichus</i>	Initial 2010
	Dytiscidae	<i>Agabus</i>	Removal 2011
		<i>Dytiscus</i>	Removal 2010, Removal 2011
		<i>Hygrotus</i>	Initial 2011, Control 2011
		<i>Laccophilus fasciatus</i>	
		<i>Laccophilus maculosus</i>	Control 2011
		<i>Laccophilus pictus</i>	
		<i>Liodessus obscurellus</i>	Initial 2011
		<i>Rhantus atricolor</i>	Removal 2010, Removal 2011
		<i>Rhantus gutticollis gutticollis</i>	Removal 2010
		<i>Stictotarsus aequinotialis</i>	Initial 2011
		<i>Stictotarsus corvinus</i>	Initial 2010
		<i>Stictotarsus roffi</i>	
		<i>Stictotarsus striatellus</i>	Initial 2011
	Elmidae	<i>Microcylloepus</i>	
	Haliplidae	<i>Peltodytes</i>	
	Hydraenidae	<i>Hydraena</i>	
	Hydrophilidae	<i>Tropisternus ellipticus</i>	Removal 2011
		<i>Berosus punctatissimus</i>	

Diptera	Ceratopogonidae	<i>Atrichopogon</i> <i>Ceratopogon</i>	Removal 2010 Removal 2011	
	Chironomidae			
	Culicidae	<i>Anopheles</i> <i>Culiseta</i> <i>Culex</i>	Initial 2011	
	Dixidae	<i>Dixella</i>	Initial 2010	
	Empididae			
	Ephydriidae			
	Psychodidae	<i>Pericoma</i>		
	Simuliidae	<i>Simulium</i>	Initial 2010	
	Stratiomyidae	<i>Caloparyphus</i> <i>Euparyphus</i>	Removal 2010	
	Tabanidae	<i>Tabanus</i>		
	Tipulidae	<i>Antocha</i> <i>Hexatoma</i> <i>Limnophila</i> <i>Limonia</i> <i>Tipula</i>	Initial 2010 Initial 2010 Initial 2010 Initial 2010 Initial 2011	
	Ephemeroptera	Baetidae	<i>Acentrella</i> <i>Baetis</i> <i>Callibaetis</i> <i>Fallceon</i>	Initial 2010 Initial 2010 Initial 2010
		Heptageniidae	<i>Ecdyonurus</i>	Initial 2010
		Leptohyphidae	<i>Homoleptohyphes</i>	
Leptophlebiidae		<i>Choroterpes</i> <i>Thraulodes</i>	Initial 2010	
Siphonuridae		<i>Siphonurus</i>	Initial 2010	
Belostomatidae		<i>Abedus herberti</i> <i>Lethocerus</i>		
Corixidae		<i>Graptocorixa</i>		
Hemiptera	Naucoridae	<i>Ambrysus woodbury</i>	Initial 2011, Removal 2010, Removal 2011	
	Nepidae	<i>Ranatra</i>		
	Veliidae	<i>Microvelia</i>	Initial 2011	
Megaloptera	Corydalidae	<i>Corydalus</i>	Initial 2011, Removal 2011	
		<i>Neohermes concolor</i>	Removal 2010	
Odonata	Aeshnidae	<i>Oplonaeshna</i>	Initial 2010	
	Calopterygidae	<i>Hetaerina</i>	Initial 2011, Control 2010	
	Coenagrionidae	<i>Argia</i>	Initial 2011, Removal 2011	
	Gomphidae	<i>Erpetogomphus</i>	Removal 2010	
Plecoptera	Libellulidae	<i>Libellula saturata</i> <i>Paltothemis lineatipes</i>	Removal 2010	
	Capniidae		Initial 2010	
	Nemouridae	<i>Malenka/Amphinemura</i>	Initial 2010	
Trichoptera	Calamoceratidae	<i>Phylloicus mexicanus</i>		
	Helicopsychidae	<i>Helicopsyche</i>		
	Hydropsychidae	<i>Cheumatopsyche</i> <i>Hydropsyche/Ceratopsyche</i>	Initial 2011 Initial 2011	
	Hydroptilidae	<i>Culoptila</i> <i>Hydroptila</i>	Initial 2010 Initial 2011, Control 2010	
		<i>Ochrotrichia</i>	Control 2010, Control 2011	
	Lepidostomatidae	<i>Lepidostoma</i>	Initial 2011	
	Leptoceridae	<i>Oecetis</i>	Removal 2011	
	Limnephilidae	<i>Hesperophylax</i>	Initial 2010	
	Odontoceridae	<i>Marilia</i>	Initial 2011	
	Philopotamidae	<i>Wormaldia</i>	Initial 2011	

	Polycentropodidae	<i>Polycentropus</i>	
Non-insects			
Copepoda			Initial 2011
Mite			Removal 2011
Oligochaeta			
Ostracoda			Initial 2011
Gastropoda	Physidae		Initial 2011
Nematoda			Initial 2010
Planaria			
Platyhelmenthes			

Appendix 6

Table A6.1. Colonist taxa. Colonists were defined as taxa with >10 individuals in final mesocosm samples and 0 in initial samples. Category indicates the experiments during which each taxon colonized.

Order	Family	Genus/species	Category
Coleoptera			
Hydroporinae larvae			2010, 2011
	Dytiscidae	<i>Berosus punctatissimus</i>	2011
		<i>Liodessus obscurellus</i>	2011
		<i>Rhantus gutticollis gutticollis</i>	2011
		<i>Thermonectus nigrofasciatus</i>	2011
		<i>Stictotarsus corvinus</i>	2011
	Elmidae	<i>Microcylloepus</i>	2010
Diptera	Culicidae	<i>Anopheles</i>	2010
		<i>Culiseta</i>	2010
		<i>Culex</i>	2010, 2011
	Ephydriidae		2010
Ephemeroptera	Baetidae	<i>Fallceon</i>	2010
Hemiptera	Corixidae	<i>Graptocorixa</i>	2010
	Nepidae	<i>Ranatra</i>	2011
Megaloptera	Corydalidae	<i>Corydalus</i>	2010
Odonata	Aeschnidae	<i>Oplonaeschna</i>	2010
	Coenagrionidae	<i>Argia</i>	2010
	Libellulidae	<i>Libellula saturata</i>	2010
Trichoptera	Lepidostomatidae	<i>Lepidostoma</i>	2010
Non-insects			
Copepoda			2010
Ostracoda			2010
Gastropoda	Physidae		2010

Appendix 7

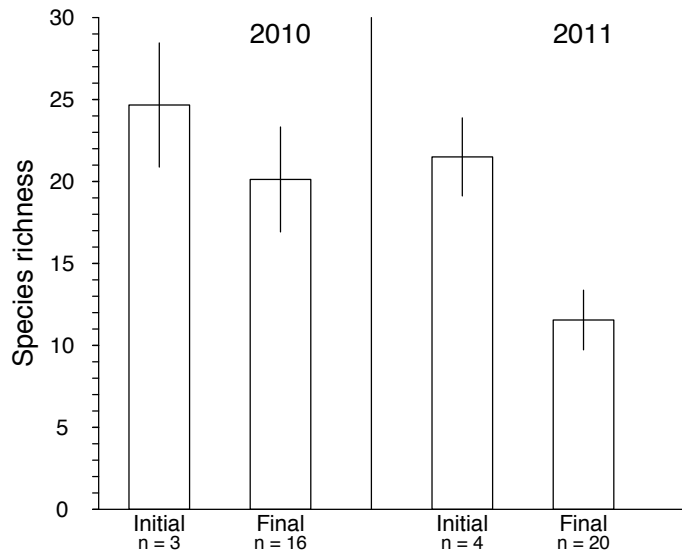


Figure A7.1. Change in species richness between initial and final community samples in 2010 and 2011. 2010: Welch's t-test, $t = -2.205$, $DF = 2.999$, $p = 0.115$; 2011: Welch's t-test, $t = -8.973$, $DF = 4.418$, $p = <0.001$.

Appendix 8

Table A8.1. Indicator species analysis of taxa significantly associated with control or top predator removal treatments based on community structure and trophic position.

	Year	Treatment	Taxon/trophic group	I.V.	p
Community	2010	Control	<i>Phylloicus mexicanus</i>	69.7	0.037
			<i>Helichus triangularis</i>	75.3	0.043
	Removal	<i>Callibaetis</i>	76.9	0.017	
		<i>Rhantus atricolor</i>	62.5	0.026	
	2011	Control	<i>Phylloicus mexicanus</i>	72.7	0.029
		Removal	-	-	-
Trophic groups	2010	Control	Shredders	74.9	0.016
		Removal	Collector-gatherers	76.4	0.009
	2011	Control	Shredders	72.7	0.033
		Removal	Piercers	70.5	0.010

Notes: the indicator values (I.V.) range from 0 to 1, with 1 being complete faithfulness to a treatment group. Only indicators with I.V. > 60 and $p < 0.05$ are shown.