2023 Spotlight Survey

Wildlife Diversity Program Note #23-1

Methods

The spotlight survey was initiated in 1981, and has been conducted annually since that time. Observers drive slowly (10–15 mph) on public roads, using 100,000-candlepower spotlights to detect animals by seeing their entire bodies or light reflected from their eyes. Sampling begins an hour after sunset. Most routes are 25 miles in length.

Sampling is phased in from Illinois' southernmost counties (21 March to 4 April) to the northernmost (11–25 April) to account for differences in phenology. Ideally, routes are sampled when relative humidity is ≥60%, air temperature is >32˚F, and rain or heavy fog is absent (Rybarczyk 1978).

Results

During 2023, staff sampled 1000 miles and observed 10,755 animals on 41 routes (Table 1). Animals observed in addition to target species included 23 coyotes, 6 red fox, 1 beaver, 1 bobcat, and 187 house cats. Staff also recorded 11 owls, 7 armadillo and a flying squirrel; in some cases, species could not be determined.

The number of raccoons observed per mile on 41 routes sampled during 2023 was slightly less than in 2022 (Table 3). Indices varied from 0.64–6.28 raccoons per mile for individual routes (Table 4). Long-term indices (1981–2023) correlated negatively with harvest levels during the preceding season (r = -0.763; $p < 0.01$).

Discussion

Spotlight surveys are useful for monitoring relative abundance of the raccoon at large spatial and temporal scales (Bauder et al. 2021, Gehrt et al. 2002). In 2023, the statewide spotlight index was almost 4 times greater than when surveys started in 1981. The index for 2023 was 1.97.

Results allow IDNR to adjust harvest regulations for large changes in abundance of raccoons. Since 1990-91, seasons for trapping raccoon increased four times, adding a total of 30 days in the northern zone and 32 in the south. Hunting seasons increased from 62 days (north) or 55 days (south) to 93 days. Such changes are not likely to affect harvest levels during periods of low pelt values (Hubert 1990). However, liberal seasons maximize recreational opportunities for core participants and make the most of upswings in volatile markets.

Raccoons are an important part of Illinois' fur harvest. They also cause property damage (Bluett 2003), harbor zoonoses (Page et al. 2016), and affect other wildlife populations through diseases, parasites, and predation (Schmidt 2002, Heske et al. 1999, Mitchell et al. 1999). Spring spotlight surveys provide reliable information for management decisions, ecological research,

and efforts to increase public support for wildlife conservation. Like Nielsen et al. (2009), we recommend sampling ≥ 37 routes per year.

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Table 1. Numbers of animals observed per mile for spotlight survey routes in Illinois, 2023.

Species	No. observed	No. observed/mi	% change from 2022[a]
Raccoon	1972	1.97	-8.8
White-tailed deer	7656	7.66	-6.4
Cottontail rabbit	517	.52	-0.6
Domestic cat	187	0.19	+28.1
Opossum	269	0.27	+13.5
Striped skunk	90	0.09	+47.5

[a] Comparable routes (41 routes in 2023) are those ran in both 2022 and 2023.

Table 2. Raccoon Indices from Annual Spotlight Surveys 1981 - 2023

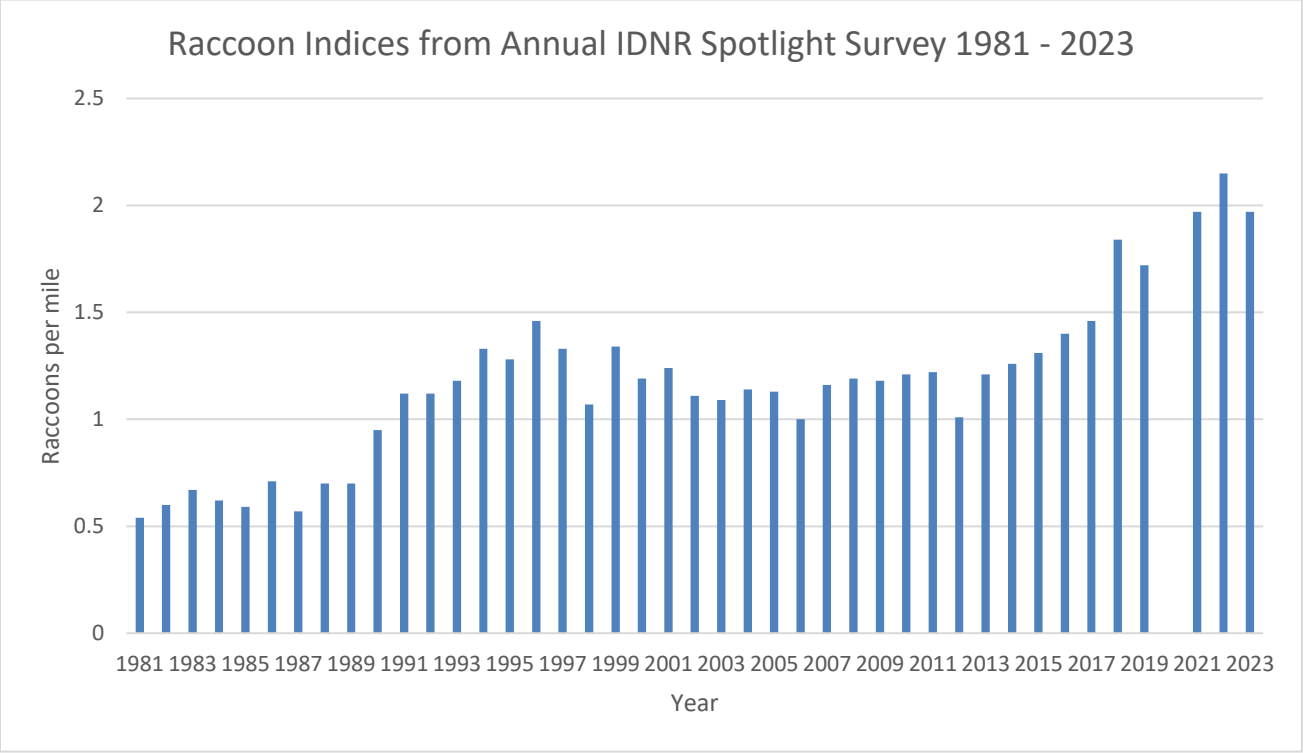

Table 3. Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2023.

Year	No. routes	No. miles sampled	No. raccoons observed	No. raccoons observed/mi	No. comparable routes	% change from previous year[a]
1981	34	834.0	454	0.54	--	--
1982	41	1007.0	600	0.60	34	+18.4
1983	41	1002.0	670	0.67	39	+10.1
1984	43	1066.0	666	0.62	40	-3.4
1985	45	1114.0	653	0.59	43	-3.7
1986	45	1119.0	797	0.71	42	+13.6
1987	46	1145.0	647	0.57	45	-19.8
1988	45	1099.0	768	0.70	44	+18.3
1989	44	1075.0	754	0.70	42	-1.0
1990	46	1125.0	1072	0.95	44	+38.6
1991	44	1075.0	1204	1.12	44	+24.4
1992	47	1148.0	1281	1.12	44	-5.0
1993	47	1142.5	1346	1.18	46	+2.9
1994	45	1098.7	1463	1.33	40	+11.5
1995	48	1100.0	1501	1.28	45	<1.0
1996	48	1174.0	1713	1.46	48	+12.5
1997	47	1142.0	1523	1.33	47	-9.7
1998	47	1149.0	1232	1.07	41	-20.2
1999	46	1129.0	1512	1.34	44	+25.8
2000	46	1124.0	1337	1.19	45	-11.3
2001	48	1179.0	1467	1.24	46	+2.5
2002	48	1175.0	1308	1.11	48	-10.5
2003	47	1155.0	1263	1.09	47	-0.7
2004	47	1153.0	1312	1.14	47	+4.2
2005	47	1155.0	1306	1.13	47	-0.8
2006	45	1105.0	1102	1.00	45	-12.8
2007	47	1155.0	1335	1.16	45	+17.9
2008	46	1119.0	1328	1.19	46	+0.9
2009	46	1129.0	1330	1.18	46	-0.7
2010	46	1130.0	1339	1.21	45	+2.6
2011	44	1080.0	1316	1.22	43	+5.1
2012	44	1067.0	1080	1.01	41	-22.5
2013	37	907.0	1096	1.21	34	+21.3
2014	39	949.2	1192	1.26	35	+8.9
2015	41	1002.2	1314	1.31	39	+6.5
2016	41	1004.4	1405	1.40	39	+5.9
2017	41	1005.4	1467	1.46	41	+4.3
2018	40	980.4	1808	1.84	40	+24.5
2019	40	957.1	1643	1.72	39	-6.5
2020*	0	-	-	-	-	-
2021	41	1002.1	1976	1.97	N/A	N/A
2022	40	975	2109	2.16	40	+9.6
2023	41	1000	1972	1.97	41	-8.8

[a] Based on comparable routes.

Table 4. Spotlight survey observations for selected species in Illinois, 2023.

County	Miles	Raccoons	Deer	Rabbit	Cat	Opossum	Skunk
Cass	25	21	116	8	2	3	2
Clark	25	102	347	20	2	5	0
Clay	24	41	164	16	10	19	2
Clinton-Washington	23	39	103	6	2	6	2
Coles	25	47	234	26	5	9	1
Cook/Busse FPD	13	17	4	5	1	3	15
Douglas	25	16	116	28	8	8	2
DuPage (Z)	19	24	86	1	0	2	0
Gallatin	25	17	175	6	1	9	0
Greene	25	35	233	6	7	2	1
Hamilton	25	22	469	16	1	5	6
Iroquois	25	78	177	9	6	5	1
Jackson	25	44	91	32	2	11	0
Jasper	25	110	340	6	6	6	1
Jefferson	25	54	335	21	10	4	4
JoDaviess	25	61	73	6	7	4	1
Johnson	21	22	200	14	2	4	1
Kankakee	25	42	39	4	5	2	1
Kendall	25	48	102	6	5	3	0
Lee	25	86	380	15	3	4	1
Macoupin	25	30	77	21	2	17	0
Marshall-Woodford	25	37	226	13	8	3	0
Mason	25	20	366	15	3	4	2
McHenry (28)	25	22	99	17	5	2	1
McLean	25	46	302	15	1	7	2
Menard-Logan	25	54	106	4	5	5	5
Mercer	25	157	191	9	3	11	3
Montgomery	25	36	115	7	12	4	0
Morgan	25	39	91	11	2	4	2
Ogle	25	35	66	8	7	3	3
Piatt	25	27	153	13	17	4	1
Pike	25	50	392	19	1	9	2
Randolph #20	25	56	147	17	1	10	8
Sangamon	25	49	353	6	8	4	5
Tazewell	25	53	180	11	1	11	4
Union	25	70	209	16	4	39	8
Vermillion	25	34	284	17	6	2	0
Warren	25	47	188	5	5	5	1
Wayne	25	24	196	23	3	8	1
Whiteside	25	116	93	8	5	0	1
Will	25	44	38	11	3	3	0
Total	1000	1972	7659	517	187	269	90