2012 Archery Deer Hunter Survey

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INTRODUCTION

Developed in Missouri during the early 1980s, the Archery Deer Hunter Survey (ADHS) offers an economical and statistically robust means of monitoring the relative abundance of several species of terrestrial mammals (Hamilton et al. 1989). Illinois first administered the ADHS in 1991 as part of a Federal Aid in Wildlife Restoration project (Ver Steeg and Warner 1997). ADHS continues to provide the most reliable, and in some cases the only information about trends in relative abundance of bobcat, coyote, gray fox and red fox in Illinois. It also provides an important comparison for results of other techniques used to monitor squirrel, white-tailed deer, and wild turkey.

METHODS

Data are collected by archery deer hunters who volunteer to keep standardized daily logs of their efforts (number of hours afield) and wildlife observations from 1 October through 14 November. Wildlife sightings are compiled statewide, by zone, and by wildlife management unit (WMU; Fig. 1).

Data are averaged for each hunter-location. Thus, if an archer hunts 20 days (trips) in County A, data are averaged to obtain a single sampling unit. If the same hunter also hunts one or more days in County B, these data constitute a second sampling unit. Averaging data for each hunter-location decreases sample size and increases variance, but it provides a conservative statistic based on truly independent samples when calculating numbers of sightings per 1,000 hours of observation.
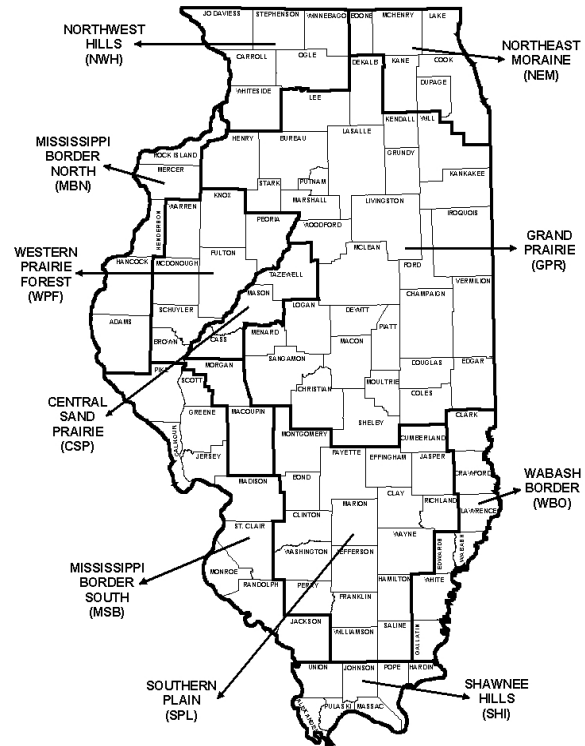

Figure 1. Locations of wildlife management units in Illinois.

RESULTS

During 2012, we received useable surveys from 896 hunters who logged 55,067 hours of observations. The number of hunter-location records varied from 42 to 422 among WMUs and totaled 1,348 statewide (Table 1). The index for coyote increased from 2011 to 2012. Indices for other species were similar to the previous year based on comparisons of 95% confidence limits (Table 2).

Long-term (1992-2012) positive trends (19 df; $p < 0.05$) occurred for bobcat ($r = 0.91$), white-tailed deer ($r = 0.70$), coyote ($r = 0.63$), squirrel ($r = 0.61$) and

Table 1. Number of sampling units by wildlife management unit for the 2012 Archery Deer Hunter Survey using hunter-location method of analysis.

Sample area	Number of hunter locations	Number of hours of observation
Central sand prairie	42	1,809
Grand prairie	422	16,898
Mississippi border (N)	56	2,965
Mississippi border (S)	142	5,799
Northeast moraine	52	1,514
Northwest hills	90	4,733
Shawnee hills	64	2,719
Southern plain	262	9,732
Wabash border	51	2,054
Western prairie forest	163	6,843
Statewide	1,348	55,067

wild turkey ($r = 0.77$). Long-term negative trends occurred for red fox ($r = -0.77$) and gray fox ($r = -0.66$).

DISCUSSION

Results for individual wildlife management units must be interpreted cautiously because of differences in sample sizes (i.e., small units tend to have fewer observers and greater confidence intervals) and land uses (e.g., hunters' abilities to observe wildlife in heavily forested parts of the state might differ from areas of the state devoted mostly to raising crops). During some years, the timing of crop harvest could affect hunters' abilities to observe wildlife.

Beginning in 2005, we recruited new observers every other year rather than every year. This cost-saving measure caused sample sizes to dwindle to 649–791 surveys during off-years. An evaluation by the Cooperative Wildlife Research Laboratory at Southern Illinois University (Nielsen et al. 2009) found that ≥1650 surveys are needed for reliable estimates of trends for coyote and squirrel. Larger numbers of returns are required for species observed infrequently (i.e., bobcat, foxes). The study did not attempt to evaluate ADHS for monitoring white-tailed deer and wild turkey.

The ADHS provides valuable information for management activities that fulfill the Department's statutory responsibilities (520 ILCS 5/1.10) and values (IDNR Strategic Plan, Priority IV). The survey should continue. New observers should be recruited each year with a goal of obtaining ≥1,650 useable surveys.

LITERATURE CITED

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Table 2. Trends in statewide Archery Deer Hunter Survey sighting indices in Illinois, 1992-2012, using hunter-location method of analysis.

				Species				
Year	Bobcat	Coyote	Deer	Gray fox	Raccoon	Red fox	Squirrel	Turkey
1992 (1,239)[a]	0.53 (0.29)[b]	27.09 (3.16)	655.29 (33.09)	2.50 (1.11)	30.14 (3.47)	9.25 (2.00)	972.66 (34.53)	93.41 (20.25)
1993 (2,877)	0.65 (0.27)	29.68 (2.82)	611.17 (17.21)	1.90 (0.41)	49.35 (3.19)	8.06 (0.99)	1017.30 (24.83)	123.85 (16.17)
1994 (1,814)	0.40 (0.17)	28.44 (3.34)	586.54 (19.69)	1.68 (0.51)	46.74 (3.61)	5.67 (0.92)	1089.03 (32.35)	146.25 (20.15)
1995 (2,278)	0.81 (0.28)	30.57 (2.59)	696.88 (21.99)	1.61 (0.49)	52.53 (3.66)	6.64 (0.95)	995.29 (26.28)	138.17 (16.13)
1996 (1,458)	0.80 (0.33)	27.50 (3.20)	662.87 (27.05)	1.18 (0.51)	45.73 (3.98)	4.68 (0.89)	938.52 (31.63)	144.45 (19.59)
1997 (1,411)	1.34 (0.77)	26.48 (2.93)	661.98 (27.14)	0.64 (0.33)	47.16 (4.68)	5.45 (0.96)	981.15 (33.60)	139.24 (19.59)
1998 (2,052)	1.10 (0.38)	30.82 (2.82)	736.18 (23.46)	0.80 (0.28)	49.18 (3.54)	6.02 (1.22)	928.99 (28.31)	201.51 (20.92)
1999 (1,931)	1.37 (0.44)	32.26 (2.75)	729.16 (23.59)	1.39 (0.99)	63.02 (4.53)	3.51 (0.65)	988.98 (28.81)	241.48 (23.26)
2000 (1,854)	1.10 (0.40)	30.56 (2.49)	853.55 (26.68)	0.68 (0.31)	65.90 (5.36)	4.11 (0.81)	1087.00 (32.30)	272.55 (34.52)
2001 (1,366)	1.57 (0.83)	32.35 (3.35)	918.72 (33.57)	0.76 (0.50)	66.64 (5.89)	4.42 (1.02)	1266.34 (40.58)	311.16 (35.32)
2002 (1,780)	2.00 (0.66)	34.47 (3.11)	995.25 (32.67)	0.60 (0.26)	55.07 (3.96)	3.74 (0.65)	1081.09 (35.79)	348.07 (31.68)
2003 (1,569)	2.10 (0.59)	29.75 (2.85)	1033.49 (34.47)	0.81 (0.36)	65.72 (5.05)	3.53 (0.67)	1177.41 (34.69)	308.02 (28.65)
2004 (1,216)	1.31 (0.49)	35.93 (3.33)	1143.40 (42.92)	0.57 (0.22)	64.12 (5.36)	3.53 (0.69)	1219.52 (43.92)	344.96 (34.51)
2005 (1,544)	3.69 (1.79)	32.01 (2.67)	1145.71 (36.69)	0.62 (0.28)	53.14 (4.17)	3.62 (0.69)	1045.07 (32.41)	280.14 (25.52)
2006 (791)	3.07 (0.94)	35.46 (4.90)	1104.14 (49.52)	0.47 (0.40)	70.32 (10.49)	3.86 (1.05)	1255.03 (56.01)	342.55 (42.27)
2007 (1,075)	2.89 (0.95)	47.58 (7.93)	1104.24 (45.63)	0.82 (0.58)	60.69 (5.52)	3.96 (1.10)	1076.21 (42.24)	332.91 (34.58)
2008 (649)	3.36 (1.46)	32.09 (5.64)	930.51 (47.85)	0.33 (0.27)	60.43 (7.51)	2.70 (1.32)	1007.79 (41.29)	267.49 (38.73)
2009 (1,067)	2.80 (0.73)	27.41 (2.70)	815.75 (24.62)	0.36 (0.23)	52.25 (4.39)	4.05 (1.03)	1098.01 (29.73)	287.15 (24.90)
2010 (700)	3.84 (1.39)	40.95 (4.66)	915.54 (59.68)	1.04 (0.84)	91.86 (9.54)	3.20 (0.87)	1223.82 (51.70)	279.73 (39.25)
2011 (936)	4.11 (1.12)	32.54 (3.89)	856.17 (41.15)	1.26 (0.78)	-[c]	3.80 (1.06)	1225.71 (49.43)	273.90 (38.55)
2012 (896)	5.89 (1.62)	43.60 (5.44)	940.70 (49.94)	0.71 (0.71)	-[c]	4.12 (1.26)	1173.81 (57.17)	279.12 (33.07)

[a] Number of observers in parentheses following year.
[b] 95% confidence limit is in parentheses following the number of sightings per 1,000 hours.
[c] Raccoon discontinued in 2011 based on recommendations of Nielsen et al. (2009); IDNR's spring spotlight survey is a better index of relative abundance for this species.