

Supplemental Data from APEX model

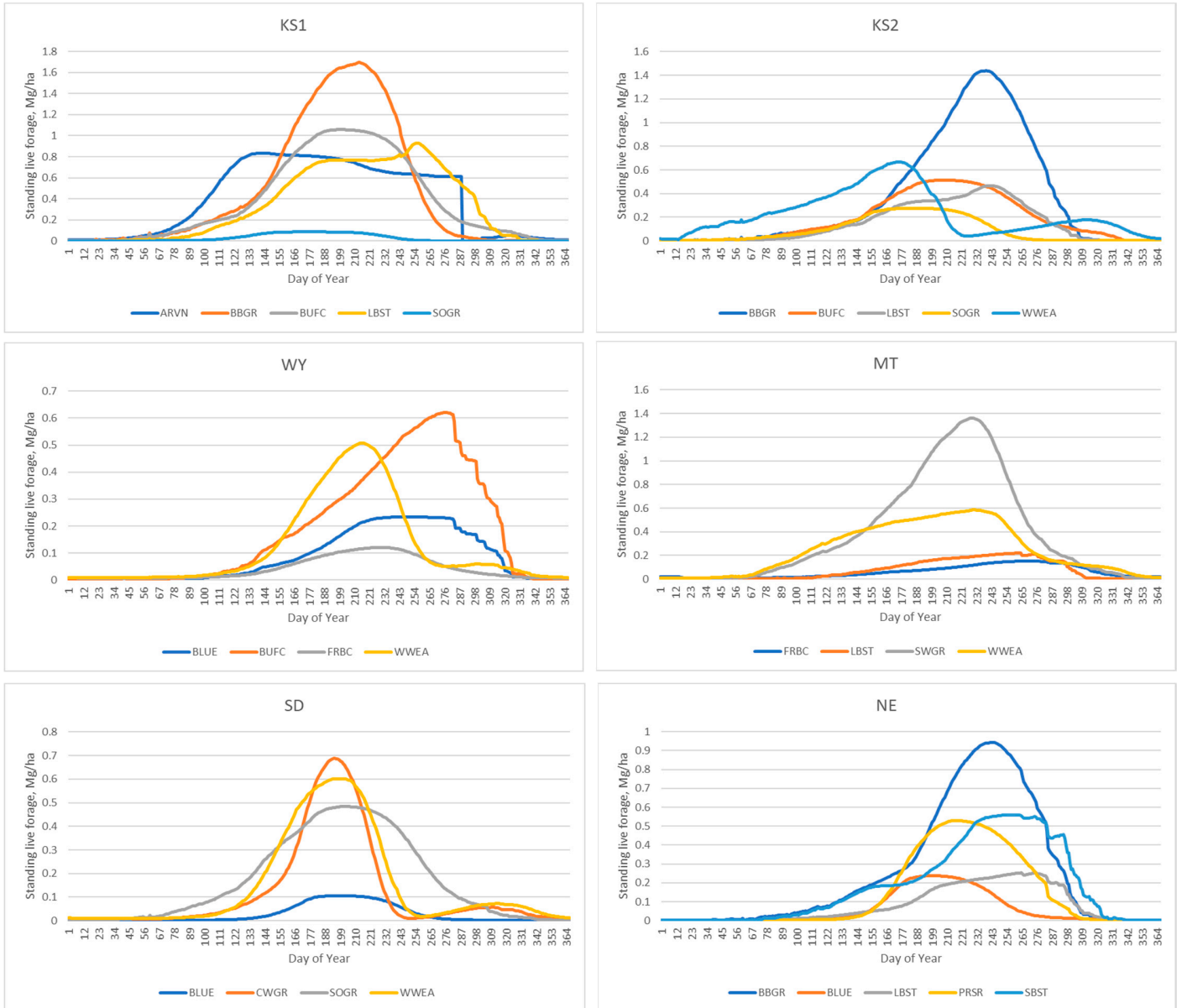


Figure S1. Daily standing live forage for each forage species at each study site for the no management scenario. KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE. ARVN = Japanese brome (*Bromus japonicus*); BBGR = big bluestem (*Andropogon gerardii*); BLUE = blue grama

(*Bouteloua gracilis*); BUFC = buffalograss (*Bouteloua dactyloides*); CWGR = crested wheatgrass (*Agropyron cristatum*); FRBC = generic forb; LBST = little bluestem (*Schizachyrium scoparium*); PRSR = prairie sandreed (*Calamovilfa longifolia*); SBST = sand bluestem (*Andropogon hallii*); SOGR = sideoats grama (*Bouteloua curtipendula*); SWGR = slender wheatgrass (*Elymus trachycaulus*); WWEA = western wheatgrass (*Pascopyrum smithii*)

Table S1. Soil loss from water and wind among rangeland management scenarios at each site from the APEX model

Item	No Mgmt	No Burn						Spring Burn					
		Continuous			Rotational			Continuous			Rotational		
		Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Water erosion, t/ha/yr													
KS1	5.42	5.73	6.02	7.36	6.50	6.81	7.94	8.44	8.61	10.29	9.49	9.82	11.27
KS2	0.78	1.07	1.26	1.83	1.30	1.45	1.89	1.08	1.28	1.83	1.30	1.47	3.55
WY	1.83	1.90	2.12	2.49	1.92	1.99	2.16	3.32	3.52	3.62	3.55	3.64	2.15
MT	0.56	0.48	0.48	0.49	0.53	0.52	0.51	1.12	1.11	1.12	1.21	1.19	1.18
SD	1.49	1.65	1.58	1.68	1.80	1.75	1.80	2.32	2.34	2.42	2.61	2.60	2.66
NE	0.05	0.05	0.05	0.05	0.09	0.09	0.09	0.12	0.12	0.12	0.15	0.15	0.14
Wind erosion, t/ha/yr													
KS1	4.67	4.28	4.16	4.17	2.72	2.74	2.76	4.24	4.20	3.98	2.77	2.78	2.81
KS2	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17
WY	0.58	0.59	0.59	0.59	0.32	0.32	0.32	0.59	0.59	0.59	0.32	0.32	0.32
MT	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.12	0.04	0.04	0.07	0.06	0.07
SD	0.04	0.04	0.04	0.04	0.07	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.07
NE	0.34	0.34	0.35	0.35	0.24	0.24	0.24	0.35	0.35	0.35	0.25	0.25	0.25

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S2. Nitrogen losses among rangeland management scenarios at each site from the APEX model

Item	No Burn								Spring Burn					
	No Mgmt	Continuous			Rotational				Continuous			Rotational		
		Low	Mod	High	Low	Mod	High		Low	Mod	High	Low	Mod	High
Surface runoff, kg/ha/yr														
KS1	3.5	4.7	5.3	6.6	4.9	5.4	7.1		3.5	4.1	5.7	3.7	4.3	6.1
KS2	1.0	1.3	1.4	1.8	1.3	1.5	1.9		1.3	1.4	1.8	1.3	1.5	1.2
WY	0.4	0.5	0.7	1.2	0.5	0.9	1.3		0.4	0.5	0.7	0.4	0.6	1.3
MT	0.4	0.5	0.6	0.7	0.5	0.6	0.7		0.5	0.5	0.6	0.4	0.5	0.7
SD	0.4	0.6	1.0	1.4	0.6	0.9	1.4		0.8	1.0	1.4	0.7	1.0	1.5
NE	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1
Percolation, kg/ha/yr														
KS1	0.6	0.8	0.8	0.9	0.8	0.8	0.9		0.7	0.6	0.7	0.7	0.7	0.8
KS2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
WY	0.2	0.3	1.1	1.9	0.3	1.0	1.6		0.1	0.4	1.1	0.1	0.5	1.7
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
SD	0.4	0.4	0.4	0.4	0.4	0.4	0.4		0.4	0.4	0.4	0.4	0.4	0.4
NE	0.8	0.9	0.9	1.0	0.9	0.9	1.0		0.8	0.8	0.9	0.8	0.8	0.9
Sediment, kg/ha/yr														
KS1	7.7	9.7	10.9	14.7	11.8	12.9	16.5		11.9	12.9	17.0	14.5	15.7	19.6
KS2	0.7	1.5	1.9	2.9	1.7	2.1	3.0		1.5	1.9	2.9	1.7	2.1	4.4
WY	0.3	0.5	0.8	1.2	0.5	1.0	1.4		0.5	0.6	0.9	0.5	0.8	1.4
MT	0.2	0.8	0.9	1.2	0.8	0.9	1.2		0.8	1.0	1.3	0.9	1.0	1.2
SD	0.3	0.8	1.1	1.4	0.8	1.1	1.5		0.9	1.2	1.6	0.9	1.2	1.6
NE	0.0	0.2	0.3	0.5	0.2	0.2	0.5		0.3	0.4	0.7	0.2	0.4	0.6
Wind, kg/ha/yr														
KS1	8.1	7.4	7.2	7.0	4.8	4.8	4.7		6.7	6.6	6.3	4.5	4.5	4.4
KS2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
WY	0.1	0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Volatilization, kg/ha/yr														
KS1	3.4	4.2	4.3	4.5	3.8	3.8	3.6		3.7	3.9	4.3	3.3	3.3	3.2
KS2	2.3	2.8	2.9	3.1	2.4	2.4	2.3		2.8	2.9	3.1	2.4	2.4	1.8
WY	0.5	0.8	1.1	1.4	0.7	0.7	0.7		0.5	0.7	0.9	0.5	0.4	0.7
MT	0.6	1.1	1.2	1.4	1.0	0.9	1.0		0.9	1.0	1.1	0.8	0.8	0.8
SD	0.3	0.6	0.9	1.1	0.5	0.8	0.8		0.9	1.0	1.1	0.7	0.9	0.9
NE	0.7	1.1	1.2	1.5	1.0	1.1	1.2		0.6	0.7	0.9	0.6	0.6	0.7

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Table S3. Phosphorus losses among rangeland management scenarios at each site from the APEX model

Item	No Mgmt	No Burn						Spring Burn					
		Continuous			Rotational			Continuous			Rotational		
		Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Surface runoff, kg/ha/yr													
KS1	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4
KS2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
WY	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percolation, kg/ha/yr													
KS1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
KS2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WY	1.1	1.3	1.4	1.5	1.2	1.3	1.3	1.4	1.6	1.7	1.3	1.4	1.3
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NE	5.6	5.6	5.7	6.1	5.7	5.8	6.0	5.7	5.8	6.3	5.7	5.8	6.2
Sediment, kg/ha/yr													
KS1	1.1	2.7	3.6	5.9	3.0	3.8	6.0	3.1	3.9	6.3	3.5	4.3	6.6
KS2	0.1	1.4	1.8	2.9	1.4	1.8	2.9	1.4	1.8	2.9	1.4	1.9	2.8
WY	0.1	0.4	1.2	2.0	0.4	1.4	2.3	0.4	0.7	1.4	0.4	1.1	2.3
MT	0.0	1.2	1.4	1.8	1.2	1.5	1.9	0.7	0.9	1.1	0.8	0.9	1.2
SD	0.1	0.6	1.0	1.5	0.7	1.0	1.5	0.6	0.8	1.3	0.6	0.9	1.3
NE	0.0	0.2	0.2	0.5	0.2	0.2	0.4	0.2	0.2	0.4	0.1	0.2	0.3
Wind, kg/ha/yr													
KS1	0.7	0.6	0.6	0.6	0.2	0.2	0.2	0.6	0.6	0.5	0.2	0.2	0.2
KS2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Table S4. Change in soil organic carbon pools among rangeland management scenarios at each site from the APEX model

Item	No Burn							Spring Burn					
	No Mgmt	Continuous			Rotational			Continuous			Rotational		
		Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Slow humus, Mg/ha/yr													
KS1	-6.6	-6.5	-6.7	-8.1	-6.5	-6.7	-7.8	-12.8	-12.8	-13.8	-13.1	-13.0	-13.8
KS2	+6.5	+7.0	+7.3	+7.2	+7.1	+7.2	+7.3	+6.9	+7.2	+7.2	+7.1	+7.1	+0.7
WY	-9.0	-8.8	-8.2	-8.4	-8.6	-7.7	-7.7	-11.0	-10.8	-10.6	-10.9	-10.5	-7.7
MT	-0.8	0.8	1.2	1.8	0.6	1.0	1.7	-4.5	-4.2	-3.8	-4.6	-4.3	-3.9
SD	-21.5	-23.9	-28.5	-28.7	-20.3	-25.5	-28.0	-31.5	-31.8	-32.0	-25.5	-31.3	-31.4
NE	-22.9	-21.1	-20.3	-18.4	-21.1	-20.4	-18.4	-24.0	-23.3	-21.9	-24.1	-23.4	-21.5
Passive humus, Mg/ha/yr													
KS1	+1.0	+1.1	+1.0	+0.8	+1.1	+1.0	+0.8	+0.5	+0.5	+0.4	+0.5	+0.4	+0.3
KS2	+0.6	+0.6	+0.6	+0.6	+0.6	+0.6	+0.5	+0.6	+0.6	+0.6	+0.6	+0.6	+0.3
WY	+0.7	+0.7	+0.7	+0.7	+0.7	+0.7	+0.7	+0.6	+0.7	+0.7	+0.6	+0.6	+0.7
MT	+0.7	+0.8	+0.8	+0.8	+0.7	+0.8	+0.8	+0.6	+0.6	+0.6	+0.6	+0.6	+0.6
SD	+2.0	+2.2	+2.6	+2.7	+1.9	+2.4	+2.6	+2.4	+2.4	+2.4	+1.9	+2.3	+2.4
NE	+1.5	+1.5	+1.5	+1.6	+1.5	+1.5	+1.6	+1.5	+1.5	+1.5	+1.5	+1.5	+1.5
Plant litter, Mg/ha/yr													
KS1	+3.0	+2.8	+2.7	+2.0	+2.9	+2.7	+2.1	+2.0	+1.9	+1.5	+2.1	+1.9	+1.6
KS2	+3.3	+3.0	+2.9	+2.7	+3.0	+2.9	+2.5	+3.0	+2.8	+2.6	+3.0	+2.9	+0.9
WY	+0.6	+0.7	+0.6	+0.2	+0.7	+0.7	+0.6	-0.2	-0.3	-0.4	-0.2	-0.3	+0.6
MT	+0.4	+1.0	+1.2	+1.3	+1.0	+1.1	+1.1	-0.3	-0.3	-0.2	-0.4	-0.4	-0.4
SD	+1.3	+1.4	+1.4	+1.3	+1.2	+1.3	+1.2	+0.6	+0.6	+0.5	+0.5	+0.5	+0.4
NE	+3.8	+3.1	+3.1	+2.8	+3.1	+3.0	+2.8	+0.6	+0.6	+0.6	+0.5	+0.5	+0.5
Biomass, Mg/ha/yr													
KS1	+3.1	+2.6	+2.4	+1.7	+2.7	+2.4	+1.8	+0.9	+0.8	+0.5	+0.9	+0.8	+0.4
KS2	+5.4	+4.5	+4.2	+3.6	+4.6	+4.3	+3.7	+4.5	+4.2	+3.6	+4.6	+4.3	+0.8
WY	-1.9	-1.9	-2.0	-2.2	-1.9	-1.9	-2.0	-2.5	-2.6	-2.6	-2.6	-2.6	-2.0
MT	+0.9	+0.9	+0.8	+0.7	+0.8	+0.8	+0.8	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
SD	-2.6	-2.7	-2.8	-3.0	-2.3	-2.7	-2.9	-3.4	-3.5	-3.5	-2.9	-3.5	-3.5
NE	-1.5	-1.4	-1.4	-1.6	-1.4	-1.4	-1.6	-2.6	-2.6	-2.6	-2.6	-2.6	-2.6

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Supplemental Data from IFSM model

Table S5. Blue water uses among rangeland management scenarios for each site from IFSM

Item	No Burn								Spring Burn				
	Continuous				Rotational				Continuous		Rotational		
	No Mgmt	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Evapotranspiration, Mg/ha													
KS1	8529	8516	8499	8487	8520	8509	8491	8502	8494	8485	8511	8502	8490
KS2	5015	4804	4763	4733	4862	4795	4766	4798	4756	4726	4852	4789	4748
WY	5174	5072	5163	5351	5087	5295	5356	5069	5155	5349	5081	5282	5356
MT	3883	3855	3878	3930	3887	3924	4027	3787	3798	3821	3805	3820	3885
SD	4730	4709	4714	4763	4724	4743	4787	4709	4714	4729	4712	4719	4743
NE	5805	5726	5731	5739	5735	5760	5710	5687	5686	5738	5712	5710	5710
Drinking, Mg													
KS1	-	2104	3187	6037	2091	3149	5979	2123	3199	6188	2108	3177	6030
KS2	-	566	812	1481	566	806	1444	574	819	1561	570	815	1490
WY	-	274	1063	1628	273	1070	1624	279	1070	1641	275	1080	1639
MT	-	2426	2898	3868	2277	2850	3806	3410	4014	5249	2944	3670	4846
SD	-	1224	1943	2806	1192	1887	2841	1249	1983	2955	1230	1946	2953
NE	-	1408	2101	4237	1412	2115	4171	1520	2282	4067	1438	2171	4085
Purchased feed production, Mg													
KS1	-	7523	11,452	22,707	6953	10,436	19,973	7948	11,832	32,444	7523	11,081	22,360
KS2	-	717	981	2441	745	993	1645	852	1167	2400	883	1187	4234
WY	-	1109	4014	8204	668	2298	9403	2116	9780	6202	1787	5691	11,787
MT	-	106,522	132,301	176,227	83,219	104,078	138,934	212,468	254,439	335,822	171,494	212,419	280,630
SD	-	50,661	79,980	95,960	40,677	64,365	97,443	51,085	80,486	122,260	51,317	80,532	121,187
NE	-	39,824	59,317	124,321	39,756	59,070	122,787	69,356	105,003	150,292	58,593	89,104	125,690

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Table S6. Reactive nitrogen losses among rangeland management scenarios for each site from IFSM

Item	No Burn						Spring Burn						
	Continuous			Rotational			Continuous			Rotational			
	No Mgmt	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Ammonia, kg													
KS1	174	1518	2160	4036	1488	2162	3987	1489	2157	4477	1505	2176	4124
KS2	68	430	580	986	442	595	1008	436	588	1101	456	623	960
WY	222	266	784	1207	293	842	1252	270	681	1125	296	737	1294
MT	475	2336	2735	3503	2310	2743	3429	2711	2944	3661	2363	2780	3495
SD	136	886	1377	2110	926	1429	2150	875	1374	2083	892	1381	2096
NE	245	1051	1448	2790	1040	1455	2765	1041	1438	2645	1023	1440	2719
De/nitrification, kg													
KS1	725	881	971	1283	879	963	1290	885	972	1679	882	967	1316
KS2	62	101	127	248	104	132	265	103	130	288	105	135	292
WY	237	167	335	434	185	335	460	197	333	423	222	334	466
MT	338	853	915	1010	787	845	898	1018	1077	1182	868	929	987
SD	77	236	397	725	278	463	803	219	399	724	256	437	794
NE	757	1030	1170	1958	1030	1197	2144	1000	1147	1969	994	1175	2161
Fuel combustion, kg													
KS1	-	46	46	46	46	46	46	46	46	51	46	46	46
KS2	-	25	25	26	25	25	25	25	25	26	25	25	26
WY	-	25	25	26	25	25	26	25	25	26	25	26	26
MT	-	83	84	85	82	83	84	86	88	90	85	86	88
SD	-	74	74	75	73	74	75	74	74	76	74	74	76
NE	-	75	76	78	75	76	77	76	78	79	76	77	78
Production of inputs, kg													
KS1	-	69	104	202	65	97	185	72	107	838	69	102	199
KS2	-	13	18	65	13	17	44	14	19	159	14	19	64
WY	-	9	41	141	7	41	140	13	67	201	12	66	150
MT	-	132	165	220	126	169	241	240	266	376	220	282	386
SD	-	154	237	361	169	260	387	165	254	367	161	244	357
NE	-	201	291	567	200	294	579	183	266	514	187	271	550

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S7. Energy uses among rangeland management scenarios for each site from IFSM

Item	No Burn								Spring Burn							
	Continuous				Rotational				Continuous				Rotational			
	No Mgmt	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High			
Feed production, MJ/ha																
KS1	-	192	192	192	192	192	192	192	192	192	192	192	192			
KS2	-	430	430	430	430	430	430	430	430	430	430	430	430			
WY	-	431	431	431	431	431	431	431	441	431	431	431	431			
MT	-	224	224	224	224	224	224	224	224	224	224	224	224			
SD	-	350	350	350	350	350	350	350	350	350	350	350	350			
NE	-	337	337	337	337	337	337	337	337	337	337	337	337			
Animal feeding, MJ/ha																
KS1	-	0	0	0	0	0	0	0	0	18	0	0	0			
KS2	-	0	0	4	0	0	2	0	0	15	0	0	3			
WY	-	0	2	11	0	3	11	0	2	20	0	4	10			
MT	-	10	12	16	8	9	12	19	24	31	15	19	25			
SD	-	7	11	13	5	8	13	7	11	17	7	11	17			
NE	-	4	7	14	4	7	14	10	15	19	8	12	15			
Animal housing, MJ/ha																
KS1	-	0	0	0	0	0	0	0	0	0	0	0	0			
KS2	-	0	0	0	0	0	0	0	0	0	0	0	0			
WY	-	0	0	0	0	0	0	0	0	0	0	0	0			
MT	-	6	8	11	6	8	11	6	8	11	6	8	11			
SD	-	4	7	10	4	7	10	4	7	10	4	7	10			
NE	-	5	7	14	5	7	14	5	7	14	5	7	14			
Production of inputs, MJ/ha																
KS1	-	146	206	366	142	195	345	152	209	1288	147	202	362			
KS2	-	174	216	573	174	214	457	182	226	1185	180	222	541			
WY	-	119	364	1077	114	396	1118	129	430	1347	126	482	1182			
MT	-	586	703	913	492	601	784	1157	1234	1617	924	1132	891			
SD	-	559	835	1082	511	759	1101	569	850	1233	566	841	1224			
NE	-	508	722	1394	508	725	1396	657	953	1481	599	866	1385			

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S8. Greenhouse gas emissions among rangeland management scenarios for each site from IFSM

Item	No Mgmt	No Burn						Spring Burn					
		Continuous			Rotational			Continuous			Rotational		
		Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Animal emissions, kg CO2e/ha													
KS1	-	355	539	1038	348	527	1001	358	540	1101	355	533	1035
KS2	-	365	518	910	372	527	905	376	534	941	386	545	880
WY	-	166	617	969	177	663	1005	142	493	861	149	561	1021
MT	-	364	453	603	362	447	588	353	443	579	343	423	561
SD	-	209	332	498	206	329	501	209	331	497	211	332	500
NE	-	210	316	631	210	313	616	218	328	660	219	326	624
Manure emissions, kg CO2e/ha													
KS1	-	2	3	5	2	3	5	2	2	7	2	3	5
KS2	-	2	3	6	2	2	6	2	3	7	2	3	6
WY	-	1	3	5	1	2	5	1	3	6	1	3	5
MT	-	6	8	10	6	8	10	6	8	10	6	7	10
SD	-	4	6	9	4	6	9	4	6	9	4	6	9
NE	-	4	6	11	4	6	11	4	6	12	4	6	11
Land emissions, kg CO2e/ha													
KS1	167	201	221	291	201	219	292	202	222	379	202	220	298
KS2	63	100	125	241	103	129	257	102	128	280	104	132	283
WY	50	45	86	112	49	85	120	53	86	108	59	85	122
MT	21	53	57	62	49	52	54	64	67	73	54	57	60
SD	10	32	54	97	38	62	106	29	54	97	35	59	105
NE	26	39	45	73	38	45	78	39	45	75	38	45	80
Anthropogenic CO2, kg CO2e/ha													
KS1	-	14	14	14	14	14	14	14	14	15	14	14	14
KS2	-	31	31	31	31	20	31	31	31	32	31	20	31
WY	-	31	31	32	31	31	32	31	31	32	31	31	32
MT	-	17	17	17	17	17	17	17	18	18	17	17	18
SD	-	26	26	26	25	26	26	26	26	26	26	26	26
NE	-	24	25	25	24	25	25	25	25	26	25	25	25
Production of inputs, CO2e/ha													
KS1	-	19	27	50	18	25	47	19	28	125	19	26	49
KS2	-	21	27	62	21	26	52	22	32	213	22	17	62
WY	-	13	39	98	12	39	101	15	50	122	14	50	107
MT	-	49	58	76	41	51	66	97	101	132	77	95	122
SD	-	48	70	92	44	65	94	48	72	104	48	71	103
NE	-	44	62	119	44	63	120	55	79	125	51	73	118

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S9. Ranch-level expenses among rangeland management scenarios for each site from IFSM

Item	No Mgmt	No Burn							Spring Burn				
		Continuous			Rotational				Continuous			Rotational	
		Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Equipment, \$/ha													
KS1	-	3.44	3.44	4.81	3.44	3.44	4.81	3.44	3.44	10.27	3.44	3.44	4.81
KS2	-	10.92	10.92	33.09	10.92	10.92	33.09	10.92	10.92	33.09	10.92	10.92	33.09
WY	-	10.96	33.20	33.21	10.96	33.20	33.21	10.96	33.20	33.21	10.96	33.20	33.21
MT	-	12.90	12.96	13.04	12.86	12.89	12.96	13.10	13.19	13.34	13.03	13.10	13.22
SD	-	16.71	16.71	16.71	16.70	16.71	16.71	16.71	16.71	16.72	16.71	16.71	16.72
NE	-	9.28	9.30	9.38	9.28	9.30	9.37	9.33	9.38	9.43	9.31	9.35	9.38
Energy, \$/ha													
KS1	-	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98	4.36	3.98	3.98	3.98
KS2	-	5.46	8.89	8.98	8.89	8.89	8.93	8.89	8.89	9.21	8.89	8.89	8.95
WY	-	9.14	9.18	9.38	9.14	9.20	9.37	9.14	9.18	9.56	9.14	9.23	9.37
MT	-	5.12	5.21	5.36	5.07	5.15	5.28	5.31	5.45	5.67	5.24	5.35	5.55
SD	-	7.50	7.66	7.78	7.46	7.59	7.78	7.50	7.65	7.88	7.50	7.66	7.87
NE	-	7.18	7.28	7.61	7.18	7.28	7.60	7.28	7.45	7.71	7.25	7.39	7.62
Labor, \$/ha													
KS1	-	97.03	111.17	182.01	154.16	176.69	306.23	97.05	111.18	182.84	154.18	176.71	306.28
KS2	-	114.44	124.24	183.24	177.69	193.03	303.78	114.46	124.27	183.79	177.71	193.05	303.95
WY	-	57.78	100.54	131.75	82.37	153.20	202.26	57.82	100.78	131.88	82.41	153.37	202.43
MT	-	68.68	66.44	78.60	101.30	98.78	117.15	69.33	67.09	79.47	101.81	99.41	117.97
SD	-	40.90	46.21	59.62	56.75	65.94	85.40	40.93	46.25	59.79	56.80	66.00	85.50
NE	-	46.76	52.50	84.02	67.04	75.62	124.61	46.90	52.72	84.01	67.12	75.74	124.54
Feed, \$/ha													
KS1	-	15.16	23.51	45.63	14.58	22.04	42.77	15.94	24.02	85.59	15.28	22.95	45.05
KS2	-	13.70	19.87	42.97	13.69	19.43	37.08	14.86	21.18	70.99	14.54	20.59	43.45
WY	-	5.35	24.22	68.84	4.90	25.51	69.01	6.38	30.57	89.88	5.99	31.68	72.92
MT	-	32.60	40.37	53.81	26.06	32.68	43.74	65.01	75.44	99.78	5.22	64.82	85.53
SD	-	26.47	41.79	56.80	24.43	38.53	57.86	27.10	42.86	63.83	26.83	42.14	63.47
NE	-	26.27	38.89	78.22	26.28	39.24	78.74	32.99	49.41	80.32	30.16	45.22	77.13
Livestock, \$/ha													
KS1	-	456.27	687.52	1297.18	456.27	687.52	1297.18	456.27	690.31	1297.18	456.27	687.52	1297.18
KS2	-	488.98	698.55	1207.14	488.98	698.55	1207.49	488.98	698.55	1207.49	488.98	698.55	1207.49
WY	-	194.89	744.77	1096.27	194.89	744.77	1096.27	194.89	744.77	1096.27	194.89	744.77	1096.27
MT	-	27.13	33.88	45.13	27.13	33.88	45.13	27.13	33.88	45.13	27.13	33.88	45.13
SD	-	17.93	28.60	43.36	17.93	28.60	43.36	17.93	28.60	43.36	17.93	28.60	43.36

NE	-	17.97	26.95	53.90	17.97	26.95	53.90	17.97	26.95	54.15	17.97	26.95	53.90
Property tax, \$/ha													
KS1	15.23	15.23	15.23	15.23	15.23	15.23	12.70	15.23	15.23	15.23	15.23	15.23	15.23
KS2	16.13	16.13	16.13	16.13	16.13	16.13	16.13	16.13	16.13	19.56	16.13	16.13	16.13
WY	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.33	8.32	8.32	8.32	8.32
MT	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20	17.20
SD	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48	16.48
NE	21.98	21.98	21.98	21.98	12.80	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Supplemental Data from IMPLAN model

Table S10. Economic and employment impact of rangeland management scenarios at Konza Prairie Biological Station (KS1) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	1.52	1.58	1.9	1.87	1.95	2.54	1.52	1.58	1.9	1.87	1.95	2.54
Indirect	0.69	0.96	1.49	0.63	0.85	1.35	0.66	0.89	1.39	0.58	0.8	1.3
Induced	0.19	0.27	0.42	0.18	0.24	0.38	0.34	0.25	0.39	0.16	0.22	0.37
Total	2.4	2.81	3.8	2.68	3.04	4.27	2.37	2.72	3.68	2.62	2.97	4.21
Labor Income												
Direct	20,691.00	28,898.00	44,811.00	18,956.00	25,593.00	40,811.00	19,940.00	26,915.00	41,811.00	18,690.15	24,023.00	39,241.00
Indirect	24,246.13	33,862.65	52,508.64	22,212.64	29,989.64	47,822.68	23,365.00	31,538.84	48,994.13	21,557.52	28,150.12	45,981.47
Induced	6,171.99	8,620.00	13,366.58	5,654.39	7,634.11	12,173.58	5,947.82	8,028.46	12,471.83	5,458.90	7,165.83	11,705.06
Total	51,109.12	71,380.65	110,686.22	46,823.03	63,216.75	100,807.27	49,252.82	66,482.31	103,276.95	45,706.58	59,338.95	96,927.53
Value Added												
Direct	41,710.00	58,255.00	90,332.00	38,213.00	51,592.00	82,270.00	40,196.00	54,257.00	84,286.00	37,677.13	48,427.00	79,104.00
Indirect	41,407.15	57,830.08	89,673.39	37,934.38	51,215.81	81,670.79	39,902.37	53,861.52	83,671.36	36,858.36	48,074.32	78,526.39
Induced	12,713.56	17,756.18	27,533.57	11,647.38	15,725.37	25,076.15	12,251.80	16,537.69	25,690.49	11,256.83	14,760.76	24,111.04
Total	95,830.71	133,841.25	207,538.96	87,794.76	118,533.18	189,016.94	92,350.17	124,656.20	193,647.85	85,792.32	111,262.07	181,741.43
Output												
Direct	170,077.00	237,535.00	368,330.00	155,814.00	210,367.00	335,459.00	163,898.00	221,234.00	343,677.00	153,628.84	197,463.00	322,545.00
Indirect	127,628.12	178,248.07	276,397.85	116,924.09	157,861.10	251,731.65	122,989.97	166,015.88	257,897.95	114,495.78	148,178.15	242,039.76
Induced	24,919.61	34,803.54	53,968.02	22,829.81	30,822.99	49,151.27	24,014.52	32,415.20	50,355.43	22,070.55	28,932.27	47,259.59
Total	322,624.73	450,586.61	698,695.87	295,567.90	399,051.09	636,341.92	310,902.49	419,665.09	651,930.38	290,195.17	374,573.43	611,844.35

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S11. Economic and employment impact of rangeland management scenarios at Kansas State University Research and Education Center (KS2) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	1.52	1.58	1.9	1.87	1.95	2.54	1.52	1.58	1.9	1.87	1.95	2.54
Indirect	0.69	0.96	1.49	0.63	0.85	1.35	0.66	0.89	1.39	0.58	0.8	1.3
Induced	0.19	0.27	0.42	0.18	0.24	0.38	0.34	0.25	0.39	0.16	0.22	0.37
Total	2.4	2.81	3.8	2.68	3.04	4.27	2.37	2.72	3.68	2.62	2.97	4.21
Labor Income												
Direct	20,691.00	28,898.00	44,811.00	18,956.00	25,593.00	40,811.00	19,940.00	26,915.00	41,811.00	18,690.15	24,023.00	39,241.00
Indirect	24,246.13	33,862.65	52,508.64	22,212.64	29,989.64	47,822.68	23,365.00	31,538.84	48,994.13	21,557.52	28,150.12	45,981.47
Induced	6,171.99	8,620.00	13,366.58	5,654.39	7,634.11	12,173.58	5,947.82	8,028.46	12,471.83	5,458.90	7,165.83	11,705.06
Total	51,109.12	71,380.65	110,686.22	46,823.03	63,216.75	100,807.27	49,252.82	66,482.31	103,276.95	45,706.58	59,338.95	96,927.53
Value Added												
Direct	41,710.00	58,255.00	90,332.00	38,213.00	51,592.00	82,270.00	40,196.00	54,257.00	84,286.00	37,677.13	48,427.00	79,104.00
Indirect	41,407.15	57,830.08	89,673.39	37,934.38	51,215.81	81,670.79	39,902.37	53,861.52	83,671.36	36,858.36	48,074.32	78,526.39
Induced	12,713.56	17,756.18	27,533.57	11,647.38	15,725.37	25,076.15	12,251.80	16,537.69	25,690.49	11,256.83	14,760.76	24,111.04
Total	95,830.71	133,841.25	207,538.96	87,794.76	118,533.18	189,016.94	92,350.17	124,656.20	193,647.85	85,792.32	111,262.07	181,741.43
Output												
Direct	170,077.00	237,535.00	368,330.00	155,814.00	210,367.00	335,459.00	163,898.00	221,234.00	343,677.00	153,628.84	197,463.00	322,545.00
Indirect	127,628.12	178,248.07	276,397.85	116,924.09	157,861.10	251,731.65	122,989.97	166,015.88	257,897.95	114,495.78	148,178.15	242,039.76
Induced	24,919.61	34,803.54	53,968.02	22,829.81	30,822.99	49,151.27	24,014.52	32,415.20	50,355.43	22,070.55	28,932.27	47,259.59
Total	322,624.73	450,586.61	698,695.87	295,567.90	399,051.09	636,341.92	310,902.49	419,665.09	651,930.38	290,195.17	374,573.43	611,844.35

KS1 = Konza Prairie Biological Station, Manhattan, KS; KS2 = Kansas State University Research and Education Center, Hays, KS; WY = USDA Agricultural Research Service High Plains Grasslands Research Station, Cheyenne, WY; MT = USDA Agricultural Research Service Livestock and Range Research Laboratory, Miles City, MT; SD = South Dakota State University Cottonwood Range and Livestock Field Station, Philip, SD; NE = University of Nebraska Gudmundsen Sandhills Laboratory, Whitman, NE.

Table S12. Economic and employment impact of rangeland management scenarios at High Plains Grasslands Research Station (WY) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	1.17	1.17	1.24	1.28	1.29	1.4	1.17	1.17	1.24	1.28	1.29	1.4
Indirect	0.23	0.89	1.24	0.23	0.86	1.24	0.24	0.9	1.23	0.24	0.87	1.23
Induced	0.06	0.24	0.34	0.06	0.23	0.34	0.07	0.25	0.34	0.07	0.24	0.34
Total	1.47	2.3	2.82	1.57	2.38	2.98	1.48	2.31	2.8	1.58	2.4	2.97
Labor Income												
Direct	7,895.00	30,017.00	41,815.00	7,755.00	29,021.00	42,042.00	8,136.00	30,323.00	41,478.00	8,076.00	29,481.00	41,590.00
Indirect	7,241.47	27,532.38	38,354.04	7,112.70	26,618.71	38,560.89	7,462.15	27,813.55	38,043.63	7,406.98	27,040.33	38,147.19
Induced	2,444.26	9,293.11	12,945.74	2,400.85	8,984.73	13,015.79	2,518.80	9,387.92	12,841.20	2,500.20	9,127.08	12,876.01
Total	17,580.73	66,842.49	93,114.78	17,268.55	64,624.44	93,618.68	18,116.95	67,524.47	92,362.83	17,983.18	65,648.41	92,613.21
Value Added												
Direct	20,383.00	77,495.00	107,955.00	20,021.00	74,924.00	108,450.00	21,004.00	78,287.00	107,083.00	20,849.00	76,111.00	107,374.00
Indirect	11,402.55	43,352.96	60,392.94	11,199.78	41,914.29	60,718.64	11,750.00	43,795.70	59,904.16	11,663.16	42,578.17	60,067.24
Induced	5,001.86	19,017.15	26,491.79	4,913.03	18,386.09	26,635.14	5,154.41	19,211.17	26,277.86	5,116.33	18,677.40	26,349.10
Total	36,787.41	139,865.11	194,839.73	36,133.81	135,224.38	195,893.78	37,908.43	141,293.87	193,265.02	37,628.49	137,366.57	193,790.33
Output												
Direct	70,656.00	268,635.00	374,223.00	69,400.00	259,721.00	376,244.00	72,809.00	271,379.00	371,196.00	72,271.00	263,835.00	372,206.00
Indirect	28,700.52	109,120.55	152,010.62	28,190.14	105,499.37	152,830.43	29,575.13	110,234.93	150,780.35	29,356.48	107,170.38	151,190.82
Induced	9,454.49	35,946.17	50,074.72	9,286.60	34,753.33	50,345.68	9,742.85	36,312.91	49,670.34	9,670.88	35,303.97	49,805.00
Total	108,811.01	413,701.72	576,308.34	106,876.74	399,973.71	579,420.10	112,126.98	417,926.84	571,646.69	111,298.36	406,309.35	573,201.82

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Table S13. Economic and employment impact of rangeland management scenarios at Fort Keogh Livestock and Range Research Laboratory (MT) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	2.21	2.16	2.44	2.98	2.92	3.34	2.21	2.16	2.44	2.98	2.92	3.34
Indirect	0.37	0.46	0.57	0.37	0.43	0.53	0.38	0.46	0.57	0.34	0.4	0.5
Induced	0.07	0.08	0.1	0.06	0.07	0.09	0.07	0.08	0.1	0.06	0.07	0.09
Total	2.65	2.7	3.11	3.41	3.42	3.97	2.65	2.7	3.11	3.38	3.39	3.92
Labor Income												
Direct	6,090.63	7,495.40	9,760.00	5,953.00	6,961.00	8,658.00	6,097.00	7,511.00	9,209.00	5,498.00	6,460.00	8,047.00
Indirect	11,565.86	14,233.45	18,535.22	11,305.11	13,219.85	16,439.84	11,577.91	14,262.21	17,487.59	10,439.34	12,267.07	15,282.55
Induced	2,336.15	2,874.97	3,743.76	2,283.43	2,670.14	3,320.72	2,338.59	2,880.83	3,532.26	2,108.69	2,477.80	3,086.75
Total	19,992.64	24,603.82	32,038.99	19,541.54	22,850.99	28,418.56	20,013.50	24,654.05	30,228.85	18,046.03	21,204.87	26,416.31
Value Added												
Direct	48,302.36	59,442.99	77,407.00	47,213.00	55,210.00	68,658.00	48,353.00	59,564.00	73,033.00	43,598.00	51,231.00	63,824.00
Indirect	25,155.58	30,957.54	40,313.83	24,588.43	28,752.96	35,756.40	25,181.77	31,020.10	38,085.25	22,705.41	26,680.68	33,239.32
Induced	4,353.89	5,358.09	6,977.27	4,255.65	4,976.36	6,188.84	4,358.44	5,369.02	6,583.08	3,929.97	4,617.89	5,752.80
Total	77,811.82	95,758.62	124,698.10	76,057.08	88,939.32	110,603.24	77,893.21	95,953.12	117,651.33	70,233.38	82,529.57	102,816.11
Output												
Direct	142,804.96	175,741.99	228,855.00	139,585.00	163,227.00	202,985.00	142,954.00	176,098.00	215,921.00	128,896.00	151,463.00	188,695.00
Indirect	63,781.64	78,492.45	102,215.20	62,343.66	72,902.77	90,659.90	63,848.05	78,651.06	96,437.89	57,569.28	67,648.52	84,277.86
Induced	8,452.53	10,402.05	13,545.48	8,261.80	9,660.97	12,014.85	8,461.36	10,423.27	12,780.23	7,629.55	8,965.05	11,168.33
Total	215,039.12	264,636.49	344,615.68	210,190.45	245,790.74	305,659.75	215,263.41	265,172.33	325,139.11	194,094.82	228,076.57	284,141.19

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Table S14. Economic and employment impact of rangeland management scenarios at Cottonwood Range and Livestock Field Station (SD) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	1.35	1.41	1.58	1.56	1.69	1.95	1.35	1.41	1.6	1.58	1.69	1.95
Indirect	0.28	0.44	0.67	0.29	0.46	0.69	0.29	0.46	0.69	0.29	0.44	0.66
Induced	0.1	0.17	0.25	0.11	0.17	0.26	0.11	0.17	0.26	0.11	0.17	0.25
Total	1.73	2.02	2.5	1.95	2.32	2.9	1.75	2.04	2.55	1.98	2.3	2.86
Labor Income												
Direct	8,573.00	13,583.00	20,485.00	8,818.00	14,016.00	21,265.00	8,900.00	14,039.00	21,280.00	8,862.00	13,700.00	20,292.00
Indirect	9,628.69	15,255.73	23,007.76	9,904.05	15,740.82	23,883.76	9,995.76	15,767.12	23,900.48	9,952.74	15,387.02	22,790.66
Induced	4,632.56	7,339.81	11,069.44	4,765.00	7,573.48	11,490.91	4,809.20	7,586.02	11,498.99	4,788.58	7,403.01	10,965.07
Total	22,834.25	36,178.54	54,562.20	23,487.05	37,330.29	56,639.68	23,704.96	37,392.14	56,679.47	23,603.31	36,490.03	54,047.73
Value Added												
Direct	20,151.00	31,928.00	48,151.00	20,728.00	32,945.00	49,985.00	20,919.00	32,998.00	50,020.00	20,829.00	32,202.00	47,697.00
Indirect	16,609.44	26,316.05	39,688.26	17,084.44	27,152.82	41,199.36	17,242.63	27,198.20	41,228.20	17,168.41	26,542.53	39,313.77
Induced	8,078.17	12,799.03	19,302.70	8,309.11	13,206.49	20,037.65	8,386.20	13,228.37	20,051.73	8,350.24	12,909.23	19,120.69
Total	44,838.61	71,043.09	107,141.95	46,121.56	73,304.31	111,222.01	46,547.83	73,424.57	111,299.93	46,347.65	71,653.76	106,131.46
Output												
Direct	59,314.00	93,978.00	141,731.00	61,011.00	96,968.00	147,128.00	61,575.00	97,128.00	147,231.00	61,310.00	94,786.00	140,394.00
Indirect	42,808.80	67,826.41	102,291.63	44,033.06	69,983.09	106,186.32	44,440.78	70,100.05	106,260.65	44,249.49	68,410.13	101,326.43
Induced	15,049.84	23,844.94	35,961.43	15,480.10	24,604.04	37,330.67	15,623.70	24,644.80	37,356.90	15,556.71	24,050.24	35,622.35
Total	117,172.64	185,649.35	279,984.07	120,524.16	191,555.13	290,644.99	121,639.49	191,872.84	290,848.56	121,116.21	187,246.36	277,342.79

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Table S15. Economic and employment impact of rangeland management scenarios at Gudmundsen Sandhills Laboratory (NE) from IMPLAN model

	No Burn						Spring Burn					
	Continuous			Rotational			Continuous			Rotational		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
Employment												
Direct	1.46	1.54	1.99	1.76	1.88	2.59	1.46	1.54	1.99	1.76	1.88	2.59
Indirect	0.13	0.19	0.39	0.13	0.19	0.36	0.14	0.2	0.4	0.13	0.2	0.36
Induced	0.03	0.04	0.08	0.03	0.04	0.08	0.03	0.04	0.09	0.03	0.04	0.08
Total	1.62	1.78	2.46	1.92	2.12	3.02	1.62	1.79	2.48	1.92	2.12	3.03
Labor Income												
Direct	3,441.44	5,162.00	10,326.00	3,416.00	5,171.00	9,490.00	3,591.00	5,369.00	10,737.00	3,554.00	5,220.00	9,660.00
Indirect	4,911.92	7,368.97	14,737.94	4,875.56	7,381.10	13,545.24	5,124.83	7,662.44	15,325.07	5,072.75	7,450.35	13,787.61
Induced	987.64	1,481.57	2,963.38	980.33	1,484.07	2,723.52	1,030.49	1,540.74	3,081.39	1,019.96	1,498.05	2,772.27
Total	9,341.00	14,012.54	28,027.32	9,271.88	14,036.18	25,758.76	9,746.32	14,573.18	29,143.46	9,646.71	14,168.40	26,219.88
Value Added												
Direct	14,447.38	21,673.00	43,349.00	14,341.00	21,709.00	39,840.00	15,074.00	22,538.00	45,075.00	14,921.00	21,913.00	40,554.00
Indirect	10,992.39	16,491.02	32,982.04	10,911.01	16,518.17	30,312.90	11,468.86	17,147.77	34,295.97	11,352.30	16,673.14	30,855.30
Induced	1,960.53	2,941.01	5,882.50	1,946.01	2,945.98	5,406.36	2,045.59	3,058.47	6,116.77	2,024.69	2,973.72	5,503.14
Total	27,400.30	41,105.04	82,213.54	27,198.02	41,173.16	75,559.26	28,588.45	42,744.24	85,487.74	28,297.99	41,559.87	76,912.43
Output												
Direct	64,242.00	96,376.00	192,755.00	63,767.00	96,535.00	177,155.00	67,027.00	100,216.00	200,433.00	66,346.00	97,441.00	180,326.00
Indirect	32,779.35	49,176.31	98,352.63	32,536.69	49,257.28	90,393.23	34,200.19	51,134.73	102,270.77	33,852.61	49,719.40	92,010.65
Induced	3,618.42	5,428.04	10,856.94	3,591.63	5,437.20	9,978.16	3,775.42	5,644.82	11,289.32	3,736.84	5,488.41	10,156.78
Total	100,639.42	150,980.35	301,964.57	99,895.32	151,229.49	277,526.39	105,002.61	156,995.55	313,993.09	103,935.46	152,648.81	282,493.43

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