Table S1 Random forest model parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	Mean square errors	*ntree*	*mtry*	R^2	*n*
Fencing	Community $ANPP_f$	1119.62	896	1	0.84	220
	Community $ANPP_d$	289.30	593	2	0.71	440
	Sedge $ANPP_f$	24.11	891	1	0.78	220
	Sedge $ANPP_d$	20.67	762	2	0.87	440
	Graminoid $ANPP_f$	61.95	736	1	0.75	260
	Graminoid $ANPP_d$	17.34	795	3	0.80	440
	Forb $ANPP_f$	1198.09	787	1	0.80	240
	Forb $ANPP_d$	116.66	716	3	0.83	405
Grazing	Community AGB_f	1824.30	791	4	0.72	110
	Community AGB_d	338.70	855	1	0.78	300
	Sedge AGB_f	142.87	792	2	0.82	130
	Sedge AGB_d	40.93	877	1	0.76	260
	Graminoid AGB_f	61.75	993	1	0.81	125
	Graminoid AGB_d	6.45	925	1	0.62	220
	Forb AGB_f	784.56	871	1	0.79	110
	Forb AGB_d	60.50	919	4	0.83	190

Table S2 Generalized boosted regression parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	Tree Nos	mean train error	mean cv error	*n*
Fencing	Community $ANPP_f$	979	1709.72	2191.58	220
	Community $ANPP_d$	992	479.17	669.69	440
	Sedge $ANPP_f$	892	31.53	43.03	220
	Sedge $ANPP_d$	994	41.01	55.11	440
	Graminoid $ANPP_f$	974	75.61	114.85	260
	Graminoid $ANPP_d$	998	38.56	44.40	440
	Forb $ANPP_f$	980	1720.56	2422.9	240
	Forb $ANPP_d$	995	259.67	332.32	405
Grazing	Community AGB_f	924	1503.89	3089.97	110
	Community AGB_d	969	448.87	705.58	300
	Sedge AGB_f	934	153.28	419.91	130
	Sedge AGB_d	942	42.78	58.26	260
	Graminoid AGB_f	968	70.60	113.30	125
	Graminoid AGB_d	674	6.50	8.79	220
	Forb AGB_f	926	734.69	2064.14	110
	Forb AGB_d	964	68.18	137.78	190

Table S3 Support vector machine parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	Mean residuals	Mean decision values	Support vector Nos	*n*
Fencing	Community $ANPP_f$	19.55	–0.24	181	220
	Community $ANPP_d$	6.99	–0.22	381	440
	Sedge $ANPP_f$	1.59	–0.15	173	220
	Sedge $ANPP_d$	1.44	–0.11	336	440
	Graminoid $ANPP_f$	2.93	–0.19	203	260
	Graminoid $ANPP_d$	2.50	–0.27	359	440
	Forb $ANPP_f$	20.10	–0.26	203	240
	Forb $ANPP_d$	5.36	–0.20	291	405
Grazing	Community AGB_f	4.48	–0.05	94	110
	Community AGB_d	6.09	–0.15	231	300
	Sedge AGB_f	1.03	–0.04	104	130
	Sedge AGB_d	2.27	–0.17	196	260
	Graminoid AGB_f	2.77	–0.15	82	125
	Graminoid AGB_d	0.79	–0.19	177	220
	Forb AGB_f	3.84	–0.06	95	110
	Forb AGB_d	3.71	–0.20	151	190

Table S4 Multiple linear regression parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	Intercept	Temperature	Precipitation	Radiation	NDVI	R^2	*n*
Fencing	Community $ANPP_f$	381.51	14.78	0.37	–0.16		0.06	220
	Community $ANPP_d$	–20.65	2.49	0.04	0.01		0.03	440
	Sedge $ANPP_f$	–42.91	–0.62	0.00	0.02		0.02	220
	Sedge $ANPP_d$	97.37	–0.93	–0.01	–0.02		0.17	440
	Graminoid $ANPP_f$	–135.49	1.16	0.00	0.04		0.02	260
	Graminoid $ANPP_d$	21.34	–0.48	–0.01	0.00		0.01	440
	Forb $ANPP_f$	734.77	10.70	0.34	–0.25		0.06	240
	Forb $ANPP_d$	–168.99	3.49	0.05	0.04		0.14	405
Grazing	Community AGB_f	–158.43	–1.50	0.48	0.05	72.34	0.12	110
	Community AGB_d	–317.53	3.21	0.00	0.09	99.45	0.17	300
	Sedge AGB_f	1173.72	1.88	0.10	–0.35	103.57	0.38	130
	Sedge AGB_d	–66.52	1.36	0.01	0.01	47.86	0.32	260
	Graminoid AGB_f	–53.45	–0.11	–0.02	0.02	–4.71	0.02	125
	Graminoid AGB_d	58.14	–0.43	–0.01	–0.01	–14.53	0.25	220
	Forb AGB_f	–1134.42	–8.65	0.19	0.35	129.60	0.14	110
	Forb AGB_d	34.05	1.31	–0.02	–0.01	–0.83	0.07	190

Table S5 Recursive regression tree parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	R^2	*n*
Fencing	Community $ANPP_f$	0.31	220
	Community $ANPP_d$	0.54	440
	Sedge $ANPP_f$	0.38	220
	Sedge $ANPP_d$	0.31	440
	Graminoid $ANPP_f$	0.34	260
	Graminoid $ANPP_d$	0.35	440
	Forb $ANPP_f$	0.42	240
	Forb $ANPP_d$	0.34	405
Grazing	Community AGB_f	0.54	110
	Community AGB_d	0.45	300
	Sedge AGB_f	0.69	130
	Sedge AGB_d	0.73	260
	Graminoid AGB_f	0.19	125
	Graminoid AGB_d	0.40	220
	Forb AGB_f	0.58	110
	Forb AGB_d	0.64	190

Table S6 Artificial neural network (ANNM), generalized linear regression (GLRM), conditional inference tree (CITM) and eXtreme gradient boosting (eXGBM) parameters of aboveground net primary production (ANPP) under fencing conditions, and aboveground biomass (AGB) under free-grazing conditions.

Conditions	Variable	ANNM	GLRM	CITM	eXGBM	*n*
Fencing	Community $ANPP_f$	4709.71	4709.71	4709.31	4432.31	220
	Community $ANPP_d$	3476.18	3554.50	3554.50	3527.61	440
	Sedge $ANPP_f$	597.11	604.35	604.35	434.66	220
	Sedge $ANPP_d$	1123.70	1254.27	933.23	752.79	440
	Graminoid $ANPP_f$	1046.26	1067.53	1067.53	552.66	260
	Graminoid $ANPP_d$	1016.93	1022.49	1022.49	682.59	440
	Forb $ANPP_f$	4328.94	4328.94	4328.94	3656.63	240
	Forb $ANPP_d$	2153.86	2322.54	1918.60	1687.08	405
Grazing	Community AGB_f	2588.92	2749.97	2568.94	2782.76	110
	Community AGB_d	2943.09	3156.86	2296.00	2959.05	300
	Sedge AGB_f	894.75	929.77	715.21	892.30	130
	Sedge AGB_d	724.13	788.97	590.28	634.02	260
	Graminoid AGB_f	439.65	456.14	456.14	337.31	125
	Graminoid AGB_d	205.84	233.16	195.78	177.84	220
	Forb AGB_f	1648.16	1774.34	1612.67	1498.79	110
	Forb AGB_d	925.81	937.33	896.00	655.89	190