2019 Spotlight Survey

Wildlife Diversity Program Note #19-1

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 2019, staff sampled 957 miles and observed 10,121 animals on 39 routes (Table 1). Animals observed in addition to target species included 35 coyotes, 2 beaver, 3 bobcat, and 171 house cats. Staff also recorded 9 foxes, 4 owls, 7 geese and 2 otter and 1 weasel; in some cases, species could not be determined.

The number of raccoons observed per mile on 39 routes sampled during 2019 decreased 6.5% (Table 2). Indices varied from 0.60–4.64 raccoons per mile for individual routes (Table 3). Long-term indices (1981–2018) correlated negatively with harvest levels during the preceding season (r = -0.724; p < 0.01).

Discussion

Spotlight surveys are useful for monitoring relative abundance of the raccoon at large spatial and temporal scales (Gehrt et al. 2002). In recent years, the statewide spotlight index was about 2–3 times greater than when surveys started in 1981. The index for 2019 was 1.72.

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, 2019.

Species	No. observed	No. observed/mi	% change from 2019
Raccoon	1643	1.72	-9.1
White-tailed deer	7452	7.79	+17.1
Cottontail rabbit	574	0.60	+14.1
Domestic cat	171	0.18	+16.3
Opossum	166	0.17	-22.4
Striped skunk	53	0.06	-17.2

[a] Comparable routes (n = 39) are those run in both 2018 and 2019.

Table 2. Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2019.

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	39	957.1	1643	1.72	39	-6.5

[a] Based on comparable routes.

Table 3. Spotlight survey observations for selected species in Illinois, 2019.

County	Miles	Raccoons	Deer	Rabbit	Cat	Opossum	Skunk
Adams	25	51	171	12	3	3	0
Cass	25	17	295	6	3	3	3
Clark	25	64	390	25	13	9	4
Clay	24	54	124	21	0	5	0
Coles	25	26	275	28	4	7	1
Cook/Busse FPD	13	18	22	0	0	2	8
Douglas	25	26	94	32	5	8	2
DuPage (Z)	21.1	33	75	5	0	1	1
Gallatin	25	15	133	3	2	4	0
Greene	25	54	168	15	5	5	0
Hamilton	25	29	577	15	3	8	0
Iroquois	25	19	149	1	1	1	0
Jackson	25	39	117	11	1	8	1
Jasper	25	116	259	10	3	2	2
Jefferson	25	30	117	10	2	3	1
JoDaviess	25	46	88	12	7	2	3
Johnson	24	29	272	12	1	3	0
Kankakee	25	49	54	13	5	2	0
Kendall	25	46	148	19	3	4	1
Lee	25	36	231	8	2	0	1
Macoupin	25	51	201	33	4	5	1
Marshall-Woodford	25	28	192	10	9	3	1
Mason	25	30	297	21	6	15	8
McHenry	25	19	73	14	6	3	0
McLean	25	66	189	18	6	11	1
Menard-Logan	25	44	164	4	2	1	1
Mercer	25	39	96	6	4	0	0
Montgomery	25	29	281	46	10	8	1
Morgan	25	66	190	11	7	6	2
Ogle	25	33	172	8	3	2	4
Piatt	25	34	200	41	7	2	0
Pike	25	108	436	12	8	3	4
Sangamon	25	18	235	18	1	2	0
Tazewell	25	45	120	4	2	2	0
Union	25	22	271	15	6	13	1
Warren	25	53	90	8	6	2	0
Wayne	25	49	316	19	9	5	1
Whiteside	25	78	91	16	9	3	0
Will	25	34	79	12	3	0	0