

Bacca et al., 2023. Land-use effects on aquatic macroinvertebrate diversity in subtropical highland grasslands streams. *Limnetica* 42-2, 2023

Supplementary Material

Table S1. Environmental characteristics and biotic variables of land covers in the Campos de Palmas Wildlife Refuge, South Brazil. Land covers are mixed ombrophilous forest (MOF), silviculture, grassland with arboreal riparian vegetation (GWRV) and grassland without arboreal riparian vegetation (GNRV). Pos hoc contrast analysis shows differences among land covers ($p < 0.05$). Resid. Dev. = Residual deviance; GLM = Generalized Linear Model. *Características ambientais e variáveis bióticas da cobertura do solo no Refúgio de Vida Silvestre Campos de Palmas, Sul do Brasil. As coberturas do solo são floresta (MOF), silvicultura e pastagens com (GWRV) e sem vegetação ciliar arbórea (GNRV). A análise pós-hoc de contraste mostrando as diferenças entre as coberturas do solo ($p < 0.05$). Resid. Dev. = desvio residual; GLM = Modelo Linear Generalizado.*

	GNRV	GWRV	MOF	Silviculture	GLMs	Analysis of contrast
Canopy openness (%)	87.00 ± 1.39	6.00 ± 0.00	5.00 ± 0.00	83.97 ± 1.21	Resid. Dev.% (3,56) = 10.1; $p < 0.01$	MOF = GWRV < Other uses
Temperature (°C)	17.88 ± 0.69	19.09 ± 0.80	16.09 ± 0.33	15.59 ± 0.17	Resid. Dev.% (3,56) = 61.4; $p < 0.01$	Other uses < GWRV = GNRV
pH	4.39 ± 0.29	4.92 ± 0.26	4.70 ± 0.23	5.23 ± 0.19	Resid. Dev.% (3,56) = 85.1; $p = 0.02$	Other uses < Silviculture
Conductivity (µS/cm)	0.01 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.04 ± 0.02	Resid. Dev.% (3,56) = 86.1; $p < 0.02$	Other uses < Silviculture
Turbidity (NTU)	24.76 ± 17.94	0.18 ± 0.10	0.85 ± 0.24	7.78 ± 4.10	Resid. Dev.% (3,56) = 88.3; $p = 0.06$	-
Dissolved oxygen (mg/L)	8.21 ± 0.38	9.01 ± 0.42	8.73 ± 0.32	8.91 ± 0.20	Resid. Dev.% (3,56) = 90.7; $p = 0.12$	-
Nitrate (mg/L)	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	0.02 ± 0.00	Resid. Dev.% (3,56) = 78.9; $p < 0.01$	Other uses < Silviculture
Orthophosphate (mg/L)	6.07 ± 0.06	7.23 ± 0.06	8.06 ± 0.03	7.00 ± 0.17	Resid. Dev.% (3,56) = 11.6; $p < 0.01$	Other uses < MOF
Ammonia (mg/L)	0.23 ± 0.03	0.21 ± 0.02	0.24 ± 0.02	0.08 ± 0.01	Resid. Dev. % (3,56) = 55.6; $p < 0.01$	Other uses < Silviculture
Water velocity (cm/s)	2.50 ± 0.38	3.01 ± 0.42	3.92 ± 0.35	6.17 ± 1.81	Resid. Dev. % (3,56) = 18.1; $p < 0.01$	Other uses < Silviculture
Water flow (cm ³ /s)	0.57 ± 0.23	0.45 ± 0.08	4.42 ± 0.79	0.30 ± 0.00	Resid. Dev.% (3,56) = 40.7; $p < 0.01$	Other uses < MOF
Litter stock (g/m ²)	18.60 ± 6.60	146.50 ± 42.50	180.80 ± 27.40	208.90 ± 17.00	Resid. Dev.% (3,26) = 34.1; $p < 0.01$	Other uses < Silviculture
Litterfall input (g/m ²)	0.00 ± 0.00	70.31 ± 13.32	56.70 ± 8.01	0.00 ± 0.00	Resid. Dev.% (3,26) = 24.4; $p < 0.01$	Other uses < MOF = GWRV

Tabanidae	9.77	0	0	0	0	0	0	0	0	29.3
Simuliidae	0	9.77	0	0	29.3	0	0	244.14	117.19	0
Chironomidae	48.83	322.27	48.83	9.77	703.13	19.53	68.36	244.14	156.25	156.25
Coleoptera										
Elmidae	78.13	39.06	9.77	29.3	97.66	0	166.02	595.7	263.67	19.53
Staphilinidae	0	0	0	0	0	0	0	0	9.77	0
Psephenidae	185.55	0	0	9.77	0	0	19.53	48.83	117.19	0
Girinidae	9.77	0	19.53	0	0	0	0	0	0	0
Lepidoptera										
Pyralidae	9.77	0	0	9.77	29.3	0	0	0	0	0
Trichoptera										
Hydropsychidae	0	0	0	0	146.48	0	0	136.72	195.31	19.53
Polycentropodidae	0	0	0	9.77	166.02	0	0	0	0	0
Odontoceridae	0	0	0	0	0	0	9.77	0	0	0
Hydroptilidae	0	0	0	0	0	0	48.83	0	0	0
Calamoceratidae	58.59	0	0	0	0	0	0	9.77	97.66	78.13
Plecoptera										
Perlidae	0	0	9.77	9.77	0	0	0	9.77	9.77	68.36
Gripopterygidae	0	0	48.83	9.77	97.66	0	9.77	1494.14	97.66	0
Megaloptera										
Corydalidae	0	0	9.77	9.77	0	0	0	0	9.77	0