 DOI: 10.1086/705809

Appendix from W. J. Resetarits Jr. et al., "Patch Size as a Niche Dimension: Aquatic Insects Behaviorally Partition Enemy-Free Space across Gradients of Patch Size" (Am. Nat., vol. 194, no. 6, p. 776)

Additional Statistical Tables and Overall Rarefaction Curve

Table A1: Species, abundance, and family for Coleoptera (51 species; pt. A) and Hemiptera (7 species; pt. B)

Order, family, species	Abundance
A. Coleoptera	5,782
Dytiscidae	2,460
Acilius fraternus	5
A. mediatus	2
Bidessonotus inconspicuus	3
Celina angustata	15
Copelatus chevrolati renovatus	2
C. glyphicus	1,932
Coptotomus loticus	7
Cybister fimbriolatus	2
Desmopachria	10
Hydrocolus deflatus	1
H. oblitus	11
Hydroporus rufilabris	20
Ilybius biguttulus	3
I. gagates	4
Laccophilus fasciatus rufus	227
L. proximus	82
Matus bicarinatus	1
Meridiorhantus calidus	1
Neoporus blanchardi	51
N. undulatus	2
Platambus flavovittatus	2
Thermonectus basillaris basillaris	41
Uvarus granarius	19
U. lacustris	17
Haliplidae	44
Peltodytes dunavani	1
P. sexmaculatus	43
Helophoridae	22
Helophorus linearis	22
Hydraenidae	4
Hydraena marginicollis	4
Hydrochidae	14
Hydrochus neosquamifer	3
H. rugosus	11
Hydrophilidae	3,236
Berosus exiguus	21
B. infuscatus	852
B. pantherinus	2
B. peregrinus	4
B. sayi	17
Cymbiodyta chamberlaini	233
C. vindicata	5
Derallus altus	42
Enochrus consors	3
E. fimbriatus	21
E. ochraceus	267
E. pygmaeus nebulosus	10
Helochares maculicollis	41
Helocombus bifidus	2
Hydrochara soror	15
Paracymus	406
Tropisternus blatchleyi	338
T. collaris	333
T. lateralis nimbatus	621
T. natator	3
Noteridae	2
Hydrocanthus oblongus	2
B. Hemiptera	1,093
Corixidae	455
Hesperocorixa vulgaris	366
Sigara	89
Gerridae	41
Limnoporus canaliculatus	41
Nepidae	2
Ranatra buenoi	2
Notonectidae	595
Buenoa	83
Notonecta indica	15
N. irrorata	497

Table A2: Fixed effects results (type III) from mixed model ANOVAs on responses for the 14 most abundant taxa

Order, species, source	df_N	df_D	*F*	*P*
Coleoptera:				
Copelatus glyphicus:				
Size	2	25	36.50	**<.0001**
Fish	1	25	46.49	**<.0001**
Size × fish	2	25	3.28	*.0541*
Paracymus:				
Size	2	25	18.94	**<.0001**
Fish	1	25	51.17	**<.0001**
Size × fish	2	25	9.83	**.0007**
Enochrus ochraceus:				
Size	2	25	17.92	**<.0001**
Fish	1	25	10.11	**.0039**
Size × fish	2	25	3.63	**.0413**
Cymbiodyta chamberlaini:				
Size	2	25	7.26	**.0033**
Fish	1	25	.35	.5617
Size × fish	2	25	1.32	.2863
Berosus infuscatus:				
Size	2	25	.36	.7041
Fish	1	25	37.46	**<.0001**
Size × fish	2	25	.19	.8302
Laccophilus fasciatus:				
Size	2	25	.99	.3863
Fish	1	25	12.13	**.0018**
Size × fish	2	25	10.21	**.0006**
Tropisternus lateralis:				
Size	2	25	2.86	*.0760*
Fish	1	25	18.58	**.0002**
Size × fish	2	25	1.00	.3838
Tropisternus blatchleyi				
Size	2	25	15.65	**<.0001**
Fish	1	25	.00	.9447
Size × fish	2	25	.98	.3898
Laccophilus proximus:				
Size	2	25	5.72	**.0090**
Fish	1	25	4.03	*.0556*
Size × fish	2	25	3.57	**.0434**
Hemiptera:				
Notonecta irrorata:				
Size	2	25	6.38	**.0058**
Fish	1	25	4.15	*.0523*
Size × fish	2	25	.79	.4648
Sigara:				
Size	2	25	26.49	**<.0001**
Fish	1	25	33.23	**<.0001**
Size × fish	2	25	20.10	**<.0001**
Hesperocorixa vulgaris:				
Size	2	25	23.69	**<.0001**
Fish	1	25	20.50	**.0001**
Size × fish	2	25	15.17	**<.0001**
Buenoa:				
Size	2	25	10.62	**.0005**
Fish	1	25	9.71	**.0046**
Size × fish	2	25	9.71	**.0008**
Tropisternus collaris:				
Size	2	25	11.67	**.0003**
Fish	1	25	2.87	.1024
Size × fish	2	25	.57	.5750

Note: Taxon order is as in figure 3*a*: by abundance within order. Boldfacing indicates significance, and italics indicate marginally nonsignificant effects. See figure 3*a* for direction and magnitude of effects.

Table A3: Fixed effects results (type III) from mixed model ANOVAs on patch level α-diversity (effective numbers) for all insects and component taxonomic groups

Source	df_N	df_D	*F*	*P*
All insects:				
Size	2	30	27.47	**<.0001**
Fish	1	30	2.66	.1131
Size × fish	2	30	.62	.5442
Hydrophilids:				
Size	2	30	3.66	**.0379**
Fish	1	30	1.04	.3167
Size × fish	2	30	3.01	*.0642*
Dytiscids:				
Size	2	30	12.26	**.0001**
Fish	1	30	18.66	**.0002**
Size × fish	2	30	9.40	**.0007**
Hemipterans:				
Size	2	25	39.83	**<.0001**
Fish	1	25	3.16	*.0875*
Size × fish	2	25	.49	.6181

Note: Boldfacing indicates significance, and italics indicate marginally nonsignificant effects. Different degrees of freedom for hemipterans inclusion of nonzero estimated block effect in the model.

Table A4: Permutational ANOVA (PERMANOVA) results for average similarity between treatments, and permutational analysis of multivariate community dispersion (PERMDISP) results for mean multivariate dispersion

	PERMANOVA (average similarity between/within groups)						PERMDISP (mean dispersion)		
Group	LNF	LF	MNF	MF	SNF	SF	Size	Average	SE
A. All insects ($S = 58$, $n = 6{,}875$):									
Large, no fish	*67.57*						6	21.168	1.4286
Large, fish	**51.34**	*64.31*					6	23.043	2.4998
Medium, no fish	**50.58**	**46.77**	*52.59*				6	30.457	3.5348
Medium, fish	**38.89**	**55.85**	**40.54**	*58.91*			6	26.452	3.0729
Small, no fish	**42.28**	**36.77**	**53.98**	**33.48**	*66.14*		6	21.88	1.2064
Small, fish	**38.59**	**43.08**	**48.48**	**38.85**	**48.74**	*57.05*	6	28.191	1.5662
B. Hydrophilids ($S = 20$, $n = 3{,}236$):									
Large, no fish	*67.51*						6	21.386	2.3125
Large, fish	**62.26**	*69.58*					6	19.386	3.2939
Medium, no fish	**55.55**	**49.59**	*56.15*				6	27.582	4.6234
Medium, fish	**58.03**	66.21	**47.99**	*63.36*			6	23.756	3.2533
Small, no fish	**48.61**	**40.87**	58.67	**40.41**	*68.27*		6	20.552	1.6014
Small, fish	**35.89**	**42.22**	**45.33**	**41.69**	**45.00**	*47.36*	6	34.524	3.3401
C. Dytiscids ($S = 24$, $n = 2{,}460$):									
Large, no fish	*69.14*						6	20.147	1.5141
Large, fish	**47.77**	*67.07*					6	21.384	1.5861
Medium, no fish	**54.92**	**44.56**	*52.19*				6	31.129	3.601
Medium, fish	**31.24**	**52.59**	**33.36**	*60.38*			6	25.286	4.7529
Small, no fish	**45.63**	**33.9**	**51.93**	**23.89**	*67.28*		6	21.249	1.1193
Small, fish	**60.05**	**51.89**	60.5	**38.73**	**56.59**	*75.41*	6	16.22	1.8514
D. Hemipterans ($S = 7$, $n = 1{,}093$):									
Large, no fish	*67.3*						6	21.562	1.9663
Large, fish	**38.79**	*46.06*					6	34.704	6.0571
Medium, no fish	**39.15**	51.27	*45.03*				4	33.638	5.6345
Medium, fish	**20.27**	**35.76**	**27.73**	*53.37*			4	29.348	3.8654
Small, no fish	**26.56**	**39.42**	**35.89**	**26.53**	*64.04*		4	21.802	4.6328
Small, fish	**24.23**	40.58	**35.95**	**25.6**	74.7	*77.56*	3	13.426	3.7884

Note: Boldfacing indicates significant effects or significantly different treatments; italics indicate within-treatment similarities for PERMANOVA. PERMDISP results for Hemiptera should be viewed cautiously because of empty cells.

Table A5: Total multisite β-diversity based on presence/absence data (Sorenson; β_{SOR}) partitioned between additive components attributable to species turnover (β_{SIM}) and nestedness (β_{NES}), and total β-diversity based on abundance data (Bray-Curtis; β_{BC}) partitioned between additive components attributable to balanced variation (turnover; $\beta_{BC.BAL}$) and abundance gradients (nestedness; $\beta_{BC.GRA}$)

	Presence/absence	Abundance
All insects:		
Full design	β_{SOR} = .897	β_{BC} = .932
	β_{SIM} = .794	$\beta_{BC.BAL}$ = .790
	β_{NES} = .104	$\beta_{BC.GRA}$ = .142
Fish	β_{SOR} = .813	β_{BC} = .870
	β_{SIM} = .677	$\beta_{BC.BAL}$ = .724
	β_{NES} = .137	$\beta_{BC.GRA}$ = .146
Fishless	β_{SOR} = .807	β_{BC} = .858
	β_{SIM} = .691	$\beta_{BC.BAL}$ = .672
	β_{NES} = .116	$\beta_{BC.GRA}$ = .186
Hydrophilidae:		
Full design	β_{SOR} = .876	β_{BC} = .935
	β_{SIM} = .759	$\beta_{BC.BAL}$ = .808
	β_{NES} = .116	$\beta_{BC.GRA}$ = .128
Fish	β_{SOR} = .777	β_{BC} = .867
	β_{SIM} = .563	$\beta_{BC.BAL}$ = .655
	β_{NES} = .214	$\beta_{BC.GRA}$ = .212
Fishless	β_{SOR} = .770	β_{BC} = .882
	β_{SIM} = .671	$\beta_{BC.BAL}$ = .752
	β_{NES} = .099	$\beta_{BC.GRA}$ = .131
Dytiscidae:		
Full design	β_{SOR} = .917	β_{BC} = .908
	β_{SIM} = .812	$\beta_{BC.BAL}$ = .560
	β_{NES} = .105	$\beta_{BC.GRA}$ = .349
Fish	β_{SOR} = .838	β_{BC} = .781
	β_{SIM} = .719	$\beta_{BC.BAL}$ = .508
	β_{NES} = .119	$\beta_{BC.GRA}$ = .273
Fishless	β_{SOR} = .842	β_{BC} = .804
	β_{SIM} = .720	$\beta_{BC.BAL}$ = .368
	β_{NES} = .122	$\beta_{BC.GRA}$ = .436
Hemiptera:		
Full design	β_{SOR} = .918	β_{BC} = .958
	β_{SIM} = .564	$\beta_{BC.BAL}$ = .636
	β_{NES} = .354	$\beta_{BC.GRA}$ = .321
Fish	β_{SOR} = .878	β_{BC} = .921
	β_{SIM} = .549	$\beta_{BC.BAL}$ = .544
	β_{NES} = .329	$\beta_{BC.GRA}$ = .377
Fishless	β_{SOR} = .833	β_{BC} = .937
	β_{SIM} = .262	$\beta_{BC.BAL}$ = .593
	β_{NES} = .570	$\beta_{BC.GRA}$ = .34

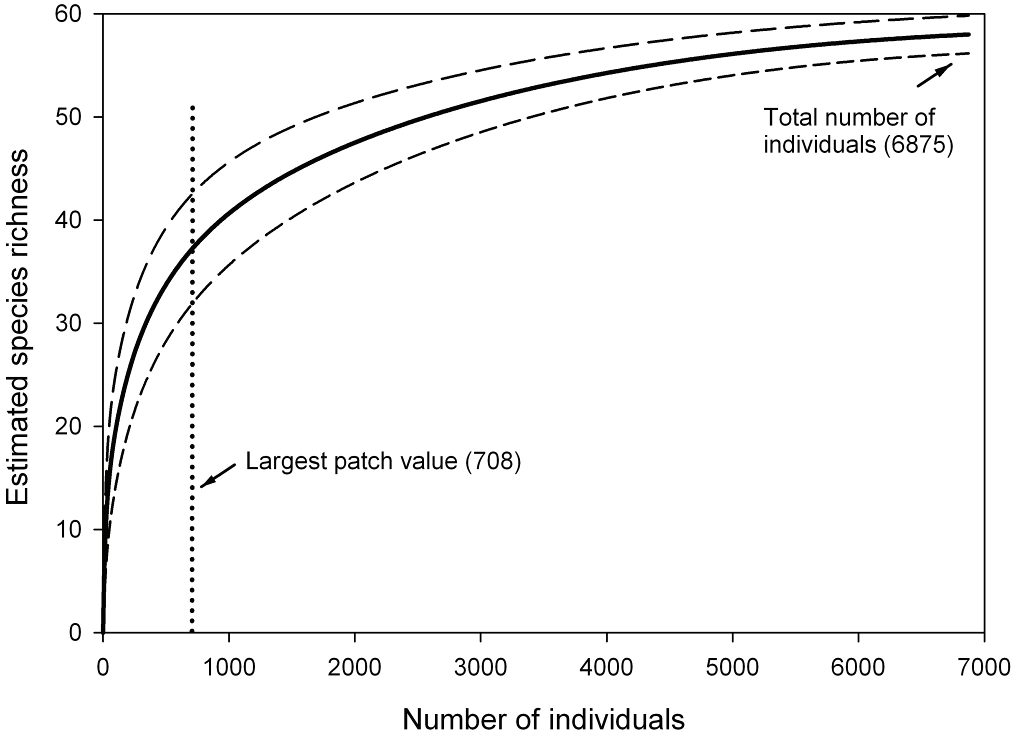

Figure A1: Rarefaction curve for all insects, with 95% confidence limits. The largest patch value from the experiment (large, fishless patch) is shown. Patches were individually rarefied for analysis: the figure simply illustrates where our samples fell on the overall rarefaction curve, indicating that for the range of abundances in our experiment, the species abundance curve was roughly linear and that richness in the largest samples was not seriously constrained by the total species pool.