

Appendix C. Metric Screening

Biological Metric	Developed to all proposals			Development of landscape adjusted proposal					Development of no landscape adjusted proposal		
	Acronym	Range Test	Normality assumption	Landscape influences adjust (OLS regression n=5)	Diference between least- and most-disturbed sites (T-test) - corrected	Redundancy with other biological metric (r > 090)	Selected to final analisys	Diference between least- and most-disturbed sites (T-test) - no corrected	Redundancy with other biological metric (r > 090)	Selected to final analisys	
<u>Richness and Composition</u>											
Total taxa richness	S	Yes	Yes		5.66	C-G_S, PRD_S, CRA_S, BWMPa, d'	X	5.66	C-G_S, PRD_S, CRA_S, BWMPa, d'		
Abundance	N	Yes	Yes		Rejected			Rejected			
Abundance minus Chironomidae abundance	N-CHI	Yes	Yes	$y = -212213 * (\text{Rainfall}) + 676412; r^2 = 0.77; \text{RMSE} = 154.9; p < 0.05$	Rejected			Rejected			
EPT family richness	EPT_S	Yes	Yes		4.94	TRIC_S, C-G_S, BMWPa, SEN_S	X	4.94	TRIC_S, C-G_S, BMWPa, SEN_S		
% EPT individuals	%EPT	Yes	Yes		3.73	ASPTa, %SEN		3.73	ASPTa, %SEN		
Non-insect Richness	NINS_S	No									
Non-insect individuals percent	%NINS	Yes	Not corrected								
Ephemeroptera richness	EPH_S	Yes	Yes		2.94		X	2.94		X	
% Ephemeroptera	%EPH	Yes	Yes		3.09		X	3.09		X	
Plecoptera richness	PLE_S	No									
% Plecoptera	%PLE	Yes	Corrected	$y = 42.24 * (\text{Rainfall}) - 134.34; r^2 = 0.82; \text{RMSE} = 0.02; p < 0.05$	Rejected			Rejected			
Tricoptera richness	TRI_S	Yes	Yes		4.89	EPT_S		4.89	EPT_S	X	
% Tricoptera	%TRI	Yes	Yes		Rejected			Rejected			
Odonata richness	ODO_S	Yes	Corrected		3.05		X	3.05		X	
% Odonata	%ODO	Yes	Corrected	$y = 1.84 * (\text{Elevation mean}) - 5.38; r^2 = 0.80; \text{RMSE} = 0.01; p < 0.05$	7.49		X	2.27		X	
Lepdoptera richness	LEP_S	No									
% Lepdoptera	%LEP	Yes	Not corrected								
Coleoptera richness	COL_S	Yes	Yes		6.01		X	6.01		X	
% Coleoptera	%COL	Yes	Yes		Rejected			Rejected			
Megaloptera richness	MEG_S	No	Yes								
% Megaloptera	%MEG	Yes	Corrected	$y = 0.41 * (\text{Slope mean}) - 0.38; r^2 = 0.88; \text{RMSE} = 0.01; p < 0.05$	Rejected			Rejected			
Heteroptera richness	HET_S	No									
% Heteroptera	%HET	Yes	Yes		Rejected			Rejected			
Diptera richness	DIP_S	Yes	Yes		Rejected			Rejected			
% Diptera	%DIP	Yes	Yes	$y = 7311.5 * (\text{Rainfall}) - 23234.7; r^2 = 0.86; \text{RMSE} = 3.84; p < 0.05$	Rejected			-3.11		X	
% Diptera minus % Chironomidae	%DIP-CHIR	Yes	Corrected		Rejected			Rejected			
% Baetidae	%BAE	Yes	Yes		Rejected			Rejected			
% Chironomidae	%CHIR	Yes	Yes	$y = 5872.7 * (\text{Rainfall}) - 18661.5; r^2 = 0.86; \text{RMSE} = 3.10; p < 0.05$	Rejected			Rejected			
% Hydropsychidae	%HYD	Yes	Yes	$y = -561.98 * (\text{Rainfall}) + 1791.06; \text{RMSE} = 0.97; p < 0.01$	Rejected			Rejected			
% Collembola	%CLL	Yes	Not Corrected								
% Hydracarina	%HYD	Yes	Not Corrected								
% Ostracoda	%OST	No									
% Bivalvia	%BIV	Yes	Not Corrected								
% Hirudinea	%HIR	Yes	Not Corrected								
% Oligochaeta	%OLI	Yes	Corrected		Rejected			Rejected			
% Planariidae	%PLA	Yes	Not Corrected								
% Nematoda	%NEM	Yes	Not Corrected								
<u>Behavioral characteristics</u>											
Collector-filterer richness	C-F_S	Yes	Corrected		3.29		X	3.29		X	
% Collector-filterer	%C-F	Yes	Corrected	$y = -3.07 * (\text{Elevation mean}) + 9.39; r^2 = 0.95; \text{RMSE} = 0.009; p < 0.01$	-2.55		X	-2.55		X	
Collector-gatherer richness	C-G_S	Yes	Yes		5.43	S, ETP_S, CRA_S, BMWPa		5.43	S, ETP_S, CRA_S, BMWPa		
% Collector-gatherer	%C-G	Yes	Corrected		Rejected			Rejected			
Predator richness	PRD_S	Yes	Yes		5.18	S		5.18	S	X	
% Predator	%PRD	Yes	Yes		2.88		X	2.88		X	
Scraper richness	SCR_S	Yes	Yes		3.37		X	3.37		X	
% Scraper	%SCR	Yes	Yes		Rejected			Rejected			
Sheredder richness	SHR_S	Yes	Yes	$y = -2.67 * (\text{Basin area}) + 6.48; r^2 = 0.97; \text{RMSE} = 0.55; p < 0.05$	Rejected			2.48		X	
% Sheredder	%SHR	Yes	Corrected		2.56		X	2.56		X	
Burrower richness	BUR_S	Yes	Yes		2.1		X	2.1		X	
% Burrower	%BUR	Yes	Yes	$y = 5654.4 * (\text{Rainfall}) - 17959.4; r^2 = 0.84; \text{RMSE} = 3.27; p < 0.05$	Rejected			Rejected			
Crawler richness	CRA_S	Yes	Yes		5.92	S, C-G_S, BMWPa, d'		5.92	S, C-G_S, BMWPa, d'	X	
% Crawler	%CRA	Yes	Not corrected								
Skater richness	SKT_S	No									
% Skater	%SKT	Yes	Not corrected								

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Swimmer richness	SWI_S	Yes	Yes		4.72		X	4.72		X
% Swimmer	%SWI	Yes	Yes		2.78		X	2.78		X
Temporarily attached richness	TAT_S	Yes	Yes		4.48		X	4.48		X
% Temporarily attached	%TAT	Yes	Corrected		Rejected			Rejected		
<u>Tolerance</u>										
Biological Monitoring Working Party adapted	BMWPa	Yes	Yes		5.66	S, EPT_S, C-G_S, CRA_S, SEN_S, d'		5.66	S, EPT_S, C-G_S, CRA_S, SEN_S, d'	
Average Score Per Taxon adapted	ASPTa	Yes	Yes		2.58	%EPT	X	2.58	%EPT	X
Biological Monitoring Working Party adapted/Total taxa richness	BMWPa/S	Yes	Yes		3.38		X	3.38		X
Super-tolerant taxa richness (Richness of taxas with value 1 or 2)	S-TOL_S	No	Yes							
% Super-tolerant individuals (% of taxas with value 1 or 2)	%S-TOL	Yes	Yes	$y = 6158.1 * (\text{Rainfall}) - 19569.3; r^2 = 0.86; \text{RMSE} = 3.35; p < 0.05$	Rejected			Rejected		
Tolerant taxa richness (Richness of taxas with value 1, 2, 3 or 4)	TOL_S	Yes	Yes		Rejected			Rejected		
% Tolerant individuals (% of taxas with value 1, 2, 3 or 4)	%TOL	Yes	Yes		Rejected			Rejected		
Super-sensitive taxa richness (Richness of taxas with value 9 or 10)	S-SEN_S	Yes	Yes		4.07		X	4.07		X
% Super-sensitive individuals (% of taxas with value 9 or 10)	%S-SEN	Yes	Corrected		5.11		X	5.11		X
Sensitive taxa richness (Richness of taxas with value 7, 8, 9 or 10)	SEN_S	Yes	Yes		5.3	EPT_S, BMWPa	X	5.3	EPT_S, BMWPa	X
% Sensitive individuals (% of taxas with value 7, 8, 9 or 10)	%SEN	Yes	Yes		4.14	%EPT		4.14		X
Baetidae / Ephemeroptera	BAE/EPH	No								
Hydropsichidae / Trichoptera	HYD/TRIC	No	Yes							
Chironomidae / EPT	CHIR/EPT	Yes	Corrected		Rejected			Rejected		
Chironomidae / Diptera	CHIR/DIP	Yes	Yes		Rejected			Rejected		
<u>Diversity and dominance</u>										
Shannon diversity (Total taxa)	H'	Yes	Yes		2.88	%2TAX		2.88	%2TAX, %3TAX, %4TAX, %5TAX	
Evenness (Total taxa)	J'	Yes	Yes		Rejected			Rejected		
Margalef ldiversity (Total taxa)	d'	Yes	Yes		5.12	S, CRA, BMWPa		5.12		
Simpson diversity (Total taxa)	λ'	Yes	Yes	$y = -25.96 * (\text{Rainfall}) + 83.46; r^2 = 0.96; \text{RMSE} = 0.006; p < 0.001$	Rejected			Rejected		
% 2 dominant taxa	%2TAX	Yes	Yes		-3.02	H'	X	-3.02	H', %3TAX, %4TAX, %5TAX	X
% 3 dominant taxa	%3TAX	Yes	Yes	$y = 41.63 * (\text{Slope mean}) + 23.42; r^2 = 0.77; \text{RMSE} = 1.22; p < 0.05$	-3.94	%4TAX, %5TAX	X	-2.86	H', %2TAX, %4TAX, %5TAX	
% 4 dominant taxa	%4TAX	Yes	Yes	$y = 33.41 * (\text{Slope mean}) + 40.01; r^2 = 0.84; \text{RMSE} = 1.22; p < 0.05$	-3.41	%3TAX, %5TAX		-2.68	H', %2TAX, %3TAX, %5TAX	
% 5 dominant taxa	%5TAX	Yes	Yes	$y = 38.07 * (\text{Slope mean}) + 41.53; r^2 = 0.92; \text{RMSE} = 0.074; p < 0.01$	-2.92	%3TAX, %4TAX		-2.15	H', %2TAX, %3TAX, %4TAX	