

2018 Spotlight Survey

Wildlife Diversity Program Note #18-1

DISCUSSION

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 2018, staff sampled 980.4 miles and observed 9156 animals on 40 routes (Table 1). Animals observed in addition to target species included 28 coyotes, 1 bobcat, and 147 house cats. Staff also recorded 10 foxes, 12 owls, 2 geese and 1 otter; in some cases, species could not be determined.

The number of raccoons observed per mile on 40 routes sampled during 2018 increased 24.5% (Table 2). Indices varied from 0.36–4.96 raccoons per mile for individual routes (Table 3). Long-term indices (1981–2016) correlated negatively with harvest levels during the preceding season ($r = -0.684$; $p < 0.01$).

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 2018 was 1.84 and set a record high.

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

- 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.

ACKNOWLEDGMENTS

This study was funded in part by Federal Aid in Wildlife Restoration Project W-99-R, IDNR and US Fish & Wildlife Service cooperating.

Prepared by Stan McTaggart – 07/18
Illinois Department of Natural Resources
Office of Resource Conservation
Division of Wildlife Resources

Table 1. Numbers of animals observed per mile for spotlight survey routes in Illinois, 2018.

Species	No. observed	No. observed/mi	% change from 2017
Raccoon	1808	1.844	+24.5
White-tailed deer	6365	6.490	+33.4
Cottontail rabbit	503	0.513	+0.2
Domestic cat	147	0.150	-15.0
Opossum	215	0.219	-26.6
Striped skunk	64	0.065	-17.9

^a Comparable routes (n = 40) are those run in both 2017 and 2018.

Table 2. Annual trends in spring spotlight survey observations for raccoons in Illinois, 1981–2018.

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

^a Based on comparable routes.

Table 3. Spotlight survey observations for selected species in Illinois, 2018.

County	No. miles	No. raccoons	No. deer	No. rabbits	No. cats	No. opossums	No. skunks
Adams	25.0	57	140	17	5	4	1
Cass	25.0	28	263	7	1	3	1
Clark	25.0	68	216	9	2	17	0
Clay	25.0	50	183	15	3	2	0
Clinton-Washington	25.0	52	46	10	3	0	4
Coles	25.0	39	162	15	12	7	0
Cook	13.0	21	12	1	1	3	15
Douglas	25.0	10	141	31	6	7	0
DuPage	20.4	36	34	2	0	4	1
Gallatin	25.0	9	129	18	4	6	1
Greene	25.0	54	116	10	3	7	2
Hamilton	25.0	13	272	14	1	7	4
Iroquois	25.0	61	158	5	2	7	2
Jasper	25.0	124	254	29	7	17	2
Jefferson	25.0	42	57	4	1	0	2
JoDaviess	25.0	17	113	8	3	1	0
Johnson	24.0	20	213	11	1	3	1
Kankakee	25.0	57	42	5	5	6	0
Kendall	25.0	53	90	10	7	7	0
Lee	25.0	52	194	3	7	2	2
Macoupin	25.0	48	192	26	5	0	0
Marshall-Woodford	25.0	59	197	6	4	3	1
Mason	25.0	33	217	14	2	7	4
McHenry	25.0	33	72	8	5	1	1
McLean	25.0	85	256	27	4	13	1
Menard-Logan	25.0	23	84	4	3	0	0
Mercer	25.0	72	147	4	2	1	1
Monroe-Randolph	24.0	41	152	5	2	5	5
Montgomery	25.0	9	162	21	5	7	0
Morgan	25.0	46	158	14	1	8	3
Ogle	25.0	31	149	6	5	4	0
Piatt	25.0	15	153	33	0	4	0
Pike	25.0	35	313	11	2	0	0
Sangamon	25.0	29	189	13	2	6	0
Tazewell	25.0	73	235	26	1	10	1
Union	25.0	60	360	11	3	19	0
Warren	25.0	71	112	7	3	7	2
Wayne	25.0	40	216	23	9	6	2
Whiteside	25.0	72	105	17	7	2	0
Will	25.0	72	61	3	8	2	5