

Supplementary Materials

Table S1. Complete list of plant taxa matched to the respective ecological guild and mean cover (%) for the shifting dunes under control (total IAP cover < 15%) and invaded conditions (total IAP cover \geq 15%).

Guild	Taxon	Control	Invaded
Diagnostic	<i>Ammophila arenaria</i> subsp. <i>australis</i>	3.27	2.78
	<i>Calystegia soldanella</i>	2.19	1.04
	<i>Cyperus capitatus</i>	5.56	1.73
	<i>Echinophora spinosa</i>	1.73	0.92
	<i>Elymus farctus</i>	13.04	8.22
	<i>Eryngium maritimum</i>	1.16	0.32
	<i>Euphorbia paralias</i>	0.12	0.03
	<i>Lotus cytisoides</i>	14.81	5.97
	<i>Medicago marina</i>	9.35	1.60
	<i>Polygonum maritimum</i>	0.12	< 0.01
	<i>Silene conica</i>	4.50	1.52
	<i>Sporobolus virginicus</i>	2.44	1.33
	Sum	58.27	25.45
Species of other coastal habitats	<i>Atriplex prostrata</i>	0.02	< 0.01
	<i>Bartsia trixago</i>	< 0.01	0.20
	<i>Blackstonia perfoliata</i>	0.02	< 0.01
	<i>Cakile maritima</i> subsp. <i>maritima</i>	0.58	0.20
	<i>Cerastium semidecandrum</i>	0.02	0.12
	<i>Crepis vesicaria</i> subsp. <i>taraxacifolia</i>	< 0.01	0.03
	<i>Elymus caninus</i>	0.12	< 0.01
	<i>Erodium laciniatum</i>	0.38	0.32
	<i>Euphorbia terracina</i>	1.63	1.20
	<i>Festuca fasciculata</i>	6.15	1.75
	<i>Hypochaeris achyrophorus</i>	0.23	0.10
	<i>Lagurus ovatus</i>	0.12	< 0.01
	<i>Limbarda crithmoides</i> subsp. <i>longifolia</i>	1.56	0.22
	<i>Medicago littoralis</i>	0.23	0.22
	<i>Medicago lupulina</i>	< 0.01	0.10
	<i>Ononis variegata</i>	1.27	1.75
	<i>Parapholis incurva</i>	0.58	1.25
	<i>Phleum arenarium</i> subsp. <i>caesium</i>	3.50	3.72
	<i>Pinus halepensis</i>	0.23	0.50
	<i>Rostraria litorea</i>	2.94	1.05
	<i>Salsola kali</i>	< 0.01	0.13
	<i>Salsola soda</i>	< 0.01	1.25
	<i>Scirpoides holoschoenus</i>	2.31	2.25
	<i>Silene colorata</i>	< 0.01	0.05
	<i>Sixalix atropurpurea</i>	0.12	0.13
	<i>Verbascum niveum</i> subsp. <i>garganicum</i>	0.35	0.20
	Sum	22.36	16.74

Generalist	<i>Aetheorhiza bulbosa</i>	1.85	0.73
	<i>Anisantha madritensis</i>	0.62	0.13
	<i>Artemisia campestris</i>	0.60	0.10
	<i>Avena barbata</i>	0.12	< 0.01
	<i>Briza media</i>	0.58	< 0.01
	<i>Cutandia maritima</i>	0.12	0.10
	<i>Cynodon dactylon</i>	1.02	0.83
	<i>Equisetum telmateia</i>	< 0.01	0.02
	<i>Glycyrrhiza glabra</i>	< 0.01	0.50
	<i>Hedypnois rhagadioloides</i>	0.13	0.12
	<i>Polycarpon tetraphyllum</i>	< 0.01	< 0.01
	<i>Reichardia picroides</i>	0.02	0.03
	Sum	5.04	2.57
Alien	<i>Ambrosia psilostachya</i>	0.13	0.52
	<i>Carpobrotus edulis</i>	0.12	< 0.01
	<i>Cenchrus longispinus</i>	0.12	0.27
	<i>Erigeron canadensis</i>	0.25	0.25
	<i>Oenothera stueckii</i>	< 0.01	20.42
	<i>Xanthium orientale</i>	0.38	1.10
	Sum	1.00	22.55

Table S2. Complete list of plant taxa matched to the respective ecological guild and mean cover (%) for the transition dunes under control (total IAP cover < 15%) and invaded conditions (total IAP cover \geq 15%).

Guild	Taxon	Control	Invaded
Diagnostic	<i>Corynephorus articulatus</i>	0.12	0.08
	<i>Erodium laciniatum</i>	< 0.01	0.10
	<i>Euphorbia terracina</i>	1.68	1.50
	<i>Festuca fasciculata</i>	2.64	4.66
	<i>Fumana procumbens</i>	4.95	0.46
	<i>Helianthemum nummularium</i> subsp. <i>obscurum</i>	0.12	< 0.01
	<i>Hypochaeris achyrophorus</i>	0.30	0.15
	<i>Lagurus ovatus</i>	0.30	0.10
	<i>Lomelosia argentea</i>	0.02	< 0.01
	<i>Medicago littoralis</i>	4.13	1.31
	<i>Ononis variegata</i>	4.03	1.44
	<i>Petrorhagia saxifraga</i> subsp. <i>saxifraga</i>	0.02	< 0.01
	<i>Phleum arenarium</i> subsp. <i>caesium</i>	7.55	6.11
	<i>Salsola kali</i>	1.92	1.65
	<i>Silene colorata</i>	2.78	2.46
	<i>Silene conica</i>	< 0.01	0.04
	<i>Teucrium capitatum</i>	0.20	< 0.01
	<i>Thymus pulegioides</i>	0.23	< 0.01
	<i>Verbascum niveum</i> subsp. <i>garganicum</i>	1.10	1.65
	Sum	32.09	21.71
Species of other coastal habitats	<i>Ammophila arenaria</i> subsp. <i>australis</i>	< 0.01	0.95
	<i>Bartsia trixago</i>	< 0.01	0.24
	<i>Blackstonia perfoliata</i>	< 0.01	0.01
	<i>Cakile maritima</i>	< 0.01	0.01
	<i>Carex liparocarpos</i>	0.20	< 0.01
	<i>Catapodium rigidum</i>	0.05	0.07
	<i>Centaureum pulchellum</i>	< 0.01	0.00
	<i>Cerastium semidecandrum</i>	0.23	0.13
	<i>Crepis vesicaria</i> subsp. <i>taraxacifolia</i>	0.02	0.03
	<i>Cyperus capitatus</i>	5.47	3.25
	<i>Draba obconica</i>	0.02	< 0.01
	<i>Echinophora spinosa</i>	0.32	0.45
	<i>Elymus farctus</i>	0.53	0.54
	<i>Euphorbia paralias</i>	0.02	< 0.01
	<i>Juncus acutus</i>	< 0.01	0.08
	<i>Lotus cytisoides</i>	4.10	5.78
	<i>Medicago marina</i>	0.80	1.59
	<i>Medicago minima</i>	0.10	< 0.01
	<i>Pancratium maritimum</i>	0.50	< 0.01
	<i>Parapholis incurva</i>	0.10	< 0.01
	<i>Pilosella piloselloides</i>	< 0.01	0.01
	<i>Pinus pinea</i>	0.02	< 0.01
	<i>Plantago arenaria</i>	< 0.01	0.01
	<i>Pulicaria sicula</i>	0.65	0.26
	<i>Rostraria litorea</i>	< 0.01	0.08

	<i>Sanguisorba minor</i>	0.62	0.28
	<i>Scabiosa triandra</i>	0.10	0.10
	<i>Silene vulgaris</i>	0.13	0.10
	<i>Sixalix atropurpurea</i>	0.72	0.38
	<i>Sporobolus virginicus</i>	0.10	0.15
	Sum	14.79	14.47
Generalist	<i>Aetheorhiza bulbosa</i>	< 0.01	< 0.01
	<i>Anisantha madritensis</i>	0.52	0.01
	<i>Arenaria leptoclados</i>	< 0.01	0.03
	<i>Artemisia campestris</i>	2.62	0.38
	<i>Avellinia festucoides</i>	0.07	0.04
	<i>Avena barbata</i>	0.22	0.23
	<i>Calamagrostis epigejos</i>	< 0.01	0.03
	<i>Centaureum erythraea</i>	< 0.01	0.15
	<i>Cutandia maritima</i>	3.05	0.46
	<i>Cynodon dactylon</i>	0.02	0.23
	<i>Dactylis glomerata</i>	0.10	< 0.01
	<i>Dittrichia viscosa</i>	< 0.01	0.08
	<i>Euphorbia peplis</i>	< 0.01	< 0.01
	<i>Hypochaeris radicata</i>	< 0.01	0.01
	<i>Silene otites</i>	0.15	0.03
	Sum	6.74	1.66
Alien	<i>Ambrosia psilostachya</i>	0.88	2.38
	<i>Amorpha fruticosa</i>	< 0.01	0.38
	<i>Cenchrus longispinus</i>	0.22	1.21
	<i>Cuscuta campestris</i>	< 0.01	0.01
	<i>Erigeron canadensis</i>	0.02	0.33
	<i>Erigeron sumatrensis</i>	< 0.01	0.01
	<i>Oenothera stueckii</i>	< 0.01	20.44
	<i>Senecio inaequidens</i>	< 0.01	0.01
	<i>Sporobolus pumilus</i>	0.02	0.15
	<i>Xanthium orientale</i>	0.12	0.16
	Sum	1.25	25.08

Table S3. SIMPER analysis

Habitats	Taxon	Guild	Av. Dissim	Contribution (%)	Cumulative (%)	Mean Control (%)	Mean Invaded (%)
Shifting dunes	<i>Oenothera stucchii</i>	Alien	13.6	16.6	16.6	0.0	20.4
	<i>Lotus cytisoides</i>	Diagnostic	9.6	11.8	28.4	14.8	6.0
	<i>Elymus farctus</i>	Diagnostic	7.5	9.1	37.5	13.0	8.2
	<i>Medicago marina</i>	Diagnostic	6.0	7.4	44.9	9.4	1.6
	<i>Cyperus capitatus</i>	Diagnostic	4.2	5.1	50.1	5.6	1.7
Transition dunes	<i>Oenothera stucchii</i>	Alien	18.6	20.7	20.7	0.0	20.4
	<i>Phleum arenarium</i> subsp. <i>caesium</i>	Diagnostic	8.1	9.0	29.6	7.6	6.1
	<i>Cyperus capitatus</i>	Species of other coastal habitats	7.1	7.9	37.5	5.5	3.3
	<i>Lotus cytisoides</i>	Species of other coastal habitats	6.0	6.6	44.2	4.1	5.8
	<i>Festuca fasciculata</i>	Diagnostic	5.8	6.7	45.3	3.6	0.0