

Table S1. Moose numbers (N) and hunting bag (B) size in the territories of 10 counties of Lithuania, 1993–2020.

Year	Alytaus		Kauno		Klaipėdos		Marijampolės		Panevėžio		Šiaulių		Tauragės		Telšių		Utenos		Vilniaus	
	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B
1993	250	8	179	10	214	22	132	–	783	271	290	–	246	49	105	1	507	202	370	42
1994	376	–*	255	–	199	–	111	–	649	–	194	–	225	–	155	–	606	–	598	–
1995	100	–	364	–	211	–	230	–	299	–	269	–	151	–	87	–	496	–	634	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	488	–	307	–	184	–	110	–	667	–	180	–	210	–	182	–	926	–	625	–
1998	–	13	–	16	–	6	–	7	–	77	–	1	–	15	–	19	–	121	–	31
1999	412	8	399	12	287	18	119	8	798	100	245	0	239	3	264	17	1240	198	872	63
2000	442	28	439	17	322	28	135	14	909	118	262	6	269	19	261	26	1384	190	986	106
2001	297	24	372	26	263	19	123	9	850	133	215	4	250	20	219	30	1210	162	929	77
2002	341	27	314	26	228	9	111	9	873	133	206	6	237	11	191	25	1061	149	896	81
2003	354	0	293	0	206	0	95	0	762	0	254	0	198	0	170	0	1007	0	753	0
2004	369	4	259	0	189	0	99	0	715	44	218	1	165	1	178	9	1001	23	667	9
2005	348	1	290	0	226	1	104	0	748	43	202	0	167	0	173	0	892	48	747	19
2006	324	4	364	0	255	2	107	0	779	48	282	0	180	0	198	2	921	64	812	29
2007	371	4	415	2	263	0	113	0	857	49	380	1	196	0	226	0	1024	78	980	39
2008	373	7	446	0	280	0	109	0	854	26	393	3	206	1	200	0	1100	56	1011	19
2009	457	7	539	5	343	3	154	1	887	35	502	7	253	1	255	0	1278	62	1159	26
2010	567	11	587	1	434	9	179	5	985	33	610	1	270	1	295	1	1467	104	1363	32
2011	701	12	610	3	482	9	218	7	1094	54	646	9	288	1	333	4	1555	117	1543	53
2012	782	24	713	19	590	26	239	1	1264	76	815	14	362	5	373	7	1841	161	1681	64
2013	813	43	804	38	607	38	271	18	1313	89	919	34	417	10	463	26	2083	166	1685	81
2014	913	59	963	85	705	65	311	27	1400	127	1157	97	543	51	678	57	2287	221	1946	149
2015	1083	101	1107	99	920	87	381	34	1780	198	1464	117	644	56	786	71	2481	314	2207	229
2016	1191	127	1262	170	963	109	435	48	1970	288	1644	178	647	88	858	128	2723	386	2398	274
2017	1308	157	1396	195	1048	114	457	47	2082	301	1762	191	727	80	971	137	2712	462	2703	315
2018	1462	165	1472	222	1177	139	541	52	2218	348	1907	244	757	103	1071	164	2943	517	3049	363
2019	1639	216	1635	237	1329	164	650	61	2445	390	2043	233	774	95	1163	169	3110	598	3383	442
2020	1782	–	1768	–	1434	–	740	–	2525	–	2152	–	901	–	1202	–	3338	–	3668	–

*—no data

Table S2. Moose densities (individuals per 1000 ha of forest area) in the territories of 10 counties of Lithuania, 1993–2020.

Year	Alytaus	Kauno	Klaipėdos	Marijampolės	Panevėžio	Šiaulių	Tauragės	Telšių	Utenos	Vilniaus
1993	0.968	0.745	1.541	1.343	3.463	1.209	1.681	0.658	2.032	0.858
1995	1.456	1.062	1.433	1.13	2.87	0.809	1.537	0.971	2.429	1.387
1997	0.387	1.516	1.519	2.341	1.322	1.121	1.032	0.545	1.988	1.471
1999	1.89	1.278	1.325	1.12	2.95	0.75	1.435	1.14	3.711	1.45
2000	1.596	1.661	2.066	1.211	3.529	1.021	1.633	1.654	4.969	2.023
2001	1.712	1.828	2.318	1.374	4.02	1.092	1.838	1.635	5.546	2.287
2002	1.15	1.549	1.893	1.252	3.759	0.896	1.708	1.372	4.849	2.155
2003	1.321	1.307	1.641	1.13	3.861	0.859	1.619	1.196	4.252	2.079
2004	1.371	1.22	1.483	0.967	3.37	1.059	1.353	1.065	4.036	1.747
2005	1.429	1.078	1.361	1.008	3.162	0.909	1.127	1.115	4.012	1.547
2006	1.348	1.208	1.627	1.058	3.308	0.842	1.141	1.084	3.575	1.733
2007	1.255	1.516	1.836	1.089	3.445	1.176	1.23	1.24	3.691	1.884
2008	1.437	1.728	1.893	1.15	3.79	1.584	1.339	1.416	4.104	2.274
2009	1.445	1.857	2.016	1.109	3.777	1.638	1.408	1.253	4.408	2.345
2010	1.77	2.244	2.469	1.567	3.923	2.093	1.729	1.597	5.122	2.689
2011	2.196	2.444	3.124	1.822	4.357	2.543	1.845	1.848	5.879	3.162
2012	2.715	2.54	3.47	2.219	4.839	2.693	1.968	2.086	6.232	3.58
2013	3.029	2.969	4.248	2.432	5.59	3.397	2.474	2.336	7.378	3.9
2014	3.149	3.348	4.37	2.758	5.807	3.831	2.849	2.9	8.348	3.909
2015	3.536	4.01	5.075	3.165	6.192	4.823	3.71	4.247	9.165	4.515
2016	4.195	4.61	6.623	3.878	7.873	6.103	4.401	4.923	9.943	5.12
2017	4.613	5.255	6.933	4.427	8.713	6.853	4.421	5.374	10.91	5.563
2018	5.066	5.813	7.545	4.651	9.208	7.345	4.968	6.082	10.87	6.271
2019	5.662	6.129	8.473	5.506	9.81	7.949	5.173	6.709	11.79	7.074
2020	6.348	6.808	9.568	6.616	10.81	8.516	5.289	7.285	12.46	7.848

Table S3. Moose hunting bag densities (shot individuals per 1000 ha of forest area) in the territories of 10 counties of Lithuania, 1998–2020.

Year	Alytaus	Kauno	Klaipėdos	Marijampolės	Panevėžio	Šiaulių	Tauragės	Telšių	Utenos	Vilniaus
1998	0.050	0.067	0.043	0.071	0.341	0.004	0.102	0.119	0.485	0.072
1999	0.031	0.050	0.130	0.081	0.442	0	0.020	0.106	0.793	0.146
2000	0.108	0.071	0.202	0.142	0.522	0.025	0.130	0.163	0.761	0.246
2001	0.093	0.108	0.137	0.092	0.588	0.017	0.137	0.188	0.649	0.179
2002	0.105	0.108	0.065	0.092	0.588	0.025	0.075	0.157	0.597	0.188
2003	0	0	0	0	0	0	0	0	0	0
2004	0.015	0	0	0	0.195	0.004	0.007	0.056	0.092	0.021
2005	0.004	0	0.007	0	0.190	0	0	0	0.192	0.044
2006	0.015	0	0.014	0	0.212	0	0	0.013	0.256	0.067
2007	0.015	0.008	0	0	0.217	0.004	0	0	0.313	0.090
2008	0.027	0	0	0	0.115	0.013	0.007	0	0.224	0.044
2009	0.027	0.021	0.022	0.010	0.155	0.029	0.007	0	0.248	0.060
2010	0.043	0.004	0.065	0.051	0.146	0.004	0.007	0.006	0.417	0.074
2011	0.046	0.012	0.065	0.071	0.239	0.038	0.007	0.025	0.469	0.123
2012	0.093	0.079	0.187	0.010	0.336	0.058	0.034	0.044	0.645	0.148
2013	0.167	0.158	0.274	0.183	0.394	0.142	0.068	0.163	0.665	0.188
2014	0.229	0.354	0.468	0.275	0.562	0.404	0.348	0.357	0.886	0.346
2015	0.391	0.412	0.626	0.346	0.876	0.488	0.383	0.445	1.258	0.531
2016	0.492	0.708	0.785	0.489	1.274	0.742	0.601	0.802	1.547	0.636
2017	0.608	0.812	0.821	0.478	1.331	0.796	0.547	0.858	1.851	0.731
2018	0.639	0.924	1.001	0.529	1.539	1.017	0.704	1.027	2.072	0.842
2019	0.837	0.987	1.181	0.621	1.725	0.971	0.649	1.059	2.397	1.025

Table S4. Correlation matrix between environmental data (FOR %—forest percentage from the area in 2018, FI1%—increase of forest percentage from 1990 to 2018, FI2%—increase of forest percentage from 2014 to 2018, WETL%—wetland percentage from the area, WATER%—water body percentage from the area, HD—human population density per km², all as for 2018), moose densities, hunting bag densities and indicators of relative increase of moose numbers, population densities and bag densities. Note: significant correlation shown in bold, all other correlations are not significant.

Indicator	Year or Period	FOR%	FI1%	FI2%	WETL%	WATER%	HD
Population density per 1000 ha of forest	1993	-0.336	-0.161	0.310	-0.100	-0.007	-0.408
	2000	0.048	0.478	0.355	0.198	0.317	-0.248
	2005	0.063	0.433	0.450	0.202	0.207	-0.322
	2010	-0.021	0.429	0.397	0.243	0.327	-0.132
	2015	-0.048	0.448	0.457	0.241	0.376	-0.243
	2020	-0.183	0.273	0.481	0.308	0.453	-0.122
Moose bag density per 1000 ha of forest	1998	-0.027	0.396	0.378	0.014	0.078	-0.424
	2000	0.012	0.492	0.372	0.229	0.269	-0.283
	2005	-0.022	0.342	0.488	0.156	0.096	-0.286
	2010	0.037	0.536	0.310	0.256	0.341	-0.296
	2015	-0.048	0.430	0.437	0.252	0.379	-0.246
	2019	-0.008	0.422	0.479	0.218	0.341	-0.215
MAVI of $I(t)$: population numbers	1993–2000	0.030	-0.287	-0.020	-0.015	-0.143	0.184
MAVI of $I(t)$: bag numbers	1998–2000	-0.423	-0.620	-0.388	-0.499	-0.381	-0.034
Increase of population density (times)	1993–2000	0.149	0.393	0.207	0.513	0.428	-0.163
	1993–2020	0.350	0.336	0.066	0.234	0.080	0.500
	2005–2020	-0.405	-0.488	-0.161	-0.145	-0.013	0.244
CAGR of population density	1993–2000	0.510	0.736	0.115	0.327	0.313	0.264
	1993–2020	0.340	0.335	0.049	0.292	0.171	0.508
	2005–2020	-0.364	-0.486	-0.268	-0.153	-0.008	0.318
Increase of hunting bag (times)	1998–2000	0.066	-0.016	-0.030	-0.335	-0.262	0.082
	1998–2020	-0.021	-0.133	-0.156	-0.491	-0.346	-0.002
	2005–2020	0.416	0.484	0.216	0.156	-0.016	-0.277
CAGR of hunting bag	1998–2000	0.081	0.545	0.191	0.203	0.431	0.176
	1998–2020	-0.266	-0.152	0.091	0.062	0.118	0.274
	2005–2020	-0.364	-0.486	-0.268	-0.153	-0.008	0.318

Table S5. Norms of allowable maximum density of ungulates in the forests of Lithuania (1995), which become Norms of recommended maximum density of ungulates in the forests of Lithuania in 2005 [35].

Forest type *	Number of Animals (per 1000 ha of Forest) **		
	Moose	Red Deer	Roe Deer
Deciduous forests with admixture of coniferous trees	4	15	55
Mixed coniferous forests with admixture of deciduous stands	3	12	45
Mixed coniferous forests with scarce deciduous admixture	2	12	35
Pure pine forests	1	6	15

* description shortened to avoid national classification of the forests and to meet international classification of the forest types; ** Notes: (1) in the forests inhabited with more than one ungulate animal species, the density of the certain species is allowable only if the densities of the other species are reduced, considering one moose equal to three red deer and one red deer equal to four roe deer (in the forests inhabited by moose and roe deer only recalculation is not required); (2) allowable red deer and moose densities are not applicable to forests smaller than 300 ha and isolated by open fields, if the distance of these patches from forest bigger than 300 ha is over 1 km; (3) allowable density of the roe deer is multiplied by two in forests smaller than 300 ha.

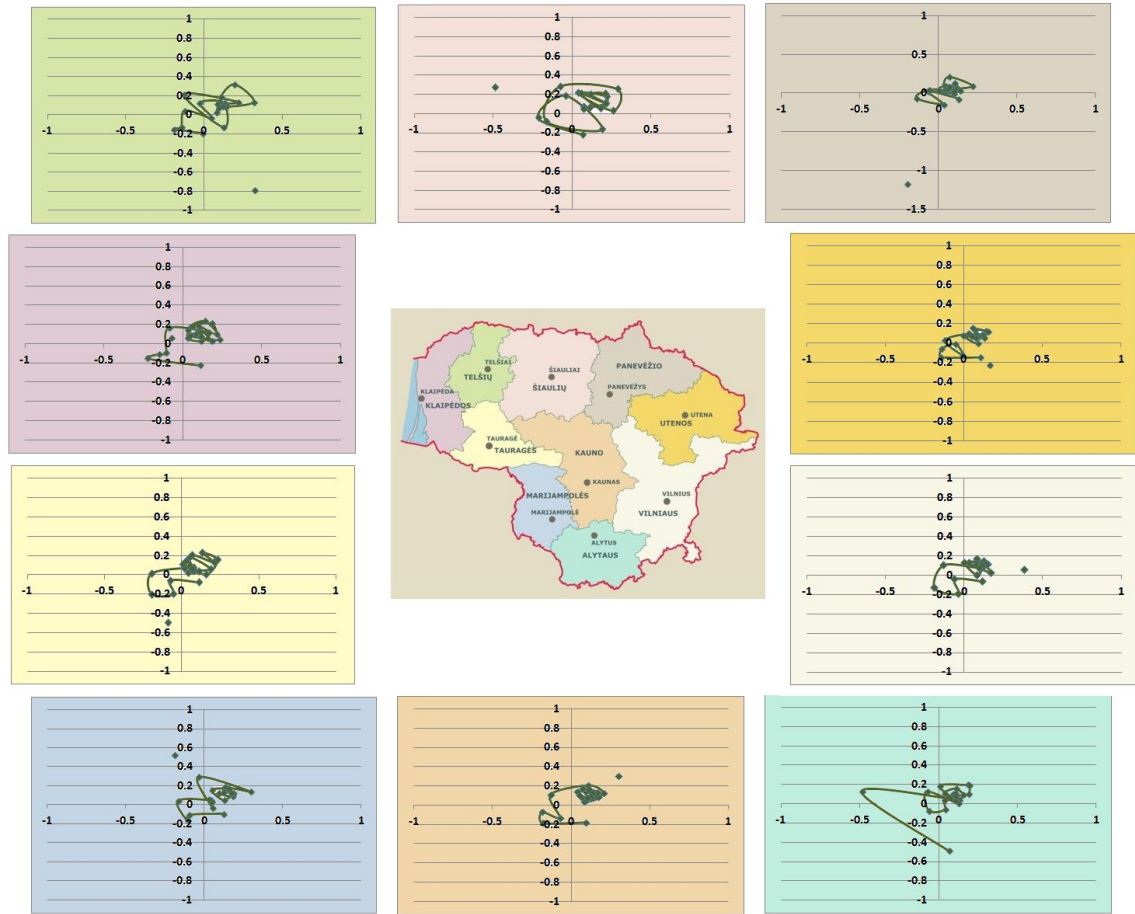


Figure S1. Connected scatterplots of changes of moose population numbers in 1998–2020. Scale is unified to show relative size of population. $I(t)$ and $I(t+1)$ are presented on the horizontal and the vertical axes. The years provided are those of $I(t+1)$. Note: in the graph for Panevėžio county in the upper right corner, the lower part of the vertical axis gauges up to -1.5 while that of other counties up to -1.

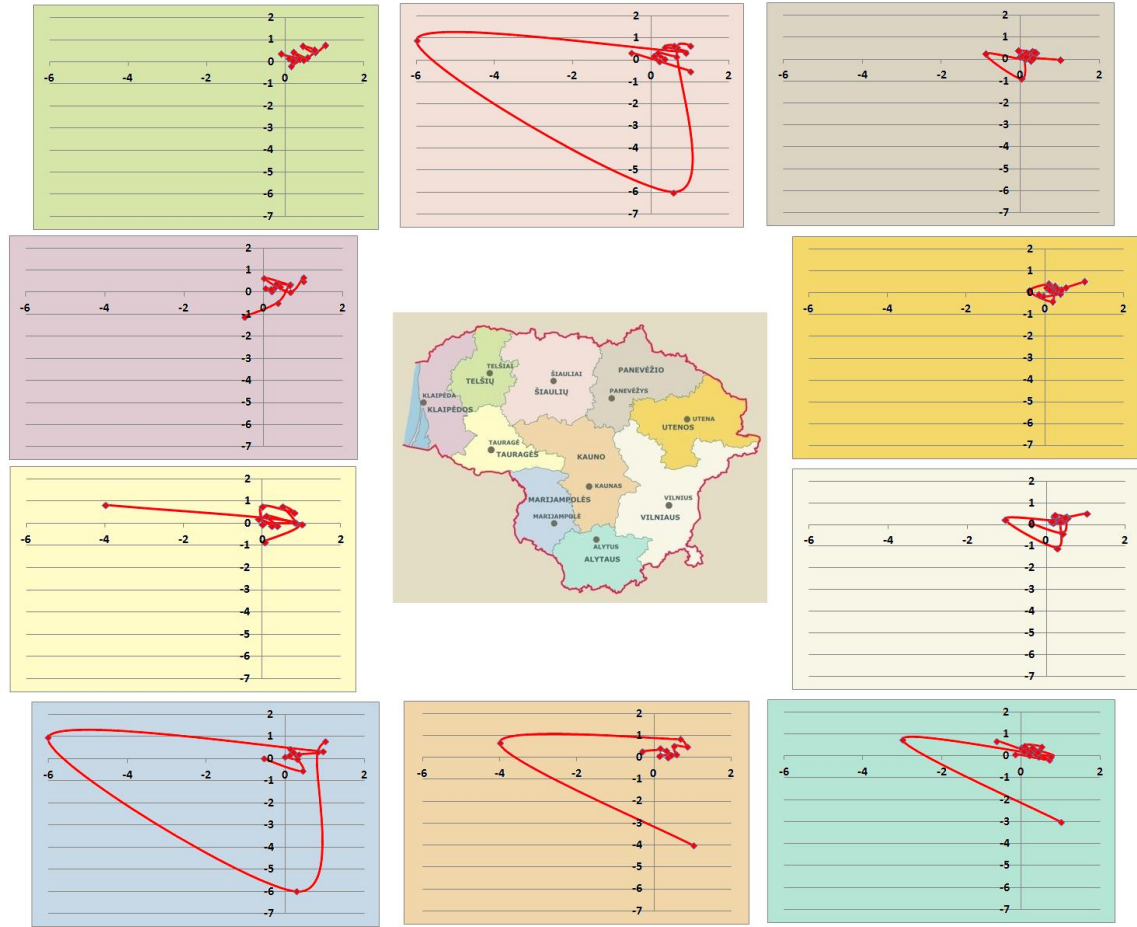


Figure S2. Connected scatterplots of moose hunting bag changes in 1998–2020. Scale is unified to show relative size of the bag. $I(t)$ and $I(t+1)$ are presented on the horizontal and the vertical axes. The years provided are those of $I(t+1)$.