

## SUPPORTING INFORMATION

**Appendix S1.** Species list including the full nomenclature (following Marticorena and Quezada, 1985), family, life form, dispersal mode and original range. <sup>1</sup>Life form was classified as follows: Annual herb (AH); Annual grass (AG); Perennial herb (PH); Perennial grass (PG); Geophyte (G); Shrub (S); Tree (T). <sup>2</sup>Information on dispersal modes was compiled from different bibliographical sources (see below), estimated from seed morphology and field observations, and classified as follows: Unknown (0); Epizoochory (1); Endozoochory (2); Hydrochory (3); Anemochory (4); Autochory (5); Barochory (6); Catapult (by animal movement) (7); Unspecialized (8). <sup>3</sup>Endemic to Chile (E).

Species	Family	Life form <sup>1</sup>	Dispersal mode <sup>2</sup>	Origin <sup>3</sup>
Aliens				
<i>Aira caryophyllea</i> L.	Poaceae	AG	8	Mediterranean
<i>Anagallis arvensis</i> L.	Primulaceae	AH	6	Eurasia
<i>Anthriscus caucalis</i> M.Bieb.	Apiaceae	AH	1	Eurasia
<i>Avena barbata</i> Pott.ex Link.	Poaceae	AG	1	Eurasia
<i>Bidens aurea</i> (Aiton) Sherff	Asteraceae	AH	1, 4	America
<i>Briza minor</i> L.	Poaceae	AG	6	Eurasia
<i>Bromus hordeaceus</i> L.	Poaceae	AG	1, 3	Eurasia
<i>Bromus diandrus</i> Roth var. <i>rigidus</i> (Roth) Sales	Poaceae	AG	1	Mediterranean
<i>Bromus madritensis</i> L.	Poaceae	AG	1	Europe
<i>Cardamine hirsuta</i> L.	Brassicaceae	AH	5	Eurasia
<i>Carthamus lanatus</i> L.	Asteraceae	AH	1, 4	Mediterranean
<i>Centaurea melitensis</i> L.	Asteraceae	AH	1, 2, 3, 7	Mediterranean
<i>Cerastium glomeratum</i> Thuill.	Caryophyllaceae	AH	8	Mediterranean
<i>Convolvulus arvensis</i> L.	Convolvulaceae	PH	8	Eurasia
<i>Erodium cicutarium</i> (L.) L'Hér. ex Aiton	Geraniaceae	AH	1, 3, 5	Eurasia
<i>Erodium malacoides</i> (L.) L'Hér. ex Aiton	Geraniaceae	AH	1, 3, 5	Mediterranean
<i>Euphorbia peplus</i> L.	Euphorbiaceae	AH	5	Europe
<i>Fumaria capreolata</i> L.	Fumariaceae	AH	6	Eurasia
<i>Galium aparine</i> L.	Rubiaceae	AH	1, 3, 4	Eurasia
<i>Hordeum marinum</i> Huds.	Poaceae	AG	1	Europe
<i>Hypochaeris glabra</i> L.	Asteraceae	AH	1, 4	Europe
<i>Leontodon saxatilis</i> Lam.	Asteraceae	AH	1, 4	Mediterranean
<i>Logfia gallica</i> (L.) Coss et Germ.	Asteraceae	AH	0	Mediterranean
<i>Lolium multiflorum</i> Lam.	Poaceae	AG	1, 7	Mediterranean
<i>Lolium temulentum</i> L.	Poaceae	AG	1, 7	Mediterranean
<i>Lythrum hyssopifolia</i> L.	Lythraceae	AH	1	Eurasia
<i>Polycarpon tetraphyllum</i> (L.) L.	Caryophyllaceae	AH	8	Mediterranean
<i>Polygonum persicaria</i> L.	Polygonaceae	PH	3	Europe
<i>Polypogon monspeliensis</i> (L.) Desf.	Poaceae	AG	1, 7	Eurasia
<i>Polypogon viridis</i> (Gouan) Breistr.	Poaceae	AG	1, 7	Eurasia
<i>Rumex acetosella</i> L.	Polygonaceae	AH	1, 3, 4	Eurasia
<i>Sagina apelata</i> Ard.	Caryophyllaceae	AH	0	Mediterranean
<i>Sherardia arvensis</i> L.	Rubiaceae	AH	0	Mediterranean
<i>Silene gallica</i> L.	Caryophyllaceae	AH	6, 7	Europe

<i>Spergula arvensis</i> L.	Caryophyllaceae	AH	0	Europe
<i>Tolpis barbata</i> (L.) Gaertn	Asteraceae	AH	1, 4	Mediterranean
<i>Torilis nodosa</i> (L.) Gaertn.	Apiaceae	AH	1	Mediterranean
<i>Trifolium angustifolium</i> L.	Fabaceae	AH	1	Mediterranean
<i>Trifolium campestre</i> Schreb.	Fabaceae	AH	6	Mediterranean
<i>Trifolium glomeratum</i> L.	Fabaceae	AH	1	Mediterranean
<i>Trifolium suffocatum</i> L.	Fabaceae	AH	1	Mediterranean
<i>Vulpia bromoides</i> (L.) Gray	Poaceae	AG	1, 4, 7	Europe
<i>Vulpia myuros</i> (L.) C.C.Gmel.	Poaceae	AG	1, 4, 7	Eurasia

#### Natives

<i>Acacia caven</i> (Molina) Molina	Mimosaceae	T	2	S America
<i>Adesmia tenella</i> Hook. et Arn.	Fabaceae	AH	0	Chile (E)
<i>Alonsoa meridionalis</i> Kuntze	Scrophulariaceae	AH	0	S America
<i>Alstroemeria pulchra</i> Sims	Alstroemeriaceae	G	6	Chile (E)
<i>Bromus berterianus</i> Colla	Poaceae	AG	1	S America
<i>Calandrinia compressa</i> Schrad. ex DC.	Portulacaceae	AH	6	Chile (E)
<i>Castilleja attenuata</i> (A.Gray) T.I.Chuang and Heckard	Scrophulariaceae	AH	0	America
<i>Centaurium cachanlahuen</i> (Molina) B.L.Rob.	Gentianaceae	AH	0	S America
<i>Cestrum parqui</i> L'Her.	Solanaceae	S	2	America
<i>Chaetanthera ciliata</i> Ruiz et Pav.	Asteraceae	AH	4	Chile (E)
<i>Clarkia tenella</i> (Cav.) F.H.Lewis et M.R.Lewis	Onagraceae	AH	0	S America
<i>Colliguaja odorifera</i> Molina	Euphorbiaceae	S	5	Chile (E)
<i>Conanthera bifolia</i> Ruiz et Pav.	Amarillidaceae	G	6	Chile (E)
<i>Conanthera campanulata</i> Lindl.	Amarillidaceae	G	6	Chile (E)
<i>Crassula closiana</i> (Gay) Reiche	Crassulaceae	AF	6	Chile (E)
<i>Deschampsia cespitosa</i> (L.) P.Beauv.	Poaceae	PG	1	S America
<i>Dichondra sericea</i> Sw.	Convolvulaceae	G	3, 6	S America
<i>Dioscorea humifusa</i> Poepp.	Dioscoriaceae	G	4	Chile (E)
<i>Dioscorea pedicellata</i> Phil.	Dioscoriaceae	G	4	Chile (E)
<i>Facelis retusa</i> (Lam.) Sch.Bip.	Asteraceae	AH	4	S America
<i>Gamochaeta spiciformis</i> (Sch.Bip.) Cabrera	Asteraceae	PH	4	S America
<i>Geranium core-core</i> Steud.	Geraniaceae	PH	1, 5	S America
<i>Gnaphalium philippi</i> Gand.	Asteraceae	PH	4	Chile (E)
<i>Helenium aromaticum</i> L.H.Bailey	Asteraceae	AH	3, 6	America
<i>Lithraea caustica</i> Hook. and Arn.	Anacardiaceae	T	2	Chile (E)
<i>Loasa tricolor</i> Ker Gawl.	Loasaceae	AH	6	Chile (E)
<i>Loasa triloba</i> Dombey ex Juss.	Loasaceae	AH	6	Chile (E)
<i>Lotus subpinnatus</i> Lag.	Fabaceae	AH	0	America
<i>Maytenus boaria</i> Molina	Celastraceae	T	2	Chile (E)
<i>Melica violacea</i> Cav.	Poaceae	PG	1	S America
<i>Muehlenbeckia hastulata</i> (Sm.) I.M.Johnst.	Polygonaceae	WV	2	S America
<i>Nassella gibba</i> (Phil.) Muñoz-Schick	Poaceae	PG	1	Chile (E)
<i>Olsynium junceum</i> (E.Mey. ex C. Presl.) Goldblatt	Iridaceae	G	6, 7	Chile (E)
<i>Oxalis micrantha</i> Bertero ex Colla	Oxalidaceae	AH	5	S America

<i>Oxalis rosea</i> Jacq.	Oxalidaceae	AH	5	Chile (E)
<i>Pectocarya linearis</i> (Ruiz et Pav.) DC.	Boraginaceae	AH	0	S America
<i>Peumus boldus</i> Molina	Monimiaceae	T	2	Chile (E)
<i>Piptochaetium panicoides</i> (Lam.) E.Desv.	Poaceae	PG	1	America
<i>Plagiobothrys fulvus</i> (Hook. et Arn.) I.M.Johnst.	Boraginaceae	AH	1	Chile (E)
<i>Plagiobothrys procumbens</i> (Colla) A.Gray	Boraginaceae	AH	1	Chile (E)
<i>Plantago firma</i> Kunze ex Walp.	Plantaginaceae	AH	8	Chile
<i>Plantago hispidula</i> Ruiz et Pav.	Plantaginaceae	AH	8	Chile (E)
<i>Quillaja saponaria</i> Molina	Rosaceae	T	4	Chile (E)
<i>Retanilla trinervia</i> (Gillies et Hook.) Hook. et Arn.	Rhamnaceae	S	2	Chile (E)
<i>Sanicula crassicaulis</i> Poepp.	Apiaceae	PH	1	America
<i>Stachis grandidentata</i> Lindl.	Lamiaceae	PH	0	Chile (E)
<i>Schinus latifolius</i> (Gill. Ex Lindl.) Engler	Anacardiaceae	T	2	Chile (E)
<i>Soliva sessilis</i> Ruiz et Pav.	Asteraceae	AH	1	S America
<i>Stellaria chilensis</i> Pedersen	Caryophyllaceae	AH	8	Chile (E)
<i>Sisyrinchium arenarium</i> Poepp.	Iridaceae	G	6	Chile (E)
<i>Sisyrinchium graminifolium</i> Lindl.	Iridaceae	G	6	Chile (E)
<i>Tecophilaea violiflora</i> Bert. et Colla.	Tecophilaceae	G	6	Chile (E)
<i>Trichopetalum plumosum</i> (Ruiz et Pav.) J.F.Macbr.	Laxmanniaceae	G	6	Chile (E)
<i>Vulpia antucensis</i> Trin.	Poaceae	AG	1	Chile (E)
<i>Wendtia gracilis</i> Meyen	Geraniaceae	S	0	S America

## References

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**Table S1.** Description of the study sites. (\*) Fire severity was estimated visually as the percentage of totally-burned shrubs and trees within the sampling area. (†) Fire frequency is the number of times burned before the present fire and during the last 20 years (from 1985 to 2005).

	Lo Orozco	Los Perales	Los Molles	El Álamo
Localization	33° 13' 8" S 71° 24' 7" W	33° 08' 9" S 71° 17' 1" W	33° 07' 1" S 71° 21' 8" W	32°48'46"S 71°24'5"W
Slope aspect	W	NW	SW	NW
Fire type	Crown fire	Crown fire	Surface fire	Surface-Crown fire
Fire severity(*)	70%	90%	0%	5%
Fire frequency(†)	2	0	0	0
Fire size	1.5 ha	5 ha	2.5 ha	10 ha
Dominant alien annual species	<i>Bromus hordeaceus</i> <i>Cardamine hirsuta</i> <i>Euphorbia peplus</i> <i>Hypochaeris glabra</i> <i>Leontodon saxatilis</i> <i>Vulpia myuros</i>	<i>Aira caryophylla</i> <i>Bromus hordeaceus</i> <i>Euphorbia peplus</i> <i>Hypochaeris glabra</i> <i>Leontodon saxatilis</i> <i>Vulpia myuros</i>	<i>Aira caryophylla</i> <i>Briza minor</i> <i>Bromus hordeaceus</i> <i>Euphorbia peplus</i> <i>Fumaria capreolata</i> <i>Lolium multiflorum</i>	<i>Anagallis arvensis</i> <i>Bromus hordeaceus</i> <i>Bromus madritensis</i> <i>Euphorbia peplus</i> <i>Hypochaeris glabra</i> <i>Vulpia myuros</i>
Dominant native herbaceous species	<i>Clarkia tenella</i> <i>Geranium core-core</i> <i>Oxalis micrantha</i> <i>Sanicula crassicaulis</i> <i>Vulpia antucensis</i>	<i>Bromus berteroi</i> <i>Dichondra sericea</i> <i>Dioscorea humifusa</i> <i>Pectocarya linearis</i> <i>Vulpia antucensis</i>	<i>Bromus berteroi</i> <i>Olsynium junceum</i> <i>Stellaria chilensis</i> <i>Tecophilaea violiflora</i> <i>Vulpia antucensis</i>	<i>Bromus berteroi</i> <i>Dichondra sericea</i> <i>Dioscorea humifusa</i> <i>Nassella gibba</i> <i>Oxalis rosea</i>
Dominant native woody species	<i>Acacia caven</i> <i>Baccharis linearis</i> <i>Colliguaja odorifera</i> <i>Lithraea caustica</i> <i>Maytenus boaria</i> <i>Peumus boldus</i> <i>Quillaja saponaria</i> <i>Retanilla trinervia</i> <i>Schinus latifolius</i>	<i>Acacia caven</i> <i>Baccharis linearis</i> <i>Colliguaja odorifera</i> <i>Lithraea caustica</i> <i>Peumus boldus</i> <i>Podanthus sp.</i> <i>Quillaja saponaria</i> <i>Retanilla trinervia</i> <i>Sophora macrocarpa</i>	<i>Acacia caven</i> <i>Baccharis linearis</i> <i>Colliguaja odorifera</i> <i>Lithraea caustica</i> <i>Peumus boldus</i> <i>Quillaja saponaria</i> <i>Retanilla trinervia</i> <i>Sophora macrocarpa</i> <i>Adesmia microphylla</i>	<i>Acacia caven</i> <i>Baccharis linearis</i> <i>Lithraea caustica</i> <i>Maytenus boaria</i> <i>Muehlenbeckia hastulata</i> <i>Peumus boldus</i> <i>Retanilla trinervia</i> <i>Sophora macrocarpa</i> <i>Schinus latifolius</i>

**Table S2.** Estimate parameters of the best-fitted GLMM for vegetation and seedbank data. Model selection was made using Likelihood Ratio Test (LRT). (---) means no significant factor effect in LRT (see Table 1 in the main text).

	Vegetation		Seedbank	
	Estimate	SE	Estimate	SE
NATIVE PERENNIALS				
<i>Species richness</i>				
Fixed effects				
Intercept	$\beta_0=0.24$	0.11	$\beta_0=0.01$	0.10
Fire	---	---	---	---
Random effects				
on intercept	$\sigma_0 = 0.74$		$\sigma_0 = 0.52$	
on slope (fire)	$\sigma_1 = 0.66$		$\sigma_1 = 0.49$	
<i>Abundance</i>				
Fixed effects				
Intercept	$\beta_0 = 3.70$	1.26	$\beta_0=0.81$	0.69
Fire	---	---	---	---
Random effects				
on intercept	$\sigma_0 = 26.0$		$\sigma_0 = 3.87$	
on slope (fire)	$\sigma_1 = 33.6$		$\sigma_1 = 3.13$	
NATIVE ANNUALS				
<i>Species richness</i>				
Fixed effects				
Intercept	$\beta_0 = 0.17$	0.12	$\beta_0 = 0.54$	0.14
Fire	$\beta_1 = 0.32$	0.16	---	---
Random effects				
on intercept	$\sigma_0 = 0.14$		$\sigma_0 = 0.25$	
on slope (fire)	---		---	
<i>Abundance</i>				
Fixed effects				
Intercept	$\beta_0 = 2.04$	2.68	$\beta_0 = 2.20$	1.63
Fire	---	---	---	---
Random effects				
on intercept	$\sigma_0 = 11.31$		$\sigma_0 = 4.85$	
on slope (fire)	$\sigma_1 = 14.57$		$\sigma_1 = 6.59$	
ALIEN ANNUALS				
<i>Species richness</i>				
Fixed effects				
Intercept	$\beta_0 = 1.93$	0.08	$\beta_0 = 1.68$	0.16
Fire	$\beta_1 = 0.22$	0.06	$\beta_1 = -0.45$	0.14
Random effects				
on intercept	$\sigma_0 = 0.14$		$\sigma_0 = 0.31$	
on slope (fire)	---		$\sigma_1 = 0.24$	
<i>Abundance</i>				
Fixed effects				
Intercept	$\beta_0 = 4.58$	10.6	$\beta_0 = 4.25$	
Fire	---	---	---	
Random effects				
on intercept	$\sigma_0 = 26.4$		$\sigma_0 = 42.3$	
on slope (fire)	$\sigma_1 = 67.0$		$\sigma_1 = 57.2$	

**Table S2** (Cont.)

	Vegetation		Seedbank	
	Estimate	SE	Estimate	SE
ANNUAL SPECIES				
<i>Species richness</i>				
Fixed effects				
Intercept	$\beta_0 = 1.12$	0.56	$\beta_0 = 1.26$	0.53
Fire	$\beta_1 = 0.22$	0.07	$\beta_1 = -0.21$	0.12
Origin	$\beta_2 = -0.17$	0.07	$\beta_2 = -0.44$	0.13
Fire x Origin	---	---	$\beta_3 = 0.34$	0.16
Random effects				
on intercept	$\sigma_0 = 1.12$		$\sigma_0 = 1.05$	
on slope (fire)	---		---	
<i>Abundance</i>				
Fixed effects				
Intercept	$\beta_0 = 6.41$	0.23	$\beta_0 = 10.25$	0.30
Fire	---	---	---	---
Origin	$\beta_2 = -3.66$	0.19	$\beta_2 = -2.69$	0.23
Fire x Origin	---	---	---	---
Random effects				
on intercept	$\sigma_0 = 0.37$		$\sigma_0 = 1.20$	
on slope (fire)	---		$\sigma_1 = 1.01$	
PROPORTION OF ALIEN ANNUALS				
Fixed effects				
Intercept	$\beta_0 = 1.82$	0.11	$\beta_0 = 1.30$	0.09
Fire	---	---	---	---
Random effects				
on intercept	$\sigma_0 = 0.13$		$\sigma_0 = 0.00$	
on slope (fire)	---		$\sigma_1 = 0.43$	
PROPORTION OF ALIEN SPECIES				
Fixed effects				
Intercept	$\beta_0 = 1.02$	0.16	$\beta_0 = 1.05$	0.14
Fire	---	---	$\beta_1 = -0.36$	0.11
Random effects				
on intercept	$\sigma_0 = 0.29$		$\sigma_0 = 0.23$	
on slope (fire)	---		---	

**Table S3.** Estimate parameters of the best-fitted GLMM for seed rain data. Model selection was made using Likelihood Ratio Test (LRT).

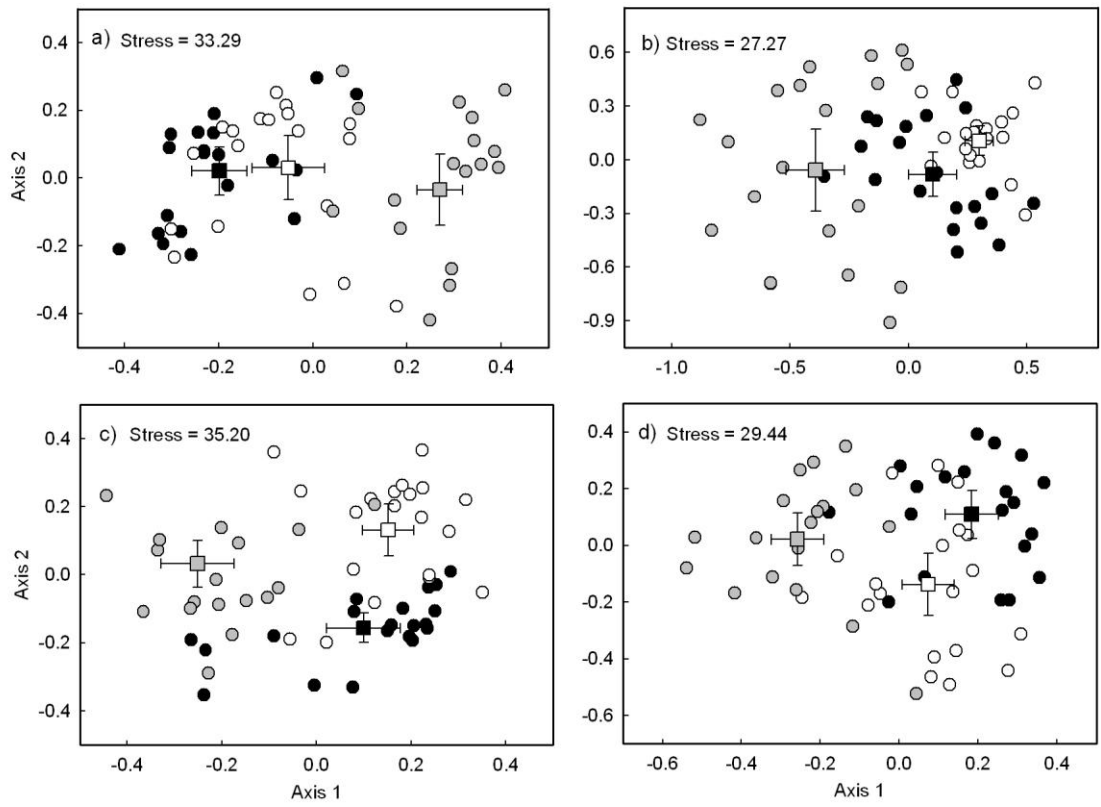
Source of variation	Seed rain	
	Estimate	SE
<i>Species richness</i>		
Fixed effects		
Intercept	$\beta_0 = 0.56$	0.20
Native annuals	$\beta_1 = -1.90$	0.32
Native perennials	$\beta_2 = -1.21$	0.41
Random effects		
on intercept	$\sigma_0 = 0.38$	
on slope (Native annuals)	$\sigma_1 = 0.43$	
on slope (Native perennials)	$\sigma_2 = 0.75$	
<i>Propagule abundance</i>		
Fixed effects		
Intercept	$\beta_0 = 1.61$	0.57
Native annuals	$\beta_1 = -2.58$	0.71
Native perennials	$\beta_2 = -1.47$	1.15
Random effects		
on intercept	$\sigma_0 = 1.12$	
on slope (Native annuals)	$\sigma_1 = 1.22$	
on slope (Native perennials)	$\sigma_2 = 2.24$	

**Table S4:** Mean ( $\pm$  2SE) species richness and abundance of the different functional groups in the sampling points of the vegetation, the seedbank and the seed rain in the coastal matorral (n = 4).

Source of variation	Vegetation		Seedbank		Seed rain
	Unburned	Burned	Unburned	Burned	Burned
<b>NATIVE PERENNIALS</b>					
Species richness	1.3 $\pm$ 0.2	1.5 $\pm$ 1.1	1 $\pm$ 0.1	1.2 $\pm$ 0.7	0.6 $\pm$ 0.26
Abundance	37.7 $\pm$ 18.6	57.5 $\pm$ 39.4	2.5 $\pm$ 0.9	3.7 $\pm$ 3.3	1.6 $\pm$ 1.3
<b>NATIVE ANNUALS</b>					
Species richness	0.8 $\pm$ 0.3	1.2 $\pm$ 0.3	1.9 $\pm$ 0.7	1.6 $\pm$ 0.7	0.3 $\pm$ 0.1
Abundance	8.8 $\pm$ 4.4	12.8 $\pm$ 13.8	11.5 $\pm$ 6.7	8.8 $\pm$ 4.7	0.5 $\pm$ 0.4
<b>ALIEN ANNUALS</b>					
Species richness	5.6 $\pm$ 1.2	7 $\pm$ 1.5	8.5 $\pm$ 1.2	5.7 $\pm$ 2.4	1.9 $\pm$ 0.8
Abundance	164.4 $\pm$ 127.3	92.7 $\pm$ 35.1	91.4 $\pm$ 30.9	51.5 $\pm$ 45.4	5.8 $\pm$ 3
<b>ANNUAL SPECIES</b>					
Species richness	6.4 $\pm$ 1.3	8.2 $\pm$ 1.8	10.5 $\pm$ 1.1	7.3 $\pm$ 3	2.2 $\pm$ 0.8
Abundance	173.1 $\pm$ 123.2	105.5 $\pm$ 48.1	102.9 $\pm$ 26.5	60.3 $\pm$ 47.6	6.3 $\pm$ 3.4
PERCENTAGE OF ALIEN ANNUAL SPECIES (relative to all annual species)	86.8 $\pm$ 1.5	87 $\pm$ 3.7	81.8 $\pm$ 6.2	77.8 $\pm$ 3.1	86.7 $\pm$ 8.3
RELATIVE ABUNDANCE OF ALIEN ANNUAL SPECIES (relative to all annual species)	90 $\pm$ 5	89 $\pm$ 7	85.3 $\pm$ 8.2	76.5 $\pm$ 11.7	92 $\pm$ 4.2
PERCENTAGE OF ALIEN SPECIES (relative to all species pool)	71.3 $\pm$ 5.1	74 $\pm$ 8.5	74.5 $\pm$ 6.8	65.8 $\pm$ 7.6	67.8 $\pm$ 16.7
RELATIVE ABUNDANCE OF ALIEN SPECIES (relative to all species pool )	86.7 $\pm$ 6.7	82.7 $\pm$ 3.6	82.6 $\pm$ 8.7	67.4 $\pm$ 15.1	72.5 $\pm$ 17.4



**Figure S1.** NMS ordinations on occurrence data showing the similarity among the samples of the established vegetation (white dots), the seed rain (grey dots), and the soil seedbank (black dots) of burned areas. a) Lo Orozco; b) Los Perales; c) Los Molles; d) El Álamo. Square dots represent the centroids (mean of the 20 subplots). Error intervals are  $\pm 2SE$ . It is shown the Stress value, which indicates the goodness of fit and ranges from 0 (the best fit) to 100 (the worst fit).



**Figure S2.** NMS ordinations on abundance data showing the similarity among the samples of the established vegetation (white dots), the seed rain (grey dots), and the soil seedbank (black dots) of burned areas. a) Lo Orozco; b) Los Perales; c) Los Molles; d) El Álamo. Square dots represent the centroids (mean of the 20 subplots). Error intervals are  $\pm 2SE$ . It is shown the Stress value, which indicates the goodness of fit and ranges from 0 (the best fit) to 100 (the worst fit).

