

Ecography

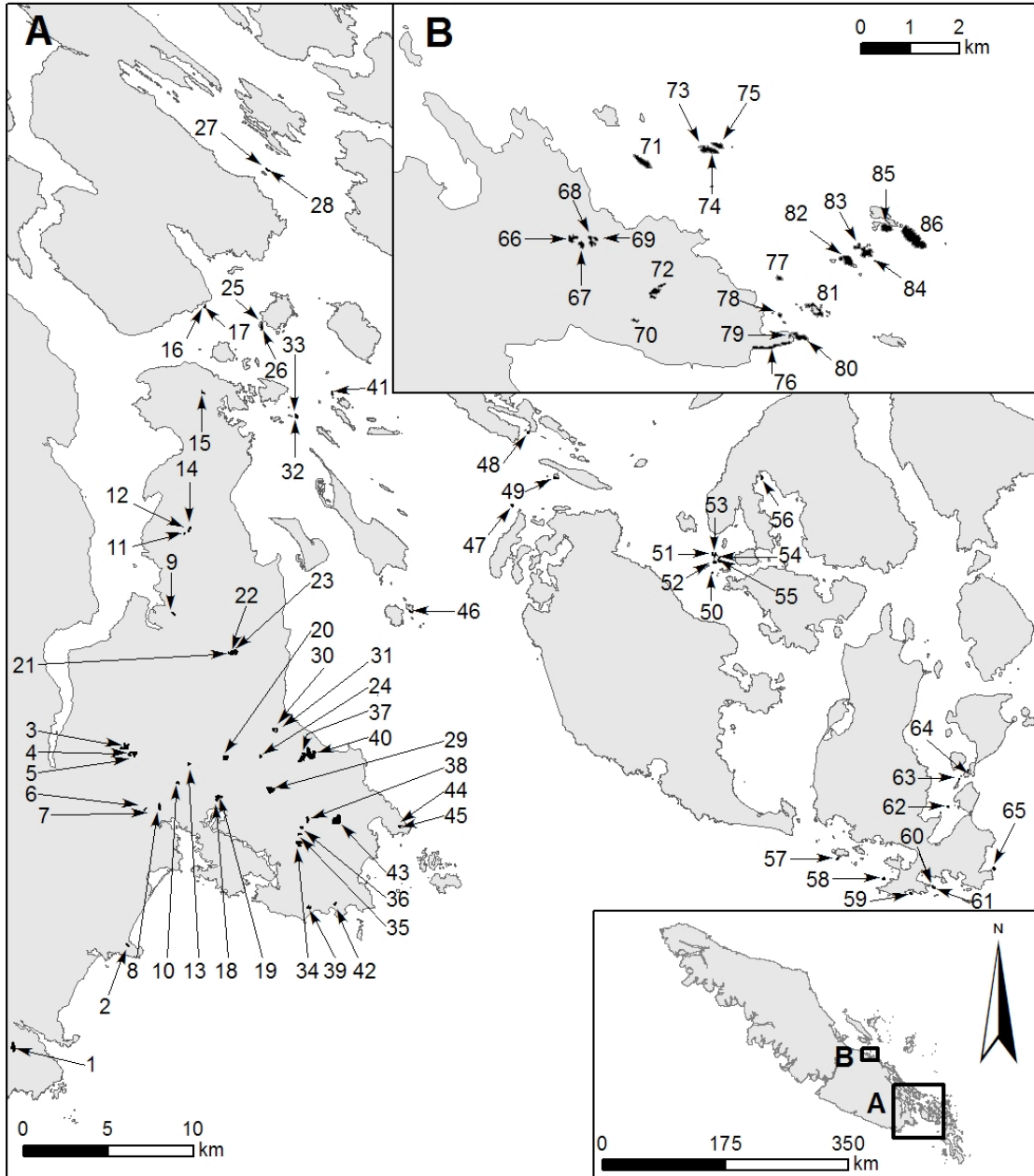
**ECOG-00393**

Bennett, J. R. 2013. Comparison of native and exotic distribution and richness models across scales reveals essential conservation lessons. – *Ecography* 36: xxx–xxx.

**Supplementary material**

Appendix 1.

Fig. A1 – Map of study locations. Location of Southern (A) and Northern (B) sites are shown with respect to Vancouver Island in the bottom right inset.



**Table A1: Study patch locations and areas**

Site Number	UTM E	UTM N	Patch Area (ha)	Site Number	UTM E	UTM N	Patch Area (ha)
1	457038	5353912	5.89	44	479738	5366852	0.60
2	463606	5371544	6.52	45	479840	5366913	0.18
3	463731	5359888	1.17	46	480408	5379481	1.07
4	463862	5371087	1.84	47	486342	5385734	1.34
5	464131	5371151	5.03	48	487290	5390016	0.92
6	464755	5367830	0.30	49	488939	5387348	2.34
7	464815	5367931	0.39	50	498094	5381777	0.37
8	465620	5368016	3.48	51	498112	5382883	0.62
9	466429	5379377	1.55	52	498243	5382377	1.46
10	466710	5369442	1.20	53	498262	5382845	0.75
11	467091	5384080	0.49	54	498497	5382594	0.50
12	467329	5384239	0.72	55	498572	5382428	1.13
13	467360	5370524	1.35	56	501013	5387344	1.14
14	467424	5384396	0.77	57	505472	5364996	0.40
15	468176	5392362	1.22	58	508172	5363805	0.92
16	468243	5397383	0.26	59	509755	5362946	0.88
17	468323	5397411	0.34	60	511053	5363329	0.33
18	468998	5368462	1.27	61	511129	5363265	0.47
19	469142	5368624	3.19	62	511945	5368033	0.70
20	469516	5370901	4.43	63	512592	5369629	0.33
21	469683	5377042	4.48	64	513136	5370141	0.39
22	469831	5377080	0.32	65	514652	5364391	1.81
23	470076	5377102	2.15	66	414789	5460188	1.96
24	471560	5370989	1.22	67	414972	5460057	1.26
25	471624	5396376	0.57	68	415177	5460132	1.62
26	471634	5396182	1.10	69	415271	5460182	0.56
27	471928	5405471	0.59	70	416081	5458504	0.68
28	471950	5405459	0.34	71	416236	5461763	4.02
29	472145	5369016	8.72	72	416504	5459107	3.37
30	472319	5372549	1.11	73	417399	5462070	0.17
31	472510	5372537	1.73	74	417587	5462008	3.83
32	473662	5390915	0.62	75	417774	5462102	1.93
33	473670	5391022	0.63	76	418879	5457985	3.72
34	473817	5365881	5.88	77	419033	5459377	0.84
35	473863	5366401	1.15	78	419042	5458617	0.59
36	473985	5366808	1.48	79	419249	5458193	0.42
37	474043	5370939	8.82	80	419459	5458174	2.84
38	474316	5367260	2.77	81	419766	5458728	3.81
39	474408	5362108	2.03	82	420424	5459740	3.83
40	474493	5371123	17.68	83	420639	5460024	1.07
41	475757	5392324	0.64	84	420820	5459904	3.66
42	475945	5362321	1.31	85	421229	5460411	3.01
43	476045	5367242	16.38	86	421783	5460202	11.54

**Table A2: Correlation matrix of variables at the patch level**

	Log(AGR500)	FOREST(500)	GOE(500)	Log(RD500)	Log(Area)	Island	DP(q/s)
FOREST(500)	0.087						
GOE(500)	0.024	0.290					
Log(RD500)	0.534	0.421	0.151				
Log(Area)	0.311	0.263	0.201	0.266			
Island	-0.476	-0.610	-0.224	-0.916	-0.276		
DP(q/s)	-0.047	0.381	0.050	0.126	0.097	-0.168	
Climate (PC1)	0.365	-0.163	-0.199	0.233	-0.053	-0.134	0.0258

**Table A3: Correlation matrix of variables at the intra-patch level**

	Northness	Eastness	Island	DP(q/s)	Litter	Log(Soil Depth)	Slope	Canopy Openness	Log(Area)	Climate (PC1)	Log(AGR500)	FOREST(500)	GOE(500)
Eastness	0.070												
Island	-0.034	0.062											
DP(q/s)	-0.007	0.015	-0.119										
Litter	0.010	0.004	-0.010	0.075									
Log(Soil Depth)	0.044	-0.003	-0.047	-0.013	0.373								
Slope	0.019	0.020	-0.218	0.135	-0.012	-0.118							
Canopy Openness	0.020	-0.009	0.127	-0.183	-0.227	-0.191	0.003						
Log(Area)	0.025	-0.027	-0.342	0.024	0.053	0.061	0.161	0.051					
Climate (PC1)	0.061	-0.023	-0.131	0.042	0.062	0.143	0.041	0.024	-0.010				
Log(AGR500)	0.054	-0.012	-0.549	-0.049	-0.110	0.024	0.122	0.112	0.370	0.395			
FOREST(500)	0.012	-0.020	-0.595	0.362	0.011	-0.080	0.319	-0.131	0.312	-0.152	0.150		
GOE(500)	0.038	0.017	-0.205	0.159	0.053	-0.073	0.139	-0.044	0.232	-0.135	0.073	0.348	
Log(RD500)	0.043	-0.065	-0.924	0.082	-0.005	0.081	0.206	-0.072	0.341	0.238	0.603	0.397	0.146

**Table A4a: Overfit (initial minus bootstrap-corrected AUC) and bootstrap-corrected AUC for inter-patch models of native species. Italicized numbers indicate bootstrap datasets where >5% models did not converge.**

Latin Name	Common Name	Overfit	Corrected AUC
<i>Camassia leichtlinii</i>	great camas	0.015	0.94
<i>Festuca rubra</i>	red fescue	0.017	0.88
<i>Brodiaea coronaria</i>	harvest Brodiaea	Na	Na
<i>Galium aparine</i>	Cleavers	Na	Na
<i>Camassia quamash</i>	common camas	<i>0.003</i>	<i>0.99</i>
<i>Brodiaea hyacinthina</i>	white Brodiaea	0.033	0.84
<i>Achillea millefolium</i>	Yarrow	<i>0.061</i>	<i>0.84</i>
<i>Sanicula crassicaulis</i>	Pacific sanicle	Na	Na
<i>Plectritis congesta</i>	sea blush	0.036	0.82
<i>Elymus glaucus</i>	blue wildrye	0.063	0.74
<i>Collinsia parviflora</i>	small-flowered blue-eyed Mary	Na	Na
<i>Polypodium glycyrrhiza</i>	licorice fern	Na	Na
<i>Luzula multiflora</i>	many-flowered wood-rush	<i>0.043</i>	<i>0.93</i>
<i>Cerastium arvense</i>	field chickweed	0.068	0.78
<i>Lotus micranthus</i>	desert deervetch	0.020	0.89
<i>Ranunculus occidentalis</i>	western buttercup	0.019	0.86
<i>Danthonia californica</i>	California oatgrass	0.017	0.87
<i>Carex inops</i>	long-stolonned sedge	0.022	0.91
<i>Trifolium willdenowii</i>	tomcat clover	0.045	0.76
<i>Lomatium utriculatum</i>	spring gold	0.015	0.71

**Table A4b: Overfit (initial minus bootstrap-corrected AUC) and bootstrap-corrected AUC for inter-patch models of exotic species. Italicized numbers indicate bootstrap datasets where >5% models did not converge.**

Latin Name	Common Name	Overfit	Corrected AUC
<i>Aira praecox</i>	early hairgrass	Na	Na
<i>Hypochaeris radicata</i>	hairy cat's-ear	Na	Na
<i>Anthoxanthum odoratum</i>	sweet vernalgrass	0.027	0.75
<i>Rumex acetosella</i>	green sorrel	Na	Na
<i>Vicia sativa</i>	common vetch	Na	Na
<i>Holcus lanatus</i>	common velvetgrass	0.048	0.83
<i>Bromus diandrus</i>	rip-gut brome	0.037	0.91
<i>Vulpia bromoides</i>	barren fescue	0.014	0.77
<i>Cytisus scoparius</i>	Scotch broom	0.021	0.96
<i>Stellaria media</i>	common chickweed	0.004	0.71
<i>Bromus hordeaceus</i>	soft brome	0.042	0.85
<i>Bromus sterilis</i>	barren brome	0.029	0.77
<i>Geranium molle</i>	dovefoot geranium	-0.001	0.77
<i>Dactylis glomerata</i>	orchard grass	0.031	0.78
<i>Vicia hirsuta</i>	tiny vetch	0.007	0.75
<i>Veronica arvensis</i>	wall speedwell	0.002	0.87
<i>Cynosurus echinatus</i>	hedgehog dogtail	0.011	0.71
<i>Myosotis discolor</i>	common forget-me-not	0.012	0.83
<i>Poa pratensis</i>	Kentucky bluegrass	0.019	0.85
<i>Aphanes arvensis/australis</i>	parsley-piert	0.006	0.78

**Table A5a: Terms from final native species distribution models at the inter-patch scale**

		B <sub>1</sub>	SE	Z	P
<i>Camassia leichtlinii</i>	Intercept	1.3965	0.5596	2.4960	0.0126
	Island	6.2068	2.3738	2.6150	0.0089
	Climate (PC1)	4.3462	1.6443	2.6430	0.0082
<i>Festuca rubra</i>	Intercept	6.9439	3.2487	2.1370	0.0326
	GOE(500)	0.00003364	0.00002342	1.4360	0.1509
	Log(RD500)	-1.7478	0.8543	-2.0460	0.0408
<i>Brodiaea coronaria</i>	(No model)				
<i>Galium aparine</i>	(No model)				
<i>Camassia quamash</i>	Intercept	-23.8886	16.5069	-1.4470	0.1478
	Island	-13.8110	7.2503	-1.9050	0.0568
	Log(Area)	7.9683	4.3824	1.8180	0.0690
	Log(AGR500)	-1.6249	1.3020	-1.2480	0.2120
	FOREST(500)	0.00001598	0.00001074	1.4870	0.1369
<i>Brodiaea hyacinthina</i>	Intercept	-5.1820	3.9663	-1.3060	0.1914
	Island	-2.2899	0.9086	-2.5200	0.0117
	DP(q/s)	1.4343	0.9086	1.5790	0.1144
	Log(Area)	1.9469	0.9823	1.9820	0.0475
	Climate (PC1)	-0.9463	0.4045	-2.3390	0.0193
<i>Achillea millefolium</i>	Intercept	-30.6646	13.8412	-2.2150	0.0267
	Island	4.9736	2.1713	2.2910	0.0220
	Log(Area)	7.5492	3.3075	2.2820	0.0225
	FOREST(500)	0.00000411	0.00000250	1.6460	0.0997
	GOE(500)	0.00005631	0.00003099	1.8170	0.0692
<i>Sanicula crassicaulis</i>	(No model)				
<i>Plectritis congesta</i>	Intercept	-1.3809	0.7143	-1.9330	0.0532
	Island	2.7915	0.8102	3.4450	0.0006
	FOREST(500)	0.00000537	0.00000197	2.7310	0.0063
	GOE(500)	0.00004480	0.00002365	1.8940	0.0582
<i>Elymus glaucus</i>	Intercept	-0.6208	5.3655	-0.1160	0.9079
	Island	-5.5965	4.4437	-1.2590	0.2079
	DP(q/s)	1.4116	1.1199	1.2600	0.2075
	Log(Area)	1.8818	0.9694	1.9410	0.0522
	Log(RD500)	-1.3296	1.1851	-1.1220	0.2619
<i>Collinsia parviflora</i>	(No model)				
<i>Polypodium glycyrrhiza</i>	(No model)				
<i>Luzula multiflora</i>	Intercept	-31.5033	10.3037	-3.0570	0.0022
	DP(q/s)	2.6268	1.4317	1.8350	0.0665
	Log(Area)	8.4457	2.7560	3.0650	0.0022



		B <sub>1</sub>	SE	Z	P
	Climate (PC1)	-1.1660	0.6204	-1.8790	0.0602
	Log(AGR500)	-0.4661	0.2853	-1.6340	0.1023
	FOREST(500)	0.00001372	0.00000555	2.4720	0.0134
	Log(RD500)	-0.9877	0.5224	-1.8910	0.0587
<i>Cerastium arvense</i>	Intercept	-8.1089	5.2409	-1.5470	0.1218
	Log(Area)	2.8097	1.4016	2.0050	0.0450
	FOREST(500)	0.00000548	0.00000291	1.8830	0.0597
	Log(RD500)	-0.7592	0.3006	-2.5250	0.0116
<i>Lotus micranthus</i>	Intercept	13.0584	6.5580	1.9910	0.0465
	Island	-15.3407	6.5091	-2.3570	0.0184
	DP(q/s)	1.7379	0.7742	2.2450	0.0248
	Climate (PC1)	-0.9884	0.4554	-2.1700	0.0300
	Log(RD500)	-3.4712	1.7482	-1.9860	0.0471
<i>Ranunculus occidentalis</i>	Intercept	-1.6195	3.0569	-0.5300	0.5963
	Island	-3.1117	1.0833	-2.8730	0.0041
	DP(q/s)	3.4045	1.1714	2.9060	0.0037
	Log(Area)	1.0717	0.7351	1.4580	0.1449
	Log(AGR500)	-0.5307	0.2318	-2.2900	0.0220
<i>Danthonia californica</i>	Intercept	-5.3771	2.9250	-1.8380	0.0660
	Island	-2.6555	0.7903	-3.3600	0.0008
	Log(Area)	1.6204	0.6921	2.3410	0.0192
	Climate (PC1)	-1.5497	0.4259	-3.6390	0.0003
<i>Carex inops</i>	Intercept	8.6753	9.5853	0.9050	0.3654
	Island	-24.9072	12.6059	-1.9760	0.0482
	DP(q/s)	2.7504	1.2833	2.1430	0.0321
	Log(Area)	3.4199	1.2842	2.6630	0.0077
	Climate (PC1)	-0.8954	0.6347	-1.4110	0.1583
	Log(RD500)	-5.6533	3.2661	-1.7310	0.0835
<i>Trifolium willdenowii</i>	Intercept	-15.4384	5.4297	-2.8430	0.0045
	Island	6.8436	3.3107	2.0670	0.0387
	Log(Area)	2.4107	0.8715	2.7660	0.0057
	FOREST(500)	0.00000404	0.00000180	2.2510	0.0244
	GOE(500)	0.00002464	0.00001416	1.7400	0.0819
	Log(RD500)	0.9927	0.7628	1.3010	0.1931
<i>Lomatium utriculatum</i>	Intercept	0.1594	0.3703	0.4300	0.6670
	Island	-1.5213	0.4996	-3.0450	0.0023
	DP(q/s)	0.7402	0.5067	1.4610	0.1441

**Table A5b: Terms from final exotic species distribution models at the inter-patch scale**

		B <sub>1</sub>	SE	Z	P
<i>Aira praecox</i>	(No model)				
<i>Hypochaeris radicata</i>	(No model)				
<i>Anthoxanthum odoratum</i>	Intercept	-0.3958	0.3651	-1.0840	0.2783
	Climate (PC1)	-0.6422	0.2787	-2.3040	0.0212
	Log(AGR500)	0.4490	0.1701	2.6400	0.0083
	Log(RD500)	0.2620	0.1717	1.5260	0.1269
<i>Rumex acetosella</i>	(No model)				
<i>Vicia sativa</i>	(No model)				
<i>Holcus lanatus</i>	Intercept	-11.5957	4.5374	-2.5560	0.0106
	DP(q/s)	-1.4022	0.8919	-1.5720	0.1159
	Log(Area)	3.9775	1.3038	3.0510	0.0023
	Climate (PC1)	0.8730	0.4605	1.8960	0.0580
	Log(AGR500)	-0.3243	0.1917	-1.6920	0.0907
	FOREST(500)	-0.00000340	0.00000140	-2.4210	0.0155
<i>Bromus diandrus</i>	Intercept	-0.8317	7.2261	-0.1150	0.9084
	Island	-15.8178	7.8349	-2.0190	0.0435
	Log(Area)	4.9296	1.6137	3.0550	0.0023
	Climate (PC1)	2.1835	0.7666	2.8480	0.0044
	Log(AGR500)	0.6136	0.3026	2.0280	0.0426
	FOREST(500)	-0.00001156	0.00000400	-2.8920	0.0038
	GOE(500)	0.00008476	0.00003480	2.4350	0.0149
	Log(RD500)	-5.5154	2.3948	-2.3030	0.0213
<i>Vulpia bromoides</i>	Intercept	-8.6000	4.2740	-2.0120	0.0442
	Log(Area)	2.7090	1.1190	2.4200	0.0155
<i>Cytisus scoparius</i>	Intercept	-17.1567	7.3308	-2.3400	0.0193
	DP(q/s)	-2.2125	1.4651	-1.5100	0.1310
	Log(Area)	3.4726	1.7288	2.0090	0.0446
	Climate (PC1)	1.7521	0.7938	2.2070	0.0273
	FOREST(500)	0.00000506	0.00000338	1.4960	0.1348
	GOE(500)	0.00004915	0.00002822	1.7420	0.0816
	Log(RD500)	1.4085	0.5699	2.4720	0.0134
<i>Stellaria media</i>	Intercept	2.6150	0.5981	4.3720	0.0000
	Island	-1.6217	0.7034	-2.3060	0.0211
<i>Bromus hordeaceus</i>	Intercept	-7.0199	4.2293	-1.6600	0.0970
	Island	-1.2599	0.8625	-1.4610	0.1441
	Log(Area)	2.3804	1.0504	2.2660	0.0234

		B <sub>1</sub>	SE	Z	P
	Climate (PC1)	1.6177	0.4952	3.2660	0.0011
	GOE(500)	0.00003319	0.00002002	1.6580	0.0973
<i>Bromus sterilis</i>	Intercept	-6.1447	3.1885	-1.9270	0.0540
	Island	-1.3903	0.6104	-2.2780	0.0227
	Log(Area)	2.0046	0.7945	2.5230	0.0116
<i>Geranium molle</i>	Intercept	1.9221	0.3843	5.0020	0.0000
	Climate (PC1)	0.9796	0.3480	2.8150	0.0049
<i>Dactylis glomerata</i>	Intercept	2.8277	1.2709	2.2250	0.0261
	Island	-3.2137	1.2483	-2.5740	0.0100
	DP(q/s)	1.2932	0.6535	1.9790	0.0478
	Log(AGR500)	0.3849	0.2049	1.8780	0.0603
	FOREST(500)	-0.00000326	0.00000168	-1.9420	0.0521
<i>Vicia hirsuta</i>	Intercept	0.6910	0.3988	1.7320	0.0832
	Island	-1.1671	0.5136	-2.2720	0.0231
	DP(q/s)	1.6589	0.6215	2.6690	0.0076
<i>Veronica arvensis</i>	Intercept	-0.5848	0.3417	-1.7120	0.0870
	DP(q/s)	2.1746	0.8151	2.6680	0.0076
	FOREST(500)	0.00000320	0.00000136	2.3560	0.0185
<i>Cynosurus echinatus</i>	Intercept	0.4460	0.3514	1.2690	0.2044
	Climate (PC1)	-0.6626	0.2977	-2.2260	0.0260
	Log(RD500)	0.4413	0.1649	2.6760	0.0075
<i>Myosotis discolor</i>	Intercept	-4.8965	3.1102	-1.5740	0.1154
	Island	-1.7570	0.7340	-2.3940	0.0167
	DP(q/s)	1.9255	0.7564	2.5460	0.0109
	Log(Area)	1.2820	0.7235	1.7720	0.0764
	FOREST(500)	0.00000245	0.00000185	1.3270	0.1846
<i>Poa pratensis</i>	Intercept	1.7261	0.8056	2.1430	0.0322
	Island	-2.1841	0.8508	-2.5670	0.0103
	DP(q/s)	1.9374	0.8553	2.2650	0.0235
	Log(AGR500)	0.4403	0.2602	1.6920	0.0907
<i>Aphanes arvensis/australis</i>	Intercept	-2.8154	2.4906	-1.1300	0.2583
	Log(Area)	1.1138	0.6332	1.7590	0.0786
	Log(RD500)	-0.6839	0.1674	-4.0850	0.0000

**Table A6a: Overfit (initial minus bootstrap-corrected AUC) and bootstrap-corrected AUC for intra-patch scale models of native species.**

	Model Type*	Overfit	Corrected AUC
<i>Camassia leichtlinii</i>	MXSP	0.019	0.89
<i>Festuca rubra</i>	MXSP	0.029	0.89
<i>Brodiaea coronaria</i>	MXLR	0.145	0.66
<i>Galium aparine</i>	MXSP	0.018	0.83
<i>Camassia quamash</i>	MXAIC/LR	0.121	0.72
<i>Brodiaea hyacinthina</i>	MXSP	0.010	0.81
<i>Achillea millefolium</i>	MXSP	0.058	0.83
<i>Sanicula crassicaulis</i>	MXLR	0.126	0.75
<i>Plectritis congesta</i>	MXSP	0.083	0.80
<i>Elymus glaucus</i>	MXSP	0.114	0.72
<i>Collinsia parviflora</i>	MXAIC	0.005	0.76
<i>Polypodium glycyrrhiza</i>	MXSP	0.009	0.88
<i>Luzula multiflora</i>	MXSP	0.001	0.77
<i>Cerastium arvense</i>	MXLR	0.106	0.73
<i>Lotus micranthus</i>	MXAIC	0.068	0.76
<i>Ranunculus occidentalis</i>	MXAIC	0.175	0.69
<i>Danthonia californica</i>	MXAIC	0.038	0.84
<i>Carex inops</i>	MXLR	0.057	0.89
<i>Trifolium willdenowii</i>	MXAIC/LR	0.116	0.71
<i>Lomatium utriculatum</i>	MXSP	Na	Na

\*Model Type: AIC = non-spatial, AIC selected; MXAIC = non-spatial mixed model, AIC-selected; MXLR = non-spatial mixed model, LR test selected; MXAIC/LR = both MXAIC and MXLR are identical; MXSP = spatial mixed model

**Table A6b: Overfit (initial minus bootstrap-corrected AUC) and bootstrap-corrected AUC for intra-patch scale models of exotic species.**

	Model Type	Overfit	Corrected AUC
<i>Aira praecox</i>	MXSP	0.039	0.83
<i>Hypochaeris radicata</i>	MXAIC/LR	0.148	0.65
<i>Anthoxanthum odoratum</i>	MXSP	0.184	0.78
<i>Rumex acetosella</i>	MXSP	0.011	0.82
<i>Vicia sativa</i>	MXSP	0.038	0.82
<i>Holcus lanatus</i>	MXAIC/LR	0.111	0.74
<i>Bromus diandrus</i>	MXSP	0.041	0.82
<i>Vulpia bromoides</i>	MXSP	Na	Na
<i>Cytisus scoparius</i>	MXAIC	0.077	0.78
<i>Stellaria media</i>	MXLR	0.139	0.68
<i>Bromus hordeaceus</i>	MXLR	0.137	0.64
<i>Bromus sterilis</i>	MXSP	0.035	0.82
<i>Geranium molle</i>	MXSP	0.031	0.83
<i>Dactylis glomerata</i>	MXSP	0.035	0.87
<i>Vicia hirsuta</i>	MXLR	0.186	0.68
<i>Veronica arvensis</i>	MXAIC	0.151	0.65
<i>Cynosurus echinatus</i>	MXSP	0.018	0.90
<i>Myosotis discolor</i>	MXSP	0.009	0.86
<i>Poa pratensis</i>	MXLR	0.150	0.74
<i>Aphanes arvensis/australis</i>	AIC	0.013	0.73

**Table A7a: Terms from final native species distribution models at the intra-patch scale**

		B <sub>1</sub>	SE	t	P
<i>Camassia leichtlinii</i>	Intercept	-8.2110	3.8625	-2.1258	0.0341
	Island	16.7377	3.9661	4.2202	0.0001
	Litter	-0.0329	0.0094	-3.4802	0.0006
	Log(Area)	-1.7043	0.4668	-3.6508	0.0003
	Log(RD500)	3.9645	1.0287	3.8539	0.0003
<i>Festuca rubra</i>	Intercept	-1.7658	0.6817	-2.5901	0.0099
	Northness	0.2615	0.1468	1.7811	0.0756
	Island	2.3489	0.3848	6.1045	0.0000
	Log(Soil Depth)	-0.5339	0.2985	-1.7890	0.0743
	Canopy Openness	0.0109	0.0058	1.8685	0.0624
	Log(AGR500)	-0.3498	0.1013	-3.4536	0.0009
<i>Brodiaea coronaria</i>	Intercept	-0.1219	0.7558	-0.1610	0.8718
	Island	-2.8507	0.6966	-4.0920	0.0000
	Canopy Openness	0.0187	0.0054	3.4760	0.0005
	Log(RD500)	-0.4581	0.1897	-2.4150	0.0157
<i>Galium aparine</i>	Intercept	0.2303	0.5829	0.3951	0.6929
	Log(Soil Depth)	1.1669	0.2727	4.2795	0.0000
	Canopy Openness	-0.0319	0.0049	-6.5569	0.0000
	FOREST(500)	0.0000016	0.0000004	4.0369	0.0001
<i>Camassia quamash</i>	Intercept	-3.2710	0.7066	-4.6280	0.0000
	Slope	-0.0429	0.0153	-2.8030	0.0051
	Canopy Openness	0.0199	0.0064	3.1300	0.0017
	GOE(500)	0.00001222	0.00000569	2.1490	0.0317
	Log(RD500)	0.4993	0.1423	3.5080	0.0005
<i>Brodiaea hyacinthina</i>	Intercept	-0.5343	0.3013	-1.7734	0.0769
	Litter	-0.0259	0.0093	-2.7945	0.0054
	FOREST(500)	0.0000015	0.00000039	3.9369	0.0002
<i>Achillea millefolium</i>	Intercept	0.5562	1.9198	0.2897	0.7721
	Island	1.0870	0.4060	2.6777	0.0091
	Log(Soil Depth)	1.0176	0.2993	3.4003	0.0007
	Canopy Openness	0.0141	0.0056	2.5324	0.0116
	Log(Area)	-1.0441	0.4445	-2.3492	0.0192
	Climate (PC1)	-0.5529	0.1936	-2.8560	0.0045
	Log(AGR500)	-0.2638	0.1039	-2.5390	0.0132
<i>Sanicula crassicaulis</i>	Intercept	-0.7514	0.6662	-1.1280	0.2594

		B <sub>1</sub>	SE	t	P
	Log(Soil Depth)	1.9831	0.3457	5.7360	0.0000
	Canopy Openness	-0.0331	0.0056	-5.8780	0.0000
	Climate (PC1)	-0.4153	0.1711	-2.4280	0.0152
<i>Plectritis congesta</i>	Intercept	3.6146	1.8407	1.9637	0.0502
	Litter	-0.0390	0.0098	-3.9599	0.0001
	Slope	0.0438	0.0146	2.9976	0.0029
	Log(Area)	-0.9905	0.4474	-2.2136	0.0274
	Climate (PC1)	-0.7337	0.2116	-3.4681	0.0006
<i>Collinsia parviflora</i>	Intercept	-2.8450	0.8617	-3.3010	0.0010
	Island	0.9518	0.3994	2.3830	0.0172
	Litter	-0.0248	0.0112	-2.2120	0.0270
	Log(Soil Depth)	-0.7136	0.3234	-2.2070	0.0273
	Slope	0.0227	0.0145	1.5700	0.1165
	Canopy Openness	0.0204	0.0070	2.9120	0.0036
	FOREST(500)	0.000001515	0.00000054	2.7790	0.0054
<i>Elymus glaucus</i>	Intercept	-0.8608	0.5587	-1.5408	0.1241
	Log(Soil Depth)	1.1672	0.2899	4.0262	0.0001
	Slope	0.0322	0.0125	2.5828	0.0101
	Canopy Openness	-0.0229	0.0046	-5.0278	0.0000
	Climate (PC1)	0.2321	0.1160	2.0014	0.0459
<i>Polypodium glycyrrhiza</i>	Intercept	0.0101	0.6540	0.0155	0.9876
	Log(Soil Depth)	-0.8027	0.2849	-2.8180	0.0050
	Slope	0.0483	0.0130	3.7311	0.0002
	Canopy Openness	-0.0150	0.0056	-2.6758	0.0077
	Climate (PC1)	0.5578	0.2021	2.7598	0.0060
<i>Luzula multiflora</i>	Intercept	-2.5572	0.4129	-6.1935	0.0000
	Log(Soil Depth)	1.3129	0.3222	4.0754	0.0001
	Climate (PC1)	-0.3380	0.1334	-2.5330	0.0117
	Log(AGR500)	-0.3254	0.0790	-4.1184	0.0001
<i>Cerastium arvense</i>	Intercept	0.8108	1.6942	0.4780	0.6323
	Canopy Openness	0.0174	0.0074	2.3650	0.0180
	Log(Area)	-0.8271	0.3905	-2.1180	0.0342
	Log(AGR500)	-0.2138	0.1007	-2.1230	0.0337
	Log(RD500)	-0.3461	0.1131	-3.0600	0.0022
<i>Lotus micranthus</i>	Intercept	-0.5999	2.0430	-0.2940	0.7691
	Log(Soil Depth)	0.9460	0.4175	2.2660	0.0234
	Slope	-0.0349	0.0194	-1.7990	0.0720
	Canopy Openness	0.0137	0.0073	1.8710	0.0613

		B <sub>1</sub>	SE	t	P
	Log(Area)	-0.8310	0.4829	-1.7210	0.0853
	Climate (PC1)	-0.7411	0.2046	-3.6220	0.0003
	FOREST(500)	0.000001428	0.00000054	2.6230	0.0087
	GOE(500)	0.00001517	0.000005232	2.9000	0.0037
<i>Ranunculus occidentalis</i>	Intercept	5.3453	2.1002	2.5450	0.0109
	Eastness	-0.3121	0.2132	-1.4630	0.1434
	Litter	-0.0266	0.0146	-1.8280	0.0676
	Log(Soil Depth)	0.8598	0.4484	1.9170	0.0552
	Slope	-0.0617	0.0263	-2.3480	0.0189
	Canopy Openness	-0.0116	0.0070	-1.6510	0.0988
	Log(Area)	-1.4490	0.4832	-2.9990	0.0027
	Climate (PC1)	-0.4603	0.1937	-2.3770	0.0175
<i>Danthonia californica</i>	Intercept	-0.5599	2.1000	-0.2670	0.7898
	DP(q/s)	-1.1480	0.4330	-2.6520	0.0080
	Log(Soil Depth)	1.0160	0.4592	2.2120	0.0270
	Log(Area)	-0.7650	0.4721	-1.6200	0.1051
	Climate (PC1)	-1.2860	0.2962	-4.3420	0.0000
	Log(AGR500)	-0.1958	0.1253	-1.5630	0.1182
	FOREST(500)	0.00000157	0.00000057	2.7610	0.0058
	GOE(500)	0.00001816	0.00000624	2.9090	0.0036
<i>Carex inops</i>	Intercept	-5.3518	0.9772	-5.4760	0.0000
	Island	-3.1332	0.6973	-4.4930	0.0000
	Log(Soil Depth)	4.0235	0.7053	5.7050	0.0000
	Climate (PC1)	-1.1847	0.3543	-3.3440	0.0008
	Log(AGR500)	-0.6302	0.1594	-3.9540	0.0001
<i>Trifolium willdenowii</i>	Intercept	-7.5890	1.3840	-5.4830	0.0000
	Eastness	-0.4173	0.2055	-2.0300	0.0423
	Island	1.7850	0.5749	3.1050	0.0019
	Canopy Openness	0.0460	0.0132	3.4780	0.0005
	FOREST(500)	0.000002034	0.00000069	2.9520	0.0032
<i>Lomatium utriculatum</i>	Intercept	-1.4407	0.2679	-5.3785	0.0000



**Table A7b: Terms from final exotic species distribution models at the intra-patch scale**

		B <sub>1</sub>	SE	t	P
<i>Aira praecox</i>	Intercept	-4.2881	1.3976	-3.0681	0.0023
	DP(q/s)	0.6724	0.2887	2.3293	0.0224
	Log(Soil Depth)	-2.6221	0.2989	-8.7725	0.0000
	Slope	-0.0299	0.0135	-2.2106	0.0275
	Canopy Openness	0.0389	0.0060	6.4807	0.0000
	Log(Area)	0.7705	0.3115	2.4735	0.0137
	GOE(500)	0.0000129	0.00000470	2.2402	0.0279
<i>Hypochaeris radicata</i>	Intercept	-2.7061	1.3249	-2.0430	0.0411
	Island	-0.9944	0.3037	-3.2740	0.0011
	Litter	-0.0273	0.0092	-2.9660	0.0030
	Log(Soil Depth)	-0.6316	0.2682	-2.3550	0.0185
	Canopy Openness	0.0240	0.0055	4.3950	0.0000
	Log(Area)	0.6147	0.2970	2.0700	0.0385
	Climate (PC1)	0.3478	0.1368	2.5430	0.0110
	Log(AGR500)	-0.2735	0.0734	-3.7270	0.0002
<i>Anthoxanthum odoratum</i>	Intercept	8.6509	3.6552	2.3667	0.0185
	Northness	0.4028	0.1738	2.3183	0.0210
	Canopy Openness	0.0263	0.0078	3.3901	0.0008
	Log(Area)	-3.2958	0.9069	-3.6342	0.0003
	FOREST(500)	0.00000337	0.00000117	2.3022	0.0252
	Log(RD500)	0.7224	0.2289	3.1561	0.0026
<i>Rumex acetosella</i>	Intercept	-3.8610	0.5751	-6.7142	0.0000
	Island	-1.0397	0.2771	-3.7527	0.0003
	DP(q/s)	0.9024	0.2708	3.3326	0.0013
	Canopy Openness	0.0317	0.0060	5.2929	0.0000
	Climate (PC1)	0.4818	0.1389	3.4694	0.0006
<i>Vicia sativa</i>	Intercept	-2.9030	0.4092	-7.0951	0.0000
	Log(Soil Depth)	1.6947	0.3091	5.4824	0.0000
<i>Holcus lanatus</i>	Intercept	-0.6036	0.2226	-2.7120	0.0067
	Climate (PC1)	-0.6646	0.1703	-3.9040	0.0001
	Log(RD500)	-0.3986	0.1018	-3.9160	0.0001
<i>Bromus diandrus</i>	Intercept	-3.8376	0.7600	-5.0494	0.0000
	Northness	-0.3318	0.1576	-2.1051	0.0359
	Island	0.7936	0.3992	1.9882	0.0516
	DP(q/s)	0.8304	0.4084	2.0332	0.0467

		B <sub>1</sub>	SE	t	P
	Canopy Openness	0.0237	0.0073	3.2377	0.0013
	Climate (PC1)	0.4610	0.2084	2.2120	0.0276
<i>Vulpia bromoides</i>	Intercept	-1.0782	0.1388	-7.7675	0.0000
<i>Cytisus scoparius</i>	Intercept	-3.4450	0.5941	-5.7980	0.0000
	Canopy Openness	0.0148	0.0063	2.3410	0.0192
	Climate (PC1)	0.8599	0.2360	3.6440	0.0003
	Log(AGR500)	0.1879	0.0691	2.7190	0.0066
	FOREST(500)	0.00000165	0.000000499	3.3030	0.0010
	GOE(500)	0.00000834	0.00000481	1.7320	0.0833
<i>Stellaria media</i>	Intercept	-3.5254	0.4430	-7.9590	0.0000
	Log(Soil Depth)	1.5104	0.3186	4.7410	0.0000
	Climate (PC1)	0.2598	0.1566	1.6590	0.0970
	Log(RD500)	0.2574	0.0850	3.0270	0.0025
<i>Bromus hordeaceus</i>	Intercept	-1.3280	0.7842	-1.6930	0.0905
	Island	-1.7920	0.6325	-2.8330	0.0046
	Canopy Openness	0.0220	0.0064	3.4190	0.0006
	GOE(500)	-0.0000110	0.00000462	-2.3880	0.0169
	Log(RD500)	-0.3564	0.1674	-2.1290	0.0333
<i>Bromus sterilis</i>	Intercept	-2.8886	0.4271	-6.7638	0.0000
	Log(Soil Depth)	0.8377	0.2800	2.9923	0.0029
	Log(RD500)	0.3138	0.0957	3.2806	0.0017
<i>Geranium molle</i>	Intercept	0.0002	0.8774	0.0002	0.9998
	Island	-2.1357	0.8397	-2.5436	0.0133
	DP(q/s)	0.9284	0.3588	2.5874	0.0118
	Litter	-0.0328	0.0110	-2.9738	0.0031
	Log(Soil Depth)	0.8358	0.3136	2.6651	0.0080
	Log(RD500)	-0.5066	0.2294	-2.2085	0.0306
<i>Dactylis glomerata</i>	Intercept	-1.7701	0.7011	-2.5247	0.0120
	Log(Soil Depth)	1.9615	0.3490	5.6201	0.0000
	Canopy Openness	-0.0288	0.0059	-4.8439	0.0000
	Climate (PC1)	0.9942	0.2255	4.4081	0.0000
<i>Vicia hirsuta</i>	Intercept	-2.2525	0.8213	-2.7420	0.0061
	Log(Soil Depth)	1.7725	0.4141	4.2800	0.0000
	Canopy Openness	-0.0155	0.0066	-2.3540	0.0186
<i>Veronica arvensis</i>	Intercept	-0.3438	0.8175	-0.4210	0.6740
	Island	-3.0767	0.8478	-3.6290	0.0003
	DP(q/s)	0.5454	0.3301	1.6530	0.0984

		B <sub>1</sub>	SE	t	P
	Litter	-0.0405	0.0134	-3.0120	0.0026
	Log(Soil Depth)	1.8413	0.3965	4.6440	0.0000
	Climate (PC1)	0.3050	0.1986	1.5360	0.1247
	Log(RD500)	-0.6210	0.2171	-2.8610	0.0042
<i>Cynosurus echinatus</i>	Intercept	-2.2756	0.2392	-9.5145	0.0000
	Northness	-0.3453	0.1697	-2.0347	0.0425
	Climate (PC1)	-0.9575	0.2258	-4.2397	0.0000
<i>Myosotis discolor</i>	Intercept	0.3246	2.0422	0.1590	0.8738
	DP(q/s)	-0.9982	0.3919	-2.5474	0.0140
	Litter	-0.0308	0.0150	-2.0588	0.0403
	Log(Soil Depth)	2.6451	0.4839	5.4659	0.0000
	Canopy Openness	0.0220	0.0080	2.7387	0.0065
	Log(Area)	-1.3528	0.4551	-2.9726	0.0032
	FOREST(500)	0.00000260	0.00000060	4.4177	0.0001
	Log(RD500)	-0.3284	0.1233	-2.6640	0.0104
<i>Poa pratensis</i>	Intercept	-3.8757	0.9846	-3.9360	0.0001
	Log(Soil Depth)	2.4625	0.5054	4.8720	0.0000
	Canopy Openness	-0.0176	0.0074	-2.3720	0.0177
<i>Aphanes arvensis/australis</i>	Intercept	1.7111	2.0227	0.8460	0.3976
	Island	-1.1067	0.4167	-2.6560	0.0079
	DP(q/s)	0.7988	0.3409	2.3430	0.0191
	Litter	-0.0212	0.0136	-1.5560	0.1196
	Canopy Openness	0.0334	0.0117	2.8490	0.0044
	Log(Area)	-1.4198	0.4345	-3.2680	0.0011
	Log(AGR500)	0.1246	0.0791	1.5770	0.1149

**Table A8:** Comparison of patch-level variables selected between inter-patch models and intra-patch models using all quadrats, and between intra-patch models using patches where species were present (i.e., those presented in the paper) and intra-patch models using all quadrats.

	Variables same	Variables opposite	Variables not shared
inter-patch-scale vs intra-patch scale (all quads)	30	2	107
intra-patch scale vs intra-patch scale (all quads)	125	0	81

**Table A9: AIC-selected variables from (log) species richness models at the inter-patch scale**

Native	B <sub>1</sub>	SE	t	P
Forest Area (m <sup>2</sup> ; 500 m buffer)	1.22×10 <sup>-7</sup>	4.6×10 <sup>-8</sup>	2.647	0.0099
Log Road Length (m; 500 m buffer)	-0.0238	0.00851	-2.802	0.0064
Log Patch Area (m <sup>2</sup> )	0.127	0.0248	5.122	<0.0001
Climate (PC1)	-0.0256	0.0153	-1.668	0.0994
Exotic	B <sub>1</sub>	SE	t	P
Island	-0.211	0.0374	-5.629	<0.0001
Log Agricultural Area (500 m buffer)	0.0127	0.00742	1.71	0.0914
Forest Area (m <sup>2</sup> ; 500 m buffer)	-2.7×10 <sup>-7</sup>	5.1×10 <sup>-8</sup>	-5.331	<0.0001
Log Patch Area (m <sup>2</sup> )	0.177	0.0273	6.474	<0.0001
Climate (PC1)	0.0256	0.0144	1.784	0.0784

**Table A10: AIC-selected variables from (log) species richness models at the intra-patch scale**

Native	B <sub>1</sub>	SE	T	P
Island	1.579	0.815	1.938	0.0561
Litter (% cover)	-0.0322	0.0127	-2.532	0.0116
Log Soil Depth (cm)	2.187	0.389	5.625	<0.0001
Slope (degrees)	0.0391	0.019	2.0503	0.0408
Canopy Openness (%)	-0.0239	0.00752	-3.183	0.0015
Log Patch Area (m <sup>2</sup> )	-1.0957	0.648	-1.692	0.0913
Climate (PC1)	-0.44	0.294	-1.494	0.136
Log Agricultural Area (m <sup>2</sup> ; 500 m buffer)	-0.226	0.156	-1.448	0.151
Forest Area (m <sup>2</sup> ; 500 m buffer)	3.0×10 <sup>-6</sup>	1.1×10 <sup>-6</sup>	3.0151	0.0034
Exotic	B <sub>1</sub>	SE	T	P
Island	-3.576	1.162	-3.077	0.0028
Litter (% cover)	-0.0333	0.0103	-3.219	0.0014
Log Soil Depth (cm)	1.172	0.313	3.741	0.0002
Canopy Openness (%)	0.0239	0.00614	3.886	0.0001
Deer Pellets in ≥1 Quadrat/Patch	1.0535	0.451	2.335	0.022
Climate (PC1)	0.356	0.226	1.575	0.116
Log Road Length (m; 500 m buffer)	-0.547	0.325	-1.682	0.0964