

**Illinois Chronic Wasting Disease Summary:
Results for the 2003-2004 Surveillance Season**



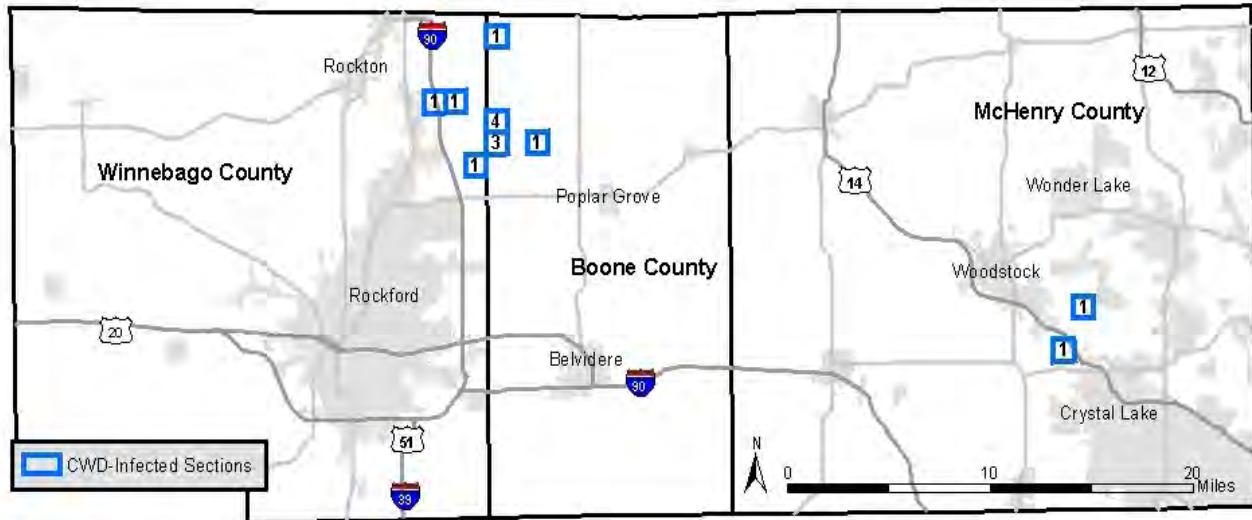
**Paul Shelton and Andrew Hulin
Forest Wildlife Program
Illinois Department of Natural Resources**

June 25, 2004

Background:

Prior to the 2003-2004 CWD-sampling season (state fiscal year beginning July 1, 2003, hereafter referred to as FY03-04), 14 CWD-positive deer in two distinct locales were identified by various surveillance methods. The primary area of infection (12 positive animals) was located along the Boone-Winnebago county line northeast of Rockford, while the other infected area (2 positives) was southeast of Woodstock in McHenry County (Fig. 1).

Figure 1. Locations and number per section of CWD-infected deer identified in northern Illinois prior to July 1, 2003.



CWD Surveillance Activities During FY2003-2004:

All CWD testing was conducted at the Illinois Department of Agriculture's Animal Disease Laboratories located at Galesburg and Centralia, Illinois, both of which are certified for CWD testing by USDA. Immunohistochemistry (IHC) was the testing method used. Sampling was accomplished by collecting tissues from (1) hunter-harvested deer during the firearm and archery deer seasons; (2) suspect animals reported to IDNR staff; (3) road-killed deer in known CWD-infected areas; (4) deer taken under authority of urban Deer Population Control Permits; and (5) deer taken by IDNR/APHIS sharpshooters in CWD areas.

Firearm Deer Season Surveillance. Tissue samples (obex and retropharyngeal lymph nodes) were taken by IDNR staff from hunter-harvested deer at check stations and stored in individually-labeled jars of formalin. Thirty-six counties were surveyed (Figure 2), with sampling intensity dependent upon the risk category assigned to each county. High-risk counties were defined as those counties bordering Wisconsin, or those bordering Illinois counties in which CWD has been found. The high-risk counties open to firearm hunting were JoDaviess, Stephenson, Winnebago, Boone, McHenry, Ogle, and DeKalb. In these counties, our goal was to collect samples either (a) from 500 adult deer, or (b) for the duration of the 7-day season, whichever came first. Collecting 500 samples allowed for some unusable samples while still attaining the 459 tests necessary for yielding 99% confidence of detecting a 1% prevalence rate (assuming a population size >10,000; i.e., approaching infinity). In high-risk counties, the location of the deer when harvested was recorded by township, range, and section (e.g., to the nearest square mile according to the public land survey system). An additional 29 reduced-risk counties were sampled at lower levels, with a goal of 65 adult deer samples from each. This allowed for a few unusable samples, while still attaining the 59 tests necessary for yielding 95% confidence of detecting a 5% prevalence rate. Carroll County, which was sampled in 2002, was resampled because of

its geographic location close to known CWD areas. The remaining 28 downstate locations were chosen from counties not sampled in 2002, with consideration given to geographic location, deer herd size, and number of captive cervid facilities. Locations of deer harvested from low-risk counties (township, range, and section) were not recorded.

A total of 4,439 usable samples were collected during the firearm deer season, with 17 CWD-positive individuals identified from four counties (Boone [9], DeKalb [3], McHenry [1], and Winnebago [4]). Appendix A provides a tabulation of the number of usable samples actually taken in each county.

Archery Deer Season Surveillance. Refrigerated sample collection stations were established in select counties in northern Illinois to allow archery deer hunters to donate samples for CWD surveillance. The stations were “self-serve” – hunters filled out a card to identify themselves and the location from which they harvested the deer, and left the deer head and the completed card in a plastic bag in the provided refrigerator. In addition, certain cooperating meat processors volunteered to collect samples for us from archery-harvested deer. The sampling stations were advertised to the hunting public in Cook, Lake, Kane, DuPage, McHenry, Boone, Winnebago, and DeKalb counties. IDNR staff checked the stations at least twice a week, removed the tissue samples from the heads, and forwarded the samples to the Galesburg Animal Disease Laboratory for testing.

Only 230 usable samples were taken in this fashion (28 donated heads were not tested because they were fawns), but many of the samples originated from locations nearby the identified CWD area along the Boone-Winnebago county line (Appendix A). As a result, six CWD-positive animals were found, all from Boone County.

Urban Deer Population Control Permit (DPCP) Surveillance. Agencies/municipalities participating in urban deer population control programs (sharpshooting) were asked to collect obex/retropharyngeal lymph node samples from a specified number of adult deer. IDNR supplied the necessary training and materials, and arranged for transfer of the samples to the testing laboratories. This provided samples of deer from northeastern Illinois counties not open to firearm deer hunting (Cook, Lake, DuPage), as well as from properties in Winnebago County and JoDaviess County not open to public hunting.

A total of 723 usable samples were taken from five counties (Appendix A). Five CWD-positive deer were identified from forest preserve district properties in southeast Winnebago County.

Suspect (“Target”) Deer Surveillance. Upon receiving reports from the public about sick deer, IDNR staff collected samples for CWD testing from deer that exhibited signs/symptoms that could be attributed to chronic wasting disease.

Samples were taken from 33 deer in 24 counties (Appendix A). An additional five deer taken under the authority of nuisance Deer Removal Permits in Stephenson County were also sampled. Two positive deer were found, one each in Winnebago and Boone counties.

Surveillance from Post-Hunting Season Sharpshooting. Sharpshooting was conducted during the period January 12, 2004 - March 31, 2004 by IDNR Wildlife Biologists, IDNR Conservation Police Officers, and USDA Wildlife Services personnel. Generally, sharpshooting locations were confined to those parts of Boone,

Fig. 2. Illinois counties sampled for CWD during the 2003 firearm deer season.

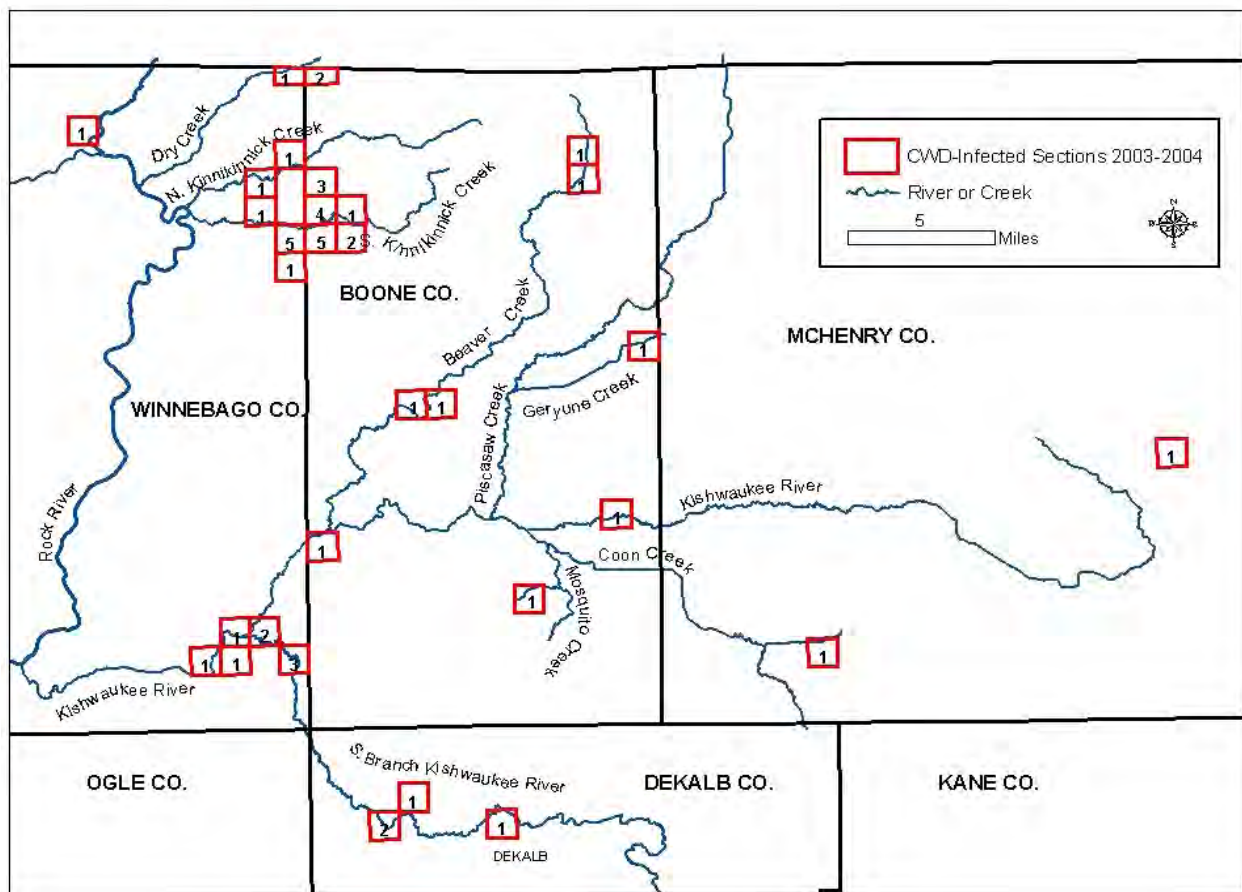


DeKalb, McHenry, and Winnebago counties from which CW D-infected deer had been identified. More specific details of goals, procedures, and results of the sharpshooting program will be discussed in the management section of this report.

Sharpshooters collected 744 usable samples from the four affected counties (Appendix A). Twenty-one positive deer were found: Winnebago (10), Boone (9), DeKalb (1), and McHenry (1).

Discussion of Surveillance Results to Date. A total of 6187 usable samples were collected statewide during FY03-04, resulting in the identification of 51 CWD-positive deer from four counties. Positive deer had been previously identified from three of the counties (Boone, McHenry, and Winnebago), but the first positive records from DeKalb County were found during this period. Locations of all positive deer found during FY03-04 are depicted in Figure 3.

Figure 3. Locations and number per section of CWD-infected deer found in Illinois during the period 1 July 2003 through 30 June 2004.



The 2003-2004 data identify considerably wider distribution of CWD in northern Illinois than the previously-detected two locales. It is impossible to determine at this time how much of this difference can be attributed to recent movements, and how much is simply a result of low disease prevalence that escaped detection in prior sampling. It still appears that the primary focus of the disease (and probable point of origin) is northeast of Rockford along North and South Kinnikinnick creeks. Based on its current known distribution, the disease seems to have spread through the fragmented landscape along riparian corridors primarily associated with the Kishwaukee River, including Beaver Creek (Boone Co.), the North Branch of the Kishwaukee River (Boone and McHenry counties), and the South Branch of the Kishwaukee River (DeKalb County). However, considerable overland movement not associated with riparian corridors has occurred, since the latter three corridors are not directly linked with North and South Kinnikinnick creeks.

Disease prevalence rates were calculated for the four affected counties from random surveillance data collected during the firearm deer season, and by pooling all surveillance data sets that could be construed as random (i.e., all data collection methods other than suspect animal surveillance). However, while these methodologies did not select for or against sick deer, only collections during the firearm deer season were truly random with respect to location within a county, as all other methods selected for deer that originated from known infected areas. Because of this bias, the pooled information always resulted in slightly higher countywide prevalence rates (Table 1), but is of interest because it include fawns as well as adults (while firearm season collection was limited to adults only). Adult prevalence rates calculated from firearm deer season data ranged from 6.04% (\pm 3.83, 95% confidence interval) in Boone County to 0.27% (\pm 0.53, 95% confidence interval) in McHenry County.

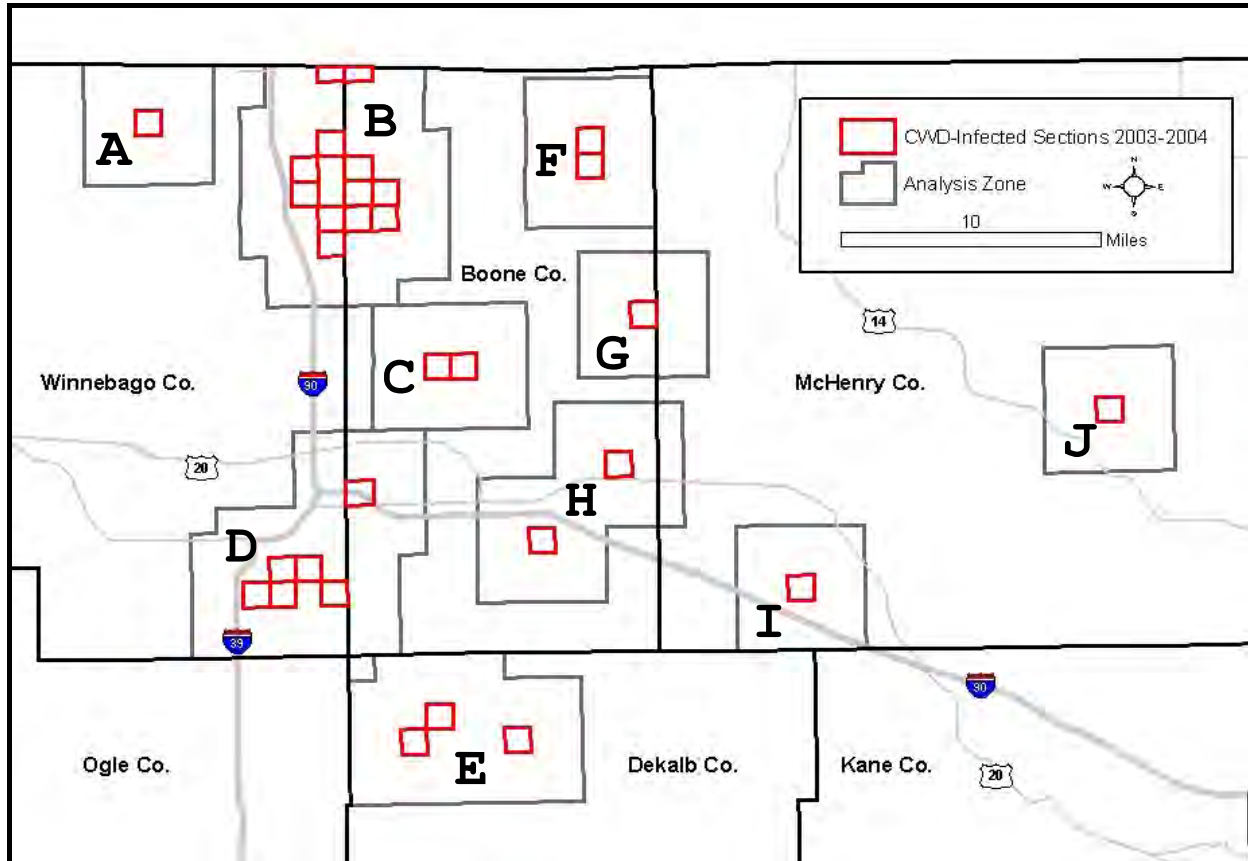
Table 1. Countywide CWD prevalence estimates in northern Illinois for the period 1 July 2003 through 30 June 2004.

County	Source of Samples	Deer Age	# of Samples	# of Positives	Percent Positive	95% Confidence Interval (+/-)
Boone	Firearm season	Adults only	149	9	6.0%	3.8%
	All random	Adults only	328	23	7.0%	2.8%
	All random	All deer	415	24	5.8%	2.2%
	All random	Fawns only	85	1	1.2%	2.3%
DeKalb	Firearm season	Adults only	140	3	2.1%	2.4%
	All random	Adults only	168	4	2.4%	2.3%
	All random	All deer	194	4	2.1%	2.0%
	All random	Fawns only	26	0	0.0%	-
McHenry	Firearm season	Adults only	367	1	0.3%	0.5%
	All random	Adults only	572	2	0.4%	0.5%
	All random	All deer	656	2	0.3%	0.4%
	All random	Fawns only	84	0	0.0%	-
Winnebago	Firearm season	Adults only	367	4	1.1%	1.1%
	All random	Adults only	741	14	1.9%	1.0%
	All random	All deer	981	19	1.9%	0.9%
	All random	Fawns only	238	5	2.1%	1.8%

Since chronic wasting disease is not randomly distributed in northern Illinois, we also calculated disease prevalence rates for known CWD areas. For this purpose, surveillance data were limited to those random samples (all methods except suspect animal surveillance) collected within two miles of a known CWD-positive section. This approach resulted in delineation of nine discrete geographical areas (Figure 4). Calculated prevalence rates (with 95% Confidence Intervals) for these areas are presented in Table 2. Caution should be used in interpreting these results, as small sample sizes preclude a high degree of precision for prevalence estimates in all areas except B, D, and J.

Zone B, located northeast of Rockford along the Boone-Winnebago county line, has an estimated CWD prevalence rate in adult deer of 8.6% (\pm 3.4). CWD appears most established in this area, which accounted for 28 of the 51 positive deer identified during FY03-04. Within this zone, prevalence rates significantly higher than 8.6% occur at a local scale on select properties. This is one of only two zones for which prevalence estimates are available for the previous year (FY02-03), although zone boundaries differ slightly. The 02-03 estimate of 6.0% (\pm 4.0) was comparable to that for this year.

Figure 4. Zones in northern Illinois for which localized CWD prevalence estimates were made during FY03-04.



Zone D, in southeast Winnebago County along the Kishwaukee River, was estimated to have an adult prevalence rate of only 2.5% (± 1.8). However, late-winter deer population density was the highest identified by aerial surveys in Illinois' CWD area (see Management Section, following), so ideal conditions exist for disease spread within a significant deer population. This population is largely un hunted, due to a network of county-owned forest preserves that currently serve as refuges. The zone's location near the confluence of the Kishwaukee and Rock rivers poses a disease threat to deer populations to the southwest of the currently-affected CWD area. These threatened deer populations are larger than those presently affected, and occupy larger blocks of more contiguous habitat.

Zone J, located southeast of Woodstock in McHenry County, had an estimated adult prevalence rate of only 1.0% (± 1.9). One hundred forty-four deer (105 adults, 39 fawns) were tested from this zone to find a single positive case. A comparable adult prevalence estimate for the previous year (6.9% ± 9.2) is of limited use because of the low sample size on which it was based. Zones such as this one, with a combination of low deer densities, low disease prevalence rates, and large numbers of landowners cooperating with DNR's sharpshooting program, could serve as an early index of the potential success of our management approach as they are the most likely to experience some measure of success in the short term.

A number of the remaining zones (A, F, G, H, and I) consist of a single positive deer, or scattered individual positives, within a matrix of very limited deer habitat and very low winter deer population size. It is likely that at least some of the individual positives identified within these zones may be "sparks" (isolated cases of CWD resulting from recent emigration of an infected individual from an established CWD area), but only future sampling efforts will clarify whether disease has become established or not.

Table 2. CWD random surveillance summary for the period 1 July 2003 through 30 June 2004. Samples taken from suspect animals are excluded. Sampling units are those areas defined in Figure 4.

Sampling Unit	Area (sq.mi.)	Age	Number of Samples	Number of Positives	Percent Positive	95% Confidence Interval (+/-)
A	25	Fawn	0	0	-	-
		Adult	28	1	3.6%	6.9%
		Total	28	1	3.6%	6.9%
B	69	Fawn	110	4	3.6%	3.5%
		Adult	255	22	8.6%	3.4%
		Total	365	26	7.1%	2.6%
C	30	Fawn	6	0	0.0%	-
		Adult	30	2	6.7%	8.9%
		Total	36	2	5.6%	7.5%
D	64	Fawn	187	2	1.1%	1.5%
		Adult	281	7	2.5%	1.8%
		Total	468	9	1.9%	1.2%
E	49	Fawn	26	0	0.0%	-
		Adult	55	4	7.3%	6.9%
		Total	81	4	4.9%	4.7%
F	30	Fawn	0	0	-	-
		Adult	14	2	14.3%	18.3%
		Total	14	2	14.3%	18.3%
G	25	Fawn	1	0	0.0%	-
		Adult	11	1	9.1%	17.0%
		Total	12	1	8.3%	15.6%
H	46	Fawn	8	0	0.0%	-
		Adult	45	2	4.4%	6.0%
		Total	53	2	3.8%	5.1%
I	25	Fawn	11	0	0.0%	-
		Adult	34	1	2.9%	5.7%
		Total	45	1	2.2%	4.3%
J	25	Fawn	39	0	0.0%	-
		Adult	105	1	1.0%	1.9%
		Total	144	1	0.7%	1.4%
All Units Combined:						
	388	Fawn	388	6	1.5%	1.2%
		Adult	858	43	5.0%	1.5%
		Total	1246	49	3.9%	1.1%

CWD Management Activities During FY2003-2004:

Use of regulated hunting for herd control in CWD-affected areas. Permit quotas for the 2003 firearm deer season were increased by 20% in Boone, McHenry, and Winnebago counties in an effort to increase gun harvest in those counties by that proportion. However, some permits remained unsold in all three counties when the firearm deer season began, and firearm harvest fell short of goal. Boone County harvest increased from 259 to 303 (+17%); McHenry increased from 570 to 615 (+8%), and Winnebago increased only from 575 to 582 (+1.2%). Combined results for the three counties was an increase from 1404 to 1500 (+7%). We will continue to explore ways to increase hunter harvest to further lower population densities in these counties.

Localized sharpshooting in CWD “hotspots”. Following the close of deer hunting seasons in January, teams of sharpshooters (IDNR staff assisted by USDA Wildlife Services) began intensive removals of deer from the immediate vicinity of new CWD locations in addition to those areas previously identified during FY02-03. In addition, an Urban Deer Population Control Permit (DPCP) was issued to the Winnebago County Forest Preserve District, allowing them to conduct a sharpshooting program on forest preserves adjacent to known CWD areas in southeastern Winnebago County. All sharpshooting activities were carried out between January 12 and March 31, 2004.

Objectives of the sharpshooting program were (1) to remove as many CWD-infected deer as possible from known areas of infection; (2) to remove/sample deer that were inaccessible to hunters because of the suburban/exurban nature of many of the known infected locations; (3) to reduce deer population levels in known CWD-infected locales to lower transmission rates; and (4) to gain additional information about disease distribution and prevalence in CWD areas.

All animals removed during the sharpshooting program, except those taken with head shots from which no testable tissue could be found, were tested for CWD to determine disease prevalence in affected areas. This included fawns from the previous year. Obex and retropharyngeal lymph nodes were removed at DNR processing facilities in the sampling zones, and transferred to IDOA Disease Laboratories for testing. Additional tissues were collected and archived for further research/testing at the University of Illinois Champaign/Illinois Natural History Survey.

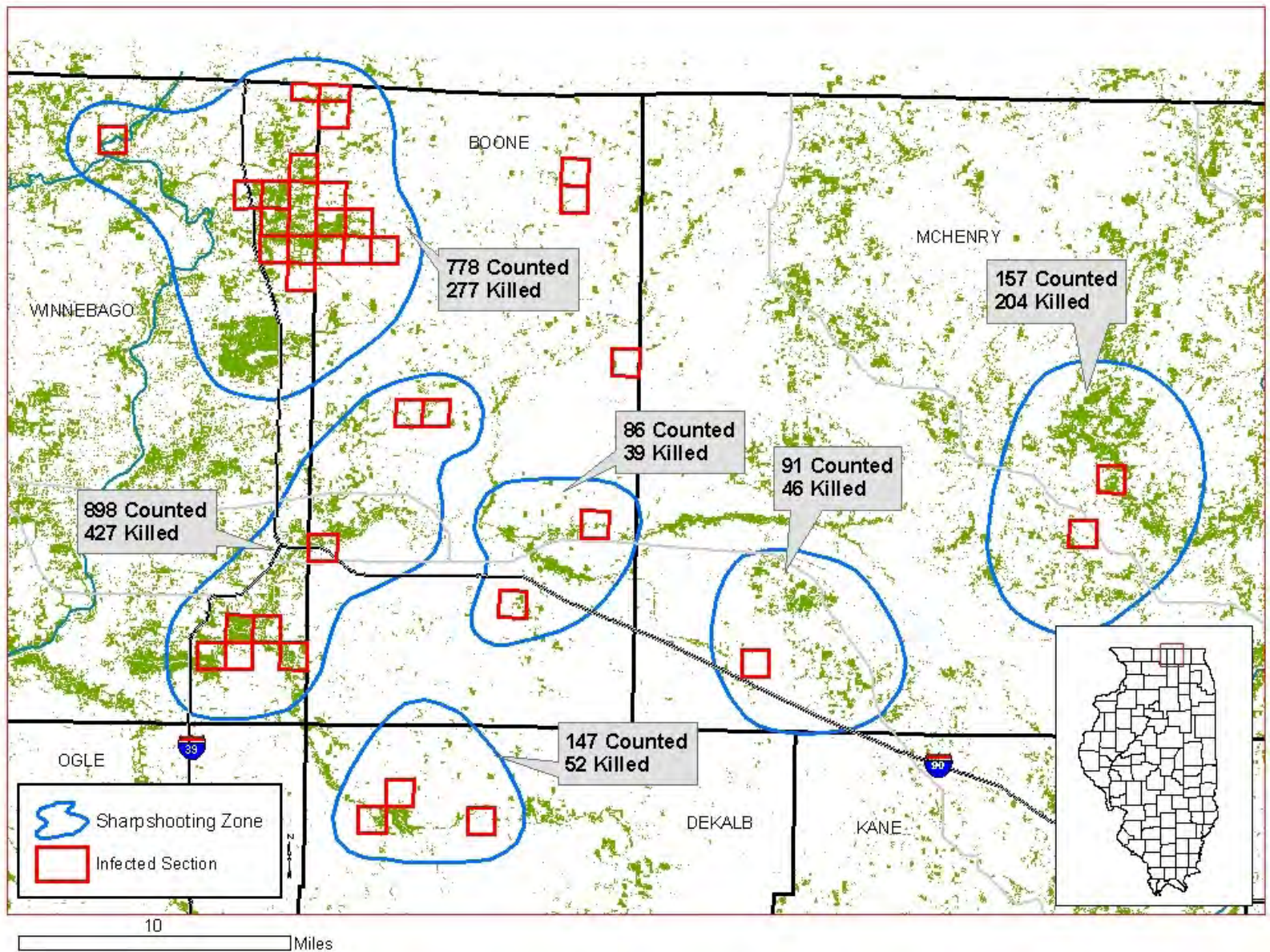
Aerial deer surveys were conducted on January 30 and 31, 2004 when more than six inches of snow cover blanketed northern Illinois counties. The purpose of the survey was to identify critical habitat containing late-winter concentrations of deer, as well as to provide rough estimates of deer numbers in the affected area. Our goal was to focus sharpshooting activities in deer winter concentration areas that included or were nearby CWD-infected properties, thus maximizing our effectiveness. Deer densities by section (uncorrected for sightability) derived from the aerial survey are depicted in Figure 5. Densities rarely exceeded 20 deer/m² across the landscape with the exception of high density pockets along the Boone-Winnebago county line associated with areas of limited hunting access. Highest densities occurred in southeastern Winnebago County along the Kishwaukee River on Forest Preserve District properties, with localized concentrations in excess of 100 deer/m².

Sharpshooting activities in the CWD zones in the four affected counties resulted in the removal of 1,050 deer, of which only six were unsuitable for testing. The total consisted of 423 fawns, 625 adults, and 2 for which age was not identified. Sex ratios were 1 male to 1.9 females (362 males: 688 females). County totals were as follows: Boone (216), Dekalb (52), McHenry (261), and Winnebago (521). Twenty-six CWD-positive deer were removed by these activities. Figure 6 presents the number of deer removed by sharpshooters in the various locations in relation to the number of deer counted during aerial surveys. Although obviously a rough comparison, these data indicate that numbers of deer removed by sharpshooters are not an insignificant impact relative to population size. The ratio of deer killed to deer counted (expressed as a percentage) ranged from 35.4% to more than 100% in the six areas, with a mean of 48.4% across all areas. We believe that continued use of this approach will result in a significantly increased rate of population turnover in the CWD area, and significant reductions in population size. However, multiple years of continued effort will be necessary to provide a reasonable expectation of measurable success. Localized high-density populations of deer still remain, most notably in southeastern Winnebago County, and these populations must be reduced.

Figure 5. Deer densities, by section, from aerial censuses conducted January 30 and 31, 2004. A moving average (the mean of all adjacent sections) was used to smooth the density values on the landscape.



Figure 6. Comparison of the number of deer counted via aerial census versus the number of deer removed by sharpshooters during January-March, 2004.



Appendix A. Usable CWD samples taken by county in Illinois during the 2003-2004 sampling season.

County	Firearm	Archery	DPCP	Roadkill	Sharpshoot	Suspect	Total
Bond	66						66
Boone	149	52		1	213	3	418
Brown	65						65
Bureau						1	1
Calhoun	64						64
Carroll	72					1	73
Champaign						1	1
Christian	65						65
Clay	65						65
Clinton						1	1
Cook		5	44				49
Crawford	65						65
Cumberland	65					1	66
DeKalb	140	2			52	1	195
DeWitt						2	2
DuPage			181				181
Fayette						1	1
Ford						1	1
Franklin	64						64
Fulton	2						2
Greene	64						64
Grundy						1	1
Hardin	65						65
Henderson						1	1
Iroquois	65						65
Jackson	67						67
Jasper	63						63
JoDaviess	493	2	26				521
Kane		4					4
Kankakee						1	1
Knox	63						63
Lake		16	171			1	188
LaSalle						1	1
Lee		2				1	3
Livingston						1	1
Macon	65						65
Madison						1	1
Marion						1	1
McHenry	367	26		2	261		656
McLean						2	2
Mercer	65						65
Monroe	73						73
Montgomery	65						65
Morgan	65						65
Ogle	572	31				4	607
Peoria	65						65
Perry	65						65
Pike						1	1
Pulaski	64						64
Richland	68						68
Schuyler	64						64
Stephenson	444	5				5	454
Tazewell	65						65
Washington						1	1
Wayne	67						67
White	65						65
Winnebago	367	85	301	10	218	3	984
Woodford	71						71
Totals	4439	230	723	13	744	38	6187

Appendix B. Summary of CWD-positive deer collected during FY03-04.

Date Collected	County	Map Coordinates	Sex	Age	Surveillance Method
9/16/2003	Winnebago	345N 2E S2	Female	4	Suspect
10/6/2003	Boone	346N 3E S31	Female	2	Hunter
10/14/2003	Boone	345N 3E S6	Female	3	Hunter
10/14/2003	Boone	344N 3E S31	Male	1	Hunter
11/04/2003	Boone	346N 3E S31	Female	3	Hunter
11/07/2003	Boone	346N 3E S6	Female	1	Hunter
11/14/2003	Boone	344N 3E S3	Male	3	Hunter
11/21/2003	Boone	344N 3E S2	Male	1	Hunter
11/21/2003	Boone	345N 4E S25	Male	2	Hunter
11/22/2003	Boone	346N 4E S22	Female	2	Hunter
11/22/2003	Winnebago	345N 2E S12	Male	1	Hunter
11/22/2003	Winnebago	346N 1E S14	Male	1	Hunter
11/22/2003	Boone	346N 3E S30	Male	2	Hunter
11/22/2003	DeKalb	342N 4E S19	Male	2	Hunter
11/22/2003	Winnebago	343N 2E S22	Male	2	Hunter
11/23/2003	Boone	346N 4E S27	Female	2	Hunter
12/04/2003	McHenry	343N 5E S24	Female	2	Hunter
12/04/2003	Boone	345N 3E S5	Male	1	Hunter
12/04/2003	Boone	343N 4E S8	Male	2	Hunter
12/05/2003	Boone	345N 3E S5	Female	5	Hunter
12/05/2003	DeKalb	342N 3E S15	Male	4	Hunter
12/06/2003	Winnebago	346N 2E S1	Female	1	Hunter
12/06/2003	DeKalb	342N 3E S21	Male	2	Hunter
12/07/2003	Boone	344N 4E S26	Male	1	Hunter
01/15/2004	Winnebago	346N 2E S35	Female	2	Sharpshooting
01/19/2004	Winnebago	345N 2E S1	Male	1	Sharpshooting

Appendix B. Continued

Date Collected	County	Map Coordinates	Sex	Age	Surveillance Method
01/19/2004	Winnebago	343N 2E S14	Male	5	Sharpshooting
01/19/2004	Winnebago	343N 2E S24	Male	Fawn	Sharpshooting
01/22/2004	Boone	345N 3E S6	Male	1	Sharpshooting
01/27/2004	Boone	346N 3E S31	Female	3	Sharpshooting
01/27/2004	Winnebago	346N 2E S26	Female	Fawn	Sharpshooting
01/28/2004	McHenry	344N 7E S13	Female	2	Sharpshooting
01/29/2004	Winnebago	343N 2E S15	Female	2	Sharpshooting
02/04/2004	Boone	346N 3E S6	Female	1	Sharpshooting
02/04/2004	Boone	345N 3E S6	Male	1	Sharpshooting
02/05/2004	DeKalb	342N 3E S21	Female	1	Sharpshooting
02/11/2004	Winnebago	345N 2E S1	Female	2	Sharpshooting
02/11/2004	Winnebago	343N 2E S24	Male	Fawn	Sharpshooting
02/18/2004	Winnebago	343N 2E S24	Female	1	Sharpshooting
02/25/2004	Winnebago	345N 2E S1	Female	4	Sharpshooting
03/04/2004	Winnebago	345N 2E S1	Female	2	Sharpshooting
03/08/2004	Boone	346N 3E S30	Female	4	Sharpshooting
03/08/2004	Winnebago	346N 2E S24	Male	Fawn	Sharpshooting
03/09/2004	Boone	346N 3E S31	Female	Fawn	Sharpshooting
03/18/2004	Winnebago	343N 2E S14	Male	2	Sharpshooting
03/23/2004	Boone	345N 3E S6	Female	2	Sharpshooting
03/24/2004	Boone	346N 3E S32	Male	2	Sharpshooting
03/24/2004	Winnebago	343N 2E S21	Male	4	Sharpshooting
03/29/2004	Winnebago	345N 2E S1	Male	Fawn	Sharpshooting
03/30/2004	Boone	346N 3E S30	Male	1	Sharpshooting
05/31/2004	Boone	346N 3E S30	Female	1	Suspect

Appendix C. Locations and number per section of all CWD-positive deer identified to date (June 23, 2004). Includes deer identified in previous years.

