Supplementary Online Material

Results tables and model assumptions

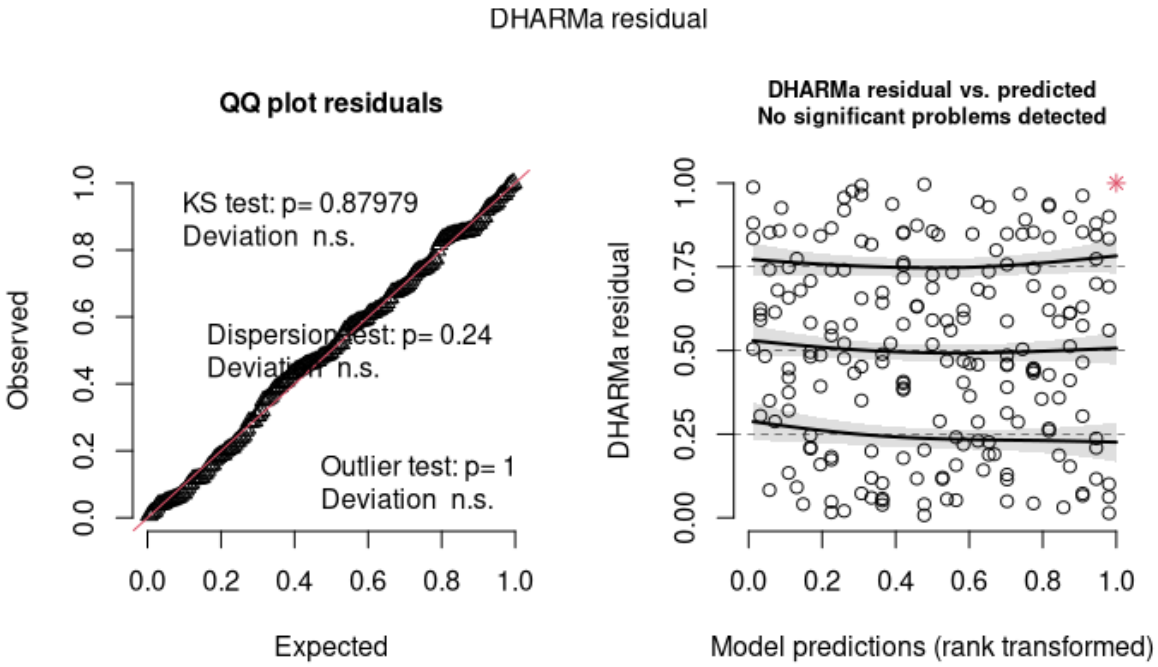
Supplementary Table 1: Habitat generalists and grassland-specialists bird species recorded in each grazing condition (Traditional grazing, Grazing exclusion and Regenerative grazing) in highland grasslands of the Paititi Private Natural Reserve, Tandilia Hill System. The occurrence frequency (Freq; number of transects where the species was registered from the total of transects) and the mean of individuals per species per transect (Mean), is reported.

Species	Traditional grazing		Grazing exclusion		Regenerative grazing	
	Mean	**Freq**	**Mean**	**Freq**	**Mean**	**Freq**
Grassland specialists						
Rhynchotus rufescens	0.042	0.083	-	-	0.092	0.500
Nothura maculosa	0.375	0.417	0.083	0.167	0.098	0.583
Hymenops perspicillatus	-	-	-	-	0.009	0.083
Cistothorus platensis	-	-	0.083	0.083	0.018	0.167
Anthus sp.	0.083	0.083	-	-	0.314	0.750
Leistes superciliaris	0.042	0.083	-	-	-	-
Leistes loyca	-	-	0.042	0.083	0.193	0.667
Pseudoleistes virescens	-	-	0.500	0.083	0.259	0.250
Sicalis luteola	0.042	0.083	0.917	0.417	0.547	0.417
Sporophila caerulescens	0.042	0.083	0.958	0.417	0.102	0.250
Embernagra platensis	0.042	0.083	0.875	0.750	0.421	0.917
Donacospiza albifrons	-	-	0.208	0.167	0.018	0.083
Habitat generalists						
Zenaida auriculata	0.083	0.083	0.042	0.083	0.259	0.500
Chlorostilbon lucidus	0.042	0.083	0.083	0.167	-	-
Leucochloris albicollis	-	-	0.042	0.083	-	-
Vanellus chilensis	-	-	-	-	0.012	0.083
Rupornis magnirostris	-	-	-	-	0.009	0.083
Colaptes melanochloros	-	-	-	-	0.028	0.250

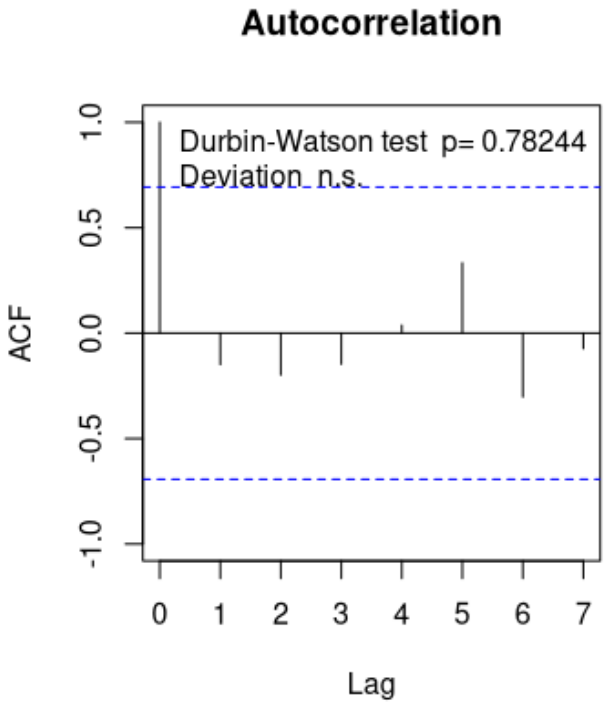
Colaptes campestris	-	-	-	-	0.028	0.167
Milvago chimango	-	-	-	-	0.048	0.333
Furnarius rufus	0.042	0.083	0.333	0.333	0.448	0.750
Phacellodomus striaticollis	-	-	0.500	0.500	0.208	0.917
Anumbius annumbi	-	-	-	-	0.009	0.083
Serpophaga subcristata	-	-	-	-	0.028	0.083
Pitangus sulphuratus	0.208	0.167	0.083	0.167	0.117	0.333
Tyrannus melancholicus	-	-	-	-	0.083	0.333
Tyrannus savana	-	-	-	-	0.055	0.333
Hirundo rustica	-	-	-	-	0.268	0.083
Troglodytes aedon	-	-	0.333	0.500	0.103	0.667
Turdus rufiventris	-	-	0.042	0.083	0.067	0.417
Mimus saturninus	-	-	0.375	0.250	0.700	0.917
Spinus magellanicus	-	-	-	-	0.104	0.333
Zonotrichia capensis	1.250	0.667	0.625	0.583	0.697	0.917
Molothrus bonariensis	-	-	0.125	0.167	0.689	0.750
Agelaioides badius	-	-	0.042	0.083	0.324	0.500
Sicalis flaveola	0.083	0.083	-	-	-	-

Supplementary Results: Evidence of model assumptions

- Outcomes of DHARMa (evaluation of model assumptions):



- Outcomes of temporal autocorrelation test (ACF):



Supplementary Table 2: Statistical significance of terms in the original model. Terms were sequentially removed (three-way → two-way interactions) until only significant terms remained (final model). Significance was assessed by comparing nested models differing solely in the target term; each significant term was tested by removal from the final model. Main effects of Vegetation structure and Habitat preference were omitted due to their involvement in significant interactions.

Term	χ2	DF	*p* value
Grazing condition	11.38	2	**<0.005**
Vegetation structure * Grazing condition	1.47	2	0.480
Vegetation structure * Habitat preference	12.41	1	**<0.001**
Grazing condition * Habitat preference	0.98	2	0.614
Vegetation structure * Grazing condition * Habitat preference	0.93	2	0.630

Supplementary Table 3: Statistical significance for all terms of the final model. Note that all terms were significant.

	Estimate	Std. Error	z value	*p* value
(Intercept)	0.7779	0.2898	2.685	0.007263
Vegetation structure	-0.0094	0.0037	-2.571	0.010129
Grazing exclusion	1.1187	0.3924	2.851	0.004365
Regenerative grazing	1.0067	0.2953	3.410	0.000651
Grassland specialists	-1.4681	0.2907	-5.051	<0.00001
Vegetation structure * Grassland specialists	0.0150	0.0043	3.518	0.000435

Supplementary Table 4: Results of collinearity test (VIF) for the three variables considered in this study.

Term	VIF	VIF 95% CI	Increased SE	Tolerance	Tolerance 95% CI
Vegetation structure	1.47	[1.27, 1.81]	1.21	0.68	[0.55, 0.78]
Grazing condition	1.46	[1.27, 1.80]	1.21	0.68	[0.56, 0.79]
Habitat preference	1.02	[1.00, 92.20]	1.01	0.98	[0.01, 1.00]