

Appendix

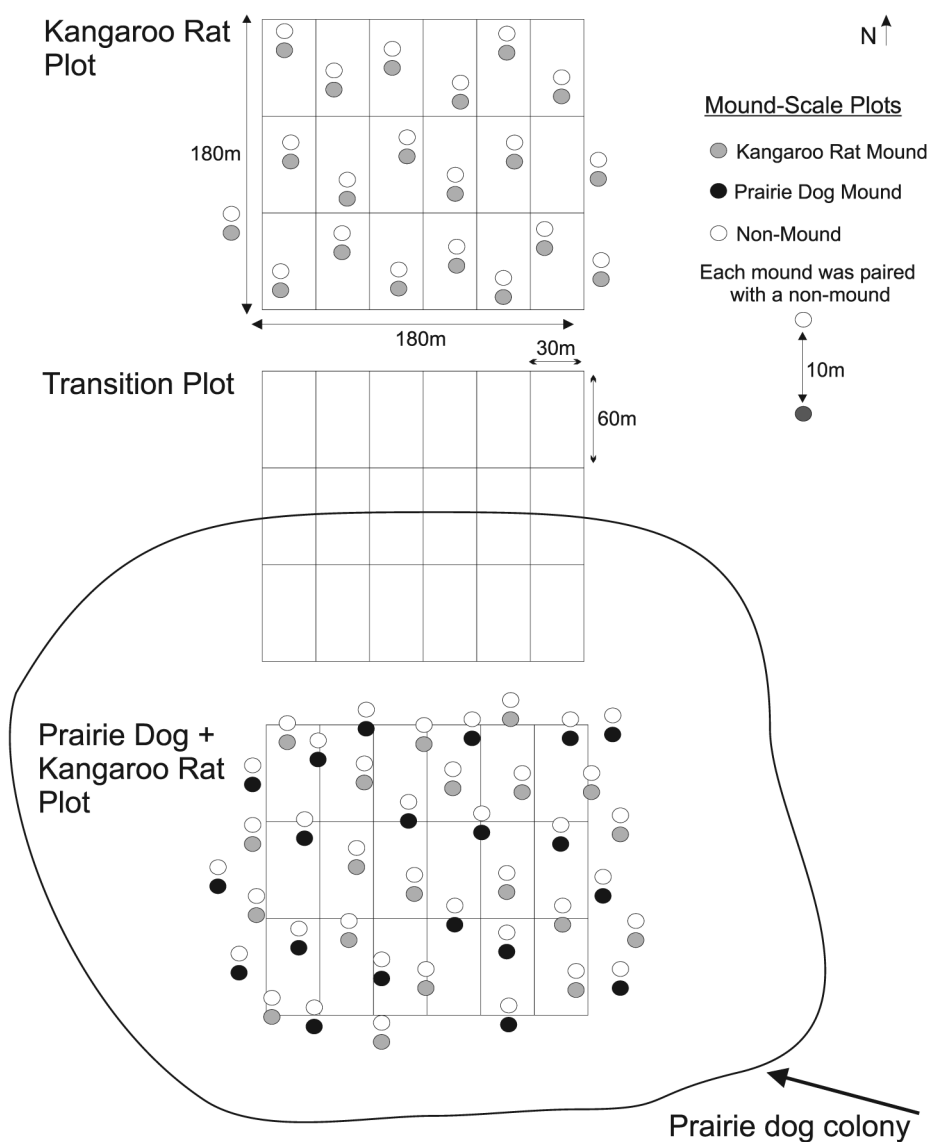


Fig. S1. Experimental design at the Sevilleta National Wildlife Refuge, New Mexico, USA. Pitfall traps were placed at each gridline intersection point of the landscape-scale plots, and grasshoppers were sampled along each of the east-west transect lines. Pitfall trapping, oat-bait sampling, and grasshopper sampling occurred at replicate mound-scale plots, see text for details and sample sizes.

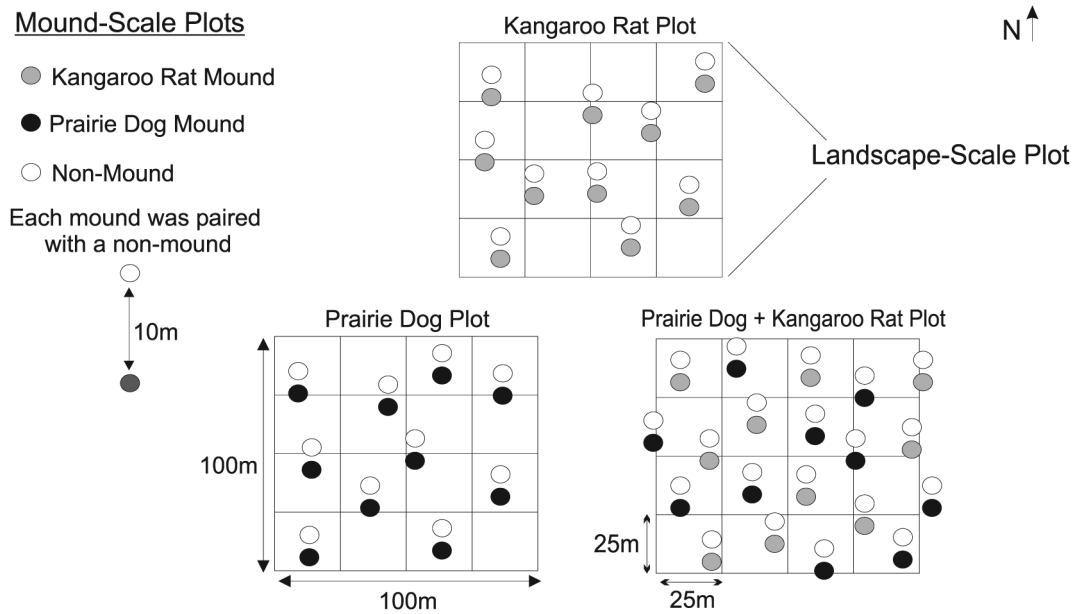


Fig. S2. Experimental design at the Janos-Casas Grandes study site, Chihuahua, Mexico. Each landscape-scale plot was naturally intermixed within each block and replicated four times, for a total of 12 plots and 40 mounds of each treatment type. Grasshoppers were sampled along each east-west transect line of the landscape-scale plots. At the mound-scale, sampling of ground-dwelling arthropods with oat-bait and grasshoppers occurred at each of the mound and paired non-mound plots on each landscape plot.

Table S1. Taxonomic ranks listed represent different trophic group organization of ground-dwelling arthropods captured at the SNWR study site.

Detritivores

Acari	Argasidae
Archaeognatha	Meinertellidae
Blattodea	Polyphagidae
Coleoptera	Anobiidae
Coleoptera	Cryptophagidae
Coleoptera	Latridiidae
Coleoptera	Nitidulidae
Coleoptera	Scarabaeidae
Coleoptera	Scaptiidae
Coleoptera	Silvanidae
Coleoptera	Tenebrionidae
Coleoptera	Trogidae
Dermoptera	Labiidae
Embioptera	Anisembiidae
Isoptera	Rhinotermitidae
Lithobiomorpha	Lithobiidae
Psocoptera	species
Spirostreptida	Spirostreptidae

Granivores

Hymenoptera	Formicidae	<i>Pheidole</i>
Hymenoptera	Formicidae	<i>Pogonomyrmex</i>

Herbivores

Coleoptera	Curculionidae
Coleoptera	Elateridae
Heteroptera	Cydnidae
Heteroptera	Lygaeidae

Omnivores

Hymenoptera	Formicidae	<i>Aphaenogaster</i>
Hymenoptera	Formicidae	<i>Crematogaster</i>
Hymenoptera	Formicidae	<i>Dorymyrmex</i>
Hymenoptera	Formicidae	<i>Forelius</i>
Hymenoptera	Formicidae	<i>Leptothorax</i>
Hymenoptera	Formicidae	<i>Myrmecina</i>
Hymenoptera	Formicidae	<i>Myrmecocystus</i>
Hymenoptera	Formicidae	<i>Neivamyrmex</i>
Hymenoptera	Formicidae	<i>Solenopsis</i>

Predators

Araneae	Arneidae
Araneae	Corinnidae
Araneae	Dictynidae
Araneae	Diguetidae
Araneae	Filistatidae
Araneae	Linyphiidae
Araneae	Liocranidae
Araneae	Lycosidae
Araneae	Oxyopidae
Araneae	Philodromidae
Araneae	Pholcidae
Araneae	Salticidae
Araneae	Theridiidae
Araneae	Thomisidae
Coleoptera	Carabidae
Coleoptera	Histeridae
Coleoptera	Staphilinae
Hymenoptera	Mutillidae
Hymenoptera	Mutillidae
Hymenoptera	Pompilidae
Hymenoptera	Tiphidae
Mantodea	Mantidae
Pseudoscorpiones	Cheliferidae
Pseudoscorpiones	Olpiidae
Scolopendromorpha	Scolopendridae
Scorpiones	Vaejovidae
Siphonaptera	Ctenophthalmidae
Solifugae	Eremobatidae

Table S2. Life form group organization of grasshopper species found at both the JCG and SNWR study sites, based on Uvarov (1977) and Lightfoot (1985).

Life-form groupings	Subfamily
Arbusticoles	
<i>Hesperotettix viridis</i>	Melanoplinae
<i>Schistocerca nitens</i>	Cyrtacanthacridinae
Graminicoles	
<i>Amphitornus coloradus</i>	Gomphocerinae
<i>Eritettix simplex</i>	Gomphocerinae
<i>Opeia obscura</i>	Gomphocerinae
<i>Paropomala pallida</i>	Gomphocerinae
<i>Syrbula montezuma</i>	Gomphocerinae
Graminiterricoles	
<i>Ageneotettix deorum</i>	Gomphocerinae
<i>Aulocara ellioti</i>	Gomphocerinae
<i>Aulocara femoratum</i>	Gomphocerinae
<i>Boopedon nubulin</i>	Gomphocerinae
<i>Brachystola magna</i>	Romalinae (Romalidae)
<i>Cordillacris crenulata</i>	Gomphocerinae
<i>Cordillacris occipitalis</i>	Gomphocerinae
<i>Dactylotum bicolor</i>	Melanoplinae
<i>Melanoplus regalis</i>	Melanoplinae
<i>Philbostruma quadrimaculatum</i>	Gomphocerinae
<i>Phoetaliotes nebrascensis</i>	Melanoplinae
<i>Psoloessa delicatula</i>	Gomphocerinae
<i>Psoloessa texana</i>	Gomphocerinae
Herbicoles	
<i>Melanoplus aridus</i>	Melanoplinae
<i>Melanoplus arizonae</i>	Melanoplinae
<i>Melanoplus flavus</i>	Melanoplinae
<i>Melanoplus gladstoni</i>	Melanoplinae
<i>Melanoplus lakinus</i>	Melanoplinae
<i>Tropidolophus formosus</i>	Oedipodinae
Terricoles	
<i>Arphia conspersa</i>	Oedipodinae
<i>Arphia pseudonietana</i>	Oedipodinae
<i>Cibolacris parviceps</i>	Gomphocerinae
<i>Conozoa texana</i>	Oedipodinae
<i>Derotmema haydeni</i>	Oedipodinae
<i>Hadtrotettix trifasciatus</i>	Oedipodinae
<i>Hippopedon capito</i>	Oedipodinae
<i>Lactista aztecus</i>	Oedipodinae
<i>Leprus wheeleri</i>	Oedipodinae
<i>Trachyrhachis kiowa</i>	Oedipodinae
<i>Trimerotropis californicus</i>	Oedipodinae
<i>Trimerotropis melanoptera</i>	Oedipodinae
<i>Trimerotropis pallidipennis</i>	Oedipodinae
<i>Xanthippus corallipes</i>	Oedipodinae

Table S3. Pairwise Mahalanobis distances (D^2) showing differences in grasshopper species composition in the upper diagonals and ground-dwelling arthropod species composition in the lower diagonals. At the mound-scale, D^2 values are presented for kangaroo rat mounds (KM), kangaroo rat non-mounds (KN), prairie dog mounds (PM), and prairie dog non-mounds on the prairie dog + kangaroo rat (Pdog+Krat) plots at (a) the SNWR and (b) JCG from autumn 2001–spring 2002. At the landscape-scale, D^2 values are presented for (c) the kangaroo rat plot (Krat), Pdog+Krat plot, and transition (Tran) plot at the SNWR, and (d) for the Krat, Pdog+Krat, and prairie dog (Pdog) plots at JCG over all sample periods. D^2 values for ground-dwelling arthropods are based on oat-bait data, except at the SNWR landscape-scale, which are based on pitfall data. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Pairwise Mahalanobis distances (D^2)				
(a) SNWR				
Mound-scale plots				
	KM	KN	PM	PN
KM	0	8.03***	7.08***	6.27***
KN	4.51***	0	5.64**	4.96**
PM	3.19***	1.91*	0	2.35
PN	4.70***	0.59	1.86*	0
(b) JCG				
Mound-scale plots				
	KM	KN	PM	PN
KM	0	8.30***	8.76***	9.65***
KN	17.09***	0	3.29***	2.59**
PM	13.41***	4.66***	0	1.32
PN	17.65***	1.22	3.79**	0
(c) SNWR				
Landscape-scale plots				
	Krat	Pdog+Krat	Tran	
K	0	17.21***	5.56	
PK	148.93**	0	10.73***	
T	45.20	112.37*	0	
(d) JCG				
Landscape-scale plots				
	Krat	Pdog	Pdog+Krat	
K	0	7.05***	2.84***	
P	1.75**	0	3.00***	
PK	1.21**	1.82***	0	

Table S4. Correlations between the grasshopper life-form groups and substrates they were found on at the SNWR (N = 120) and at JCG (N = 320). Correlations shown here are based on mound-scale data. Landscape-scale data showed similar patterns.

Spearman correlations	Grass	Forbs	Bare soil
SNWR			
Graminicole	0.61***	0.25**	0.30**
Terricole	0.65***	0.37***	0.93***
Herbicole	0.32*	0.86***	0.28**
Graminiterricole	0.77***	0.03	0.79***
JCG			
Terricole	-0.04	-0.17***	0.39***
Herbicole	0.58**	0.78***	0.25***
Graminiterricole	0.39***	0.12*	0.28***

* $0.01 < p < 0.05$, ** $0.001 < p < 0.01$, *** $p < 0.001$.