Supplementary Material

Determining the distributions of plant communities in subantarctic vegetation using species distribution models

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Table S1. Summary of species observations (of 9 target species) from the dataset of 770 plots: (a) frequency and percentage of plots in which each species is present (>0% cover) or dominant (>25% cover); (b) frequency of plots with *n* co-occurring species or dominant species.

(a)

	Number of plots		Percentage of all plots	
	Present	Dominant	Present	Dominant
Acaena	541	106	70.3	13.8
Agrmag	733	301	95.2	39.1
Azomac	255	90	33.1	11.7
Desch	20	5	2.6	0.6
Festuca	237	94	30.8	12.2
Luzula	634	109	82.3	14.2
Pleuro	182	60	23.6	7.8
Poafol	174	60	22.6	7.8
Stilbo	104	24	13.5	3.1
None	9	232	1.2	30.1

(b)

n	Present	Dominant
0	9	232
1	37	314
2	116	148
3	192	65
4	179	11
5	129	0
6	82	0
7	26	0
8	0	0
9	0	0

Acaena, *Acaena* spp.; Agrmag, *Agrostis magellanica*; Azomac, *Azorella macquariensis*; Desch, *Deschampsia cespitosa*; Festuca, *Festuca contracta*; Luzula, *Luzula crinita*; Pleuro, *Pleurophyllum hookeri*; Poafol, *Poa foliosa*; Stilbo, *Stilbocarpa polaris*.

Table S2. Ruleset for determining floristic assemblage from modelled species ranges and core ranges. The process is iterative starting with the first category, if the species range rule is not met it proceeds down the table.

Species range	Floristic assemblage
Core range of *P. foliosa, P. hookeri* and *S. polaris*	Tall herbfield complex
Core range of *P. foliosa* and *S. polaris*	*P. foliosa–S. polaris* tall herbfield
Core range of *P. foliosa*	*P. foliosa* tussock grassland
Core Range of *S. polaris*	*S. polaris* tall herbfield
Core range of four or more of *Acaena* spp.*, A. macquariensis, A. magellanica, F. contracta, L. crinita, P. hookeri*	Short grassland and herbfield complex
Core range of *P. hookeri*	*P. hookeri* herbfield
Core range of three or more of *Acaena* spp.*, A. magellanica, D. cespitosa, F. contracta, L. crinita*	Short grassland
Core range of *Acaena* spp.	*Acaena* herbfield
Total range of *A. macquariensis*	Feldmark
None of the above	Unclassified

Table S3. Vegetation communities described by Selkirk *et al.* (1990) in relation to assemblages identified in the present study.

Vegetation community	Key Species	Assemblage classified in this study
P. foliosa–S. polaris–P. hookeri complex	*Poa foliosa*	*P. foliosa–S. polaris–P. hookeri* complex
	Pleurophyllum hookeri	
	Stilbocarpa polaris	
P. foliosa–S. polaris (coastal terraces)	*Poa foliosa*	*P. foliosa–S. polaris* tall herbfield
	Stilbocarpa polaris	
P. foliosa–S. polaris (coastal slopes)	*Poa foliosa*	*P. foliosa–S. polaris* tall herbfield
	Stilbocarpa polaris	
P. vestitum–P. foliosa–S. polaris–P. hookeri mixed	*Poa foliosa*	*P. foliosa–S. polaris–P. hookeri* complex
	Polystichum vestitum[A]	
	Pleurophyllum hookeri	
	Stilbocarpa polaris	
P. vestitum fernbrake	*Polystichum vestitum*[A]	Not classified
S. polaris stand	*Stilbocarpa polaris*	*S. polaris* tall herbfield
Coastal tussock	*Poa foliosa*	*P. foliosa* tussock grassland
Tall tussock (coastal terrace)	*Poa foliosa*	*P. foliosa* tussock grassland
Tall tussock (coastal slopes)	*Poa foliosa*	*P. foliosa* tussock grassland
Tall tussock (plateau)	*Poa foliosa*	*P. foliosa* tussock grassland
Short grassland	*Acaena* spp.	Short grassland and herbfield
	Agrostis magellanica	*Acaena* herbfield[B]
	Festuca contracta	
	Luzula crinita	
Feldmark	*Azorella macquariensis*	Feldmark
	Bryophytes	

[A]*Polystichum vestitum* not modelled in this study due to rarity of the species

[B]*Acaena* herbfield was separated from short grassland in the present study because our data allowed this assemblage to be discriminated. *Acaena* herbfield occurs in a mosaic with short grassland and is often combined into a single class (e.g. the 'closed short herb vegetation' of the Macquarie Island vegetation map), although Selkirk *et al.* (1990) do note the existence of a distinct *Acaena* herbfield.

Table S4. Best models for each taxon, based on highest area under the curve of a receiver operating characteristic plot (AUC) value from 100 models.

	PA	DN
Acaena spp.	0.8	0.84
A. magellanica	0.92	0.78
A. macquariensis	0.98	0.94
D. cespitosa	0.97	0.96
F. contracta	0.81	0.88
L. crinita	0.82	0.85
P. hookeri	0.9	0.95
P. foliosa	0.89	0.94
S. polaris	0.86	0.98

PA, presence or absent model; DN, dominant or not-dominant model.

Table S5. Variable importance for core range models: (a) mean importance from 100 models, (b) variables ranked in importance for each species (1, most important; 11, least important).

(a)

| Taxon	demmean	dist_coast	eastness	mi_lee	northness	northsouth	slope	solrad6mo	tpi180	wetness	wind_270
Acaena	0.098	0.059	0.069	0.031	0.034	0.173	0.03	0.038	0.036	0.055	0.064
Agrmag	0.246	0.066	0.017	0.044	0.018	0.042	0.021	0.022	0.024	0.016	0.03
Azomac	0.242	0.093	0.017	0.02	0.009	0.254	0.011	0.009	0.015	0.028	0.022
Desch	0.099	0.07	0.533	0.181	0.423	0.116	0.024	0.219	0.108	0.036	0.013
Festuca	0.174	0.242	0.042	0.132	0.017	0.034	0.04	0.019	0.06	0.032	0.021
Luzula	0.239	0.081	0.036	0.203	0.018	0.047	0.026	0.029	0.056	0.028	0.035
Pleuro	0.084	0.096	0.097	0.025	0.028	0.3	0.121	0.029	0.013	0.013	0.022
Poafol	0.177	0.252	0.011	0.018	0.026	0.062	0.023	0.032	0.011	0.009	0.011
Stilbo	0.051	0.104	0.027	0.071	0.014	0.047	0.009	0.007	0.084	0.014	0.024

(b)

Taxon	demmean	dist_coast	eastness	mi_lee	northness	northsouth	slope	solrad6mo	tpi180	wetness	wind_270
Acaena	2	5	3	10	9	1	11	7	8	6	4
Agrmag	1	2	10	3	9	4	8	7	6	11	5
Azomac	2	3	7	6	10	1	9	11	8	4	5
Desch	7	8	1	4	2	5	10	3	6	9	11
Festuca	2	1	5	3	11	7	6	10	4	8	9
Luzula	1	3	6	2	11	5	10	8	4	9	7
Pleuro	5	4	3	8	7	1	2	6	10	11	9
Poafol	2	1	9	7	5	3	6	4	8	11	10
Stilbo	4	1	6	3	9	5	10	11	2	8	7

Acaena, *Acaena* spp.; Agrmag, *Agrostis magellanica*; Azomac, *Azorella macquariensis*; Desch, *Deschampsia cespitosa*; Festuca, *Festuca contracta*; Luzula, *Luzula crinita*; Pleuro, *Pleurophyllum hookeri*; Poafol, *Poa foliosa*; Stilbo, *Stilbocarpa polaris*.

**Table S6.** Co-occurrence of species pairs by core range overlap.

	Acaena	Agrmag	Azomac	Desch	Festuca	Luzula	Pleuro	Poafol	Stilbo
Acaena	100	36.5	12.4	33.9	41.3	49	45.5	47.5	45.5
Agrmag	48.4	100	29.5	43.7	75	72	32.7	22.8	9.7
Azomac	17.9	32.1	100	35.1	33.7	12	23.2	2.8	1.5
Desch	4.8	4.6	3.4	100	4	3.3	5.2	2.9	1.8
Festuca	38.1	52.3	21.6	26.4	100	48.9	35.9	15.7	10.6
Luzula	21.1	23.4	3.6	10.2	22.8	100	9.6	21	16.5
Pleuro	41.1	22.2	14.5	33.3	35.1	20.2	100	43.8	63.4
Poafol	35.4	12.8	1.5	15.5	12.7	36.3	36.1	100	98.3
Stilbo	7.3	1.2	0.2	2.1	1.8	6.1	11.2	21.1	100

Values are percentage of the core range of the species in the column. Acaena, *Acaena* spp.; Agrmag, *Agrostis magellanica*; Azomac, *Azorella macquariensis*; Desch, *Deschampsia cespitosa*; Festuca, *Festuca contracta*; Luzula, *Luzula crinita*; Pleuro, *Pleurophyllum hookeri*; Poafol, *Poa foliosa*; Stilbo, *Stilbocarpa polaris*.
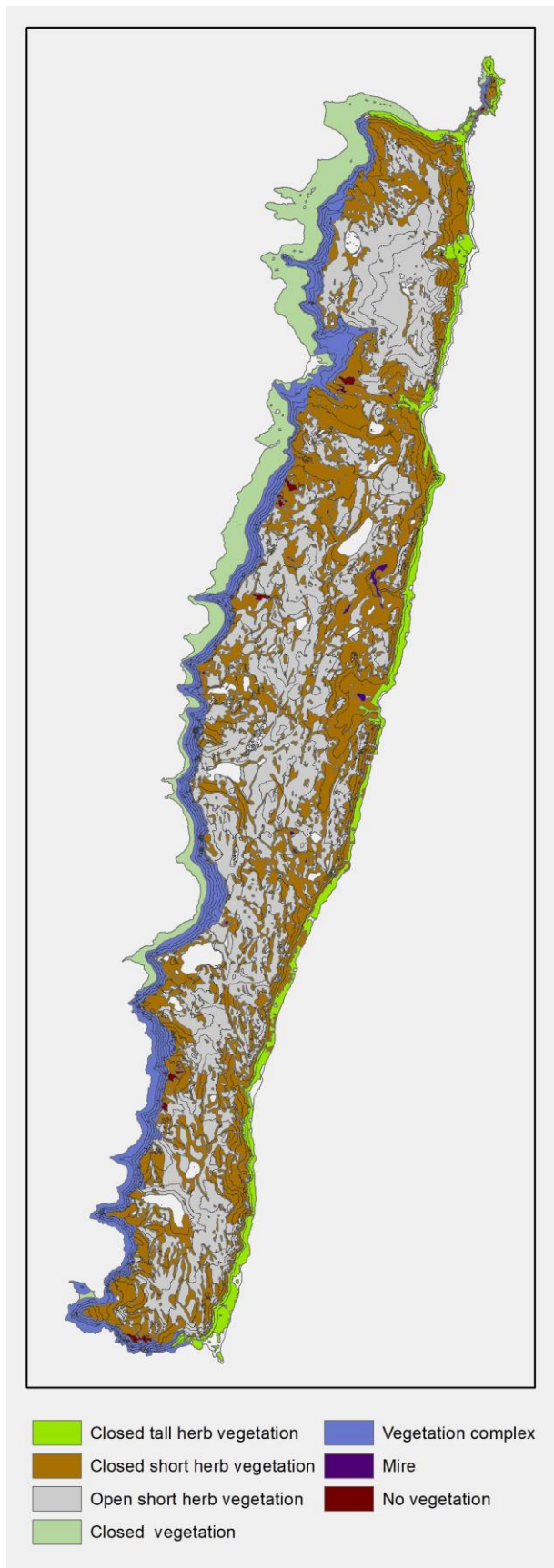
Fig. S1. Existing vegetation map for Macquarie Island (TASVEG 4.0, Department of Primary Industries, Parks, Water and Environment 2013).
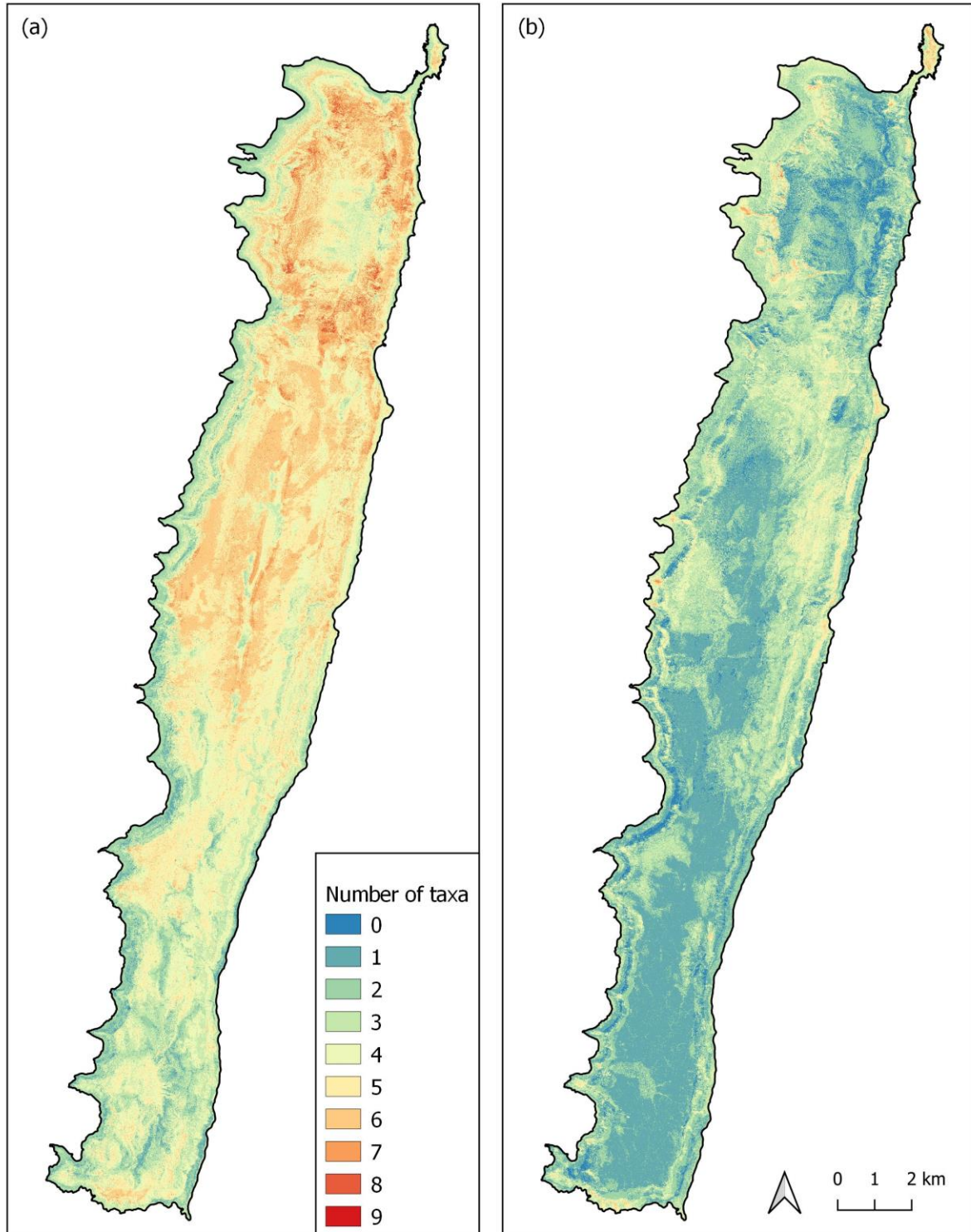
Fig. S2. Spatial coincidence of the nine modelled species: (a) total range models, (b) core range models. Colouring indicates how many of the nine species have overlapping core or total range at any point on Macquarie Island.

References

Selkirk PM, Seppelt RD, Selkirk DR (1990) 'Subantarctic Macquarie Island: Environment and

    Biology.' (Cambridge University Press)

Department of Primary Industries, Parks, Water and Environment (2013) 'TASVEG 3.0

    Macquarie Island.' (Tasmanian Vegetation Monitoring and Mapping Program, Resource

    Management and Conservation Division, DPIPWE: Hobart, Tas., Australia)