Pinus contorta reduces plant diversity in Patagonian ecosystems by changing microenvironmental conditions

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Table S1. List of plant species and growth form that make up each study ecosystem. The no-native species of each ecosystem are shown in bold.

Species *A. araucana* forest	Growth form	Species Patagonian steppe	Growth form
Acaena pinnatifida	Herb	*Acaena integerrima*	Herb
Anthoxanthum juncifolium	Grass	*Acaena pinnatifida*	Herb
Araucaria araucana	Tree	***Aira cariophylea***	**Grass**
Austrolycopodium paniculatum	Pteridophyta	***Aira praecox***	**Grass**
Baccharis magellanica	Shrub	*Agrostis inconspicua*	Grass
Baccharis neaei	Shrub	*Anemone multifida*	Herb
Berberis empetrifolia	Shrub	*Armeria maritima*	Herb
Berberis microphylla	Shrub	*Azorella acaulis*	Herb
Calceolaria integerrima	Herb	*Azorella ameginhoi*	Herb
Carex aphylla	Grass	*Baccharis magellanica*	Shrub
Cerastium arvense	**Herb**	*Berberis empetrifolia*	Shrub
Chusquea culeou	Shrub	*Calceolaria biflora*	Herb
Discaria chacaye	Shrub	***Cerastium arvense***	**Herb**
Empetrum rubrum	Shrub	*Chlorea magellanica*	Herb
Festuca scabriuscula	Grass	*Erigeron andicola*	Herb
Fragaria chiloensis	Herb	*Festuca pallescens*	Grass
Galium araucanum	Herb	*Galium araucanum*	Herb
Gamochaeta americana	Herb	*Gamochaeta americana*	Herb
Gaultheria poeppigi	Shrub	*Gaultheria poeppigi*	Shrub
Gaultheria pumila	Shrub	*Gavilea venosa*	Herb
Gavilea venosa	Herb	*Geranium sessiloflorum*	Herb
Hieracium pilosella	**Shrub**	***Hieracium pilosella***	**Herb**
Hypochaeris incana	Herb	***Holcus lanatus***	**Grass**
Hypochaeris radicata	**Herb**	***Hordeum vulgare***	**Grass**
Lathyrus magellanicus	Herb	***Hypochaeris radicata***	**Herb**
Maytenus disticha	Shrub	*Lathyrus magellanicus*	Herb
Montiopsis umbellata	Herb	*Leucheria candidissima*	Herb
Mulinum spinosum	Herb	*Loasa argentina*	Herb
Nothofagus antarctica	Tree	*Luzula alopecurus*	Herb
Pinus contorta	**Tree**	*Microsteris gracilis*	Herb
Quinchamalium chilense	Herb	*Montiopsis gayana*	Herb
Ribes cucullatum	Shrub	*Mulinum spinosum*	Shrub
Ribes trilobum	Shrub	*Nassauvia darwinii*	Herb
Rodhophiala andicola	Herb	*Noccaeae magellanica*	Herb
Rumex acetosella	**Herb**	*Oreopulus glacialis*	Herb
Senecio baccharidifolius	Shrub	***Oxalis articulata***	**Herb**
Solenomelus segethii	Herb	*Osmorhiza berteroi*	Herb
Trifolium repens	**Herb**	*Perezia candida*	Herb
Vicia nigricans	Herb	*Phacelia secunda*	Herb
Viola reichei	Herb	***Pinus contorta***	**Tree**
		Polygala salasiana	Herb
		Quinchamalium chilense	Herb
		Rumex acetosella	**Herb**

	Senecio kingii	Herb
	Senecio seritonitens	Herb
	Spergularia rubra	Herb
	Sisyrinchium patagonicum	Herb
	Symphyotrichum vahlii	Herb
	Taraxacum officinale	**Herb**
	Trifolium repens	**Herb**
	Valeriana carnosa	Herb
	Vicia sativa	**Herb**
	Viola maculata	Herb

Table S2. Estimates, standard error, z-value and p-values of all measured environmental variables (variables that change with *P. contorta* biomass) that influence changes in native plant richness in the *A. araucana* forest. *Significant variables are marked in bold (p-value<0.05).*

	Estimated	Standard error	*z value*	*P value*
T° max soil	-0.040	0.029	-1.371	0.170
T° max air	0.034	0.039	0.874	0.382
Total litter	-0.005	0.003	-1.785	**0.044**
Litter deep	-0.172	0.143	-1.206	0.227
Potassium (mg/kg)	3.594	2.519	1.427	0.153
pH	0.665	0.299	2.220	**0.026**
Tree cover	1.136	0.735	1.545	0.122
PAR	0.004	0.002	1.500	0.133

Table S3. Estimates, standard error, z-value and p-values of all measured environmental variables (variables that change with P. contorta biomass) that influence changes in native plant richness in the Patagonian steppe. *Significant variables are marked in bold (p-value<0.05).*

	Estimated	Standard error	*z value*	*P value*
T° max soil	0.014	0.008	-2.002	**<0.001**
T° max air	0.016	0.015	5.314	**<0.001**
Total litter	-0.004	0.008	-4.583	**<0.001**
Litter deep	-0.090	0.004	-2.232	**0.025**
Potassium (mg/kg)	1.496	-0.717	2.084	**0.037**
pH	0.563	-0.008	6.733	**<0.001**
Tree cover	-0.087	-0.207	4.327	**<0.001**
PAR	-0.003	-0.202	5.267	**<0.001**

Table S4. Estimates, standard error, z-value and p-values of all measured environmental variables (variables that change with P. contorta biomass) that influence changes in native plant abundance in the *A. araucana* forest. *Significant variables are marked in bold (p-value<0.05).*

	Estimated	Standard error	*z value*	*P value*
T° min air	-0.231	0.092	-2.500	**0.012**
Soil moisture	-2.356	1.062	-2.217	**0.026**
Total litter	-0.007	0.005	-1.373	0.169
Litter depth	0.100	0.058	1.716	0.086
Organic matter	0.399	0.052	7.570	**<0.001**
Nitrate (mg/kg)	-0.084	0.040	-2.094	**0.036**
Tree cover	-0.558	0.412	-1.353	0.176
PAR	0.003	0.001	2.649	**0.008**

Table S5. Estimates, standard error, z-value and p-values of all measured environmental variables (variables that change with P. contorta biomass) that influence changes in native plant abundance in the Patagonian steppe. *Significant variables are marked in bold (p-value<0.05).*

	Estimated	Standard error	*z value*	*P value*
T° min air	0.215	0.142	-1.518	**0.001**
Soil moisture	-2.160	1.184	-1.824	0.068
Total litter	0.015	0.007	-2.005	**0.004**
Litter depth	0.188	0.088	2.147	0.125
Organic matter	-0.259	0.081	3.203	**0.001**
Nitrate (mg/kg)	-0.006	0.069	-0.091	0.927
Tree cover	-0.587	0.620	-0.947	0.343
PAR	0.002	0.001	1.413	0.157

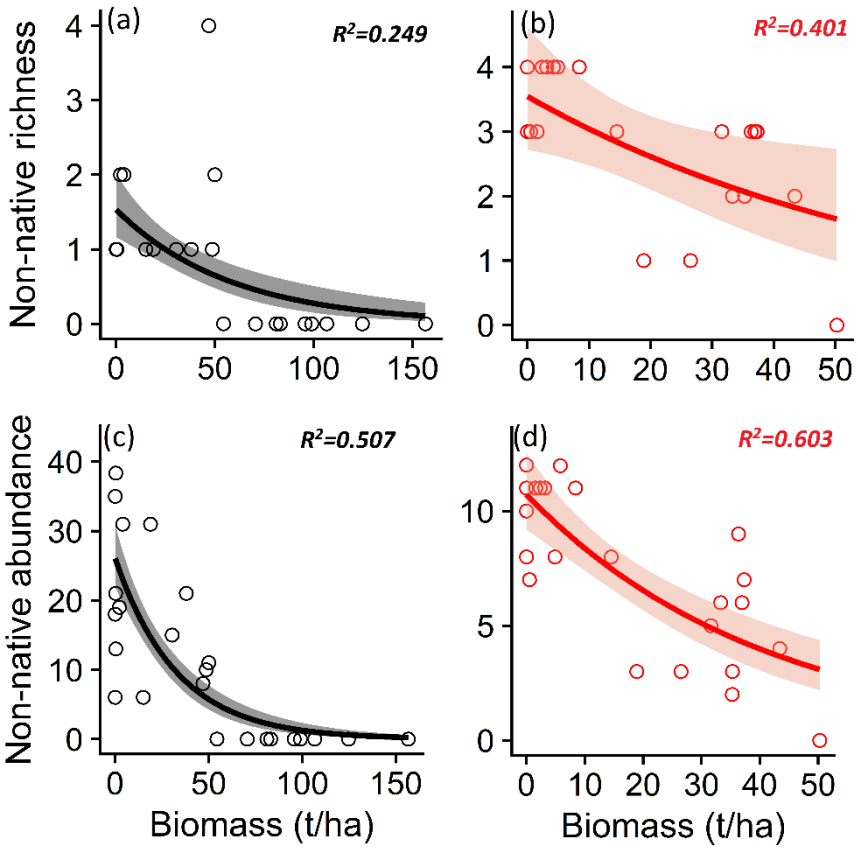

Figure S1. Relationship between the biomass of *Pinus contorta* and the richness and total abundance of non-native plants for the *A. araucaria* forest (a, c) and for the Patagonian steppe (b, d). The lines show the linear model fit and the 95% confidence interval. R^2 is the adjusted R^2.