2024 Archery Deer Hunter Survey

Wildlife Diversity Program Note 25-4

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.

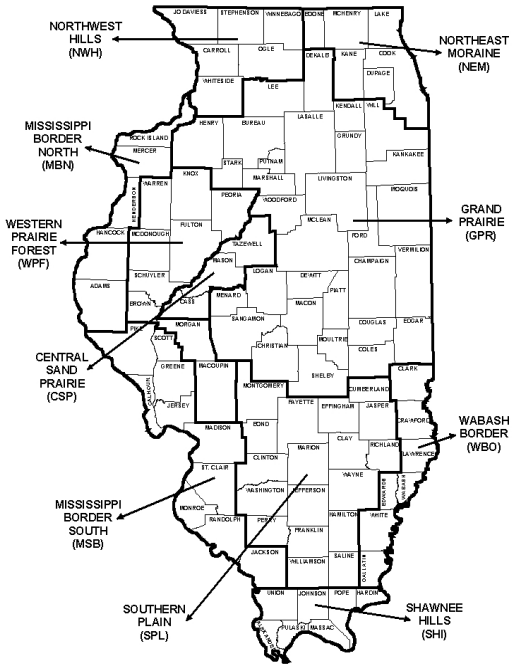

Figure 1. Locations of Wildlife Management Units in Illinois.

RESULTS

During 2024, we received useable surveys from 521 hunters who logged 22,283 hours of observations. The number of hunter-locations varied from 23–218 among WMUs and totaled 666 statewide (Table 1). Observations of bobcat, coyote, gray fox, and squirrel increased while red fox and wild turkey were down during 2024. Deer observations stayed the same. All of the changes from 2023 to 2024 were within the 95% confidence interval except for bobcat (+) and wild turkey (-). (Table 2).

Long-term (1992–2024) positive trends ($p < 0.05$) occurred for bobcat ($r = 0.92$), white-tailed deer ($r = 0.58$), coyote ($r = 0.44$), squirrel ($r = 0.55$), and wild turkey ($r = 0.28$). Long-term

negative trends occurred for red fox (r = -0.69) and gray fox (r = -0.10).

Table 1. Sampling effort by Wildlife Management Unit for the Archery Deer Hunter Survey in Illinois, 2024.

Wildlife Mgmt. Unit	No. hunter locations	No. hours observation
Central Sand Prairie	23	704
Grand Prairie	218	6765
Mississippi Border (N)	28	1284
Mississippi Border (S)	76	2591
Northeast Moraine	23	853
Northwest Hills	59	1810
Shawnee Hills	24	860
Southern Plain	115	3495
Wabash Border	25	816
Western Prairie Forest	75	3105
Statewide	666	22,283

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

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Table 2. Number of sightings per 1000 hours of observation during Archery Deer Hunter Survey in Illinois, 1992–2024 (using hunter-location method of analysis).

	Species							
Year	**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)
2023 (943)	**7.8** (1.9)	**29.4** (4.6)	**1044** (57.3)	**1.3** (1.0)	_[c]	**4.5** (3.7)	**1185.1** (56.5)	**217.5** (29.4)
2024 (521)	**11.1** (3.5)	**36.6** (8.7)	**1044** (75.2)	**2.2** (2.0)	_[c]	**3.2** (1.7)	**1298.7** (82.7)	**173.6** (29.5)

[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.