

Ecography

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Supplementary material

Supplementary Material Appendix 1

Table A1. Extant flightless bird data used to model the relationship between body mass and population density under three alternative scenarios (Low, Medium, High) created to represent, for a given species, density of populations from different habitats (i.e. more or less suitable) or populations more or less impacted by human activities.

Family	Binomial	Species	Male weight (g)	Female weight (g)	Density scenario- (individuals/km ²)			Habitat ¹	Human Impact	Reference
					Low	Medium	High			
Struthionidae	<i>Struthio camelus</i>	Ostrich	128,000	100,000	0.03	–	–	DSD	High	Lowest estimate; Okello et al. (2016)
					0.15	–	–	DSD	Medium	Estimate from inside SNP; Magige et al. (2009)
					–	0.08	–	DSD	High	Highest estimate; Okello et al. (2016)
					–	0.16	–	DSD	Medium	Overall density estimate; Magige et al. (2009)
					–	0.70	–	DSD	Medium	Mean of upper and lower estimates; Brown et al. (1982)
					–	–	0.25	DSD	Medium	Estimate from outside SNP; Magige et al. (2009)
					–	–	0.80	DSD	Low	Estimate for plains with low predation; Brown et al. (1982)
Rheidae	<i>Rhea americana</i>	Greater rhea	25,000	20,000	0.05	–	–	NDSG	High	Lower range estimate in agro-ecosystem; Giordano et al. (2008)
					–	0.86	–	NDSG	Medium	Upper range estimate in natural grassland; Giordano et al. (2008)
					–	2.22	–	NDSG	Medium	1 individual/45 ha; Bellis et al. (2004)
					–	–	7.69	NDSG	Low	1 individual/13 ha; Bellis et al. (2004)
Rheidae	<i>Rhea pennata</i>	Lesser rhea	23,900	19,600	0.01	–	–	DSD	Medium	Lower range estimate; Baldi et al. (2015)
					1.29	–	–	NDSG	Medium	Chilean estimate in 1976; in Sales (2009)
					–	0.14	–	DSD	Medium	Average of upper and lower range estimates; Baldi et al. (2015)
					–	2.44	–	NDSG	High	1 individual/41 ha; Bellis et al. (2004)
					–	5.13	5.13	NDSG	Medium	Chilean estimate in 2000; in Sales (2009)
–	–	8.33	NDSG	Low	1 individual/12 ha; Bellis et al. (2004)					
Rheidae	<i>Rhea tarapacensis</i>	Puna rhea	23,900	19,600	0.47	–	–	DSD	Low	Breeding season estimate; Marinero et al. (2014)
					–	0.61	–	DSD	Medium	Mean of low and high models; Marinero et al. (2014)
					–	–	0.75	DSD	Low	Non-breeding season estimate; Marinero et al. (2014)

Casuariidae	<i>Casuarius casuarius</i>	Southern cassowary	32,500	58,500	0.48	–	–	F	High	Estimate including adults only; Moore (2007)
					–	0.78	–	F	High	Estimate including adults and subadults; Moore (2007)
					–	1.19	1.19	F	Medium	AOO in Australia, 2,500 mature individuals in 2,100 km ² ; Garnett et al. (2011)
Casuariidae	<i>Casuarius unappendiculatus</i>	One-wattled cassowary	36,600	58,000	1.40	–	–	F	High	Forest garden estimate; Pangau-Adam et al. (2015)
					–	7.75	–	F	Medium	Average of low and high models; Pangau-Adam et al. (2015)
					–	–	14.10	F	Low	Primary forest estimate; Pangau-Adam et al. (2015)
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu	31,500	36,900	0.07	–	–	DSD	Medium	1 emu/15 km ² , Goldfields-Esperance, WA; Blakers et al. (1984)
					0.80	–	–	NDSG	Medium	Estimate of ≤0.8 emu outside the dingo (<i>Canis dingo</i>) fence; Pople et al. (2000)
					–	1.40	–	DSD	Medium	Average of low and high models; Pople et al. (2000)
					–	–	2.00	DSD	Medium	Estimate of ≤2.0 emu inside the dingo fence; Pople et al. (2000)
Apterygidae	<i>Apteryx haastii</i>	Great spotted kiwi	1,700	2,400	8.00	–	–	F	High	McLennan and McCann (1991)
					–	9.00	–	F	High	Average of low and high models; McLennan and McCann (1991)
					–	–	10.00	F	High	McLennan and McCann (1991)
Apterygidae	<i>Apteryx owenii</i>	Little spotted kiwi	1,150	1,350	–	25.93	–	F	Low	1,400 adults in 54 km ² (AOO); IUCN 2016
					–	–	31.48	F	Low	1,700 adults in 54 km ² (AOO); IUCN 2016
Apterygidae	<i>Apteryx mantelli</i>	North Island brown kiwi	2,100	2,500	1.16	–	–	F	High	Range in 2003 = 21,600 km ² ; Basse and McLennan (2003); kiwi estimate = 25,000; Holzapfel et al. (2008)
					–	70.00	–	F	Low	Average of 40–100 adults/km ² ; Buller (1877, 1888); McLennan et al. (1996)
					–	–	100.00	F	Low	Buller (1877, 1888); McLennan et al. (1996)
Anatidae	<i>Anas aucklandica</i>	Auckland teal	520	410	14.29	–	–	F	Medium	600 birds/42 km ² (AOO); IUCN 2016
					–	30.96	–	F	Medium	Average of low and high models; IUCN 2016
					–	–	47.62	F	Medium	2,000 birds/42 km ² (AOO); IUCN 2016
Anatidae	<i>Anas nesiotis</i>	Campbell teal	430	323	0.83	–	–	NDSG	High	150 birds/180 km ² (EOO); IUCN 2016
					–	1.67	–	NDSG	High	300 birds/180 km ² (EOO); IUCN 2016

Podicipedidae	<i>Rollandia microptera</i>	Titicaca grebe	707	706	6.10	–	–	FW	Medium	2,582 grebes per sq. km of lake area; Martinez et al. (2006)
					–	44.45	–	FW	Medium	Average of low and high models; Martinez et al. (2006)
					–	–	82.80	FW	Medium	2,582 grebes in local population distribution range (AOO); Martinez et al. (2006)
Podicipedidae	<i>Podiceps taczanowskii</i>	Junín grebe	423	360	0.36	–	–	FW	High	50 grebes in 140 km ² (EOO) in 2007; IUCN 2016
					–	1.78	–	FW	High	249 grebes in 140 km ² (EOO) in 2007; IUCN 2016
					–	–	7.14	FW	High	1,000 grebes in 140 km ² (EOO) in 1961; IUCN 2016
Rallidae	<i>Gallirallus australis</i>	Weka	1,049	737	30.00	–	–	F	Medium	0.3 weka/ha at Double Cove, Marlborough Sounds; Beauchamp (1987b)
					–	55.00	–	F	Medium	Average of low and high models; Beauchamp (1987a, b)
					–	–	80.00	F	Low	0.8 weka/ha Kapiti Island; Beauchamp (1987a)
Rallidae	<i>Hypotaenidia sylvestris</i>	Lord Howe woodhen	536	456	40.00	–	–	F	Medium	240 birds/6 km ² (EOO); IUCN 2016
					–	120.00	–	F	Medium	240 birds/2 km ² (AOO); IUCN 2016
					–	–	150.00	F	Medium	300 birds/2 km ² (AOO); IUCN 2016
Rallidae	<i>Dryolimnas cuvieri aldabranus</i>	Aldabra rail	189	176	37.73	–	–	F	Medium	"At least 1,000" rails/area of Malabar Island (26.5 km ²); Penny and Diamond (1971)
					–	169.78	–	F	Medium	Average of low and high models; Penny and Diamond (1971); Wanless et al. (2002)
					–	–	301.83	F	Medium	c. 8,000 rails/area of Malabar Island (26.5 km ²); Wanless et al. (2002)
Rallidae	<i>Atlantisia rogersi</i>	Inaccessible Island rail	41	37	294.74	–	–	NDSG	Low	5,600 birds/19 km ² (EOO); IUCN 2016
					–	442.11	–	NDSG	Low	8,400 birds/19 km ² (EOO); Fraser et al. (1992); IUCN 2016
					–	–	731.71	NDSG	Low	3 rails/acre; Ripley (1977)
Rallidae	<i>Zapornia atra</i>	Henderson Crane	80	75	154.29	–	–	F	Medium	5,755 rails in 37.3 km ² (size of island); IUCN 2016
					–	228.20	–	F	Medium	8,512 rails in 37.3 km ² (size of island); IUCN 2016
					–	–	341.80	F	Medium	12,749 rails in 37.3 km ² (size of island); IUCN 2016

Rallidae	<i>Porphyrio hochstetteri</i>	Takahē	2,670	2,270	0.22	–	–	NDSG	Medium	110 birds in Special Takahē Area (50,000 ha); Maxwell (2013)
					–	28.23	28.23	F	Low	70 takahē in 248 ha; Grueber et al. (2012)
Rallidae	<i>Tribonyx mortierii</i>	Tasmanian native hen	1,334	1,251	100.00	100.00	–	NDSG	Low	Lower range estimate of 2 adults/2 ha; Ripley (1977)
					–	–	175.00	NDSG	Low	Mean estimate of 3.5 adults/2 ha; Ripley (1977)
Strigopidae	<i>Strigops habroptila</i>	Kākāpo	2,000	1,500	0.68	–	–	F	High	1 kākāpo/147 ha on Little Barrier; Powlesland et al. (1995)
					–	1.55	–	F	High	1 kākāpo/64.5 ha on Stewart Island; Powlesland et al. (1995)
					–	–	2.13	F	High	1 kākāpo/47 ha on Codfish Island; Powlesland et al. (1995)

¹ DSD = Desert or semi-desert, F= Forest, FW = Freshwater, NDSG = Non-desert scrub or grassland.

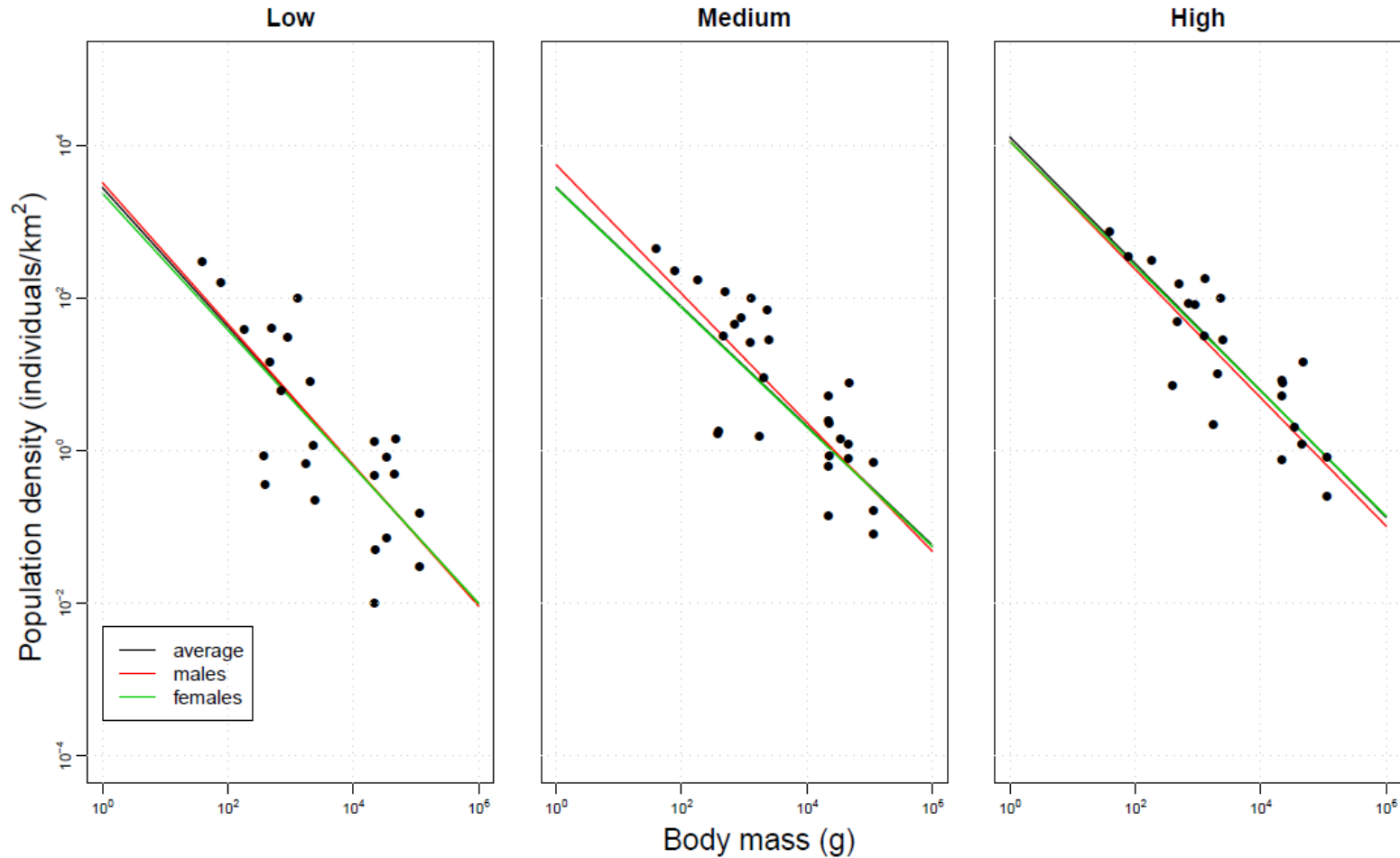


Fig. A1. The relationship between population density (individuals/km²) and body mass (g) for extant flightless birds estimated using female (green line), male (red line), or average weight (black line), for each of three alternative scenarios (low, medium, high). The scenarios were created to represent, for a given species, density of populations from different habitats (i.e. more or less suitable) or populations more or less impacted by humans. The x- and y-axes are on a log₁₀ scale.

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