

# 2016 Spotlight Survey

## *Wildlife Diversity Program Note #16-1*

### 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  $\geq 60\%$ , air temperature is  $>32^\circ\text{F}$ , and rain or heavy fog is absent (Rybarczyk 1978).

### RESULTS

During 2016, staff sampled 1004.4 miles and observed 6,154 animals on 41 routes (Table 1). Animals observed in addition to target species included 26 coyotes, 2 bobcats, 6 beavers, 5 mink, 1 muskrat, and 1 badger. Staff also recorded 10 foxes, 7 owls, and 3 geese; in some cases, species could not be determined.

The number of raccoons observed per mile on 39 routes sampled during both 2015 and 2016 increased 5.9% (Table 2). Indices varied from 0.28–3.8 raccoons per mile for individual routes (Table 3). Long-term (1981–2014) indices correlated negatively with harvest levels during the preceding season ( $r = -0.665$ ;  $p < 0.01$ ).

### 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 2016 approached a record set in 1996 (1.46 raccoons per mile).

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  $\geq 37$  routes per year.

## LITERATURE CITED

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**Table 1.** Numbers of animals observed per mile for spotlight survey routes in Illinois, 2016.

Species	Comparable routes <sup>a</sup> (n = 39)		
	No. observed	No. observed/mi	% change from 2015
Raccoon	1352	1.417	+5.9
White-tailed deer	3646	3.820	-25.2
Cottontail rabbit	457	0.479	+0.8
Domestic cat	127	0.133	-24.9
Opossum	225	0.236	+79.4
Striped skunk	65	0.068	+7.8

<sup>a</sup>Comparable routes are those run in both 2015 and 2016.

**Table 2.** Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2016.

Year	No. routes	No. miles sampled	No. raccoons observed	No. raccoons observed/mi	No. comparable routes	% change from previous year <sup>a</sup>
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

<sup>a</sup>Based on comparable routes

**Table 3.** Spotlight survey observations for selected species in Illinois, 2016.

County	No. miles	No. raccoons	No. deer	No. rabbits	No. cats	No. opossums	No. skunks
Adams	25.0	21	48	9	1	1	1
Cass	25.0	7	49	7	0	0	0
Clark	25.0	58	138	14	6	8	0
Clay	25.0	25	144	40	7	8	1
Clinton-Washington	25.0	53	46	5	4	11	1
Coles	25.0	35	135	19	1	11	0
Cook	13.0	21	3	3	0	1	25
Douglas	25.0	23	67	13	3	2	2
DuPage	20.4	10	43	1	0	2	0
Gallatin	25.0	22	63	3	2	7	0
Greene	25.0	23	73	7	3	8	0
Hamilton	25.0	32	204	15	3	14	3
Iroquois	25.0	61	57	5	3	0	0
Jackson	25.0	11	75	8	2	17	0
Jasper	25.0	62	77	11	6	15	1
Jefferson	25.0	26	45	2	0	0	1
JoDaviess	25.0	30	61	3	4	3	3
Johnson	21.0	19	160	50	3	6	2
Kankakee	25.0	46	27	9	1	2	0
Kendall	25.0	45	63	10	4	1	0
Lee	25.0	28	147	5	5	0	0
Macoupin	25.0	22	68	15	3	9	0
Marshall-Woodford	25.0	38	113	3	2	0	1
Mason	25.0	15	70	10	1	2	1
McHenry	25.0	23	42	14	3	4	1
McLean	25.0	36	90	12	2	5	1
Menard-Logan	25.0	19	76	5	1	2	0
Mercer	25.0	52	74	9	6	0	0
Monroe-Randolph	25.0	63	65	10	3	22	11
Montgomery	25.0	24	104	19	2	14	2
Morgan	25.0	54	84	14	4	4	0
Ogle	25.0	33	123	8	0	0	4
Piatt	25.0	30	69	30	4	1	0
Pike	25.0	47	144	18	5	8	0
Sangamon	25.0	25	99	16	7	0	2
Tazewell	25.0	33	99	10	3	5	0
Union	25.0	95	310	36	4	31	0
Warren	25.0	35	50	2	3	1	1
Wayne	25.0	17	170	13	9	3	2
Whiteside	25.0	55	107	13	11	0	0
Will	25.0	31	75	5	3	2	0