Article:

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Supporting material

Table S1. Full statistical models of plant and invertebrate responses to rainy season change. Plot identity was included as a random effect in all models, with year also included as a random effect for invertebrate responses.

Response	Rainy season change		β	SE	t*	P
Plant production	Intensification	Control	178.310	12.190	14.627	<0.0001
		$C_{(int)}$	24.790	18.540	1.337	0.208
		$Int_{(1,2)}$	-10.360	22.440	-0.462	0.653
		$Int_{(3\text{-}10)}$	60.350	17.240	3.500	0.005
	Extension	Control	178.380	18.880	9.449	<0.0001
		$C_{(ext)}$	24.450	20.780	1.177	0.261
		$Ext_{(1,2)}$	144.890	31.170	4.648	0.001
		$Ext_{(3\text{-}10)}$	152.130	26.700	5.698	<0.0001
Plant species richness	Intensification	Control	15.844	0.805	19.682	<0.0001
		$C_{(int)}$	-3.344	0.945	-3.537	0.003
		$Int_{(1,2)}$	0.156	1.354	0.115	0.910
		$Int_{(3\text{-}10)}$	0.521	1.138	0.457	0.654
	Extension	Control	14.802	1.045	14.160	<0.0001
		$C_{(ext)}$	1.865	0.892	2.091	0.061
		$Ext_{(1,2)}$	3.156	1.632	1.934	0.080
		$Ext_{(3\text{-}10)}$	-4.604	1.478	-3.114	0.010
Herbivore abundance	Intensification	Control	2.398	0.216	11.122	<0.0001
		$C_{(int)}$	0.150	0.149	1.008	0.313
		$Int_{(1,2)}$	0.055	0.168	0.328	0.743
		$Int_{(3\text{-}10)}$	0.199	0.148	1.345	0.179
	Extension	Control	2.302	0.147	15.633	<0.0001
		$C_{(ext)}$	0.745	0.116	6.419	<0.0001
		$Ext_{(1,2)}$	0.850	0.106	7.993	<0.0001
		$Ext_{(3\text{-}10)}$	0.215	0.098	2.202	0.028
Predator abundance	Intensification	Control	1.044	0.167	6.255	<0.0001
		$C_{(int)}$	-0.292	0.233	-1.251	0.211
		$Int_{(1,2)}$	0.137	0.226	0.608	0.543
		$Int_{(3\text{-}10)}$	0.230	0.144	1.601	0.109
	Extension	Control	0.898	0.169	5.317	<0.0001
		$C_{(ext)}$	0.351	0.216	1.625	0.104
		$Ext_{(1,2)}$	1.260	0.211	5.969	<0.0001
		$Ext_{(3\text{-}10)}$	0.416	0.179	2.320	0.020
Parasitoid abundance	Intensification	Control	0.261	0.175	1.490	0.136
		$C_{(int)}$	-1.156	0.507	-2.278	0.023
		$Int_{(1,2)}$	0.063	0.283	0.223	0.824
		$Int_{(3\text{-}10)}$	-0.111	0.203	-0.548	0.584
	Extension	Control	0.011	0.238	0.047	0.962
		$C_{(ext)}$	0.057	0.369	0.155	0.877

	$Ext_{(1,2)}$	0.296	0.268	1.106	0.269
	$Ext_{(3-10)}$	-0.022	0.248	-0.090	0.928

* Z values for models of herbivore, predator and parasitoid abundance. Degrees of freedom for the t test statistic were estimated using the Kenwood-Roger approximation.

Table S2. Full results of post-hoc simultaneous tests of general linear hypotheses.

Response	General linear hypothesis	Estimate	SE	Z	P
	Rainy season intensification				
Plant production	$C_{int} - C = 0$	24.790	18.540	1.337	0.526
	$Int_{1,2} - C = 0$	-10.360	22.440	-0.462	0.966
	$Int_{3\text{-}10} - C = 0$	60.350	17.240	3.500	0.003
	$Int_{1,2} - C_{int} = 0$	-35.140	26.640	-1.319	0.537
	$Int_{3\text{-}10} - C_{int} = 0$	35.560	22.440	1.585	0.375
	$Int_{3\text{-}10} - Int_{1,2} = 0$	70.700	18.540	3.814	<0.001
Plant species richness	$C_{int} - C = 0$	-3.344	0.945	-3.537	0.002
	$Int_{1,2} - C = 0$	0.156	1.354	0.115	0.999
	$Int_{3\text{-}10} - C = 0$	0.521	1.138	0.457	0.966
	$Int_{1,2} - C_{int} = 0$	3.500	1.539	2.274	0.096
	$Int_{3\text{-}10} - C_{int} = 0$	3.865	1.354	2.855	0.020
	$Int_{3\text{-}10} - Int_{1,2} = 0$	0.365	0.945	0.386	0.979
Herbivore abundance	$C_{int} - C = 0$	0.150	0.149	1.008	0.724
	$Int_{1,2} - C = 0$	0.055	0.168	0.328	0.986
	$Int_{3\text{-}10} - C = 0$	0.199	0.148	1.345	0.508
	$Int_{1,2} - C_{int} = 0$	-0.095	0.225	-0.423	0.972
	$Int_{3\text{-}10} - C_{int} = 0$	0.049	0.194	0.254	0.994
	$Int_{3\text{-}10} - Int_{1,2} = 0$	0.144	0.114	1.265	0.561
Predator abundance	$C_{int} - C = 0$	-0.292	0.233	-1.251	0.575
	$Int_{1,2} - C = 0$	0.137	0.226	0.608	0.924
	$Int_{3\text{-}10} - C = 0$	0.230	0.144	1.601	0.358
	$Int_{1,2} - C_{int} = 0$	0.429	0.316	1.359	0.505
	$Int_{3\text{-}10} - C_{int} = 0$	0.522	0.211	2.475	0.058
	$Int_{3\text{-}10} - Int_{1,2} = 0$	0.093	0.242	0.385	0.979
Parasitoid abundance	$C_{int} - C = 0$	-1.156	0.507	-2.278	0.091

	$Int_{1,2} – C = 0$	0.063	0.283	0.223	0.996
	$Int_{3\text{-}10} – C = 0$	-0.111	0.203	-0.548	0.941
	$Int_{1,2} - C_{int} = 0$	1.219	0.570	2.139	0.125
	$Int_{3\text{-}10} - C_{int} = 0$	1.044	0.489	2.137	0.126
	$Int_{3\text{-}10} - Int_{1,2} = 0$	-0.174	0.338	-0.515	0.950
	Rainy season extension				
Plant production	$C_{ext} – C = 0$	24.447	20.777	1.177	0.622
	$Ext_{1,2} – C = 0$	144.889	31.174	4.648	<0.001
	$Ext_{3\text{-}10} – C = 0$	152.135	26.698	5.698	<0.001
	$Ext_{1,2} – C_{ext} = 0$	120.442	35.083	3.433	0.003
	$Ext_{3\text{-}10} - C_{ext} = 0$	127.688	31.174	4.096	0.000
	$Ext_{3\text{-}10} – Ext_{1,2} = 0$	7.246	20.777	0.349	0.984
Plant species richness	$C_{ext} – C = 0$	1.865	0.892	2.091	0.138
	$Ext_{1,2} – C = 0$	3.156	1.632	1.934	0.192
	$Ext_{3\text{-}10} – C = 0$	-4.604	1.478	-3.114	0.009
	$Ext_{1,2} – C_{ext} = 0$	1.292	1.772	0.729	0.873
	$Ext_{3\text{-}10} - C_{ext} = 0$	-6.469	1.632	-3.964	0.000
	$Ext_{3\text{-}10} – Ext_{1,2} = 0$	-7.760	0.892	-8.703	<0.001
Herbivore abundance	$C_{ext} – C = 0$	0.745	0.116	6.419	<0.001
	$Ext_{1,2} – C = 0$	0.850	0.106	7.993	<0.001
	$Ext_{3\text{-}10} – C = 0$	0.215	0.098	2.202	0.116
	$Ext_{1,2} – C_{ext} = 0$	0.105	0.156	0.676	0.900
	$Ext_{3\text{-}10} - C_{ext} = 0$	-0.530	0.111	-4.776	<0.001
	$Ext_{3\text{-}10} – Ext_{1,2} = 0$	-0.635	0.112	-5.664	<0.001
Predator abundance	$C_{ext} – C = 0$	0.351	0.216	1.625	0.353
	$Ext_{1,2} – C = 0$	1.260	0.211	5.969	<0.001
	$Ext_{3\text{-}10} – C = 0$	0.416	0.179	2.320	0.089
	$Ext_{1,2} – C_{ext} = 0$	0.909	0.285	3.187	0.007

	$Ext_{3\text{-}10} - C_{ext} = 0$	0.065	0.214	0.303	0.990
	$Ext_{3\text{-}10} - Ext_{1,2} = 0$	-0.844	0.202	-4.182	<0.001
Parasitoid abundance	$C_{ext} - C = 0$	0.057	0.369	0.155	0.999
	$Ext_{1,2} - C = 0$	0.296	0.268	1.106	0.667
	$Ext_{3\text{-}10} - C = 0$	-0.022	0.248	-0.090	1.000
	$Ext_{1,2} - C_{ext} = 0$	0.239	0.432	0.554	0.941
	$Ext_{3\text{-}10} - C_{ext} = 0$	-0.079	0.304	-0.262	0.993
	$Ext_{3\text{-}10} - Ext_{1,2} = 0$	-0.319	0.352	-0.904	0.788

Table S3. Effect of precipitation treatment, year and their interaction on plant and invertebrate response variables. Plot identity was included as a random effect in all models, with year also included as a random effect for invertebrate responses.

Response	Model term	β	SE	t*	P
Plant production	Intercept (Control)	148.464	22.879	6.489	<0.0001
	Extension	152.671	32.355	4.719	<0.0001
	Intensification	52.950	32.355	1.637	0.108
	Year	6.328	2.838	2.230	0.030
	Extension: Year	-1.250	4.013	-0.311	0.757
	Intensification: Year	-2.128	4.013	-0.530	0.598
Plant species richness	Intercept (Control)	12.678	1.223	10.368	<0.0001
	Extension	3.744	1.729	2.165	0.036
	Intensification	2.456	1.729	1.420	0.163
	Year	0.454	0.142	3.195	0.003
	Extension: Year	-1.304	0.201	-6.487	<0.0001
	Intensification: Year	-0.243	0.201	-1.211	0.233
Herbivore abundance	Intercept (Control)	2.777	0.362	7.680	<0.0001
	Extension	0.583	0.140	4.169	<0.0001
	Intensification	-0.036	0.143	-0.252	0.801
	Year	-0.057	0.057	-1.003	0.316
	Extension: Year	-0.077	0.015	-5.000	<0.0001
	Intensification: Year	0.036	0.015	2.388	0.017
Predator abundance	Intercept (Control)	1.540	0.241	6.393	<0.0001
	Extension	0.910	0.217	4.185	<0.0001
	Intensification	0.034	0.233	0.148	0.882
	Year	-0.100	0.039	-2.564	0.010
	Extension: Year	-0.077	0.036	-2.164	0.031
	Intensification: Year	0.050	0.037	1.378	0.168

Parasitoid abundance	Intercept (Control)	1.034	0.243	4.249	<0.0001
	Extension	0.194	0.290	0.668	0.504
	Intensification	-0.342	0.305	-1.124	0.261
	Year	-0.182	0.048	-3.809	0.0001
	Extension: Year	-0.029	0.061	-0.475	0.635
	Intensification: Year	0.096	0.059	1.636	0.102

* Z values for models of herbivore, predator and parasitoid abundance. Degrees of freedom for the t test statistic were estimated using the Kenwood-Roger approximation.

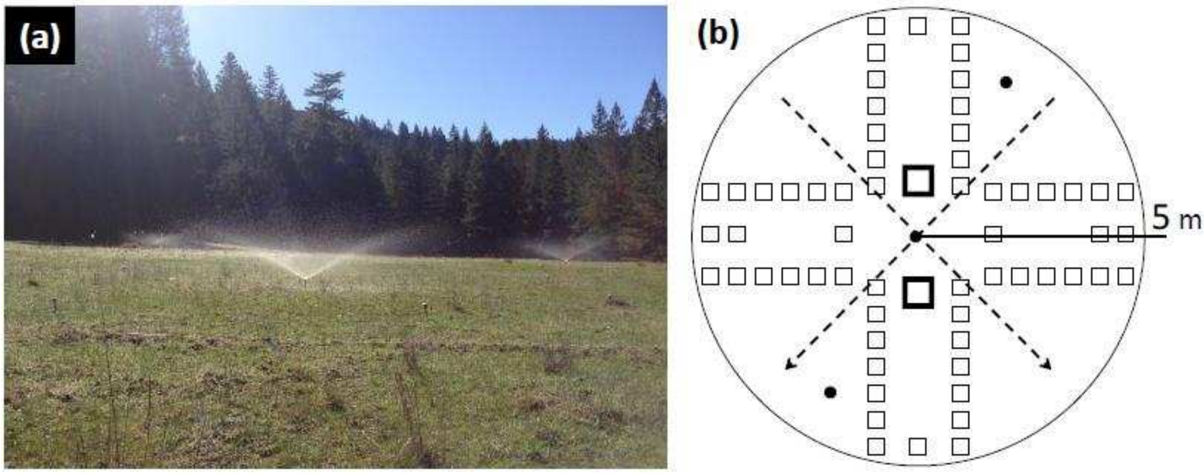

Figure S1. Experimental manipulation and sampling.
(a) Water is delivered evenly over the surface of each open 70m^2 plot from a sprinkler designed to mimic natural rainfall. (b) Plots are partitioned for simultaneous long-term measurement of multiple variables of plant and consumer response with minimal cross-interference among samples or year: plant production is measured from two pre-designated 900cm^2 subplots (small squares) three times per year, each subplot sampled once over the course of the experiment; plant diversity is measured in two central 2500cm^2 subplots (bolded large squares) across each year; foliar and flying invertebrates are sampled along perpendicular sweep-net transects (dashed arrows); ground-dwelling invertebrates are sampled in pitfall traps (filled circles).

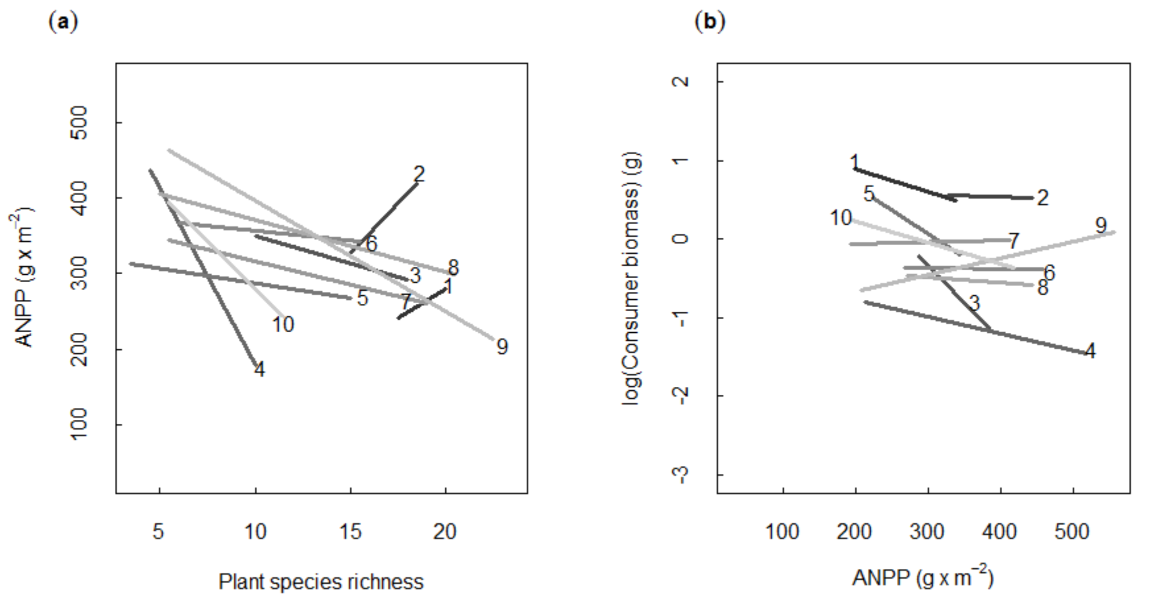

Figure S2. Relationship between (a) plant species richness and plant productivity (ANPP) and (b) between plant productivity and consumer biomass in Ext treatment plots in each year of the experiment. Lines show bivariate regression fits using data from Ext treatment plots in each year.

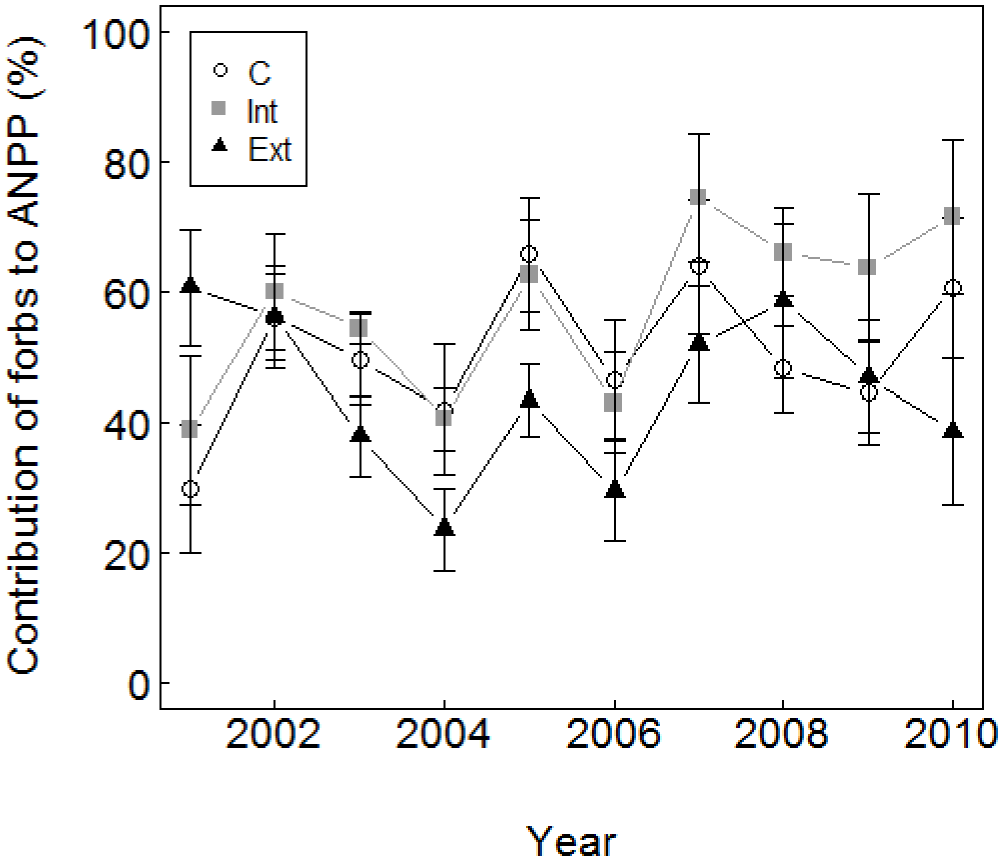

Figure S3. Change in the contribution of forbs to annual net primary productivity (ANPP) over the course of the experiment. Data from control plots are shown by open circles, Int plots by grey squares, and Ext plots by black triangles.