2022 Archery Deer Hunter Survey

Wildlife Diversity Program Note 23-4

INTRODUCTION

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 study funded by Federal Aid in Wildlife Restoration (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, red fox, and gray fox. It also provides a way to compare trends from ADHS to results of other methods 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, daily observations are averaged to obtain a single sampling unit. If the same archer 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 estimate based on truly independent samples when calculating numbers of sightings per 1,000 hours of observation.
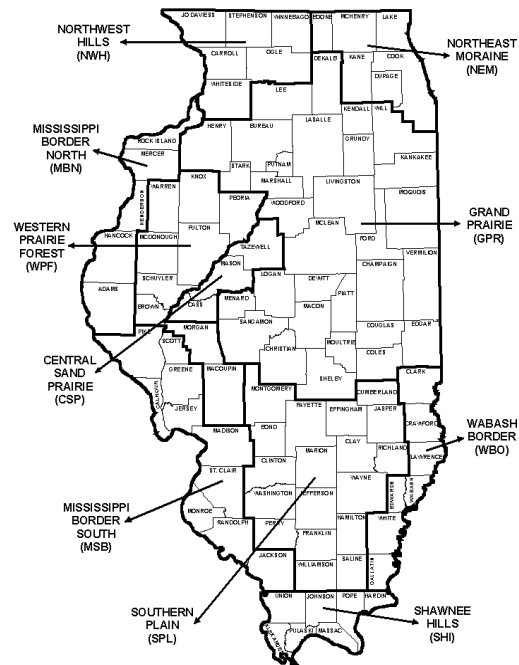

Figure 1. Locations of Wildlife Management Units in Illinois.

RESULTS

During 2022, we received useable surveys from 1011 hunters who logged 51,699 hours of observations. The number of hunter-locations varied from 36–400 among WMUs and totaled 1,369 statewide (Table 1). Observations of deer and gray fox and squirrel increased while bobcat, coyote, red fox, and turkey were down during 2022. Almost all of the changes from 2021 to 2022 were within the 95% confidence interval, except for squirrels. (Table 2).

Long-term (1992–2022) positive trends ($p <$ 0.05) occurred for bobcat ($r = 0.92$), white-tailed deer ($r = 0.54$), coyote ($r = 0.51$), squirrel ($r = 0.51$), and wild turkey ($r = 0.39$). Long-term

negative trends occurred for red fox ($r = -0.75$) and gray fox ($r = -0.29$).

Table 1. Sampling effort by Wildlife Management Unit for the Archery Deer Hunter Survey in Illinois, 2022.

Wildlife Mgmt. Unit	No. hunter locations	No. hours observation
Central Sand Prairie	43	1296
Grand Prairie	400	723
Mississippi Border (N)	74	3173
Mississippi Border (S)	144	5824
Northeast Moraine	36	1303
Northwest Hills	118	4336
Shawnee Hills	54	2160
Southern Plain	274	8893
Wabash Border	46	1813
Western Prairie Forest	180	7576
Statewide	1369	51,669

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). Differences in land uses also affect the ability of hunters to see animals. For example, detection could be lower in heavily forested parts of the state than those devoted mostly to raising crops. Observations are also likely to be lower when many crops are standing during part of the archery season than years with an early harvest.

An evaluation by the Cooperative Wildlife Research Laboratory at Southern Illinois University (Nielsen et al. 2009) estimated ≥1650 returns are needed for reliable estimates of trends for coyote and squirrel. Larger numbers of observers are required for species that are observed infrequently (e.g., red fox and gray fox). 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 is consistent with its commitment to responsible management of the state's natural resources (IDNR Strategic Plan, Priority IV). The survey should continue and can be improved by obtaining ≥1650 useable surveys.

LITERATURE CITED

Hamilton, D.A., T.G. Kulowiac, and D. Erickson. 1989. Archer's index to upland furbearer populations and sign station indices – a comparison. Proceedings of the Seventh Midwest and Third Southeast Furbearer Workshop, Potosi, Missouri, USA.

Nielsen, C., E. Hellgren, and J. Nawrot. 2009. Cooperative fur-bearing and nongame mammal investigations. Final Report, Federal Aid Project W-135-R-9–10. Cooperative Wildlife Research Laboratory at Southern Illinois University, Carbondale, Illinois, USA.

Ver Steeg, B., and R.E. Warner. 1997. Red fox studies, 1991–1997. Final P-R Project Report, W-111-R. Illinois Department of Natural Resources, Springfield, Illinois, USA.

ACKNOWLEDGMENTS

Prepared by Stan McTaggart – 08/23
Illinois Department of Natural Resources
Office of Resource Conservation
Division of Wildlife Resources

Table 2. Number of sightings per 1000 hours of observation during Archery Deer Hunter Survey in Illinois, 1992–2022 (using hunter-location method of analysis).

Year	Species							
	Bobcat	**Coyote**	**Deer**	**Gray fox**	**Raccoon**	**Red fox**	**Squirrel**	**Turkey**
1992 (1239)[a]	**0.5** (0.3)[b]	**27.1** (3.2)	**655.3** (33.1)	**2.5** (1.1)	**30.1** (3.5)	**9.3** (2.0)	**972.7** (34.5)	**93.4** (20.3)
1993 (2877)	**0.6** (0.3)	**29.7** (2.8)	**611.2** (17.2)	**1.9** (0.4)	**49.4** (3.2)	**8.1** (1.0)	**1017.3** (24.8)	**123.8** (16.2)
1994 (1814)	**0.4** (0.2)	**28.4** (3.3)	**586.5** (19.7)	**1.7** (0.5)	**46.7** (3.6)	**5.7** (0.9)	**1089.0** (32.4)	**146.3** (20.2)
1995 (2278)	**0.8** (0.3)	**30.6** (2.6)	**696.9** (22.0)	**1.6** (0.5)	**52.5** (3.7)	**6.6** (0.9)	**995.3** (26.3)	**138.2** (16.1)
1996 (1485)	**0.8** (0.3)	**27.5** (3.2)	**662.9** (27.0)	**1.2** (0.5)	**45.7** (4.0)	**4.7** (0.9)	**938.5** (31.6)	**144.4** (19.6)
1997 (1441)	**1.3** (0.8)	**26.5** (2.9)	**662.0** (27.1)	**0.6** (0.3)	**47.2** (4.7)	**5.5** (1.0)	**981.1** (33.6)	**139.2** (19.6)
1998 (2052)	**1.1** (0.4)	**30.8** (2.8)	**736.2** (23.5)	**0.8** (0.3)	**49.2** (3.5)	**6.0** (1.2)	**929.0** (28.3)	**201.5** (20.9)
1999 (1931)	**1.4** (0.4)	**32.3** (2.8)	**729.2** (23.6)	**1.4** (1.0)	**63.0** (4.5)	**3.5** (0.7)	**989.0** (28.8)	**241.5** (23.3)
2000 (1854)	**1.1** (0.4)	**30.6** (2.5)	**853.6** (26.3)	**0.7** (0.3)	**65.9** (5.4)	**4.1** (0.8)	**1087.0** (32.3)	**272.6** (34.5)
2001 (1366)	**1.6** (0.8)	**32.3** (3.4)	**918.7** (33.6)	**0.8** (0.5)	**66.6** (5.9)	**4.4** (1.0)	**1266.3** (40.6)	**311.2** (35.3)
2002 (1780)	**2.0** (0.7)	**34.5** (3.1)	**995.2** (32.7)	**0.6** (0.3)	**55.1** (4.0)	**3.7** (0.6)	**1081.1** (35.8)	**348.1** (31.7)
2003 (1569)	**2.1** (0.6)	**29.8** (2.9)	**1033.5** (34.5)	**0.8** (0.4)	**65.7** (5.0)	**3.5** (0.7)	**1177.4** (34.7)	**308.0** (28.6)
2004 (1216)	**1.3** (0.5)	**35.9** (3.3)	**1143.4** (43.0)	**0.6** (0.2)	**64.1** (5.4)	**3.5** (0.7)	**1219.5** (43.9)	**345.0** (34.5)
2005 (1544)	**3.7** (1.8)	**32.0** (2.7)	**1145.7** (36.7)	**0.6** (0.3)	**53.1** (4.2)	**3.6** (0.7)	**1045.1** (32.4)	**280.1** (25.5)
2006 (791)	**3.1** (0.9)	**35.5** (4.9)	**1104.1** (49.5)	**0.5** (0.4)	**70.3** (10.5)	**3.9** (1.1)	**1255.0** (56.0)	**342.6** (42.3)
2007 (1075)	**2.9** (1.0)	**47.6** (7.9)	**1104.2** (45.6)	**0.8** (0.6)	**60.7** (5.5)	**4.0** (1.1)	**1076.2** (42.2)	**332.9** (34.6)
2008 (649)	**3.4** (1.5)	**32.1** (5.6)	**930.5** (47.9)	**0.3** (0.3)	**60.4** (7.5)	**2.7** (1.3)	**1007.8** (41.3)	**267.5** (38.7)
2009 (1067)	**2.8** (0.7)	**27.4** (2.7)	**815.8** (24.6)	**0.4** (0.2)	**52.3** (4.4)	**4.1** (1.0)	**1098.0** (29.7)	**287.1** (24.9)
2010 (700)	**3.8** (1.4)	**41.0** (4.7)	**915.5** (59.7)	**1.0** (0.8)	**91.9** (9.5)	**3.2** (0.9)	**1223.8** (51.7)	**279.7** (39.3)
2011 (936)	**4.1** (1.1)	**32.5** (3.9)	**856.2** (41.1)	**1.3** (0.8)	_c	**3.8** (1.1)	**1225.7** (49.4)	**273.9** (38.5)
2012 (896)	**5.9** (1.6)	**43.6** (5.4)	**940.7** (50.0)	**0.7** (0.7)	_c	**4.1** (1.3)	**1173.8** (57.2)	**279.1** (33.1)
2013 (886)	**5.9** (1.7)	**31.2** (5.0)	**764.5** (40.8)	**0.4** (0.4)	_c	**2.3** (0.7)	**1135.5** (51.4)	**225.3** (29.5)
2014 (1002)	**5.6** (1.9)	**34.6** (5.1)	**802.6** (50.5)	**0.1** (0.1)	_c	**3.9** (1.2)	**1223.3** (60.1)	**253.6** (32.4)
2015 (1089)	**11.1** (3.8)	**44.9** (6.3)	**871.7** (53.6)	**0.4** (0.5)	_c	**5.6** (2.2)	**1403.7** (78.1)	**323.7** (47.6)
2016 (1250)	**7.8** (1.8)	**38.5** (4.8)	**810.8** (33.2)	**0.3** (0.2)	_c	**3.0** (1.3)	**1082.9** (44.0)	**245.0** (27.0)
2017 (1647)	**6.5** (1.9)	**32.3** (4.3)	**921.1** (68.8)	**0.6** (0.7)	_c	**3.3** (1.5)	**1092.9** (70.5)	**238.0** (46.6)
2018 (1283)	**6.5** (2.0)	**36.7** (5.0)	**1096.6** (80.8)	**0.3** (0.2)	_c	**3.5** (1.9)	**1154.7** (79.0)	**277.3** (45.4)
2019 (1172)	**6.6** (2.0)	**34.1** (6.1)	**1014.5** (77.9)	**3.0** (2.9)	_c	**2.9** (1.1)	**1194.7** (83.6)	**237.1** (38.8)
2020 (1034)	**7.7** (2.8)	**37.3** (6.8)	**956.9** (66.2)	**1.8** (2.2)	_c	**2.1** (0.7)	**1194.5** (89.8)	**229.9** (45.1)
2021 (977)	**8.3** (2.0)	**35.8** (5.4)	**963.3** (49.3)	**0.4** (0.2)	_c	**2.5** (0.9)	**995.5** (45.8)	**213.2** (31.5)
2022 (1011)	**7.8** (1.6)	**31.9** (4.3)	**994.1** (44.9)	**0.8 (0.5)**	_c	**2.1** (0.7)	**1190.9** (87.3)	**211.2** (31.8)

[a]Number of observers in parentheses following year.

[b]95% confidence limit in parentheses following the number of sightings per 1000 hours.

[c]Raccoon discontinued in 2011 based on availability of alternate methods.