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Supporting Online Material for

Opposing Effects of Native and Exotic Herbivores on Plant Invasions

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Materials and methods

We used multiple search criteria (e.g., herbivor* and (exclu* or cage* or insecticid*)) in the online database Web of Science (http://plants.usda.gov/, 1945 - August, 2005) to compile studies that manipulatively excluded herbivores and examined at least one exotic plant species. Additional studies were found by searching the reference lists of empirical studies and review articles. Plant origin was commonly not identified by the authors because most studies addressed herbivore impacts to plant species composition rather than to exotic plant success *per se*. For these studies, we determined plant origin using online databases (e.g., the United States Department of Agriculture (USDA) PLANTS Database http://plants.usda.gov/, the New Zealand Plants Database http://nzflora.landcareresearch.co.nz/, and the Germplasm Resources Information Network (GRIN) http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl). Three species (*Phragmites australis, Poa pratensis,* and *Taraxacum officinale*) have obscure native ranges but were designated as exotics in their study region by the authors or by online databases. We considered these species to be exotic, but their exclusion from all analyses did not change our conclusions (data available on request). Herbivore origin was determined using the authors' own designations, and we considered cattle, sheep, and goats to be native to the Fertile Crescent of southwest Asia (S*1*). We considered horses to be non-native to North America given that they have absent from North America for about 11,000 years (S*2*). Exotic plants and exotic herbivores were considered to share a co-evolutionary history if they originated from the same region of the same continent.

To be included in the analyses of herbivore effects on the relative abundance of exotic plants (S*3-37,* Table S1), studies had to: (i) exclude herbivores and have a control site with herbivores, (ii) conduct the experiment in a field setting, and (iii) report enough data to determine the total proportion of exotic plants within the entire plant community, not just within a particular subset (e.g., summer annuals only). All studies were reported in terms of plant cover or biomass per area. We did not include studies utilizing herbivore inclusions because these studies were rare (two studies) and used artificially high consumer densities. We included three studies (n = 7 separate experiments) that reported only the abundance of 'major' species because these species always comprised greater than 80% of the total plant abundance. Their exclusion from analyses did not change our conclusions (data available on request). For experiments that used nested manipulations of several herbivore species, we used the appropriate treatment and control that differed only in the presence/absence of the herbivore of interest. A second group of studies (S*38-65,* Table S2) fulfilled criteria 1 and 2 above but reported the response (plant abundance, survivorship, or plant size) of selected plant species rather than the entire plant community. We utilized the data from these experiments to analyze whether native vertebrate herbivores had a stronger influence on exotic plant survival than invertebrate herbivores. We also combined the data from these experiments with data on individual plant species extracted from the community-level experiments for a broader analysis of herbivore impacts to invasive and non-invasive exotic plant species in the US.

Data from each paper were extracted from the text, tables, or digitized from figures using the software GrabIt! XP. If the relative abundance or species richness of plant communities was not explicitly calculated by the authors, we calculated the relative abundance by adding the absolute abundances of individual species, and by recording the presence or absence of species in species lists for species richness. When studies on individual exotic plant populations examined multiple variables of plant performance, we included only one of these variables in our analyses by prioritizing in order of the variables that were most commonly presented: i.e., plant abundance (e.g., plant cover, plant density, or plant biomass per area; n = 14 studies), survivorship (n = 12 studies), or plant size (n = 2 studies). This ranking did not exclude survivorship data from a subsequent analysis.

Data from each study were standardized using the unweighted log response ratio: $RR_u = \ln(\bar{X}_{+h})/(\bar{X}_{-h})$ (S*66*), where $\bar{X}_{+h}$ is the mean abundance, survival, or growth of plants in the presence of herbivores, and $\bar{X}_{-h}$ is the same metric in the absence of herbivores. We used the log response ratio because it does not require sample sizes or error measurements (S*67*) and because relatively few studies reported these data. The presence of zeros in the dataset indicates an ecologically meaningful outcome (e.g., 0 % survival in the presence of herbivores) but renders the log response ratio incalculable. We added a 1 to all data points to alleviate this problem. Using Meta-Win 2.0 (S*67*), we performed unweighted, fixed-effect model meta-analyses and calculated 95% confidence intervals for effect sizes using a bias-corrected bootstrapping technique with 9999 randomized re-calculations (S*68*). We used the fixed-effect model because in initial analyses using a mixed-effect model, none of the effects within a category were heterogeneous (Q-statistic, all $P \geq 0.462$), though both models produced similar results (data available on request). Effects were considered significant ($P < 0.05$) when the 95% confidence intervals did not include zero. Differences between effects within an analysis were determined using a randomized re-sampling technique that tests for differences among groups in meta-analysis (S*68*).

The size of exclusion plots, ecosystem productivity, and the intensity of herbivory have all been shown to influence herbivore effects on plant communities (S*62,* S*69*). However, we found no detectable differences in the size of exclusion plots or in annual precipitation (a proxy for productivity, S*28*) between community-level experiments manipulating native vs. exotic herbivores (t-tests, $P = 0.945$ and $P = 0.494$, respectively, with precipitation analyzed for terrestrial experiments only). We also found no correlations between the impact of herbivores on the relative abundance of exotic plants and the size of exclusion plots ($P = 0.358$, $r^2 = 0.02$), annual precipitation ($P = 0.908$, $r^2 = 0.0$), or herbivore impacts on total plant abundance (a proxy for grazing intensity; $P = 0.873$, $r^2 = 0.0$). Thus, the strong differences that we found for the effects of native versus exotic herbivores were unlikely to be driven by other covariates.

Additionally, to test whether the patterns that we documented were driven by particular herbivores with large impacts, we both examined our analyses for heterogeneity among categories and analyzed the data after excluding studies with particular herbivores that had large effect sizes. None of the tests for heterogeneity among categories (e.g., the effect of native herbivores on exotic plant abundance, the effect of exotic herbivores on native plant richness, etc.) were statistically significant (all $P \geq 0.462$, Q-statistic), indicating low levels of heterogeneity among studies. Moreover, although several of the native waterfowl studies had large negative effects on the relative abundance of exotic plants (Table S1), non-waterfowl native herbivores still suppressed the relative abundance of exotic plants (effect size = -0.2956, CI = -0.7356 to -0.0051, n

= 19) and the absolute abundance of exotic plants (effect size = -0.4200, CI = -0.9968 to -0.0594, n = 19). Similarly, although several (though not all) of the cattle studies had positive effects on the relative abundance of exotic plants (Table S1), when we excluded any studies that had manipulated cattle, we still found that all non-cattle studies had positive effects on the relative abundance of exotic plants (effect size = 0.6147, CI = 0.0390 to 1.0713, n = 25) by suppressing the absolute abundance of native plants (effect size = -0.5981, CI = -1.0708 to -0.2374, n = 24). Thus, our results did not appear to be driven by particular herbivores that were studied more commonly or that had stronger impacts.

To determine whether native vertebrate herbivores had a stronger effect on exotic plant survival than did native invertebrate herbivores, we calculated the effect sizes for herbivore impact on plant survivorship in the studies that reported data for specific species of exotic plants. For these analyses we used the log response ratio rather than the odds ratio to calculate herbivore impacts because use of the log response ratio allowed a broader and more complete analysis. Odds ratios were not used to calculate effect sizes because the odds ratio response requires use of the total number of individual plants used in the experiments, and many studies did not provide this information. If we considered all experiments as separate replicates even if they were conducted on the same plant species, vertebrate herbivores had a 5-fold larger impact on exotic plant survival (effect size = -1.7435, CI = -2.2848 to -1.2298, n = 36 experiments) than did invertebrates (effect size = -0.3528, CI = -0.7005 to -0.1248, n = 35 experiments, $P = 0.0002$). If we considered plant species as replicates after calculating a mean herbivore effect size for that species across all experiments using that exotic plant species (i.e., using species instead of studies as independent replicates), vertebrate herbivores had a 3-fold larger impact on exotic plant survival (effect size = -1.5588, CI = -2.0627 to -1.1432, n = 7 species) than did invertebrates (effect size = -0.5089, CI = -1.1176 to -0.1213, n = 8 species, $P = 0.017$).

Effect of herbivores on noxious exotic plants. Following Mitchell and Power (S*70*), we used two proxies for noxiousness. We used state noxious weed lists maintained by the USDA Agricultural Research Service (http://www.ars-grin.gov/cgi-bin/npgs/html/taxweed.pl) to compile the number of US states listing each exotic plant species as noxious in agricultural systems. We also used a list compiled by the Alien Plant Working Group of the Plant Conservation Alliance (http://www.nps.gov/plants/alien/list/all.htm) to compile the number of agencies listing each exotic plant species as noxious in natural areas. This limited our analyses to studies conducted in the United States. To determine whether herbivores had smaller effects on more widely noxious exotic plants, we calculated the mean herbivore effect size for each exotic species from all examined plant populations for all 63 studies (i.e., data on individual exotic plant species were extracted from the community-level studies where available), and then used linear least squares regression to look for a relationship between herbivore effect size and the number of states or agencies listing that species as noxious.

Because governmental listings are likely an imperfect indicator of ecological impact, we also analyzed the data categorically, i.e., we considered plants to be noxious if even a single US state or natural resource agency had declared them to be noxious. For agricultural pests, native herbivores affected invasive and non-invasive plants to a similar degree (effect on invasive exotic plants = -0.5825, CI = -1.2041 to -0.194, n = 34 species; effect on non-invasive exotic plants = -0.3977, CI = -0.7968 to -0.0504, n = 17 species, P = 0.677), as did exotic herbivores (effect on invasive, agricultural pests = -0.2545, CI = -0.5983 to 0.0557, n = 14 species; effect on non-invasive agricultural pests = 0.3355, CI = -0.0720 to 0.7831, n = 22 species, P = 0.067). A large majority of exotic plant species had been declared noxious by at least one natural resource agency (45 out of 51 species impacted by native herbivores in the US, and 27 out of 36 species for exotic herbivores), thus greatly skewing our analysis. Nevertheless, in these analyses, invasive plants were still no less impacted by native herbivores (effect size = -0.5111, CI = -0.9932 to -0.2029, n = 45 species) than were non-invasive plants (effect size = -0.5942, CI = -1.1266 to -0.1359, n = 6 species, *P* = 0.878). Results were similar for the effects of exotic herbivores on invasive (effect size = 0.1292, CI = -0.2084 to 0.5450, n = 27 species) vs. non-invasive plants (effect size = 0.0366, CI = -0.5785 to 0.3818, n = 9 species, P = 0.802).

Table S1. Studies used in the analysis of herbivore impacts on whole plant communities.

			Effect sizes (log response ratio)				
Citation	**Study site**	**Manipulation**	**% Exotics**	**Native plant abund.**	**Exotic plant abund.**	**Native plant spp.**	**Exotic plant spp.**
S3	Wetlands, Ohio, USA	Cages (native deer, waterfowl)	-1.12	-0.46	-1.37		
S4	Open heath, Australia	Cages (native wallabies)	0.34	-0.94	-0.10	-0.51	0.15
S4	Open scrub, Australia	Cages (native wallabies)	0.07	-0.59	-0.39	-0.10	0.00
S4	Open scrub, Australia	Cages (native wallabies)	-0.41	1.50	-0.51	0.81	0.47
S4	Low open forest, Australia	Cages (native wallabies)	-2.76	1.07	-2.16	-0.29	0.22
S5	Grassland, Arizona, USA	Cages (exotic cattle)	-0.30	-0.37	-0.47	-0.05	0.00

S6	Grassland, Idaho, USA	Cages (exotic sheep)	1.02	-0.09	0.93		
S6	Grassland, Idaho, USA	Cages (exotic sheep)	-0.35	0.07	-0.29		
S7	Old field, Virginia, USA	Cages (native deer)	0.02	-0.19	-0.05	0.00	0.00
S7	Old field, Virginia, USA	Cages (native rabbits)	-0.05	0.04	-0.04	0.07	0.00
S7	Old field, Virginia, USA	Cages (native rodents)	0.19	0.00	0.16	-0.13	0.00
S7	Old field, Virginia, USA	Cages (native rabbits, rodents)	0.14	0.04	0.12	-0.06	0.00
S7	Old field, Virginia, USA	Cages (native deer, rabbits, rodents)	0.16	-0.16	0.08	-0.06	0.00
S8	Desert grassland and oak woodland, Arizona, USA	Cages (exotic cattle)	0.67	-0.31	0.47	-0.04	0.69
S9	Dry-forest, Hawaii, USA	Cages (exotic cattle, goats)	0.30	-1.28	-0.01		
S10	Old field, New Jersey, USA	Cages (native deer, rabbits, voles)	-0.10	-0.14	-0.31	0.06	0.10
S10	Old field, New Jersey, USA	Cages (native deer, rabbits, voles)	-0.82	0.29	-0.93	0.06	-0.18
S11	Grassland, Argentina	Cages (exotic cattle)	3.27			0.28	0.99
S11	Grassland, Argentina	Cages (exotic cattle)	2.36				
S12	Grassland, South Dakota, Wyoming, Montana, USA	Cages (native bison, elk, deer, antelope)	-0.14	0.70	-0.03	0.88	0.00
S13	Scrub-shrub, California, USA	Herbivore eradication (exotic rabbits)	0.60	-0.47	1.02		
S14	Grassland, Alberta, Canada	Cages (exotic unidentified livestock)	2.13	-2.09	0.29	-0.25	0.34
S14	Grassland, Alberta, Canada	Cages (exotic unidentified livestock)	1.12	-0.02	0.99	0.00	0.22
S15	Salt marsh, Louisiana, USA	Cages (exotic nutria)	3.00	-0.72	4.79	0.18	0.69
S15	Salt marsh, Louisiana, USA	Cages (exotic nutria)	-3.73	-0.23	-7.29	-0.41	-0.69
S15	Salt marsh, Louisiana, USA	Cages (native waterfowl)	-3.73	0.16	-7.29	0.29	0.00
S16	Grassland, Argentina	Cages (exotic cattle)	2.82	-0.65	2.42		
S17	Grassland, South Dakota, USA	Cages (native bison)	-0.44	0.05	-0.63		
S17	Grassland, South Dakota, USA	Cages (native bison)	0.29	0.02	0.37		
S18	Old field, New Zealand	Insecticide (exotic insect)	0.40	-1.17	0.07		
S19	Grassland, California, USA	Cages (exotic cattle)	0.11	-0.18	0.20	-0.14	0.26
S20	Scrub-shrub, Chile	Cages (exotic cattle, horses, goats)	1.30	-1.29	0.82		
S20	Scrub-shrub, Chile	Cages (exotic cattle, horses, goats)	1.07	-1.12	0.45		

S21	Oak savanna, California, USA	Cages (exotic cattle)	0.34				0.25
S21	Oak savanna, California, USA	Cages (exotic horses)	0.24				0.34
S22	Grassland, California, USA	Cages (exotic cattle)	0.16	-0.06	0.32	-0.65	0.15
S23	Grassland, Idaho, USA	Cages (exotic sheep)	1.53	-0.30	1.59		
S23	Grassland, Idaho, USA	Cages (exotic sheep)	1.06	0.06	1.45		
S23	Grassland, Idaho, USA	Cages (exotic sheep)	0.41	-0.12	0.49		
S23	Grassland, Idaho, USA	Cages (exotic sheep)	-0.13	0.12	-0.10		
S24	Grassland, South Georgia, Sub-Antarctic	Cages (exotic reindeer)	2.12	-3.77	1.98	-0.69	0.00
S25	Grassland, New Zealand	Cages (exotic sheep)	-0.30	0.84	-0.38	0.62	0.35
S26	Lake benthos, Alabama, USA	Cages (exotic grass carp)	0.82	-2.88	-1.21	-0.69	0.00
S26	Lake benthos, Alabama, USA	Cages (exotic grass carp)	-0.53	-0.28	-0.85	0.00	0.00
S27	Lake benthos, UK	Cages (native waterfowl)	0.17	-0.16	0.69	0.00	0.00
S27	Lake benthos, UK	Cages (native waterfowl)	-2.31	-0.51	-0.10	-0.41	-0.69
S28	Riparian meadow, Colorado, USA	Cages (exotic cattle)	0.72	-0.19	0.90	-0.19	-0.41
S28	Riparian meadow, Colorado, USA	Cages (exotic cattle)	-0.79	0.32	-0.81	-0.02	0.18
S29	Grassland, New Zealand	Cages (exotic sheep, deer, chamois)	1.35	-1.18	1.50		
S29	Grassland, New Zealand	Cages (exotic sheep, deer, chamois)	0.48	-0.58	0.22		
S29	Grassland, New Zealand	Cages (exotic sheep, deer, chamois)	0.31	-0.63	0.50		
S29	Grassland, New Zealand	Cages (exotic sheep, deer, chamois)	0.28	-0.84	0.29		
S30	Grassland, Argentina	Cages (exotic cattle)	-0.34	0.04	-0.33	0.22	0.79
S31	Riparian meadows, Colorado, USA	Cages (exotic cattle)	1.21	-0.71	1.00	0.00	0.00
S32	Lake benthos, Minnesota, USA	Cages (native snails)	-2.16	-0.31	-3.97	-0.92	-0.69
S33	Grassland, Montana, USA	Cages (native elk)	0.06	0.35	0.61	0.00	0.00
S34	Grassland, Montana, USA	Cages (exotic cattle)	-0.05	0.13	0.00	-0.02	0.00
S34	Grassland, Wyoming, USA	Cages (exotic cattle)	-0.13	0.07	-0.14	0.04	0.09
S34	Grassland, Colorado, USA	Cages (exotic cattle)	-0.95	0.01	-0.66	0.17	-0.13
S34	Grassland, Colorado, USA	Cages (exotic sheep)	-0.17	0.35	0.08	0.24	0.00

S34	Grassland, Montana, USA	Cages (exotic horses)	0.99	0.18	1.11	-0.08	0.25
S34	Grassland, South Dakota, USA	Cages (native bison, elk, prairie dog)	0.15	0.00	0.24	0.11	0.17
S34	Grassland, Wyoming, USA	Cages (native bison, elk)	0.11	-0.29	0.00	0.19	0.15
S34	Grassland, Colorado, USA	Cages (native elk, deer)	-0.28	-0.09	-0.45	0.32	0.00
S35	Lake benthos, Holland	Cages (native waterfowl)	-2.33	0.85	-1.70	0.00	0.00
S35	Lake benthos, Holland	Cages (native waterfowl, fish)	-3.90	4.56	-3.92	1.10	0.00
S36	Grassland, New Zealand	Cages (exotic sheep, rabbits)	-0.03	0.07	-0.03	-0.14	0.18
S37	Forest, Australia	Cages (exotic sheep)	2.74	-0.69	3.02		

Table S2. Studies used in the analysis of herbivore impacts on exotic plant species.

Citation	Study site	Manipulation	Measurement	Exotic plant species	Effect size (log response ratio)
S38	Grassland, Washington, USA	Molluscicide (exotic slugs)	Plant density	*Senecio vulgaris*	-0.28
S38	Grassland, Washington, USA	Molluscicide (exotic slugs)	Plant density	*Senecio vulgaris*	-0.45
S38	Grassland, Washington, USA	Molluscicide (exotic slugs)	Plant density	*Senecio vulgaris*	-0.47
S38	Grassland, Washington, USA	Molluscicide (exotic slugs)	Plant density	*Senecio vulgaris*	-1.23
S39	Grassland, North Dakota, USA	Cages (exotic cattle)	Plant cover	*Poa pratensis*	-0.08
S39	Grassland, North Dakota, USA	Cages (exotic cattle)	Plant cover	*Poa pratensis*	-0.14
S39	Grassland, North Dakota, USA	Cages (exotic cattle)	Plant density	*Taraxacum officinale*	-0.13
S39	Grassland, North Dakota, USA	Cages (exotic cattle)	Plant density	*Taraxacum officinale*	-0.98
S40	Coastland, California, USA	Cages (native elk, deer, gophers)	Plant density	*Cytisus scoparius*	-0.26
S41	Old field, New York, USA	Insecticide (exotic insects)	Biomass/plot	*Agrostis stolonifera*	-0.51
S41	Old field, New York, USA	Insecticide (exotic insects)	Biomass/plot	*Chrysanthemum leucanthemum*	0.06
S41	Old field, New York, USA	Insecticide (exotic insects)	Biomass/plot	*Daucus carota*	0.25
S41	Old field, New York, USA	Insecticide (exotic insects)	Biomass/plot	*Phleum pratense*	0.65
S41	Old field, New York, USA	Insecticide (exotic insects)	Plant biomass	*Plantago major*	-0.22

S41	Old field, New York, USA	Insecticide (exotic insects)	Plant biomass	*Rumex crispus*	-0.16
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	0.00
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-0.28
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-1.48
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-2.99
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-3.42
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-3.83
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-3.93
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-4.13
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-4.17
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-4.33
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-4.34
S42	Coastland, California, USA	Cages (native deer, rabbits, gophers)	Plant survival	*Carpobrotus edulis*	-4.53
S43	Coastland, California, USA	Cages (native deer, rabbits)	Seedling emergence	*Carpobrotus edulis*	0.12
S43	Coastland, California, USA	Cages (native deer, rabbits)	Seedling emergence	*Carpobrotus edulis*	-0.45
S43	Coastland, California, USA	Cages (native deer, rabbits)	Seedling emergence	*Carpobrotus edulis*	-0.79
S43	Coastland, California, USA	Cages (native deer, rabbits)	Seedling emergence	*Carpobrotus edulis*	-0.89
S44	Forest, Hawaii, USA	Insecticide (exotic insects)	Plant survival	*Clidemia hirta*	0.01
S44	Forest, Hawaii, USA	Insecticide (exotic insects)	Plant survival	*Clidemia hirta*	-0.01
S45	Lake benthos, Texas, USA	Cages (native waterfowl)	Biomass/plot	*Hydrilla verticillata*	-0.86
S46	Grassland, Texas, USA	Cages (exotic cattle)	Seedling dry mass	*Bothriochloa ischaemum*	-0.85
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-1.56
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-0.14
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-0.21
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	0.18
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-0.43
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-0.04
S46	Grassland, Texas, USA	Cages (exotic cattle)	Plant biomass	*Bothriochloa ischaemum*	-0.01

S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Adenanthera pavonia*	-0.17
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Adenanthera pavonia*	-0.46
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Clausena excavata*	-0.15
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Clausena excavata*	-0.50
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Leucaena leucocephala*	-0.40
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Leucaena leucocephala*	-1.79
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Muntingia calabura*	0.00
S47	Rainforest, Christmas Island	Cages (native land crabs)	Plant survival	*Muntingia calabura*	0.00
S48	Grassland, Michigan, USA	Insecticide (native insects)	Plant survival	*Hypericum perforatum*	0.12
S48	Grassland, Michigan, USA	Insecticide (native insects)	Plant survival	*Hypericum perforatum*	-0.34
S48	Grassland, Michigan, USA	Insecticide (native insects)	Plant survival	*Hypericum perforatum*	-0.44
S49	Desert, Arizona, USA	Cages (exotic cattle)	Plant density	*Mollugo cerviana*	-0.32
S50	Grassland, Missouri, USA	Cages (exotic cattle)	Plant cover	*Bromus commutatus*	2.92
S50	Grassland, Missouri, USA	Cages (exotic cattle)	Plant cover	*Cerastium fontanum*	0.98
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.04
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.06
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.07
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.09
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.24
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-0.45
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-1.14
S51	Salt marsh, Holland	Cages (native rabbits, waterfowl)	Plant survival	*Elymus athericus*	-3.44
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia jubata*	-2.17
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia jubata*	-3.58
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia jubata*	-0.04
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia jubata*	0.00
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia jubata*	-0.31
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia selloana*	-2.38

S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia selloana*	-2.66
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia selloana*	-0.63
S52	Coastland, California, USA	Cages (native deer, gophers)	Plant survival	*Cortaderia selloana*	0.00
S52	Coastland, California, USA	Cages (native rabbits)	Plant survival	*Cortaderia selloana*	-0.21
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	0.56
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	0.34
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	-0.81
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	-0.99
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	-1.07
S53	Grassland, North Dakota, USA	Cages (exotic goats)	Plant density	*Euphorbia esula*	-1.56
S54	Lake benthos, Florida, USA	Cages (exotic grass carp)	Biomass/plot	*Egeria densa*	-0.79
S55	Grassland, California, USA	Cages (native deer, rabbits, voles, grasshoppers)	Plant density	*Anthoxanthum odoratum*	-0.21
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.03
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.07
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.08
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.09
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.11
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.31
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.36
S56	Forest, Washington, Idaho, USA	Cages (native unidentified small mammals)	Plant density	*Bromus tectorum*	-0.46
S57	Wetland, Canada	Cages, insecticide (native deer, insects)	Plant survival	*Lythrum salicaria*	-0.50
S58	Grassland, California, USA	Cages (native voles)	Survival to reproduction	*Erodium botrys*	-1.64
S58	Grassland, California, USA	Cages (native voles)	Survival to reproduction	*Erodium brachycarpum*	-1.37
S59	Grassland, UK	Cages (native rabbits)	Plant survival	*Senecio inaequidens*	-2.59
S59	Grassland, UK	Cages (native rabbits)	Plant survival	*Senecio inaequidens*	-1.61
S60	Old field, South Carolina, USA	Cages (native deer)	Plant biomass	*Lonicera japonica*	0.15

S60	Old field, South Carolina, USA	Insecticide (native insects)	Plant biomass	*Lonicera japonica*	0.18
S61	Prairie, Texas, USA	Insecticide (native insects)	Plant survival	*Sapium sebiferum*	-0.69
S61	Prairie, Texas, USA	Insecticide (native insects)	Plant survival	*Sapium sebiferum*	-0.98
S61	Prairie, Texas, USA	Insecticide (native insects)	Plant survival	*Sapium sebiferum*	-3.33
S61	Prairie, Texas, USA	Insecticide (native insects)	Plant survival	*Sapium sebiferum*	-3.59
S62	Grassland, South Dakota, USA	Cages (native bison, elk, deer)	Plant cover	*Bromus japonicus*	1.01
S62	Grassland, South Dakota, USA	Cages (native bison, elk, deer)	Plant cover	*Poa pratensis*	-0.16
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	0.13
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	0.05
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	0.02
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	0.00
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	0.00
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	-0.03
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	-0.05
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza canadensis*	-0.10
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.12
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.09
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.08
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.03
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.03
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.02
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.01
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.00
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	0.00

S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	-0.01
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	-0.01
S63	Old field, France	Insecticide, molluscicide (native insects, slugs)	Plant survival	*Conyza sumatrensis*	-0.03
S64	Grassland, Arizona, USA	Cages (exotic cattle)	Plant cover	*Eragrostis lehmanniana*	-0.09
S65	Coastland, California, USA	Cages (native rabbits)	Mean survival time	*Carpobrotus edulis*	-0.14
S65	Coastland, California, USA	Cages (native rabbits)	Mean survival time	*Carpobrotus edulis*	-0.48

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