2024 Spotlight Survey

Wildlife Diversity Program Note #24-1

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 2024, staff sampled a total of 43 routes (39 comparable routes in 2023), drove 1056 miles and observed 10,874 animals (Table 1). Animals observed in addition to target species included 163 house cats, 22 coyotes, 10 red fox, 4 bobcat, 1 beaver and 1 mink. Staff also recorded 27 Canada Geese, 5 bats, 2 owls, 2 armadillo, 1 duck, 1 Great Blue Heron and a weasel; in some cases, species could not be determined.

The number of raccoons observed per mile on 43 routes sampled during 2024 was slightly less than in 2023 (Table 3). Indices varied from 0.60–4.48 raccoons per mile for individual routes (Table 4). Long-term indices (1981–2024) correlated negatively with harvest levels during the preceding season (r = -0.77; $p < 0.01$).

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 2024, the statewide spotlight index was more than 3 times greater than when surveys started in 1981. The index for 2024 was 1.77 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.

Literature Cited

Bauder, J.M., Allen, M.L., Benson, T.J. et al. An approach for using multiple indices for monitoring long-term trends of mesopredators at broad spatial scales. Biodivers Conserv (2021). https://doi.org/10.1007/s10531-021-02259-8

Bluett, R.D., G.F. Hubert, Jr., and C.A. Miller. 2003. Regulatory oversight and activities of wildlife control operators in Illinois. Wildlife Society Bulletin 31:104–116.

Gehrt, S.D., G.F. Hubert, Jr., and J.A. Ellis. 2002. Long-term population trends of raccoons in Illinois. Wildlife Society Bulletin 30:457–463.

Heske, E.J., S.K. Robinson, and J.D. Brawn. 1999. Predator activity and predation on songbird nests on forest-field edges in east-central Illinois. Landscape Ecology 14:245–254.

Hubert, G.F., Jr. 1990. Raccoon investigations. P-R Project Report, W-99-R-2, Study XII, Jobs 1–4. Illinois Department of Conservation, Springfield, Illinois, USA.

Mitchell, M.A., L.L. Hungerford, C. Nixon, T. Esker, J. Sullivan, R. Koerkenmeier, and J.P. Dubey. 1999. Serologic survey for selected infectious disease agents in raccoons from Illinois. Journal of Wildlife Diseases 35:347–355.

Nielsen, C., E. Hellgren, and J. Nawrot. 2009. Cooperative fur-bearing and nongame mammal investigations. Federal Aid Project W-135-R-9–10 Final Report. Cooperative Wildlife Research Laboratory, Southern Illinois University, Carbondale, Illinois, USA.

Page, L.K., D.A.P. Delzell, S.D. Gehrt, E.D. Harrell, M. Hiben, E. Walter, C. Anchor, and K.R. Kazacos. 2016. The structure and seasonality of *Baylisascaris procyonis* populations in raccoons (*Procyon lotor*). Journal of Wildlife Diseases 52:286–292.

Rybarczyk, W.B. 1978. Evaluation of a spotlight survey technique as an index to Iowa white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*) populations. Thesis, Iowa State University, Ames, Iowa, USA.

Schmidt, K.A. 2002. Nest predation and population declines in Illinois songbirds: a case for mesopredator effects. Conservation Biology 17:1141–1150.

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Table 1. Numbers of animals observed per mile for spotlight survey routes in Illinois, 2024.

Species	No. observed	No. observed/mi	% change from 2023[a]

[a] Comparable routes (39 routes in 2024) are those ran in both 2023 and 2024.

Raccoon	1624	1.70	-14.1
White-tailed deer	7186	7.52	-5.0
Cottontail rabbit	518	.54	2.9
Domestic cat	161	0.17	-10.5
Opossum	212	0.22	-21.4
Striped skunk	49	0.05	-46.3

Table 2. Raccoon Indices from Annual Spotlight Surveys 1981 - 2024

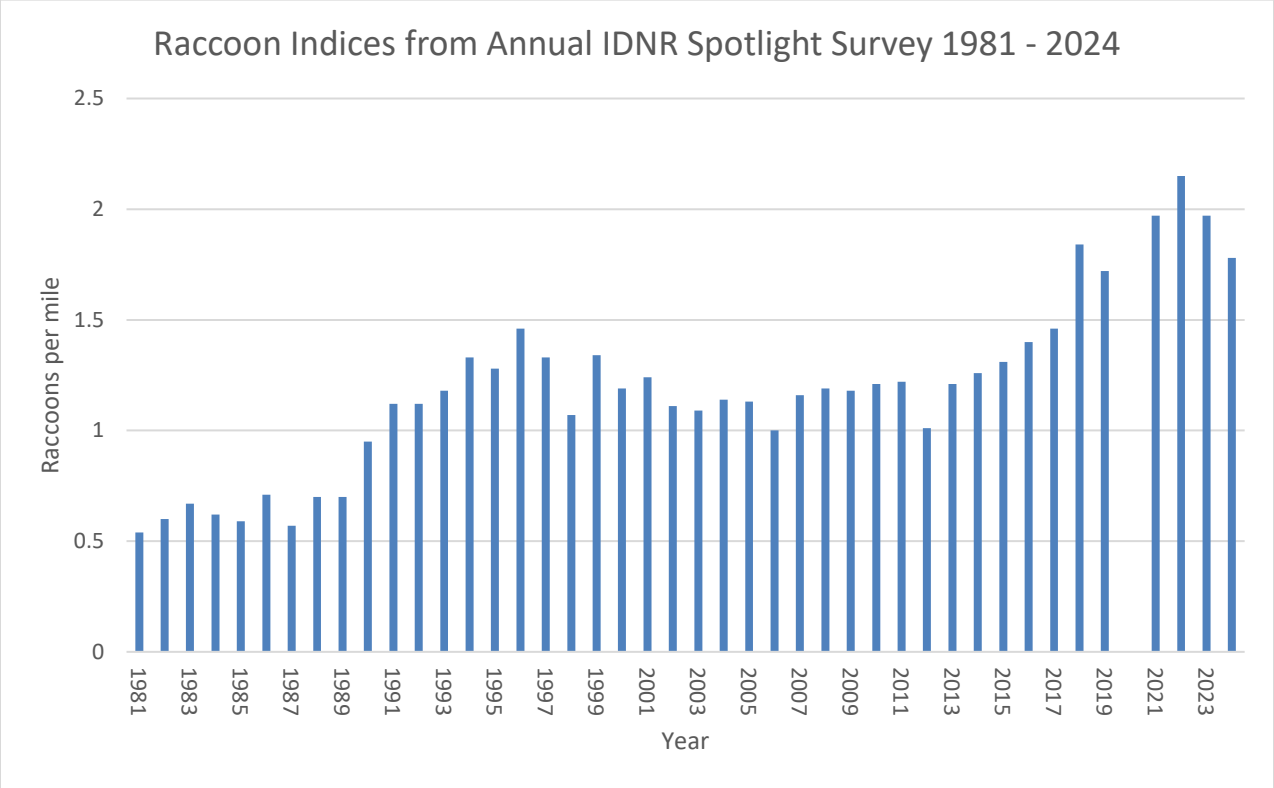

Table 3. Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2024.

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	41	1000	2149	2.15	40	+9.2
2023	42	1025	2005	1.96	41	-8.8
2024	43	1056	1872	1.77	39	-14.1

[a] Based on comparable routes.

Table 4. Spotlight survey observations for selected species in Illinois, 2024.

County	Miles	Raccoons	Deer	Rabbit	Cat	Opossum	Skunk
Adams	25	24	76	10	7	5	0
Cass	25	33	278	17	4	5	0
Clark	25	54	174	4	1	2	0
Clay	25	26	90	15	3	10	3
Clinton/Washington	25	15	85	6	0	6	3
Coles	25	35	247	21	7	10	0
Cook/Busse FPD	13	39	13	11	2	3	7
Douglas	25	18	189	40	5	6	1
DuPage	21	16	46	3	0	3	0
Fulton	25	44	433	17	2	4	0
Gallatin	25	27	75	18	7	8	4
Greene	25	27	140	7	1	8	1
Hamilton	25	66	435	7	10	2	1
Iroquois	25	61	211	10	4	8	0
Jackson	25	37	91	49	4	18	0
Jasper	25	60	251	3	2	8	1
Jefferson	25	35	376	9	6	0	3
Jo Daviess	25	44	57	5	4	2	1
Johnson	22	32	87	9	2	3	0
Kankakee	25	26	21	2	3	1	0
Lake-McHenry	25	27	103	14	3	4	2
Lawrence	25	82	129	7	6	5	0
Lee	25	105	395	12	2	9	1
Macoupin	25	27	199	13	0	5	0
Marshall-Woodford	25	42	236	14	4	6	0
Mason	25	24	270	34	1	4	0
McLean	25	37	270	2	10	3	0
Menard-Logan	25	35	124	7	4	3	0
Mercer	25	112	308	11	6	9	1
Monroe-Randolph	25	72	117	13	0	6	10
Montgomery	25	29	229	5	3	1	0
Morgan	25	45	145	9	8	2	2
Ogle	25	56	80	6	7	9	0
Piatt	25	28	287	31	9	4	3
Pike	25	50	323	31	6	8	0
Sangamon	25	35	215	14	5	5	2
Stephenson	25	98	121	10	2	0	0
Tazewell	25	37	176	9	6	2	1
Union	25	28	168	5	2	12	1
Vermillion	25	33	135	21	5	6	0
Warren	25	78	166	8	4	2	1
Wayne	25	22	355	14	7	4	0
Whiteside	25	51	19	9	4	5	0
Total	1056	1872	7945	562	178	226	49