2022 Spotlight Survey

Wildlife Diversity Program Note #22-1

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 2022, staff sampled 975 miles and observed 10,855 animals on 40 routes (Table 1). Animals observed in addition to target species included 43 coyotes, 11 red fox, 3 beaver, 7 bobcat, and 146 house cats. Staff also recorded 1 owl, 9 geese 2 mink and a muskrat; in some cases, species could not be determined.

The number of raccoons observed per mile on 40 routes sampled during 2022 was slightly more than in 2021 (Table 2). Indices varied from 0.76–7.40 raccoons per mile for individual routes (Table 3). Long-term indices (1981–2022) correlated negatively with harvest levels during the preceding season (r = -0.764; $p < 0.01$).

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 2022, the statewide spotlight index was 4 times greater than when surveys started in 1981. The index for 2022 was 2.16.

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, 2022.

Species	No. observed	No. observed/mi	% change from 2021[a]
Raccoon	2109	2.16	+9.6
White-tailed deer	7705	7.9	+37.4
Cottontail rabbit	520	.53	+29.7
Domestic cat	146	0.15	-14.8
Opossum	237	0.24	+102.5
Striped skunk	61	0.06	-22.2

[a] Comparable routes (40 routes in 2022) are those ran in both 2021 and 2022.

Table 2. Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2022.

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

[a] Based on comparable routes.

Table 3. Spotlight survey observations for selected species in Illinois, 2022.

County	Miles	Raccoons	Deer	Rabbit	Cat	Opossum	Skunk
Cass	25	35	130	7	1	2	1
Clark	25	69	481	22	1	12	2
Clay	24	52	103	20	5	5	1
Clinton-Washington	23	53	141	4	5	7	0
Coles	25	50	334	38	2	8	2
Cook/Busse FPD	13	42	8	5	1	3	8
Douglas	25	27	159	54	5	6	3
DuPage (Z)	19	29	50	4	1	1	1
Gallatin	25	31	198	11	8	15	2
Greene	25	48	151	5	3	6	2
Hamilton	25	32	303	20	2	7	1
Iroquois	25	96	186	6	2	4	2
Jackson	25	91	142	13	7	10	0
Jasper	25	185	311	14	3	10	0
Jefferson	25	71	217	8	3	5	2
JoDaviess	25	35	46	2	2	0	1
Johnson	21	34	169	25	1	9	1
Kankakee	25	36	28	6	8	1	0
Kendall	25	43	136	11	3	6	1
Lee	25	94	325	19	3	6	1
Macoupin	25	22	176	14	0	7	0
Marshall-Woodford	25	59	142	3	5	1	0
Mason	25	44	443	29	2	7	4
McHenry (28)	25	19	98	6	2	4	3
McLean	25	38	309	7	5	8	4
Menard-Logan	25	40	98	2	3	3	2
Mercer	25	86	181	4	8	3	1
Montgomery	25	32	188	9	9	3	0
Morgan	25	62	77	10	4	3	3
Ogle	25	50	114	19	8	1	3
Piatt	25	28	259	28	4	2	1
Pike	25	60	267	10	3	13	1
Randolph #20	25	63	119	7	1	5	1
Sangamon	25	50	347	11	4	8	3
Tazewell	25	51	233	8	0	5	2
Union	25	71	425	17	3	27	2
Warren	25	55	68	6	3	3	0
Wayne	25	47	338	6	6	3	0
Whiteside	25	38	93	13	6	8	0
Will	25	41	112	17	4	0	0
Total	975	2109	7705	520	146	237	61