

A REVIEW OF IOWA'S DEER MANAGEMENT PROGRAM



**REPORT TO THE GOVERNOR AND
GENERAL ASSEMBLY
JANUARY 10, 2009**

Submitted by the Deer Study Advisory Committee

Deer Study Advisory Report
Table of Contents

Executive Summary3

Outline of meeting results and recommendations.....5

**The current status of Iowa's deer population, harvest,
and population management programs6**

The economic impact and value of Iowa's deer population23

The cost of damage to crops caused by deer.....27

The number and cost of motor vehicle accidents caused by deer.....28

**A review of the deer management challenges and programs
of other Midwestern states37**

**An assessment of public opinion concerning the number of deer,
and the impact and value of Iowa's deer population43**

**Appendix I. The purpose of the deer study committee,
the timeline of the meetings and it's members50**

Appendix II. Aerial survey areas.....52

Appendix III. The spotlight survey routes conducted from 1978 to the present53

Appendix IV. Deer Population Update54

Executive summary: Recommended actions to be taken to better manage Iowa's deer resource in balance with the needs of Iowa's citizens.

A consensus was reached by the committee on these recommended actions and they are respectfully submitted for consideration.

- The current seasons and regulations are appropriate to manage Iowa's deer population in counties where management goals have been met. Making antlerless licenses available in counties where deer surveys are above the management goals is an appropriate way to reduce deer numbers at the county level. Where management goals have not been met, the department should keep all options available including new harvest strategies to quickly achieve goals.
- The DNR should survey Iowa's producers and hunters more frequently on their attitudes about deer damage and desired population levels. Additionally the DNR should contract with a third party to conduct a survey of all stakeholders' attitudes about deer and deer management and incorporate the results of this survey into the goals for each management unit.
- The HUSH program is a vital component of Iowa's deer management program. Steps need to be taken to ensure that funding is adequate to pay the actual costs of processing. Additional funding sources should be examined so the cost is shared by more stakeholders. It is important that the program is available in all areas of the state.
- Make the temporary positions in the depredation program permanent and completely implement the changes suggested during the Kaizen event.
- The DNR and the DOT should work cooperatively as members of the Deer-Vehicle Crash Information and Research Center to keep current on techniques to reduce deer crashes. Together they should work with the insurance industry to educate drivers on how to reduce deer crashes and fatalities.
- The DNR and the Iowa Department of Agriculture and Land Stewardship should work cooperatively to develop information to help Iowa's producers reduce deer damage.
- The DNR should continue to work with Iowa's communities to develop deer control programs and strategies for Iowa's urban and suburban areas that are compatible with the local community.
- Study a method to improve the connections between landowners and persons interested in hunting their property.
- The DNR should work with hunters and landowners to help them develop a better understanding of proper deer management including the benefits of harvesting does and keeping deer numbers at ecologically acceptable levels. Hunters working with landowners at the local level are the best and most efficient way to keep deer numbers at an acceptable level and provide a high quality deer herd.

- The DNR should work with farming and hunting groups, counties and cities to improve access to private land for hunters willing to harvest antlerless deer.
- To reduce the risk of disease and the problems associated with unnaturally concentrating deer the practice of placing supplemental feed or bait for deer should be banned legislatively.
- There is some evidence that the current regulations for nonresidents have concentrated nonresident hunters and/or landowners in some counties. The sizes of the current nonresident zones need to be reduced to redirect and equalize hunting pressure across the state.
- Increasing the number of nonresident hunters will not control Iowa's deer population. It is important from a social and economic perspective for non-resident hunters to not be restricted without sound management reasons. It is desirable to continue to provide former residents and family members the opportunity to return to Iowa and hunt.
- Explore a pilot program using an ad hoc committee to allow landowners to share the economic benefit of deer hunting, land access, and management.
- The DNR should collect and report information regarding the number and activities of guides and outfitters operating in Iowa. The DNR should also look into how other states go about regulating and tracking guides and outfitters in their states.
- The DNR should continue the practice of meeting annually with this group and additional stakeholders to review progress on the issues identified in this report and to make further recommendations as needed to successfully manage Iowa's deer population for all of Iowa's citizens.

A consensus was not reached on this recommendation.

- The DNR should be given the authority to set all deer quotas.

Comments: The committee was evenly split on this issue. Some of the committee members stated that it would be an advantage to have the DNR control all deer quotas since the DNR would be able to work with stakeholders to find the best solutions. Other committee members feared that quotas might be increased to increase funding for the DNR which could reduce the availability for resident hunters to have access to hunt deer. They would prefer to see elected representatives continue to set the quota.

Outline of meeting results and recommendations.

Legislative directive: The committee shall review, analyze, and make recommendations on issues relating to the state's deer population including but not limited to the following:

- a. The current status of Iowa's deer population, harvest, and population management programs.
- b. The economic impact and value of Iowa's deer population.
- c. The cost of damage to crops caused by deer.
- d. The number and cost of motor vehicle accidents caused by deer.
- e. A review of the deer management challenges and programs of other Midwestern states.
- f. An assessment of public opinion concerning the number of deer, and the impact and value of Iowa's deer population.

The following pages summarize the information that was presented at the meetings. Some of the information has been updated to reflect the latest data available.

a. The current status of Iowa's deer population, harvest, and population management programs.

How many deer should there be?

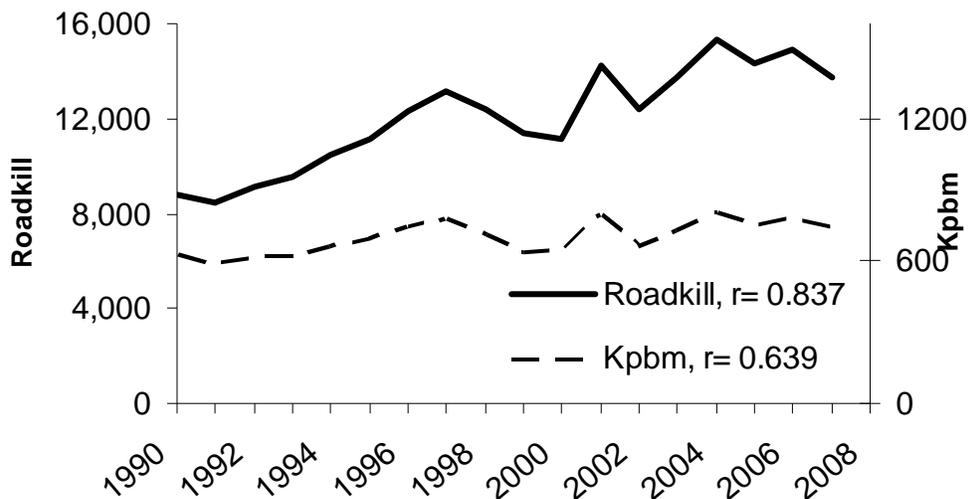
Deer management in Iowa may be characterized as trying to maintain a balance between the public's demand for hunting and viewing opportunities with a need to keep deer numbers compatible with agricultural interests, highway safety, and habitat limitations. The current management objective is a stable deer population at the approximate level that occurred in the mid to late 1990s. This time period was chosen because the acceptance of deer numbers was favorable among many of the stakeholder groups at that time. At that level the population would be capable of supporting a harvest of between 110,000 and 130,000 deer annually under the new reporting system.

How many are there?

It is not feasible to precisely determine the actual number of deer in the state. Instead population surveys are used as indexes to evaluate where deer numbers currently are compared with the goal. Annual population trends are determined in three ways: 1) changes in deer reported killed in traffic accidents when related to vehicle volume (Figure 1), 2) spring spotlight counts along 25-mile standardized routes, and 3) winter aerial surveys (Figure 2).

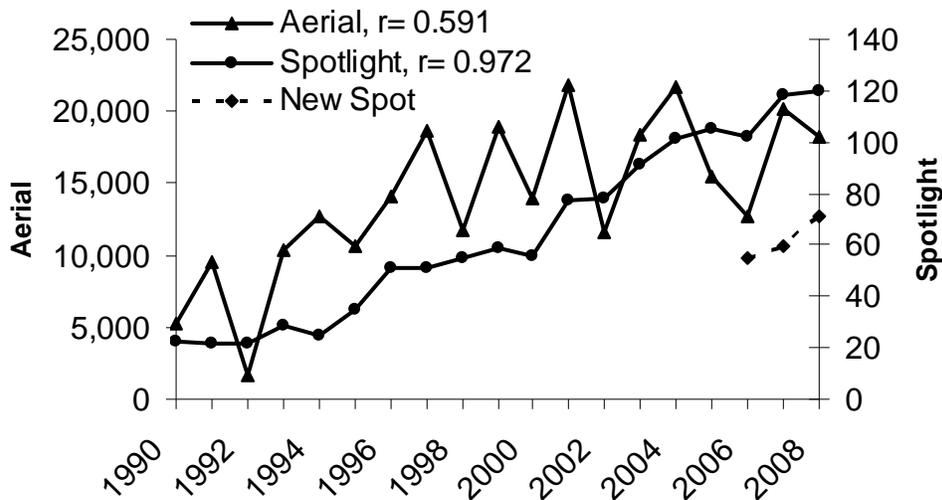
Beginning in the spring of 2006, approximately 200 new spotlight routes were established and surveyed (about 2 per county). These new routes provide a much better distribution of the spotlight surveys within each county and cover a greater diversity of habitats. When data has been gathered on these routes for a long enough period to establish trends and their relationships to the "old" spotlight survey routes, the old routes may be phased out of use. Maps of the areas surveyed are shown in Appendices I and II.

Figure 1. The number of roadkill deer salvaged (Iowa DNR) and removed from Iowa's highways (Iowa DOT). The kill per billion miles (kpbm) is the number of carcasses removed divided by the total number of miles driven (Iowa DOT).



Trend indices indicated that following a decline in survey numbers of about 15% from 1987-91, numbers increased from 1993-2006. In 2003, the Department initiated harvest strategies designed to reduce the number of deer in Iowa. After three years of greatly increased doe harvests, the survey numbers stabilized on a statewide basis and in 2006 continued emphasis on antlerless harvest appear to have caused survey numbers to decline. With the end of the 2007/08 hunting season, deer numbers statewide had been reduced approximately 5% from their peak reached in the spring of 2006.

Figure 2. The number of deer observed on the winter aerial counts and spring spotlight surveys.

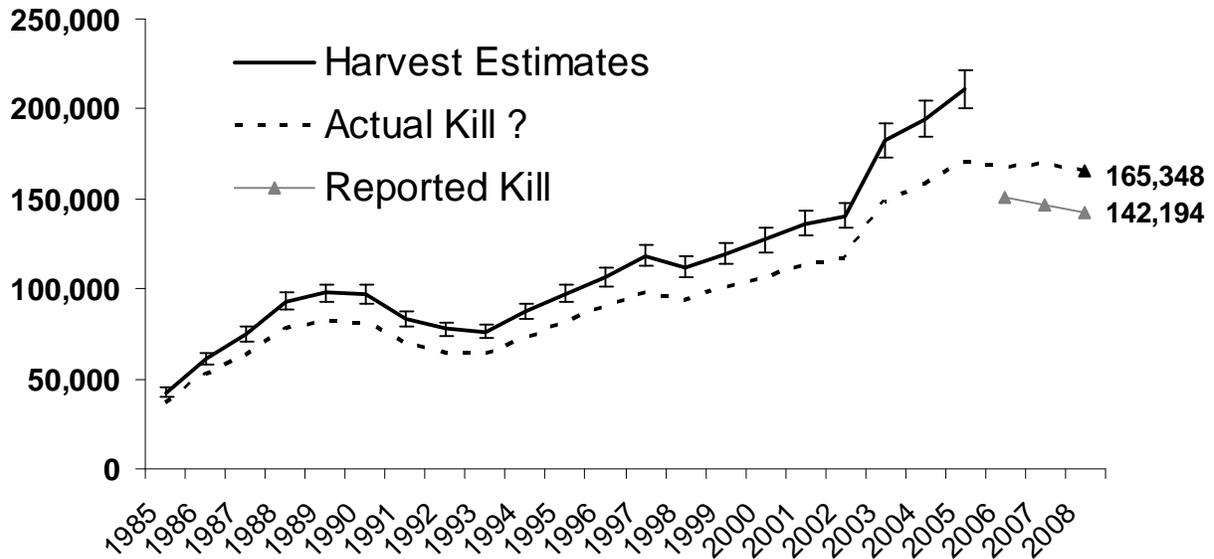


How do we get there?

Prior to 2006 harvest results were statistically estimated using information provided by hunters on postseason postcards. Beginning with the 2006 hunting season, hunters were required to report their harvest via a telephone reporting system or by using the internet. Beginning in 2006 harvest numbers represent reported minimum harvest levels and the estimates of the actual harvest are based on an annually estimated reporting rate. Harvest numbers between the two systems cannot be directly compared but the data suggests that the postcard system overestimated the actual harvest.

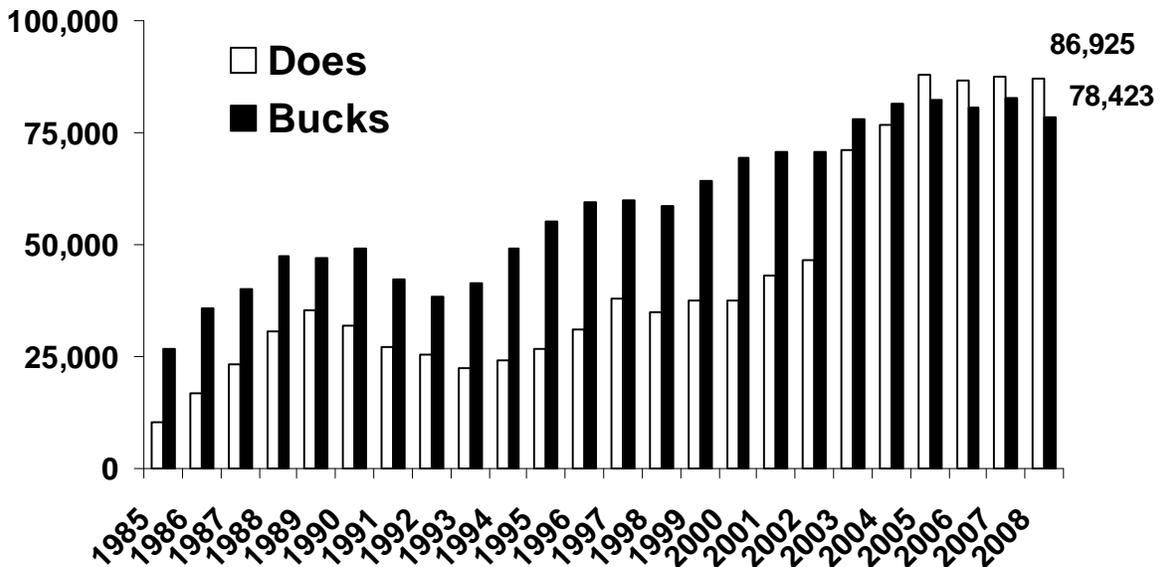
Statewide harvest rates increased an average of 3% per year from 1988 through the 2002 hunting season (Figure 3) because of increasing deer populations, higher hunter numbers, and liberal regulations. In 2003, when herd reduction strategies were implemented, the deer harvest increased by 30%, gained another 6% in 2004, and increased again during the 2005 hunting seasons by another 9%. Harvests for the 2006, 2007 and 2008 seasons have remained very close to the record 2005 levels (when differences between the two reporting systems are corrected for) with does making up the majority of the harvest and antlerless deer making up over 60% of the total harvest (Figure 4).

Figure 3. A comparison of harvest estimates from 1985 to 2007. From 1985 to 2005 the harvest was estimated using a postcard survey. For 2006 and 2007 the harvest was a minimum reported harvest. The actual harvest was likely somewhere between the two estimates.



These antlerless harvest rates are among the highest in the United States. Management strategies designed to increase the harvest of female deer for population control have resulted in annual doe harvests that are about 90% greater than those of 2002 on a statewide level with many counties displaying doe harvest increases of well over 100%.

Figure 4. The estimated number of bucks (antlered, button and shed bucks) and does killed from 1985 to 2008.



Utilizing the estimated harvests and harvest structures from 1990-2007, the data was used in a population model and the resulting “best fit” simulation indicates a declining deer population statewide (Figure 5). The model indicates that about a 5% decline has occurred since the simulation peaked in the 2006 postseason analyses. The model has a very strong correlation with the spotlight survey and good correlation with the aerial survey and roadkill index.

The state is divided into 20 Wildlife Management Units (WMU) and a separate analysis is conducted for each management unit (Figure 6). The analyses conducted after the 2007/2008 season indicated that in eight of these WMUs (38 counties) deer populations are at or near desired goals, in nine of the WMUs (46 counties) deer populations are trending downwards but are still above goal levels, and in the remaining three WMUs (15 counties) while population growth has been slowed or in some cases almost stopped, a greater harvest is needed to cause a population decline. Figure 7 is a summary map showing which WMUs are in each category and Appendix III provides the deer harvest and population simulation information for each of the 20 WMUs based on the 2008 analyses.

These simulations are then used to determine the number of antlerless licenses needed in each county to achieve a harvest that will move the population toward the stated goals (Figure 8).

Figure 5. A comparison of the simulated population and the deer trend indices and the management goal after the 2007 season.

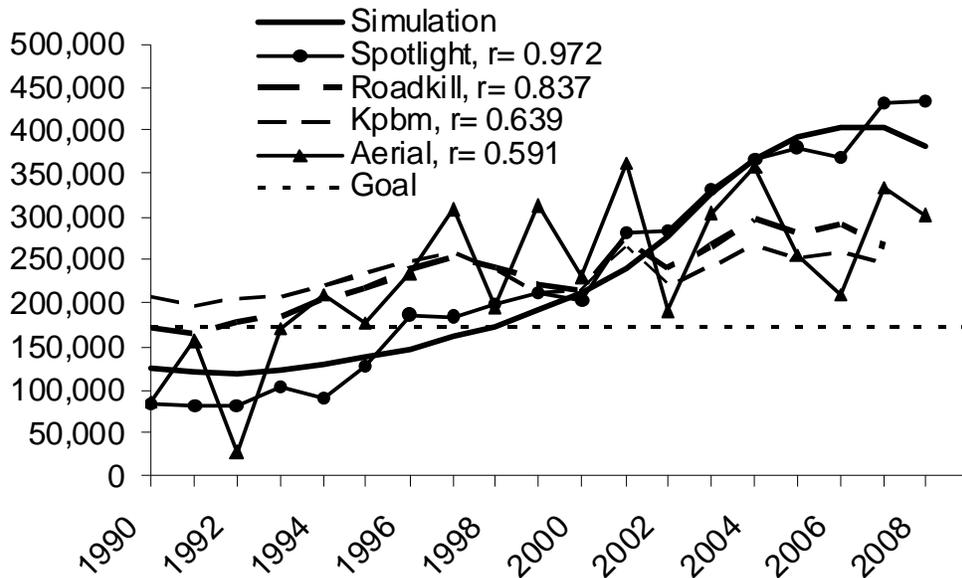


Figure 6. A map of the 20 Wildlife Management Units.

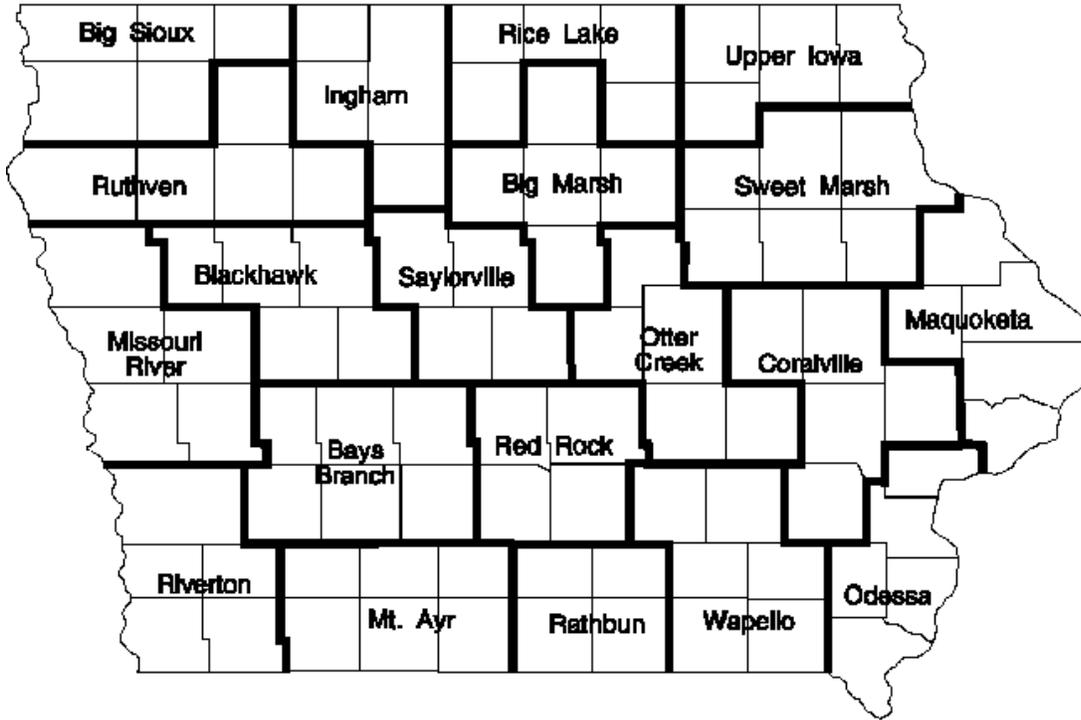
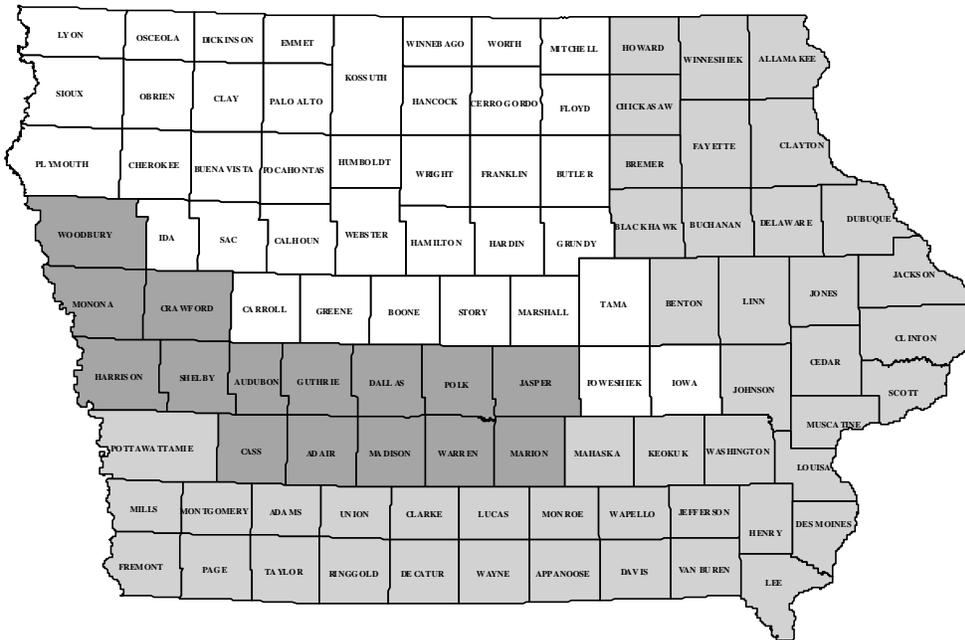
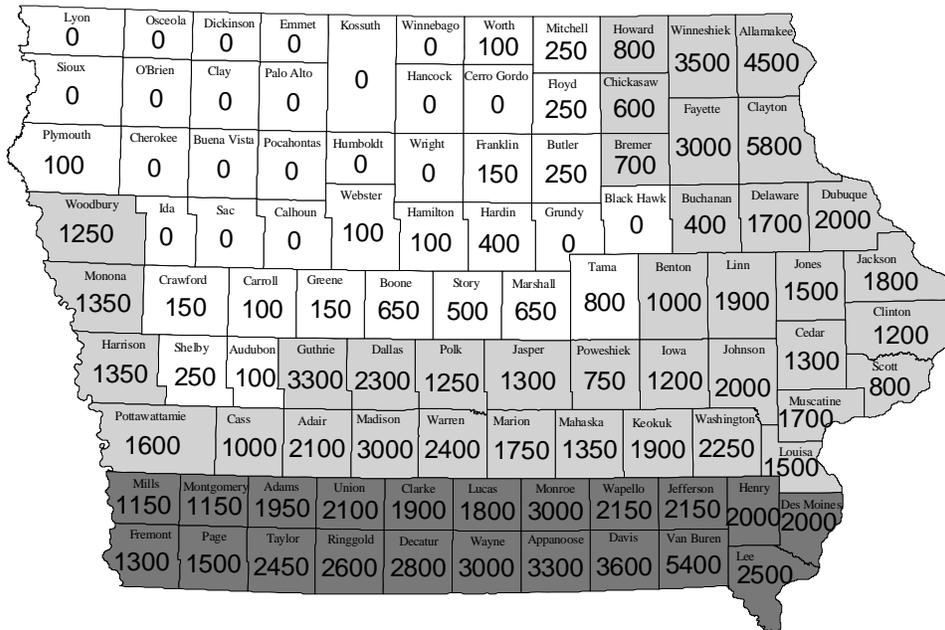


Figure 7. Simulation analyses results after the 2007/2008 deer season.



Dark Gray – increased harvest needed to reach goals
 Light Gray – current harvest reaches goals
 White – at or close to goals

Figure 8. The number of paid resident antlerless licenses that were available for the 2008/2009 deer season. The shaded counties were open for the January antlerless season in 2009. In the dark shaded counties centerfire rifles could be used to take deer during the January antlerless season.



2008 Harvest update

The 2008 deer season ran for 126 days beginning on September 20, 2008 and ending on January 25, 2009. This is one week shorter than in 2007 due to a shift in calendar dates. Iowa offers hunters multiple seasons within which to pursue deer. This variety spreads the hunting pressure out, providing more hunters more access to more land and allows hunters multiple chances to harvest deer. The majority of the kill occurs in December after the deer breeding season when bucks are less vulnerable to being over-hunted. The timing of this harvest is one of the main reasons Iowa maintains a high quality deer herd while still having the ability to take many antlerless deer (Figure 9).

The reported harvest in 2008 was slightly lower than the reported harvest in 2007; however the number of does reported in the harvest stayed almost the same. There were 3,700 fewer bucks reported killed in 2008. This means that does made up a larger percent of the harvest in 2008 at 53%. This is the highest proportion recorded with the current reporting system. Nearly two thirds of all deer reported taken by hunters in 2008 were antlerless deer (Table 1). One out of every 5 deer licenses issued in 2008 was to a landowner at a reduced price.

Figure 9. The reported deer harvest during the 2008/2009 deer season..

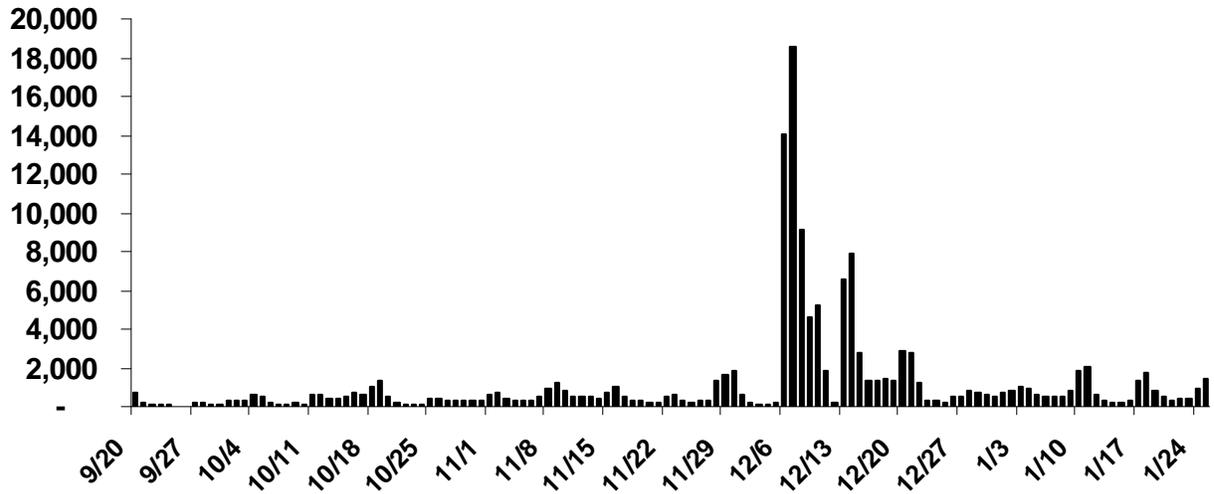
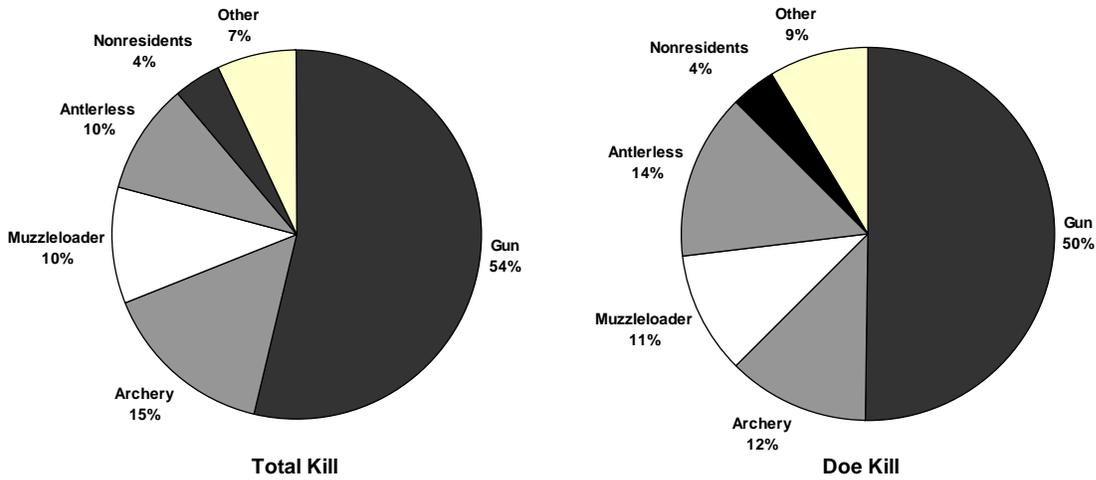


Table 1. Results from the 2008/2009 deer season.

	Licenses	Reported Harvest	Success Rate	Percent Does	Percent Antlerless
Youth/Disabled	8,839	3,405	39%	39%	49%
Archery	84,718	21,819	26%	42%	50%
Early Muzzleloader	12,498	4,342	35%	47%	56%
November Antlerless	12,562	3,858	31%	78%	99%
Gun 1	85,629	41,501	48%	46%	56%
Gun 2	65,013	21,829	34%	53%	64%
Gun (<i>Landowner/Tenant</i>)	42,186	12,762	30%	55%	67%
Late Muzzleloader	36,611	10,254	28%	57%	69%
January Antlerless	29,655	10,144	34%	77%	92%
Nonresident	15,228	5,975	39%	47%	53%
Depredation	6,466	3,083	48%	82%	97%
Special hunts	6,764	3,222	48%	82%	98%
Total	406,169	142,194	35%	53%	64%

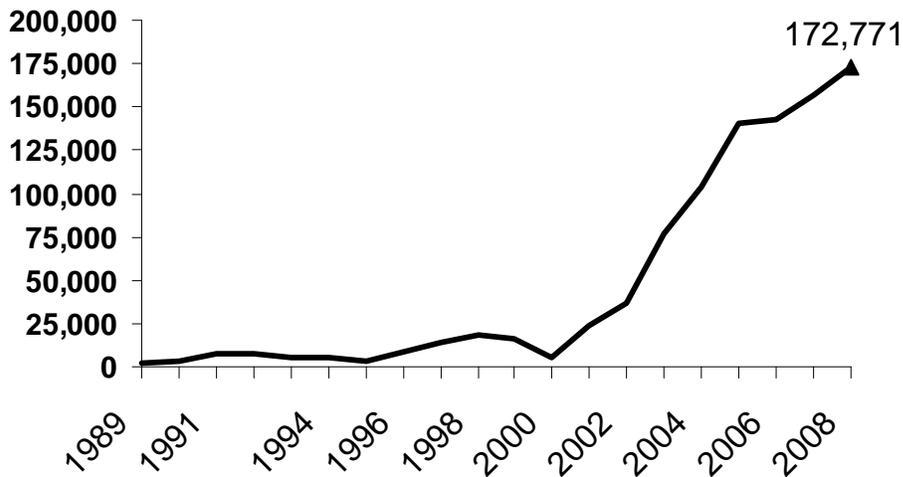
The majority of the 2008 deer kill occurred in the shotgun seasons (Figure 10). The archery and muzzleloader seasons and the November and January antlerless seasons accounted for 35% of the reported harvest. Half of the doe kill occurred during the shotgun seasons. The November and January antlerless seasons and, the archery and muzzleloader seasons accounted for 37% of the doe kill during the 2008 deer season.

Figure 10. The percentage of the deer kill and the percentage of the doe kill reported in each season in 2008/2009.



The increased doe kill in 2008 is a direct result of the record number of antlerless licenses issued for the 2008 season (Figure 11).

Figure 11. The number of antlerless deer licenses issued since 1989.



Depredation Program for producers with damage.

Deer numbers also vary greatly within the rural areas of most counties in Iowa. This variation in deer numbers is due to a number of different factors including; the amount and quality of deer habitat, proximity to urban areas, past levels of hunting pressure, existing hunting practices and changing land ownership patterns. In some areas of the state rural land that has a limited capacity for raising row crops is being purchased by owners interested in recreational uses including deer hunting. Some of these owners prefer seeing larger numbers of deer and often limit the access which can cause local areas of overabundance.

The goal of the DNR depredation program is to provide private landowners with the guidance and assistance they need to effectively deal with wildlife damage in these situations. The landowner can get technical advice on how to use fences, repellents or scare devices to keep animals from damaging the producer's crop. They can also receive advice on how to use tree tubes or other practices to prevent deer and other wildlife from having easy access to young trees that are easily damaged. These techniques allow the seedlings to grow above the level where damage occurs. Probably the most important advice they receive when deer cause the damage is how to take more antlerless deer within existing seasons and with existing hunters. The producer and the hunters already hunting the property may be able to significantly reduce deer numbers by harvesting more antlerless deer. This is especially true if the current harvest is mainly antlered bucks. In some instances hunters could also use the antlerless licenses available in each county to increase the number of does taken during the seasons they already hunt.

Hunters on properties where deer damage is occurring should try to significantly increase the number of does killed and be selective on the type of bucks they kill. This philosophy is known as Quality Deer Management or QDM. Both hunters and landowners benefit when hunters practice QDM. Bucks are allowed to reach older age classes so the quality of the herd is improved yet there will be fewer does remaining to produce fawns the next year.

Another option to increase the doe harvest would be to hunt during the November and January antlerless deer seasons if the producer's land is in one of the counties where licenses are available. In some instance landowners may need to have frank discussions with their hunters to explain the need to kill more does if the hunter wants to continue to enjoy the privilege of hunting on the property. To quickly reduce deer numbers hunters should harvest at least 3 does for every buck they take. Landowners should insist that any hunter who wants to hunt needs to help by taking additional does.

If the landowner does not currently have enough hunters to obtain an adequate harvest the DNR maintains a list of hunters from a website where hunters who are willing to kill antlerless deer may sign up. This list is available to the landowner from the depredation biologist. It is up to the landowner however to contact hunters and the landowner always controls who has permission to hunt on their property.

If a producer has one thousand dollars in damage or likely will sustain one thousand dollars in damage (Iowa Code 481C.2) they are eligible to obtain extra licenses or permits for their property. There are two types of permits or licenses available; depredation licenses (for hunting deer within existing seasons) and shooting permits (to kill deer outside of existing seasons).

To receive these licenses or permits the depredation biologist will first arrange to meet with the producer to assess the amount and type of damage occurring. If there is substantial damage due to deer, the biologist and producer will develop a management plan for the property. The plan specifies how many deer need to be killed and the number and type of permits that will

be needed. The biologist will review the plan annually and work with the landowner if more assistance is needed. The goal of the plan will be to reduce deer numbers in 3 years to the point that damage is less than one thousand dollars and that deer numbers can be controlled with normal hunting pressure.

To ensure success it is essential for landowners to work cooperatively with neighbors to keep deer populations at acceptable levels. The biologist can help landowners who are experiencing damage by working with adjacent landowners to increase the hunting pressure on adjacent land as well as on the landowner's land. The biologist and any landowners in the area willing to cooperate will create an area or "block" of land where deer numbers are above desired levels. Depredation licenses will be made available to other landowners and their hunters as well as to the producer experiencing the damage. These areas are called "block hunt" areas. Sometimes this is the most effective way to deal with damage experienced by landowners with crops next to good deer habitat. The landowner may experience substantial damage to their crops but since the deer spend the majority of their time on the adjacent property successfully reducing the damage will require cooperation with neighboring landowners.

Redesigning the depredation program

In January 2008 the depredation program was redesigned and the following recommendations were made to improve the program:

1. Remove 3 License Limit (*done for 2008 season*)
2. Improve Web Page (*done*)
3. DNR Brochure/Handouts (*done*)
4. Additional DNR staff and training (*3 temporary reassignments, See discussion below*)
5. Data Entry at Point of Origin (*Done*)
6. Disseminate the Authorization permits on Site (*Done*)
7. Landowner Driven Incentive Program for Hunters (*continued discussions*)
8. Master Hunter Pool (*work in progress*)

Items 1, 2, 3, 4, 5 and 6 were implemented during 2008 and appear to be working well. Discussions continue on what would be an effective landowner incentive program. Additional licenses were made available at reduced cost to all producers with substantial damage. A producer could get landowner tags for every season in addition to their normal landowner and paid licenses. Work is moving forward to develop a web-based master hunter certification program.

A key component to implementing the recommendations was to increase the staffing from the previous level which had 2 depredation biologists to 5 biologists to deliver the program. The 2 depredation biologists are specified in Iowa Code, (Chapter 481C.1). The wildlife bureau has reorganized from 4 to 5 districts so a sound staffing plan identified at the Kaizen event was one depredation biologist in each district. A legislative request was made in 2008 for additional staffing and funding for these positions but it was not acted upon. Because of the critical nature of the depredation program three existing personnel were assigned on a temporary basis to the depredation program for 6 months, from August, 2008 to January, 2009 (Figure 15).

In 2008 the number of producers working with the depredation program increased by 25%. There were nearly 500 producers in 77 counties working with depredation biologists (Figure 16). The number of depredation licenses issued increased by 34% and the number of deer killed by 54% over 2007. The number of out of season shooting permits increased by 250% and

although the total number of deer killed was small (335), it was nearly 600% more than in 2007. Without the additional staffing these increases would not have been possible. Gaining the authority to permanently staff these 3 positions is vital for the future of the program's success.

Figure 15. Current staff assignments for the depredation program which includes 3 temporary staff reassignments.

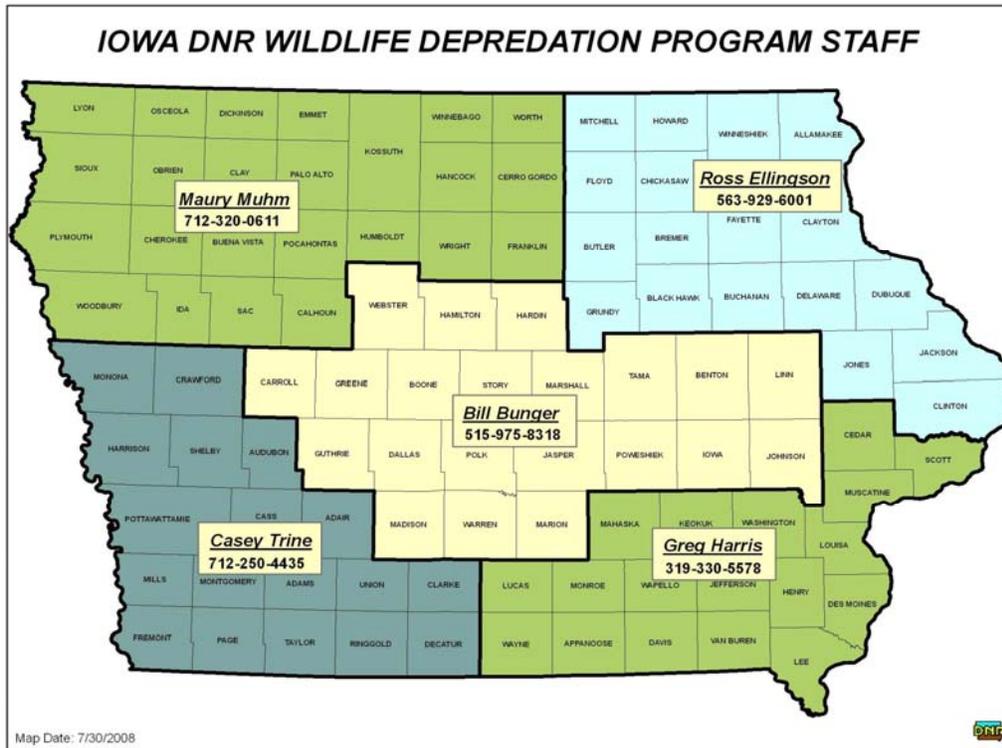
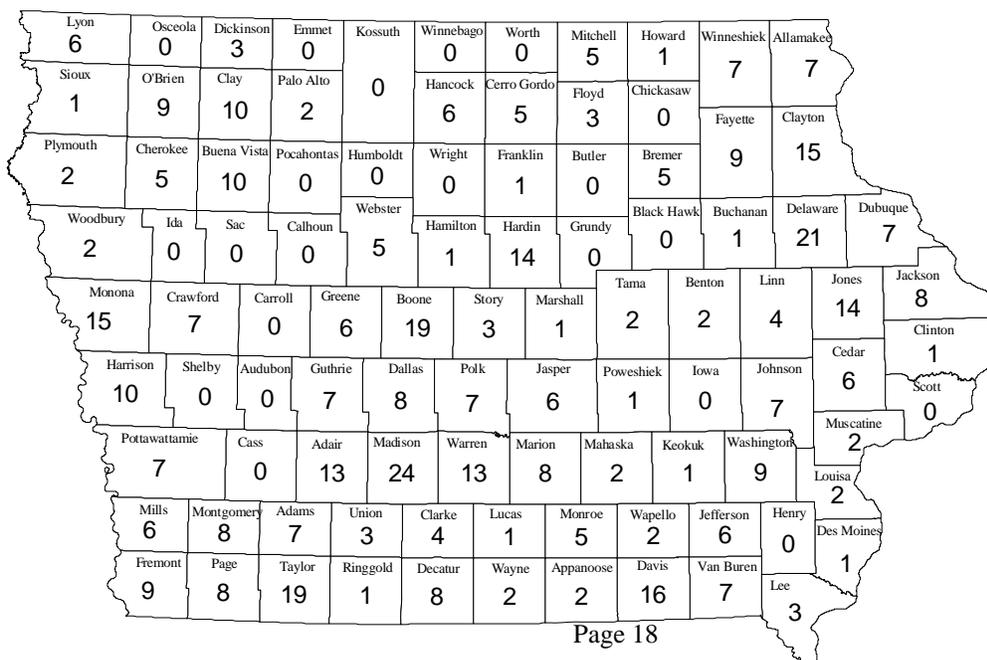


Figure 16. The number of producers working with the depredation program in each county in 2008.



Donating venison to Iowa's Food Banks.

Another program that has helped hunters take more deer is the Help Us Stop Hunger or HUSH program. The program was expanded in 2003 by the DNR in cooperation with the Food Bank of Central Iowa. It expanded a program developed by members of the Polk County Deer Task Force to help urban hunters take more deer so that it covered 60 counties. Hunters could bring a field dressed deer to a participating locker and donate the meat to the HUSH program. The lockers processed the deer into 1-2 pound packages of pure ground deer meat which was then picked up by the Food Bank for distribution. Participation by a locker was voluntary. Prisons also work with lockers in some areas to accept deer if it is cost effective for the prison.

During the first two seasons the program was partially funded by donations solicited from hunters, organized hunting groups and other groups interested in reducing deer numbers such as the Iowa Farm Bureau. The balance came from hunting license fees. It was also only available in the central part of the state until 2005 when the legislature added a \$1 fee to all deer licenses to help fund the program statewide. The number of deer processed has risen steadily and should top 9,000 deer or 6% of the total kill during the 2008/2009 season (Table 2).

Table 2. A summary of the Help Us Stop Hunger (HUSH) program from the 2003/2004 season through the 2007/2008 season.

Season	Cost	HUSH Deer	PVP 1 Deer	Processing Cost	Overhead costs	Total Costs	Income	Amount Underfunded
2003/04	\$55	1,604	226	\$89,200	\$9,800	\$100,000	\$78,000	\$23,000
2004/05	\$60	1,898	0	\$118,880	\$10,000	\$128,880	\$69,000	\$59,880
2005/06	\$65	5,680	736	\$431,360	\$17,000	\$448,360	\$379,370	\$68,990
2006/07	\$65	6,482	63	\$421,330	\$3,000	\$424,330	\$377,801	\$46,529
2007/08	\$70	8,350	98	\$584,500	\$3,000	\$587,500	\$389,000	\$198,500
Total		24,014	1,123	\$1,645,270	\$42,800	\$1,689,070	\$1,293,171	\$396,899

1/ Prison Venison Program (HUSH paid processing only in 05-06 season).

Nonresident Hunters

One issue that generates a lot of passionate discussion is the number of nonresident hunters that are allowed to hunt in Iowa. This likely has to do with the fact that up until 1989 nonresidents were not allowed to hunt deer in Iowa. The Legislature initially allowed 1,200 nonresidents in 1989 and not all of the licenses sold. The quota was increased in 1995 and 1999. Antlerless licenses were made available in 1999 and were required for nonresidents obtaining an either-sex license in 2005 (Table 3).

In 2008 there were 11,470 applications for 6,000 either-sex deer licenses (Table 4). Nonresident either-sex licenses are issued for 10 zones. These are the same 10 zones that were used for residents back in 1989 when nonresidents were first allowed into the state. Iowa code specifies that 35% of the nonresident either-sex licenses are to be issued for the archery season. In 2008 only 20% of the resident either-sex licenses were issued for the archery season. All of the quotas were filled in the initial drawing. There were no left over either-sex licenses available in any zone.

Table 3. A comparison of the nonresident quota and the number of resident licenses issued from 1989 to 2008.

Year	Resident Licenses	Nonresident Quota		
		Either-sex	Required Antlerless	Optional Antlerless
1989	159,613	1,200		
1990	164,245	1,200		
1991	151,207	1,200		
1992	154,352	1,200		
1993	143,630	1,200		
1994	155,216	1,200		
1995	156,784	5,000		
1996	172,254	5,000		
1997	180,695	5,000		
1998	190,959	5,000		
1999	195,994	6,000		1,500
2000	191,184	6,000		1,500
2001	220,619	6,000		1,500
2002	215,696	6,000		1,500
2003	254,296	6,000		2,000
2004	344,672	6,000		2,500
2005	382,364	6,000	6,000	3,500
2006	368,025	6,000	6,000	3,500
2007	379,663	6,000	6,000	3,500
2008	390,941	6,000	6,000	3,500

Table 4. Results from the 2008 nonresident deer drawing.

Zone	Quota	Bow Applied	Odds of Drawing	Gun Quota	Applied	Odds of Drawing
1	63	104	61%	117	133	88%
2	63	96	66%	117	130	90%
3	196	432	45%	364	462	79%
4	448	1,192	38%	832	1,528	54%
5	560	1,521	37%	1,040	1,766	59%
6	280	699	40%	520	684	76%
7	126	347	36%	234	442	53%
8	84	166	51%	156	171	91%
9	210	590	36%	390	737	53%
10	70	128	55%	130	142	92%
Total	2,100	5,275	40%	3,900	6,195	63%

Forty-six percent of the nonresident applications in 2008 were for an archery license. Forty percent of those that applied for an archery license drew a license. The odds of drawing a license ranged from 36% in Zones 7 and 9 to 66% in Zone 2. One hundred twenty-four hunters drew bow licenses in Zones 1, 2 and 10 without a preference point. One hundred fourteen hunters in zone 5 and 9 did not draw licenses even with 2 preference points. It took 2 preference

points to be guaranteed of drawing a license in Zones 3, 4, 6 and 7. Everyone with a preference point was awarded a license in Zones 1, 2, 8 and 10.

Fifty-four percent of the applications were for a firearms license. Sixty-three percent of those that applied were successful in drawing a license. The odds of drawing a license for a firearm ranged from 53% in zones 7 and 9 to 91% in Zone 8. Everyone who applied with a preference point was awarded a license for the firearms season and 48% of those without a preference point drew a license for the firearms season.

The quota of 3,500 optional nonresident antlerless licenses went on sale in July, 2008. These licenses are issued on an individual county basis in the same proportion as resident antlerless licenses. At the end of the 2008 season there were 458 nonresident optional antlerless licenses left in 39 counties. Nonresident landowners are guaranteed by Iowa Code of an antlerless license for the land they own. In 2008 there were only 24 of these licenses issued and 8 deer were reported killed.

One of the concerns with the current nonresident regulations is that the nonresident hunting pressure and harvest are not evenly distributed. Over 40% of the nonresident deer harvest occurred in ten counties in 2008 (Table 5). These same counties accounted for only 22% of the resident deer harvest. For example over 6% of all the deer taken by nonresidents were taken in Van Buren County.

Table 5. The percent of the overall deer harvest that were taken by nonresident and resident hunters in each county in 2008.

County	Percent of Harvest	
	Nonresidents	Residents
Van Buren	6.3%	3.0%
Allamakee	4.9%	2.7%
Appanoose	4.8%	2.0%
Taylor	4.6%	1.7%
Wayne	4.5%	1.5%
Decatur	3.3%	1.6%
Clayton	3.2%	4.8%
Davis	3.1%	2.3%
Monona	2.7%	0.9%
Ringgold	2.6%	1.2%
	40.0%	21.8%

This might not be a problem if adequate numbers of deer are still being taken in these counties. However all of these counties are in parts of the state where the harvest has been lower than needed and where it has been difficult to sell enough antlerless licenses to obtain an adequate doe kill.

Looking back over time we see that in 1994 the proportion of resident and nonresident hunters in each county were fairly similar. However when the nonresident quota was increased to 5,000 the number of nonresident hunters has increased more in certain counties than in adjacent counties while the number of resident hunters has not changed. Overall there is a negative relationship between the expected number of resident and nonresident hunters in a county. Resident hunters go to where there is more habitat (forest cover) while nonresident hunters select for certain counties regardless of the available deer cover.

b. The economic impact and value of Iowa's deer population.

Economic benefits can be estimated by two types of economic measures: economic impacts and economic values. An economic impact addresses the business and financial activity resulting from the use of a resource. Economic value, on the other hand, measures the difference between what an individual would be willing to pay and what they actually pay for a commodity or activity.

The following information is taken from “2006 Economic Benefits of Hunting, Fishing and Wildlife Watching in Iowa”. This study is done every 5 years and provides the best information we have on the economic impact of fish and wildlife resources in Iowa.

2006 Economic Benefits of Hunting, Fishing and Wildlife Watching in Iowa.

There are three types of economic impacts: direct, indirect and induced. A direct impact is defined as the economic impact of the initial purchase made by the consumer. For example, when a person buys a pair of binoculars for \$100 there is a direct impact to the retailer of \$100. Indirect impacts are the secondary effects generated from a direct impact. Indirect impacts indicate that sales in one industry affect not only that industry, but also the industries that supply the first industry. For example, the retail store must purchase additional binoculars; the binocular manufacturers must purchase additional materials for production; materials manufacturers must buy inputs, and so on. Therefore, the original expenditure of \$100 for the binoculars benefits a host of other industries. An induced impact results from the salaries and wages paid by the directly and indirectly impacted industries. The employees of these industries spend their income on various goods and services. These expenditures are induced impacts which, in turn, create a continual cycle of indirect and induced effects.

The sum of the direct, indirect and induced impact effects equals the total economic impact. As the original retail purchase (direct impact) goes through round after round of indirect and induced effects, the economic impact of the original purchase is multiplied, benefiting many industries and individuals. Likewise, the reverse is true. If a particular item or industry is removed from the economy, the economic loss is greater than the original retail sale. Once the original retail purchase is made, each successive round of spending is smaller than the previous round. When the economic benefits are no longer measurable, the economic examination ends.

Hunters and wildlife watchers' expenditures were obtained from the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (Survey). This Survey is conducted approximately every five years by the U.S. Fish and Wildlife Service and U.S. Bureau of the Census. The Survey provides data required by natural resource management agencies, industry and private organizations at the local, state, and national levels to assist in optimally managing natural resources. The Survey is funded through excise taxes on hunting and fishing equipment through the Federal Aid in Sport Fish and Wildlife Restoration Acts.

Expenditures made for fish and wildlife-related recreation support significant industries. Unlike traditional industries which are often easily recognized by large factories, the hunting, fishing and wildlife viewing industries are comprised of widely scattered retailers, manufacturers, wholesalers and support services that, when considered together, become quite significant. Given that outdoor recreation dollars are often spent in rural or lightly populated areas, the economic contributions of fish and wildlife resources can be especially important to rural economies. This project assesses the 2006 economic contributions of fish and wildlife-based recreation in Iowa. The purpose was to provide resource managers with the economic

information necessary to better conserve and manage wildlife and other natural resources. Only the effects of recreation expenditures that occurred within Iowa are considered.

Table 1. Demographic Background of Deer Hunters in Iowa in 2006 (Participants 16 years old and older).

Demographic category	Estimate
Average age	41.1
Gender (male)	93.10%
Marital Status (married)	73.20%
Average household income	\$57,345
Education	
No High School	4.60%
Some High School	8.30%
High School Diploma	39.20%
College Graduate	31.70%
Post-graduate	16.20%
Number of days	2,070,984
Average Days of Participation	12.6

Table 2. Economic Activity Generated by Iowa Deer Hunters, 2006 (Participants 16+ years).

	RETAIL SALES	OUTPUT	EARNINGS	JOBS	FEDERAL TAX REVENUE	STATE & LOCAL TAX REVENUE
Deer	\$137,366,321	\$213,831,121	\$67,270,545	2,838	\$15,192,545	\$14,746,888
Residents	\$120,597,609	\$188,066,069	\$58,858,597	2,529	\$13,352,158	\$13,138,729
Nonresidents	\$16,768,712	\$25,765,052	\$8,411,948	309	\$1,840,387	\$1,608,159

Table 3. Per Day and Per Person Expenditures for Iowa Deer Hunters, 2006 (Participants 16+ years).

Average daily expenditures	\$66.33
Average annual expenditures	\$834.89

Table 4. Travel-Related Expenditures, Iowa 2006 (Participants 16+ years).

Deer	\$51,557,740
------	--------------

Table 5. Participation in Non-residential Watchable Wildlife Recreation by Site Visited and Wildlife Observed, Fed, or Photographed in Iowa in 2006 (Participants 16+ years; Ranked by number of participants per activity).

Total number of participants	403,967
Large land mammals	242,738 60%

Table 6. Participation in Residential Watchable Wildlife Recreation by Wildlife Observed in Iowa in 2006 (Participants 16+ years).

Total Number of participants	1,059,405
Large mammals	368,533 (35%)

Table 7. Economic Activity Generated by Iowa Wildlife Watchers, 2006 (Participants 16+ years).

RETAIL SALES	OUTPUT	EARNINGS	JOBS	FEDERAL TAX REVENUE	STATE & LOCAL TAX REVENUE
\$312,545,812	\$494,313,674	\$131,619,081	5,340	\$30,554,787	\$29,689,421

Table 8. Economic Activity Generated by Hunting, Fishing and Wildlife Watchers in Iowa, 2006 (Participants 16+ years).

RETAIL SALES	OUTPUT	EARNINGS	JOBS	FEDERAL TAX REVENUE	STATE & LOCAL TAX REVENUE
\$974,244,560	\$1,543,068,813	\$453,864,763	17,846	\$102,584,837	\$96,831,849

Conclusion

Deer hunting generates \$137 million in retail sales in Iowa which has an economic impact of over \$214 million and supports over 2,800 jobs. Wildlife watching generates another \$312 million in retail sales which has an economic impact of \$494 million and supports over 5,300 jobs. Although the study doesn't break out how much of this is directly attributable to deer, 35% of those who watch wildlife around their residence reported watching deer and 60% of those who travel away from their residence (non-residential) to watch wildlife watch deer.

Fish and wildlife provide numerous recreation opportunities for Iowa residents. The recreation expenditures benefit Iowa with significant jobs, income and other economic activity. These benefits are particularly important in rural or remote areas where other sources of income are limited. Anglers, hunters and wildlife viewers spend dollars that, in turn, benefit many other industries throughout the state. The resulting economic benefits reach every corner of the State and its economy. Every resident and tourist of Iowa benefits from fish and wildlife recreation spending. It is clear that fish and wildlife generates significant economic impacts that must be considered in policy-making.

Taken from:

The 2006 Economic Benefits of Hunting, Fishing and Wildlife Watching in Iowa. Prepared by: Southwick Associates, Inc., PO Box 6435, Fernandina Beach, FL 32035.

Determining the full societal value of a natural resource is difficult at best and relies on a number of assumptions on how to assign a value to a resource that is not traded in the marketplace. Latent demand for participation in deer-related activities could be taken into account when trying to estimate the value of deer. For example how many people are interested in participating but haven't been exposed to the practice. Another way of framing this could be expressed as an option value. For example, I would like the opportunity to see/hunt deer on my property in the future even though I cannot do so this year. Another approach would be the bequest value. For example I would like for my grandchildren to be able to hunt this property when they become old enough. Another type of value might be a nonuse values. For example I enjoy relaxing and watching deer feed under the apple trees in my backyard. There has been no comprehensive effort to quantify these economic values of deer in Iowa.

Summary

Deer hunting generates \$232 million of economic activity and 2.1 million days of outdoor recreation annually. (Source: Association of Fish and Wildlife Agencies 2006)

The following amounts (in millions) were spent on:

Food – \$30.2 (Residents \$29.9 + Nonresidents \$6.3)

Lodging - \$13.6 (Residents \$2.3 + Nonresidents \$11.3)

Auto - \$47.3 (Residents \$37.3 + Nonresidents \$10.0)

Guide fees* - \$7.4 (Residents \$0.3 + Nonresidents \$7.1)

Other - \$200.9

Total - \$299.4 (Residents \$239.3 + Nonresidents \$60.1)

Wildlife watching generates \$494 million of economic activity. Sixty percent of the respondents to this survey reported spending some time watching, feeding or photographing large mammals (deer).

c. The cost of damage to crops caused by deer.

Neither the DNR or the Iowa Department of Agriculture and Land Stewardship records or estimates the amount of damage that occurs to Iowa's producers due to any of Iowa's wildlife species.

In 1993 the USDA funded a study to estimate the amount of wildlife-caused damage to agricultural products, the percent of producers with damage, an assessment of which wildlife caused the losses and the producer's estimate of the value of the loss. The study looked at a sample of 20,001 producers nationally with 1,594 coming from 5 states in the Midwest. They found that the total production lost was less than 0.3% of the total production and the median value was less than \$300. However they found that the distribution of losses was highly skewed with a few producers sustaining a large proportion of the losses.

In 1993 the USDA also funded a study to determine the amount of wildlife-caused loss of field corn in the top 10 corn-producing states. There were 3,000 fields sampled in the ten states with 400 fields sampled in Iowa. In Iowa wildlife caused the loss of 0.31% of the harvested production of field corn. Deer caused roughly 1/3 of the loss, birds caused 28% and other wildlife (raccoons, squirrels, unknown) were responsible for the rest of the loss. In 1993 the total loss in corn production was estimated to be \$6.9 million when corn was an estimated \$2.50 per bushel. The loss to deer would have been \$2.3 million.

In 1993 there were 880 million bushels of corn produced in Iowa. In 2008 there were 2.2 billion bushels of corn produced. If the same rate of damage occurred in 2008 as in 1993 the loss due to deer would be \$7.9 million at \$3.50 per bushel corn. If there are 2.8 times more deer (as suggested by the simulations) then the loss would have been \$22.1 million in 2008.

The cost of fencing and protective measures by gardeners and producers protecting their crops has not been studied nor has the cost to homeowners for damage to landscaping.

There have not been any studies estimating the extent of damage to the natural ecosystems in Iowa. The DNR has looked at the impact of deer on the numbers and species composition of woody vegetation in Springbrook State Park. After 9 years the number of woody stems had declined by nearly 80% in the plots where deer were allowed to browse. However the number of woody stems had declined by nearly 60% in the deer-proof enclosures. Six of the 17 species initially present were no longer found in the plots where deer browsed while all of the species initially present were present in the enclosures. The number of oaks 1 to 6 feet tall that were present declined considerably in both treatments although an adequate seed source appeared to be present as seedlings were numerous in both treatments. Although deer did alter the composition of the woody species in this community, they do not appear to be responsible for the failure of oaks to regenerate. Winter counts in the park over this period averaged 176 deer per square mile which is much higher than the vast majority of Iowa's woodlands.

Summary

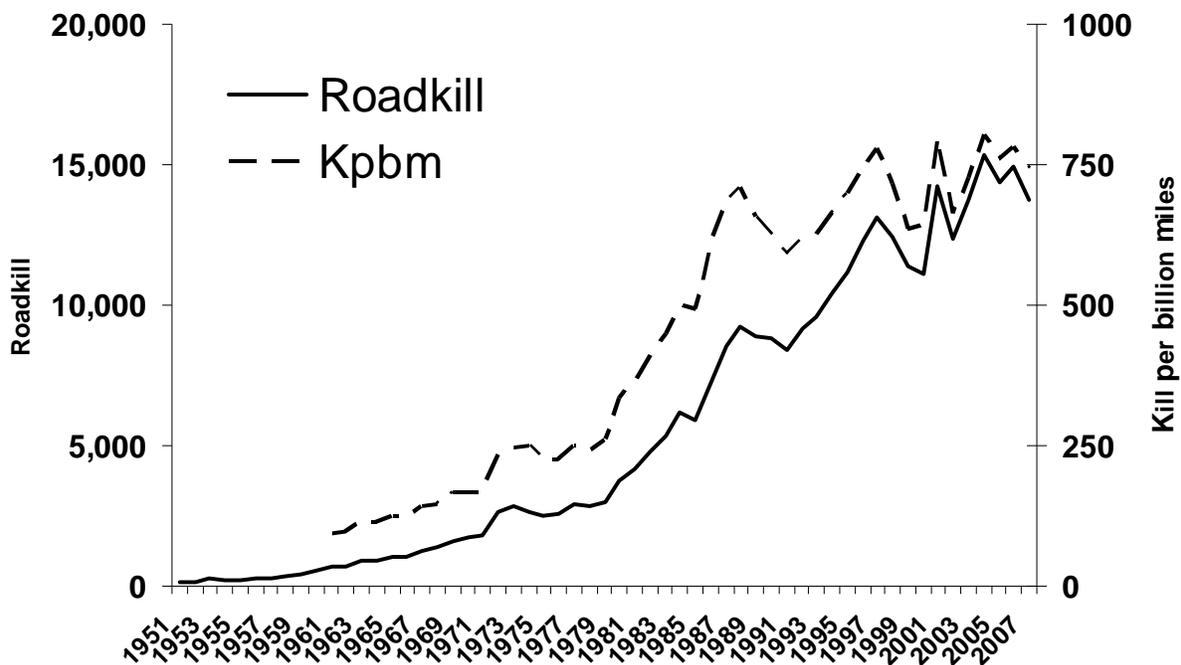
Although it might be useful to know the total amount of crop damage done each year it is not necessary to properly manage deer numbers. Attitude surveys of producers should reflect the level of damage that is acceptable and take into account changing prices, values and other economic concerns. There are currently 488 producers in the Iowa DNR's depredation program. There are 88,400 producers listed in USDA NASS database. The cost of doing such a survey would be extremely cost prohibitive.

d. The number and cost of motor vehicle accidents caused by deer.

The number of deer vehicle accidents is recorded by both the DNR and the Iowa DOT. If a person hits a deer with a vehicle in Iowa they can salvage the deer carcass by filling out a salvage tag. Conservation officers with the DNR keep a record of each deer salvaged. Prior to 1986 all deer salvaged and unsalvaged were recorded by DNR conservation officers.

Beginning in 1986, if a deer was not salvaged and was on the traveled portion or shoulder of a state or Federal highway, personnel from the Iowa DOT maintenance department moved it from the roadway so that it is not a hazard to traffic. The Iowa DOT keeps a record for each deer moved and refers to these records as unsalvaged deer. These data sources are combined and is the information the DNR uses as an index to deer numbers. Beginning in 1961, the number of vehicle miles driven on Iowa’s rural highways was also recorded. This number is used to create an “adjusted” roadkill index that reflects the change in traffic volume over time. This index is created by reporting the number of deer per billion miles of traffic (Kpbm) (Figure 1).

Figure 1. The number of salvaged and unsalvaged deer reported each year from 1951 to 2007.



Another source of data comes from Iowa DOT/Department of Public Safety traffic crash records. Iowa law requires motorists to report any motor vehicle crash which involved one or more vehicles and results in death, injury or property damage of at least \$1000. One category on the crash form is for animal-vehicle crashes. The animal involved in these reports could be anything from livestock to wild animals to pets but likely the majority of the reported crashes involve deer. Animal-vehicle crashes appear to have risen slightly since 1993 but are still only a small proportion of the total (See Figure 2 and Table 1).

Table 1. The total number of crashes reported, the number of animal-vehicle crashes and the number that results in injuries or fatalities.

Year	Total Crashes	Animal-Vehicle Crashes			
		Number	Percent	Fatalities	Injuries
1993	73,608	7,012	10%	0	461
1994	74,048	7,138	10%	1	467
1995	76,203	8,052	11%	1	516
1996	78,357	8,614	11%	3	620
1997	71,512	8,097	11%	4	884
1998	64,041	7,564	12%	2	761
1999	64,485	7,787	12%	2	779
2000	64,364	7,556	12%	1	795
2001	52,987	6,057	11%	4	617
2002	59,659	8,641	14%	2	600
2003	59,437	8,396	14%	10	582
2004	59,192	8,481	14%	7	590
2005	58,644	7,320	12%	4	633
2006	54,815	8,335	15%	12	536
2007	60,367	8,027	13%	11	468

The number of fatalities has spiked in the past five years and almost all of the increase has been due to an increase in the number of fatal motorcycle crashes.

Figure 2. A comparison of the total number of crashes with the number of animal-vehicle crashes.

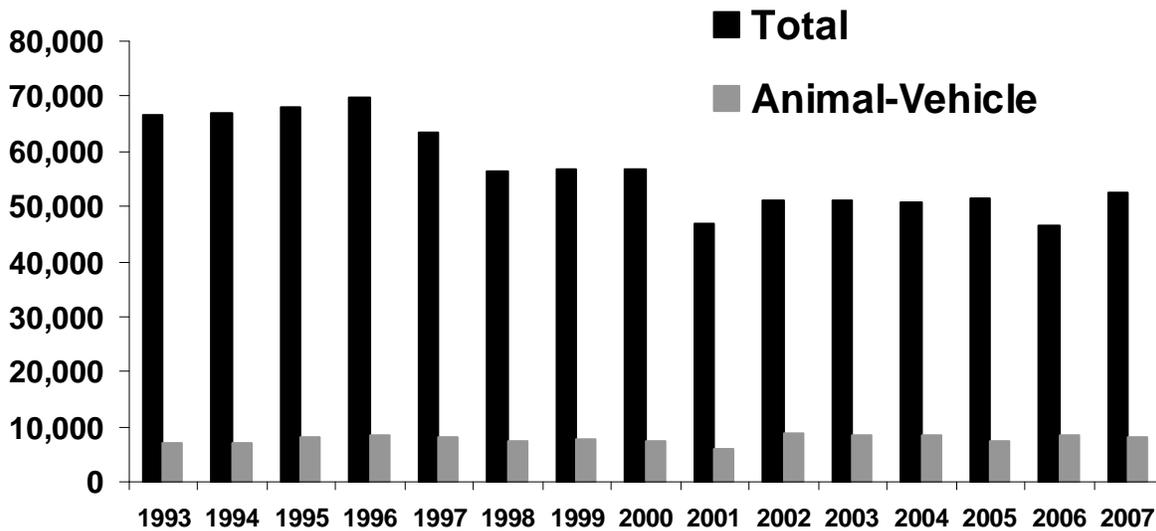
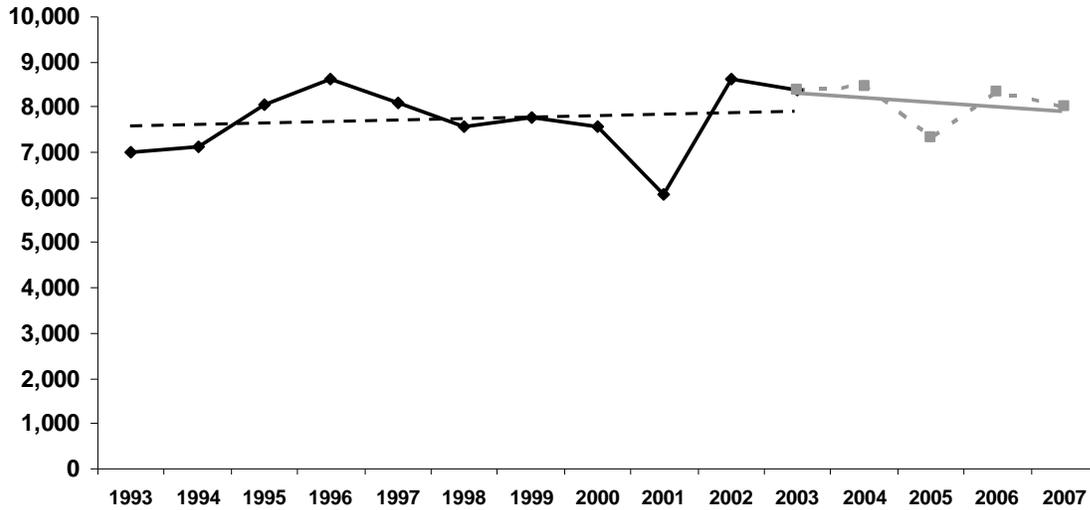


Figure 3. The number of animal-vehicle crashes reported and the trends from 1993 to 2003 compared to the trend from 2003 to 2007.



The number of animal-vehicle crashes has remained relatively stable since 1993. There was a slight upward trend from 1993-2003 and a slight downward trend from 2003 -2007. Animal-vehicle crashes have increased in Iowa DOT Districts 1, 5 and 6 in eastern and southern Iowa, stayed the same in District 4 in southwest Iowa and decreased in Districts 2 and 3 in north central and north western Iowa (Figure 4).

Figure 4. Animal-vehicle crashes recorded in each Iowa DOT district.

Iowa DOT Districts

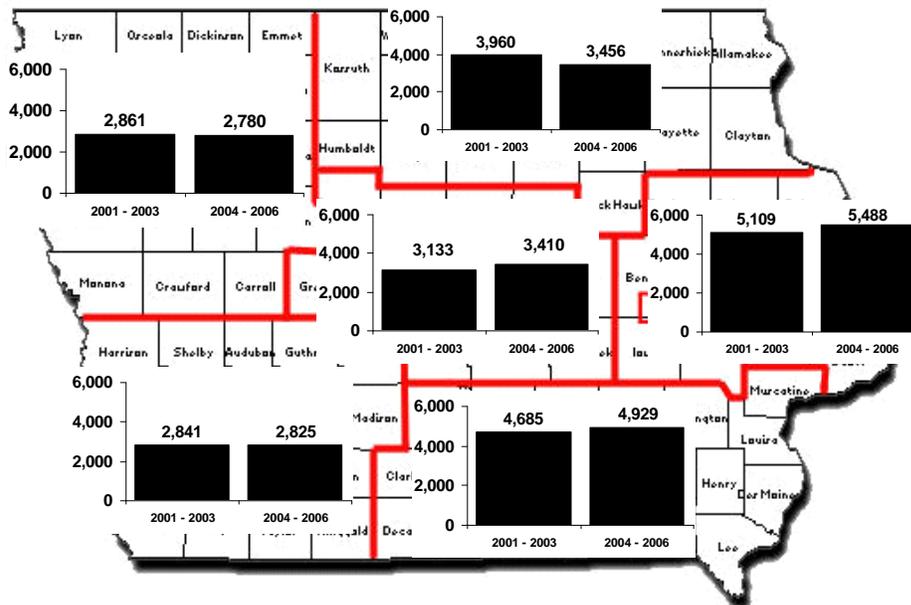
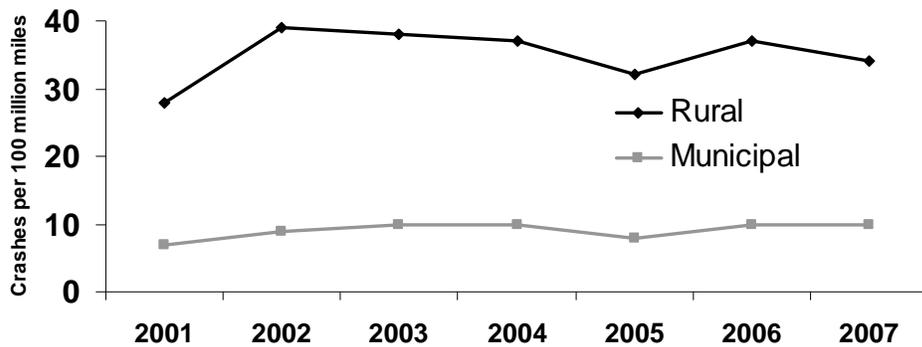


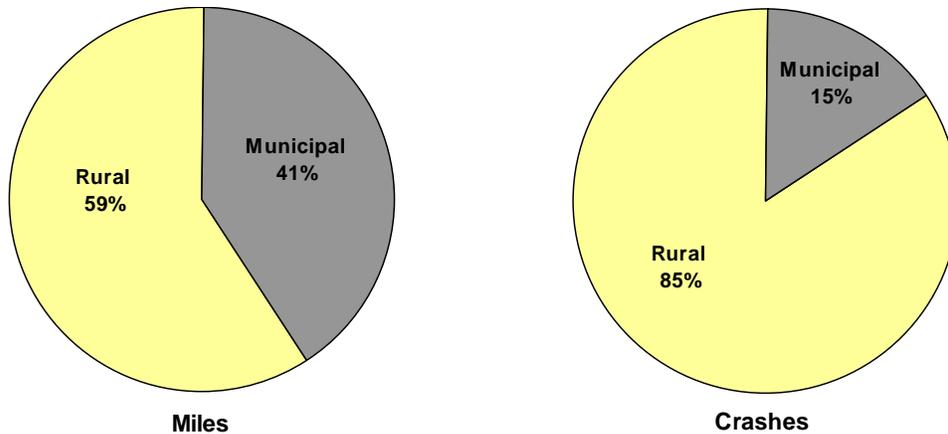
Figure 5. A comparison of the number of animal-vehicle crashes that occur on roads in rural areas with the number that occur in urban areas.



During the period of 2001-2007 there was an average of 35 animal-vehicle accidents per 100 million miles of traffic on rural roads and 9 animal-vehicle accidents per 100 million miles of traffic in urban areas (Figure 5).

During this time period 59% of the miles driven were on rural roads while 85% of all animal-vehicle crashes occurred on rural roads (Figure 6).

Figure 6. A comparison of the percentage of miles driven on rural and urban roads with the percentage of animal-vehicle crashes that occur on each type of road.



Although 29% of the miles driven in rural areas are on rural secondary roads, 43% of the animal-vehicle crashes in rural areas occur on secondary roads (Figure 7). Rural interstates account for 27% of the miles but only 9% of the reported animal-vehicle crashes. Forty-four percent of the miles driven in rural areas were on primary roads and 48% of the animal-vehicle crashes occurred there.

In urban areas 54% of the miles driven are on city streets and 44% of the animal-vehicle crashes in urban areas occur on city streets (Figure 8). Twenty-eight percent of the miles driven in urban areas were on primary roads and 43% of the animal-vehicle crashes occurred there. Urban interstates account for 18% of the miles and 13% of the reported animal-vehicle crashes.

Figure 7. The percentage of miles driven on rural interstate, primary and secondary roads compared to the percentage of animal-vehicle crashes on each type of road.

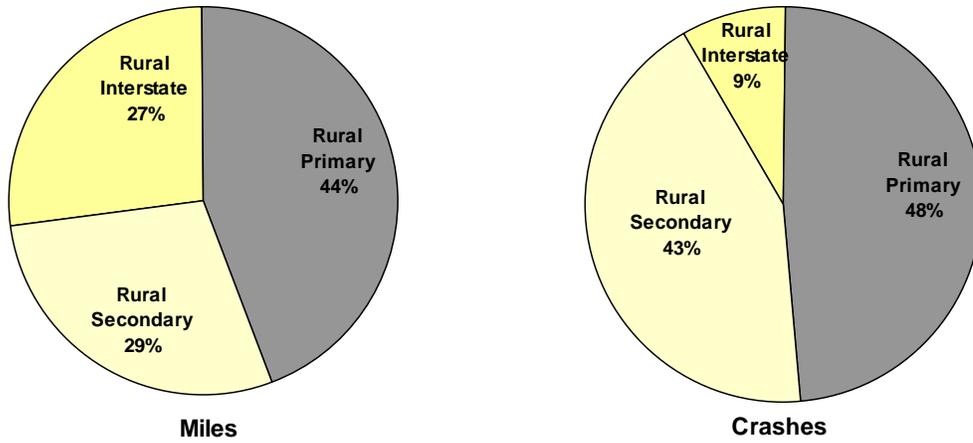
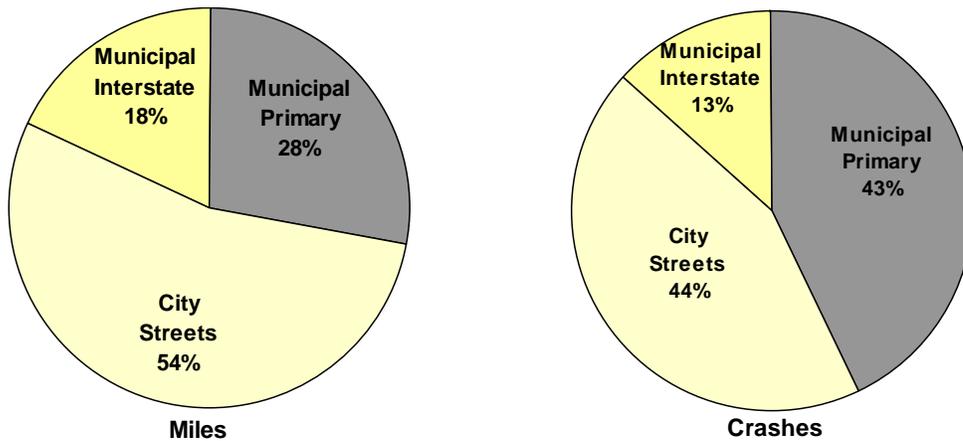
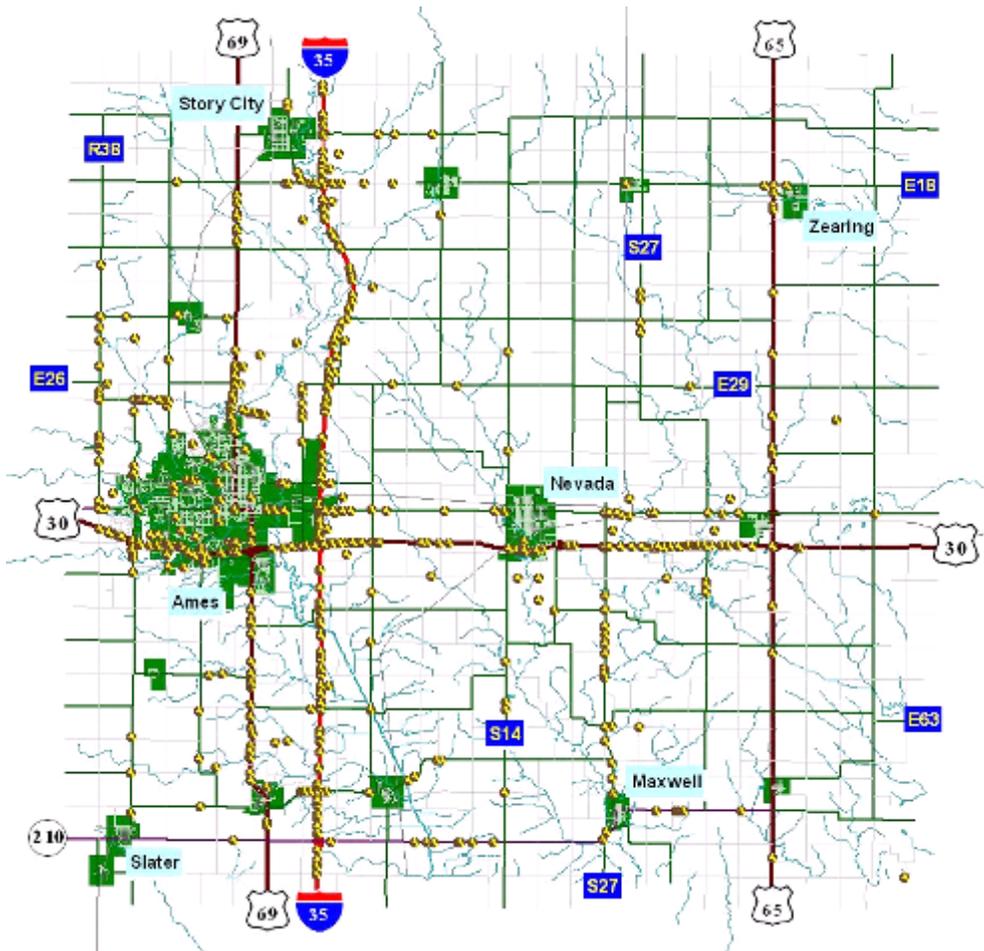


Figure 8. The percentage of miles driven on urban interstate, primary and secondary roads compared to the percentage of animal-vehicle crashes on each type of road.



The Iowa DOT has a website (www.iowadot.gov/crashanalysis/county.htm) to aid the public in identifying where crashes occur in each county (Figure 9).

Figure 9. The Iowa DOT has a web application to map crash locations in each county.



Grinnell Mutual reported that an average of 2,335 claims were filed for deer-related accidents for the 6 years from 2002 through 2007. The average claim was for \$2,135 so the total annual cost averaged \$5.0 million. There was a slight decrease in the claims filed with Grinnell Mutual and a slight increase in the claims filed with Select over the 6 year period (Table 2).

Table 2. The number of insurance claims involving deer and the total and average amount of the claim for 2002 through 2007 for Grinnell Mutual policy holders.

	Grinnell Mutual			Select			Combined		
	Claims	Total	Average	Claims	Total	Average	Claims	Total	Average
2002	1,703	\$3,306,020	\$1,941	654	\$1,340,583	\$2,050	2,357	\$4,646,602	\$1,971
2003	1,492	\$3,055,567	\$2,048	739	\$1,409,909	\$1,908	2,231	\$4,465,476	\$2,002
2004	1,536	\$3,216,375	\$2,094	800	\$1,579,872	\$1,975	2,336	\$4,796,247	\$2,053
2005	1,403	\$3,115,101	\$2,220	707	\$1,551,524	\$2,195	2,110	\$4,666,624	\$2,212
2006	1,480	\$3,363,204	\$2,272	956	\$2,249,941	\$2,353	2,436	\$5,613,146	\$2,304
2007	1,336	\$3,048,351	\$2,282	1,203	\$2,711,008	\$2,254	2,539	\$5,759,359	\$2,268

The Iowa Insurance Institute, a nonprofit organization reported that its members reported 20,742 claims were filed for deer accidents in Iowa in the previous 12 months for \$56,494,542 or an average of \$2,724 per claim. It also reported that its members had 104 claims for crop damage due to deer and the cost of the claims was \$371,639 or an average of \$3,573 per claim. It is not known what proportion this represents of the total claims since not all insurance companies are members.

State Farm estimated that there were 31,737 deer-vehicle accidents in Iowa over a 12-month period and that the number has increased 12.2% over the last 5 years. Only North Dakota, Pennsylvania and Wisconsin had a decrease over the 5-year period. The average change was +14.9% nationally (Table 3).

Table 3. The percent change in the number of deer-vehicle accident claims over the past 5 years according to State Farm Insurance.

State	%	State	%	State	%
Alabama	19.5	Kentucky	7.3	North Dakota	-0.4
Arizona	0.1	Louisiana	1.5	Ohio	21.8
Arkansas	34.5	Maine	23.1	Oklahoma	18.4
California	16.1	Maryland	11.1	Oregon	1.8
Colorado	8.1	Michigan	13.6	Pennsylvania	-8.1
Connecticut	26.1	Minnesota	18.4	South Carolina	12.9
Delaware	27.1	Mississippi	33.1	South Dakota	8.8
Florida	24.9	Missouri	12.5	Tennessee	22.2
Georgia	9.8	Montana	32.2	Texas	22.1
Idaho	31.2	Nebraska	43.7	Utah	25.2
Illinois	8.7	New Hampshire	16.8	Virginia	31.8
Indiana	24.2	New Jersey	47.7	Washington	15.1
Iowa	12.2	New Mexico	27.7	West Virginia	11
Kansas	29.7	New York	22.6	Wisconsin	-5.3
		North Carolina	35.5	Wyoming	36.1

Using their estimated deer-vehicle accidents and the number of registered vehicles in each state, State Farm estimates that the odds of hitting a deer are 1 in 105 each year in Iowa (Figure 10). This puts Iowa near the top behind West Virginia, Pennsylvania and Michigan.

The National Association of Insurance Commissioners list the top ten most expensive and least expensive states for automobile insurance in 2006 (Table 5). Iowa ranks as 2nd least expensive state for automobile insurance in the nation. Deer-vehicle collisions (DVC) would typically be covered under the comprehensive portion of the insurance policy which is also the least expensive part (Table 4).

Table 4. The average cost of an automobile insurance policy in Iowa.

State	Liability	Collision	Compre- hensive	Average expenditure
Iowa	282	199	163	536

Source: © 2008 National Association of Insurance Commissioners.

Figure 10. The likelihood of being involved in collision with a deer for each state.



Table 5. The most expensive and the least expensive states for automobile insurance in 2006.

Rank	Most expensive states	Average expenditure	Rank	Least expensive states	Average expenditure
1	D.C.	\$1,164	1	North Dakota	\$530
2	New Jersey	1,152	2	Iowa	536
3	Louisiana	1,094	3	South Dakota	554
4	New York	1,083	4	Idaho	577
5	Florida	1,069	5	Kansas	579
6	Massachusetts	1,042	6	Nebraska	584
7	Rhode Island	1,038	7	Wisconsin	590
8	Delaware	1,024	8	North Carolina	596
9	Nevada	1,006	9	Indiana	631
10	Connecticut	981	10	Maine	634

Source: © 2008 National Association of Insurance Commissioners.

The Iowa Insurance Institute urges insurance companies to proactively work to educate drivers on how to avoid deer. Here are some of their recommendations:

- Drive with caution where roads pass near creeks and forested areas.
- Always wear your seat belt.
- Use high beam headlights when possible.
- Be especially attentive from sunset to midnight and during the hours shortly before or after sunrise.
- The worst month for deer accidents is November.
- Brake firmly when you notice a deer in or near your path, but stay in your lane.
- Do not rely on devices such as deer whistles, deer fences and reflectors to deter deer.

Deer-Vehicle Crash Information and Research Center

The Iowa DOT and the Iowa DNR have been working with the Deer-Vehicle Crash Information and Research (DVCIR) Center to reduce the number and severity of these collisions. The center is critically evaluating deer-crash data collection methods and research on countermeasures. The hope is that dissemination of this information will contribute to making the roads safer for both drivers and deer. DVCIR Center members currently include the Department of Transportation from Connecticut, Iowa, Maryland, Minnesota, New York, Ohio, Texas and Wisconsin. The lead agency is the Federal Highway Administration Office of Natural and Human Environment.

The DVCIR Center provides excellent focal-point resources for practitioners trying to find better information and methods connected to the problem of deer-vehicle crashes. They are a great location for anyone looking for information related to deer-vehicle crashes.

Products so far include a web-based countermeasures toolbox. This toolbox contains what is believed to be the most detailed summary and evaluation of DVC countermeasure information. Three levels of discussion are provided that focus on the current state-of-the-knowledge related to 16 potential DVC countermeasures. Specific findings and conclusions for each countermeasure are discussed. Each of the summaries can be acquired from the DVCIR webpage. More broad-based conclusions and recommendations are provided as well.

It was generally concluded that it is difficult to define the magnitude of the DVC problem in the United States, and that the collection of roadside deer carcass locations may provide a more accurate measure of the problem. The 16 countermeasures are grouped into five categories based on their apparent use and how much they have been studied. It was not considered appropriate, given the current limited state-of-the-knowledge and lack of definitive studies, to group the countermeasures by their apparent DVC reduction capabilities.

The majority of the potential countermeasures are used in the field, but the safety impacts of few have been evaluated rigorously. Only studies of properly installed/maintained exclusionary fencing and wildlife crossing installations have consistently shown DVC reductions. The DVC reduction capabilities of the other 14 countermeasures appear to still be in question. Different types of evaluations are recommended for each of the five categories defined.

It is also recommended that a national or regional DVC database be created and that the value of a similar database of roadside carcass locations be evaluated. It is proposed that all DVC countermeasure installations and evaluations be completed by a team of transportation safety and ecology professionals. A national or regional DVC or large ungulate-vehicle crash safety research center should also be created to fund/promote appropriately designed research in the DVC area.

e. A review of the deer management challenges and programs of other Midwestern states.

All Midwestern states are facing similar challenges in managing deer numbers. Iowa was second only to Wisconsin in the proportion of antlerless deer in the harvest in 2007. Although most states list population estimates few have identified a goal for their management program due to the difficulty in making total population estimates (Table 1).

Table 1. Deer harvest and deer population statistics in other states.

State	Last Harvest	Percent Antlerless	Current Population	Population Goal
Iowa	146,214	63%	330,000 post, 475,000 pre	Mid to late 1990s levels - 170-200,000 postseason
Illinois	199,671	59%	750-800,000 pre	None, manage by deer/vehicle collisions in '08
Indiana	124,427	60%	None calculated.	None, manage for stable to declining population trends
Kansas	71,012	48%	350,000	None, manage for stable deer population
Minnesota	260,434	58%	1.2 million	None, manage for stable to declining population trends
Missouri	300,915	60%	1.4 million	Stable to declining populations
Nebraska	57,121	39%	325,000 preseason	Stable to declining populations
Ohio	232,854	62%	700,000	None, manage for declining to stable population
South Dakota	70,040	52%	300,000	None, manage for stable to declining population trends
Wisconsin	520,400	67%	1.3 million preseason	702,000 preseason

All Midwestern states rely on their harvest estimates to determine deer population trends. Iowa uses several additional techniques to verify harvest trends (Table 2).

Table 2. How each state determines deer numbers.

State	How are population trends determined
Iowa	Harvest & herd parameters, DVC, aerial surveys, & spotlight surveys used in model. Also stakeholder surveys. In prep. - New spotlight surveys & bowhunter field observation survey
Illinois	DVC - deer/vehicle collisions
Indiana	Harvest-based modeling & stakeholder surveys
Kansas	DVC - deer/vehicle collisions, fall spotlight surveys, & stakeholder surveys
Minnesota	Harvest-based modeling, some spotlight & aerial surveys
Missouri	Harvest-based modeling, accident reports on DVC, attitude surveys
Nebraska	Harvest-based modeling
Ohio	Harvest-based modeling, stakeholder surveys, accident reports of DVC
South Dakota	Harvest-based modeling
Wisconsin	Harvest-based modeling

Most Midwestern states use controlled hunts and sharpshooters to control urban deer numbers (Table 3).

Table 3. Deer control programs in urban areas.

State	How are Urban Deer Managed
Iowa	Special urban hunt areas & 1 sharpshooting area
Illinois	Mainly sharpshooting in urban areas
Indiana	Urban Deer Zones - open earlier & allow greater antlerless harvest
Kansas	Struggling, some urban archery hunts, extended gun season in the metro unit
Minnesota	Urban hunt areas (mostly archery) & some sharpshooting areas
Missouri	Slowly an increasing number of archery hunting areas but still struggling; many areas resist lethal control as an option
Nebraska	Urban hunt areas
Ohio	Urban units with reduced cost antlerless licenses
South Dakota	Urban hunt areas & sharpshooting areas
Wisconsin	Urban hunt areas & sharpshooting areas

Iowa has the lowest proportion of public land open to hunting of any state in the Midwest (Table 4).

Table 4. How much public land each state has available to hunting.

State	Percent Private or Closed	Percent Public or Open
Iowa	98.5%	1.5%
Illinois	95.0%	5.0%
Indiana	95.0%	5.0%
Kansas	97-97.5%	2.5-3%
Minnesota	75.0%	25.0%
Missouri	93.0%	7.0%
Nebraska	98.0%	2.0%
Ohio	95.0%	5.0%
South Dakota	87.5%	12.5% (2.2% leased by SD)
Wisconsin	85.0%	15% (mainly in north)

Most other Midwestern states do not have quotas on the number of nonresident licenses available. Iowa is fairly similar to other Midwestern states as far as the proportion of total hunters that are nonresidents.

Illinois did a study in 2007 that compared the willingness of residents and nonresidents to harvest antlerless deer. The study noted “that non-resident desires may be in direct conflict with the broader objectives for white-tailed deer management from a statewide perspective”. They found that nonresidents harvested more large bucks than any other type of deer (64% of kill were bucks) and although more than half of the nonresidents surveyed indicated a willingness to harvest 2 or more does only 3% did so. Eighty-one percent did not harvest any does and 16% killed one.

Table 5. Summary of harvest numbers including nonresidents.

State	Total Licenses	Total Harvest	Nonresidents	Nonresident Quota
Iowa	389,163	146,214	9,374 NR hunters & 15,448 NR licenses, 5.2% of hunters	6,000 either-sex, 3,500 antlerless
Illinois	697,248	199,671	50,938+ NR licenses (28,450+ are antlerless), 7.3% of licenses	25,000 (Archery), Firearms***
Indiana	277,679*	124,427	3,200 NR hunters (also NR youth hunters not broken out), 2.7% of adult hunters	None
Kansas	159,908	71,012	N/A, estimated 20% of hunters	20% of previous year
Minnesota	700,000	260,434	13,200 NR hunters, 2.6% of hunters	None
Missouri	710,960	300,915	25,000 NR hunters, 5.2% of hunters	None
Nebraska	129,283**	57,121	11,276 NR licenses, 8.7% of licenses	None
Ohio	578,366	232,854	29,741 NR hunters (youth hunters not broken out), 9.0% of adult hunters	None
South Dakota	119,212	70,040	9,367 licenses, 7.9% of licenses	None/Some limitations
Wisconsin	901,677	520,400	Approx. 46,600 NR Bow & Gun hunters, 5.2% of Bow & Gun hunters	None

*Does not include lifetime license holders

**Multiple deer can be harvested on some licenses

*** Nonresidents can only apply for counties that have left-over licenses in a county after the resident's draw

Iowa has a variety of seasons that have evolved to meet a growing demand for different types of deer hunting recreation. Iowa’s management philosophy has been to provide hunters with a variety of choices on how they prefer to hunt deer while controlling deer numbers through taking antlerless deer with the additional seasons (Table 6).

For example Iowa hunters can obtain 1 either-sex license for a firearm season and 1 either-sex license for the archery season. However a hunter could hunt in the muzzleloader season, the November antlerless season and the January antlerless season for antlerless deer if they choose a county where antlerless licenses are available.

Table 6. Hunting seasons and dates.

State	Seasons (general timeframe example)
Iowa	Archery: 10/1-12/5 & 12/22-1/10 Firearm: 12/6-10 & 12/13-21 Muzzleloader: 10/11-19 & 12/22-1/10 Youth: 9/20-10/5 Antlerless-only: 11/28-30 & 12/24-1/2 & 1/11-1/25
Illinois	Archery: 10/1-1/15 (closed during firearms) Firearm: 11/21-23 & 12/4-7 Muzzleloader: 12/12-15 Youth: 10/11-12 Antlerless-only: 1/16-18
Indiana	Archery: 10/1-12/2 & 12/8-1/6 Firearm: 11/17-12/2 Muzzleloader: 12/8-23 Youth: 9/29-30 (AO) Antlerless-only: none
Kansas	Archery: 9/22-12/31 Firearm: 12/3-14 Muzzleloader: 9/22-10/5 Youth: 9/13-21 Antlerless-only: 1/1-4
Minnesota	Archery: 9/13-12/31 Firearm: 11/08-14 to 30 depends on area Muzzleloader: 11/29-12/14 Youth: 2-day hunts in certain areas. Otherwise a reduced fee youth license Antlerless-only: 10/11-12
Missouri	Archery: 9/15-11/9 & 11/21-1/15 Firearm: 11/10-20 Muzzleloader: 11/23-12/2 Youth: 10/27-28 & 2 days in Jan. Antlerless-only: 12/8-16
Nebraska	Archery: 9/15-11/14 & 11/24-12/31 Firearm: 11/15-23 Muzzleloader: 12/1-31 Youth: 9/15-1/15 Antlerless-only: 1/1-1/15
Ohio	Archery: 9/29-2/3 Firearm: 11/26-12/2 & 12/15-16 Muzzleloader: 10/22-27 (mostly AO & permit only) & 12/27-30 Youth: 11/17-18 Antlerless-only: None
South Dakota	Archery: 9/27-1/31 (Jan. AO) Firearm: variable, 11/15-30 east, B Hills 11/1-30 Muzzleloader: 12/13-1/31 (Jan. AO) Youth: 9/13-1/31 AO Antlerless-only: in Jan.
Wisconsin	Archery: 9/15-11/15 & 11/26-1/6 Firearm: 11/17-25 Muzzleloader: 11/26-12/5 Youth: 10/6-7 Antlerless-only: typically 4-day season in mid Oct.

Table 7. The technique each state uses to gather deer harvest data.

State	Harvest reporting system
Iowa	Mandatory reporting (Online, telephone, ELSI.
Illinois	Mandatory reporting (check stations and online)
Indiana	Mandatory reporting (check stations)
Kansas	Postseason survey (sample of hunters)
Minnesota	Mandatory reporting (check stations)
Missouri	Mandatory reporting (telephone reporting)
Nebraska	Mandatory reporting (check stations)
Ohio	Mandatory reporting (check stations)
South Dakota	Postseason survey (sample of hunters)
Wisconsin	Mandatory reporting (check stations)

Earn-a-buck

In the past 3 years the deer harvest in Iowa has been within one or two percentage points of Wisconsin as far as the proportion of antlerless deer in the harvest without an earn-a-buck system. Wisconsin is the only Midwestern state that uses the earn-a-buck system to increase the antlerless kill on a large scale. This regulation is often mentioned as a way to increase the antlerless kill in Iowa.

First it is important to realize that the earn-a-buck system has not been a popular program with hunters or landowners in Wisconsin. The main reason hunters do not like the season is that it forces them to use the limited time they have available to hunt to kill and register an antlerless deer before they can pursue other deer. Some landowners do not like having to kill a doe as they perceive deer numbers on their land as being low enough already.

Recent changes in Wisconsin's regulations have allowed hunters to take the antlerless deer in a prior season which has made the regulation more accepted by hunters.

A primary requirement for the earn-a-buck system to work is that the harvest of an antlerless deer is verified physically at a check station. Iowa does not have this type of harvest reporting system on a statewide basis.

Many of the special urban hunts in Iowa do require deer to be physically checked as part of their management system. Hunters who harvest a certain number of does become eligible for an incentive tag. This has been accepted by hunters since these control programs are viewed as an additional opportunity to hunt. Hunters in this situation accept the additional requirement as part of the "extra" opportunity they are seeking.

Wildlife diseases are costly

In 2008 Michigan spent an estimated \$13 million monitoring and trying to control the spread of Bovine Tuberculosis. Since 1995 when the disease was discovered in the northern part of the Lower Peninsula, Michigan has spent over \$100 million on TB eradication. Wisconsin has spent \$5 million annually on CWD since it was discovered in 2002. Illinois spends \$1.1 million annually on CWD as well. In response to the recent discovery of TB in Minnesota their state spent over \$760,000 in 2008 on its control program.

Michigan, Minnesota and Wisconsin have all instituted bans on the recreational feeding of deer in areas where there are disease concerns. Recreational or supplemental feeding is not biologically needed for Iowa's deer population to remain healthy. It does pose the risk of

increased potential for disease spread if a disease is ever found in Iowa. Supplemental feeding can also be a problem when it is used to concentrate deer on private land that has limited hunting pressure. These areas can quickly become overpopulated and cause substantial damage to neighboring fields.

Summary

Iowa faces many of the same challenges as do other Midwestern states in managing their deer populations. Iowa has one of the highest rates of antlerless harvest and collects more population trend data than does any other Midwestern state.

f. An assessment of public opinion concerning the number of deer, and the impact and value of Iowa's deer population.

The Iowa Department of Natural Resources periodically surveys Iowa's landowners and producers to determine their attitudes toward deer and other wildlife. This data is used to evaluate how well deer management activities are being accepted by this important set of stakeholders. This survey was conducted previously in 1988, 1996 and 2002. Most of the questions remain the same each year although some of the questions have been changed to reflect changes in issues that were important at the time the survey was conducted. Quantitatively measuring these attitudes and how they change over time is an important part of the decision making process for managing deer. Balancing the demands of hunters, recreational users of wildlife, producers and the concerns for public safety are all crucial to having a sound management program.

The sample for the 2007 survey was drawn by USDA, National Agricultural Statistics Service, Iowa Field Office and surveys were mailed to 1,500 randomly selected producers in 5 regions in November 2007. Another 300 surveys were sent to producers who grew a specialty crop such as fruit or nuts, vegetables, nursery crops, Christmas trees, ornamental plants or trees. The survey was self-administered and included a return mailer. A follow-up reminder was mailed in February, and in March non-respondents were phoned.

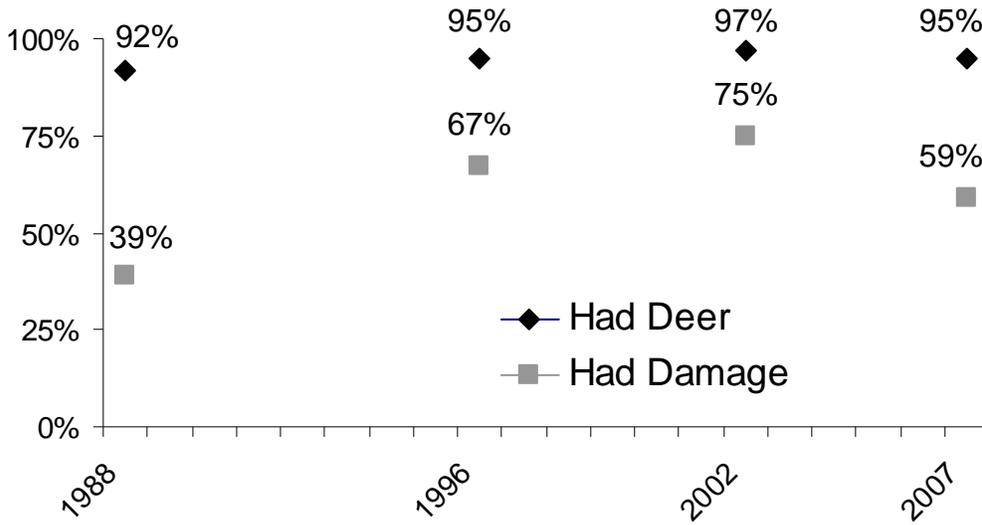
Statewide

A total of 1,055 surveys were returned for a 59% response rate. Seventy-two phone surveys were conducted of non-respondents to assess this potential source of bias. A statistical analysis was done using SAS for the statewide total as well as by region and for producers with specialty crops. Regions 2-5 were combined into a bigger region so that comparisons could be made back to 1988 when only 2 regions were used (Table 1).

Table 1. Responses to selected questions compared with previous years.

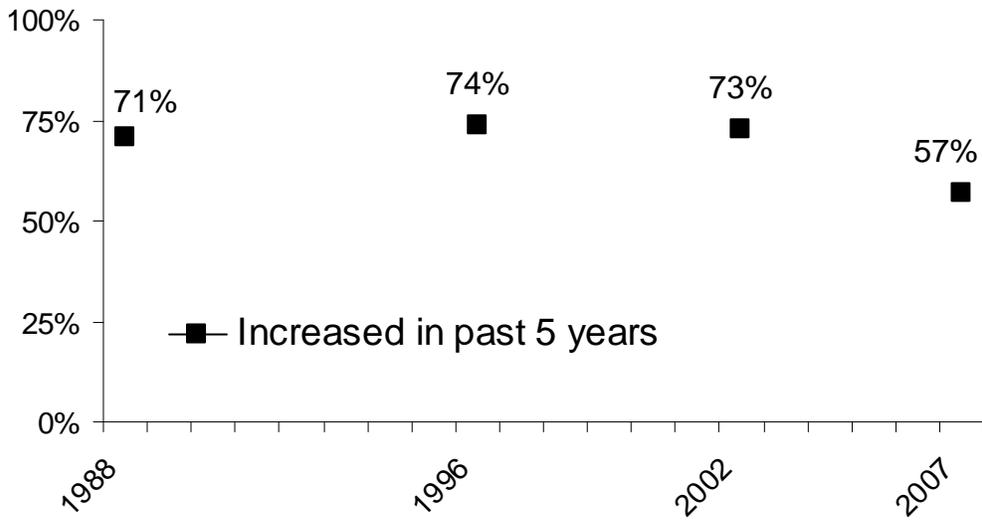
Question	Statewide			
	1988	1996	2002	2007
Had deer on property	92%	95%	97%	95%
Thought deer population in the past 5 years had increased	71%	74%	73%	57%
Thought deer population was too high	31%	52%	67%	56%
Had deer damage	39%	67%	75%	59%
Thought deer population should:				
Increase	11%	6%	3%	5%
Remain the same	51%	29%	23%	26%
Decrease slightly	28%	35%	33%	34%
Decrease greatly	10%	30%	41%	35%

Figure 1. The proportion of farm operators who reported they had deer on their property at some time during the year and the proportion that had damage.



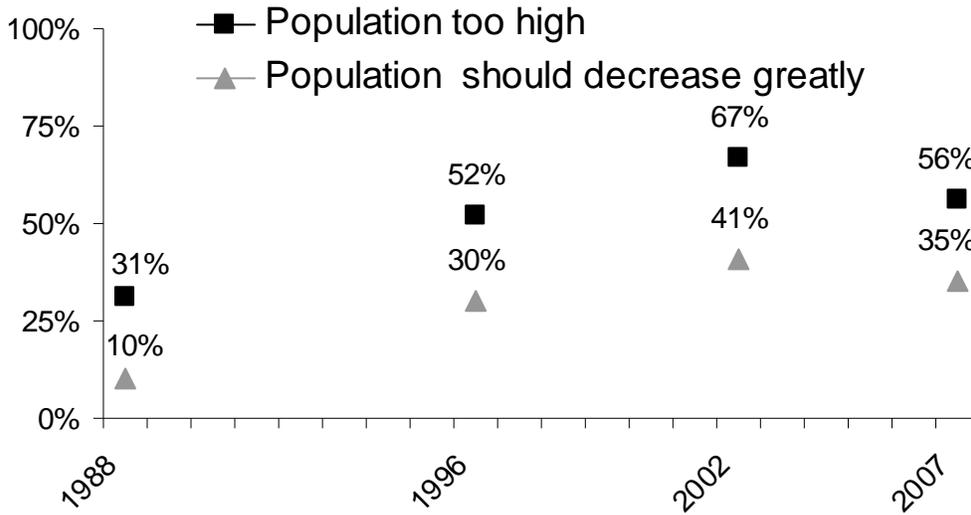
The proportion of farms with deer has stayed pretty much the same since 1996. However the proportion of operators that reported they had damage due to deer decreased by 16% in 2007 and is now back at the level it was in 1996. This reverses the trend recorded from 1988 to 2002 (Figure 1).

Figure 2. The proportion of farm operators who reported that deer numbers had increased in the past 5 years.



The proportion of farm operators who reported that deer numbers had increased in the past 5 years decreased markedly in 2007 and is now at the lowest point since the surveys were initiated in 1988. This decline may have begun to appear in 2002 although the results from 1988 to 2002 are very similar (Figure 2).

Figure 3. The proportion of farm operators who reported that deer numbers are too high and the proportion that reported they believe that deer numbers should decrease greatly.



The proportion of farm operators who reported that deer numbers are too high on their farm decreased by 11% from 2002 and was slightly higher than it was in 1996. The proportion of farm operators who reported that they believe deer numbers should decrease greatly was down 6% in 2007 and was also slightly higher than in 1996. The results from both of these surveys break the trend observed from 1988 to 2002 (Figure 3).

Regions

When the results for these questions are compared for the two regions that have been used since 1988, we see similar trends. The proportion of farm operators who stated that deer numbers are too high has declined since 2002. In the North and Central region the proportions are lower than they were in 1996 while in the Northeast, East, South and West region they are still above 1996 (Figure 4 and Figure 5, Table 2)..

Figure 4. The proportion of farm operators who reported that deer numbers are too high in each region.

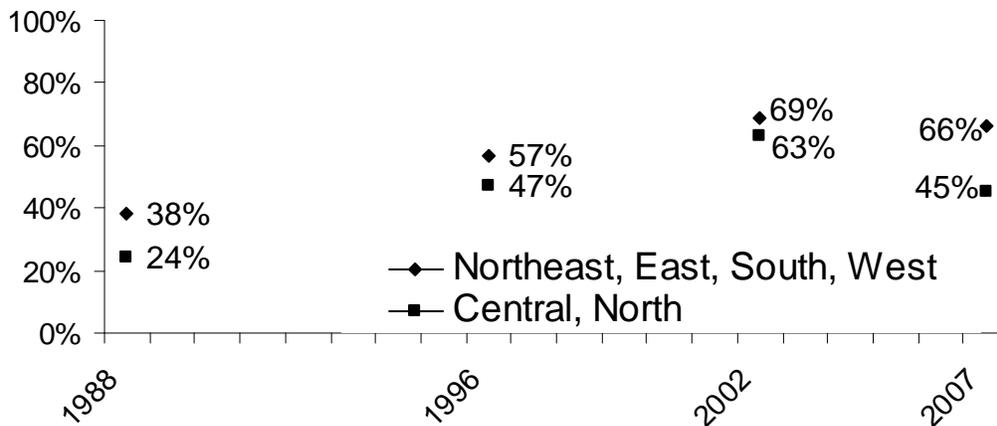


Table 2. Responses to selected questions compared with previous years.

	Regions	1988	1996	2002	2007
Had deer on property	1	91%	92%	97%	95%
	2-5	93%	97%	97%	96%
Thought deer population in the past 5 years had increased	1	72%	75%	70%	50%
	2-5	69%	71%	74%	63%
Thought deer population was too high	1	24%	47%	63%	45%
	2-5	38%	57%	69%	66%
Had deer damage	1	33%	57%	76%	55%
	2-5	45%	74%	75%	62%
Thought deer population should:					
Increase	1	12%	6%	5%	4%
Remain the same	1	56%	30%	23%	32%
Decrease slightly	1	26%	34%	32%	34%
Decrease greatly	1	6%	29%	40%	29%
Increase	2-5	9%	6%	2%	4%
Remain the same	2-5	46%	27%	23%	32%
Decrease slightly	2-5	31%	36%	33%	34%
Decrease greatly	2-5	14%	32%	42%	41%

Region 1 - Central and North (See map)

Region 2 - 5 – Northeast, East, South and West

Region Map

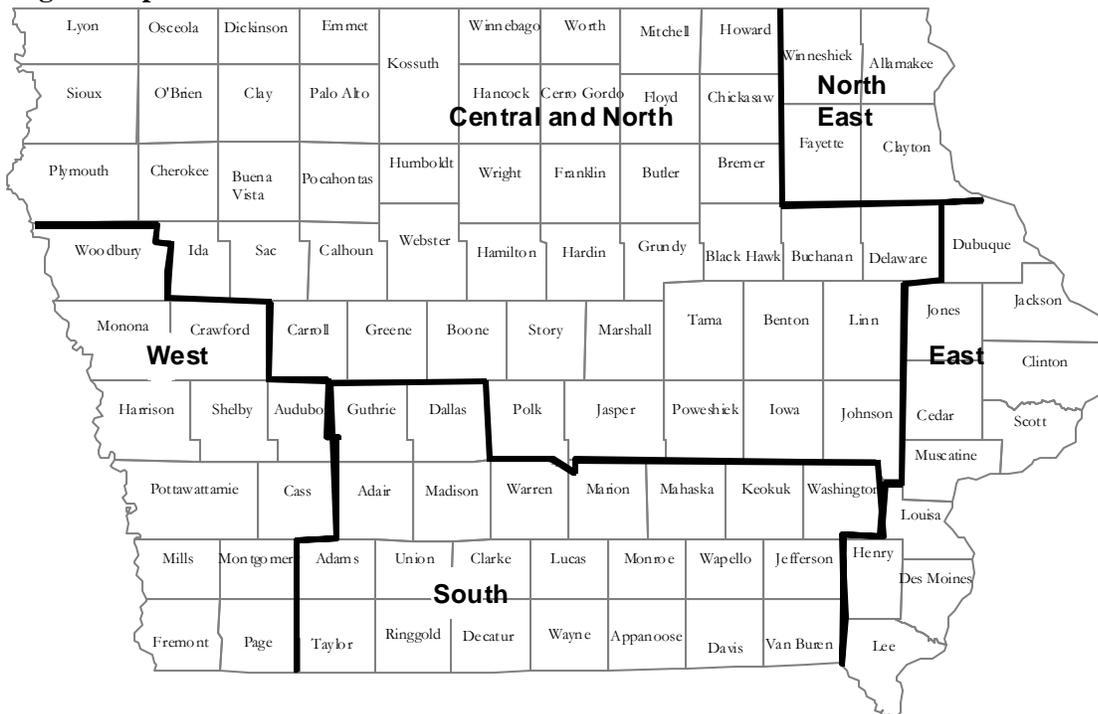


Figure 5. The proportion of farm operators who reported they had damage.

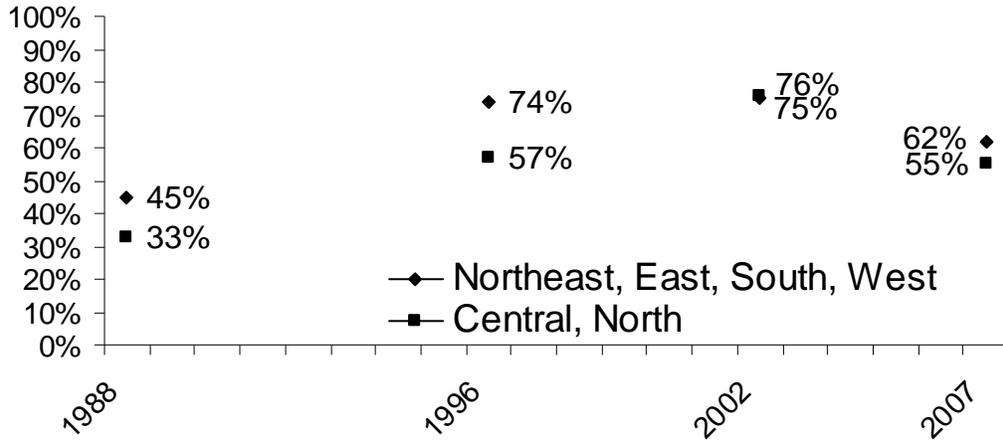
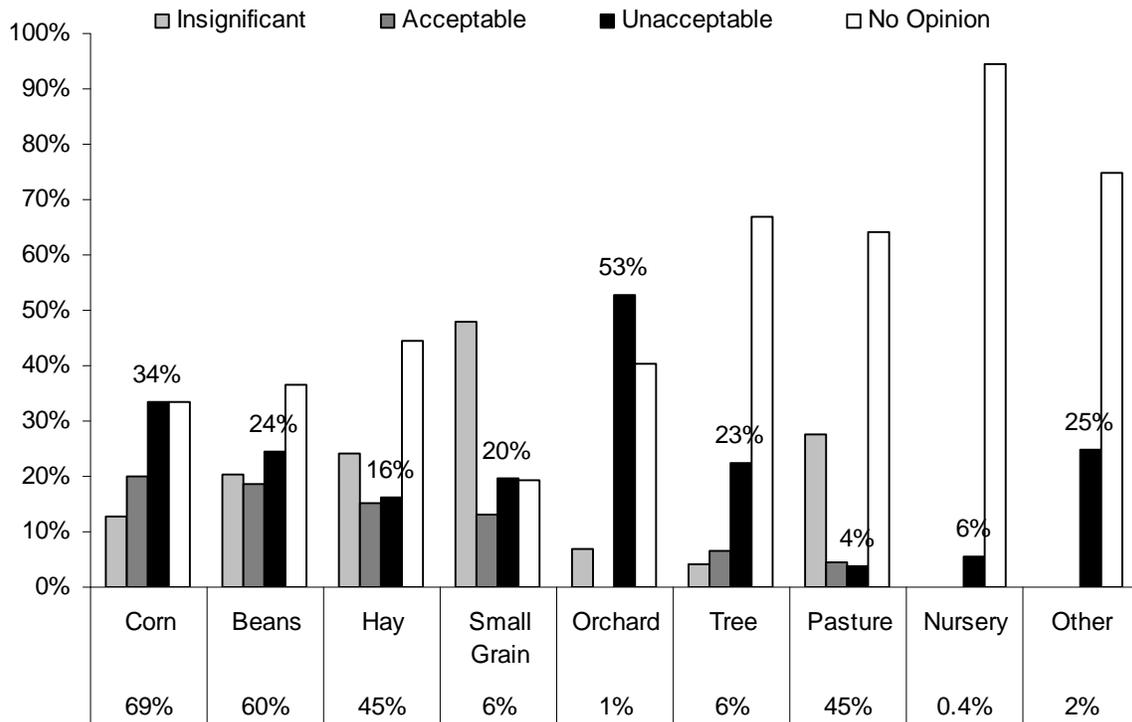


Figure 6. The proportion of respondents who reported growing each crop (along the bottom) and the proportion of respondents who reported that their current level of damage was (Insignificant, Acceptable, Unacceptable or had No Opinion). The percent that responded “unacceptable” is labeled for each crop.



Orchard was the only crop where a majority of the producers responded that their current level of damage was unacceptable (Figure 6). Thirty-four percent of those with corn and 24% of those with beans rated the level of damage as unacceptable however the highest response rate for those that grow beans was “no opinion”. Producers who reported trees and “other” crops had the highest response of “no opinion” although about 25% of both reported that damage was unacceptable.

Summary

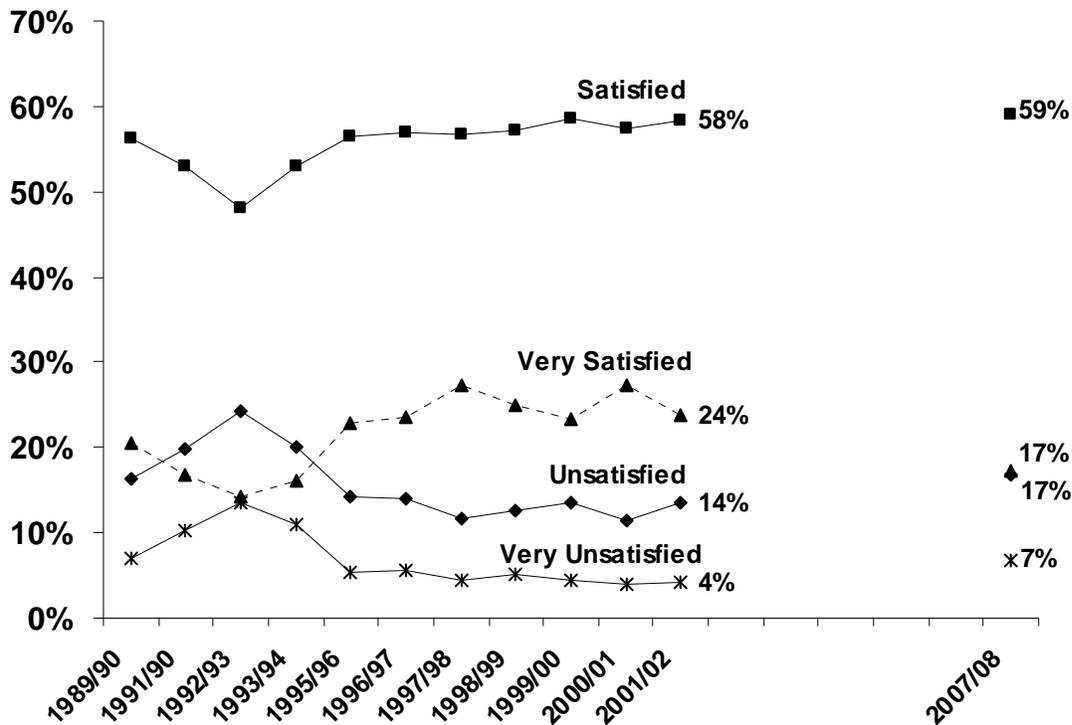
Based upon these comparisons it appears that the deer management program has measurably reduced Iowa producer’s negative perceptions about deer numbers and the level of damage they are experiencing on their farm. If the current trend continues the overall deer herd should be close to the department’s goal with deer numbers that are similar to where they were in the mid to late 1990’s.

Hunter Opinions

The DNR periodically surveys deer hunters about their opinions on deer numbers and how they would rate their hunting experience. Up until 2002 the survey was conducted annually along with the postseason harvest survey. Since then the survey is only conducted when the landowner attitude survey is conducted. The goal is to provide comparable information from two important stakeholder groups, hunters and landowners/producers.

It appears that hunters level of satisfaction has remained high however the proportion that are unsatisfied or very unsatisfied increased in 2007 (Figure 7).

Figure 7. The responses of deer hunters to an attitude survey that asks then how satisfied they are with their deer hunting.



Survey of Attitudes toward deer in Polk County - 1998

Thirty-six percent of the respondents in the metro area had deer in their neighborhood on at least a monthly basis. Nearly 40% regularly maintain a bird feeder whether there were deer in their neighborhood or not and 1% reported that they regularly fed deer. People with deer in their neighborhood were nearly 10 times more likely to have hit a deer with their car or truck (11% - vs.- 1%) and nearly 20% reported some property damage in the past year. Five percent estimated they had less than \$100 in damage, 9% from \$101 to \$500 in damage and 6% reported more than \$500 in damage.

Although 54% of the respondents with deer in their neighborhoods enjoyed having them around, they were 7 times more likely to agree that there were too many deer. Although over 50% were not concerned about the deer impacting the health of their family, they were twice as likely to express this concern. Over half of both groups agreed that deer could impact the plants in a forest.

Respondents with deer in their neighborhood were more likely to disagree that the situation should be left alone (54% vs. 40%). They were more agreeable to trapping and killing deer and to a controlled bow hunt. All 3 differences would be statistically meaningful at a 10% level of significance. Otherwise respondents agreed with fencing, repellents, and controlled bow or gun hunts and disagreed with trapping and killing or trapping and moving deer, sharpshooters, and using birth control.

It appears that the easiest way to characterize people's attitudes about deer is to examine how often they deal with them. Those that deal with deer on a regular basis have more problems, both with vehicle accidents and property damage. Although most still enjoy having deer they are more concerned about deer numbers and more likely to agree that something needs to be done. This is true regardless of age, gender, home ownership or whether they live in the Polk county metro area or outside of it.

Their attitudes about deer management options appear to be more consistent. These opinions also do not change much by age, gender, home ownership and even how often they deal with deer. In general the management options that were agreeable to a majority of the respondents included a controlled bow hunt, fencing, a controlled gun hunt and the use of repellents. The options that respondents disagreed with were trap and kill, sharpshooters, birth control, and trapping and removing deer. This was true regardless of age and home ownership. Women were less likely to approve of trapping and killing or sharpshooters than were men. People outside of the metro area viewed a controlled gun hunt more favorably. People with deer in their neighborhoods were more favorable to trapping and killing deer and felt more strongly that something needed to be done.

Appendix I. The purpose of the deer study committee, the timeline of the meetings and it’s members.

The Iowa Legislature passed and the Governor signed Senate File 2328 in 2008 which established a deer study advisory committee for the purpose of studying the best way to maintain a sustainable, socially acceptable deer population in the state while maximizing and balancing the economic value of deer hunting to Iowa's economy with the needs of the agricultural industry and public safety concerns.

The committee was composed of members from the following organizations or entities: Iowa Association of County Conservation Boards, Iowa Farm Bureau Federation, Iowa Farmers Union, Iowa Conservation Alliance, Iowa Bowhunters Association, Iowa Meat Processors Association, the Iowa Department of Transportation, Iowa Woodland Owners Association, Iowa Insurance Institute, Iowa Chapter of the Sierra Club, Iowa Environmental Council, Iowa Nursery and Landscape Association, the director of the Department of Natural Resources or a designee, the Secretary of Agriculture or a designee, the director of the Department of Economic Development or a designee, two members of the Senate and two members of the House of Representatives. Whitetails Unlimited, Iowa Realtors Association, Iowa League of Cities, Iowa Hospitality Association and the Iowa Restaurant Association also were designated as members but did not send representatives to any of the meetings.

Deer Study Committee Appointees.

Appointee	Organization
Andrea Evelsizer	IA Conservation Alliance
Chris Nelson	IA Farmer's Union
Curtis Weiss	IA County Conservation Boards
Dana Chittick	IA Insurance Institute
Deanna Maifield	IA DOT
Donald Tripp	IA Environmental Council
Ace Hendricks	IA Woodland Owner's Association
James Riggs	IA Sierra Club
Linda Grieve	IA Nursery & Landscape Association
Randy Taylor	IA Bow Hunters Association
William Beers	IA Farm Bureau
William Dayton	IA Meat Processors Association
Steve McCann	IDED
Mike Bevins	IDALS
Henry Rayhons	IA House of Representatives
McKinley Bailey	IA House of Representatives
Dennis Black	IA Senate
Mark Zieman	IA Senate
Ken Herring	IA DNR (Chair)

The committee met five times: September 16 and 17, October 14, October 28, November 17 and December 30. At the first meeting the committee was given an overview of Iowa’s deer management program by Iowa DNR staff and an outside facilitator hired by the DNR.

During the first meeting the committee developed a set of questions in an attempt to answer the six issues outlined in the legislation:

- a. The current status of Iowa's deer population, harvest, and population management programs.
- b. The economic impact and value of Iowa's deer population.
- c. The cost of damage to crops caused by deer.
- d. The number and cost of motor vehicle accidents caused by deer.
- e. A review of the deer management challenges and programs of other Midwestern states.
- f. An assessment of public opinion concerning the number of deer, and the impact and value of Iowa's deer population.

The next three meetings were used to examine the information requested by the committee and to begin to form recommendations. The final meeting was spent reviewing the final set of recommendations contained in this report.

The body of the report contains the information that was presented during these meetings along with the committee's recommendations. Unless noted the committee reached consensus on these recommendations.

The executive summary contains a set of recommended actions that the committee approved at the last meeting. Again unless noted the committee reached a consensus on these recommendations.

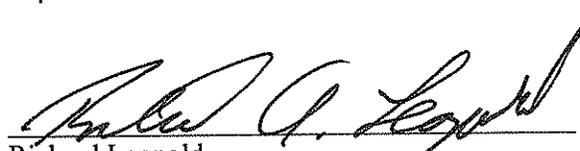
ACKNOWLEDGEMENT

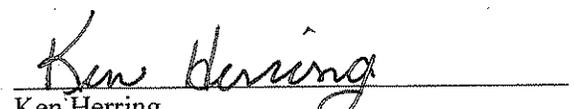
To the recipients of this report:

As assigned facilitators of the Deer Study Advisory Committee, it has been our pleasure to serve as guiding members of this committee. The forward thinking of our legislators to request individuals from diverse organizations as representatives on the committee should be acknowledged and applauded. The committee members effectively represented their wide range of knowledge, expertise, and concern about the need to find a balance in managing Iowa's deer population. The cooperation, consensus, and mutual respect this committee exhibited in their work has been a trademark that has been inspiring and motivating.

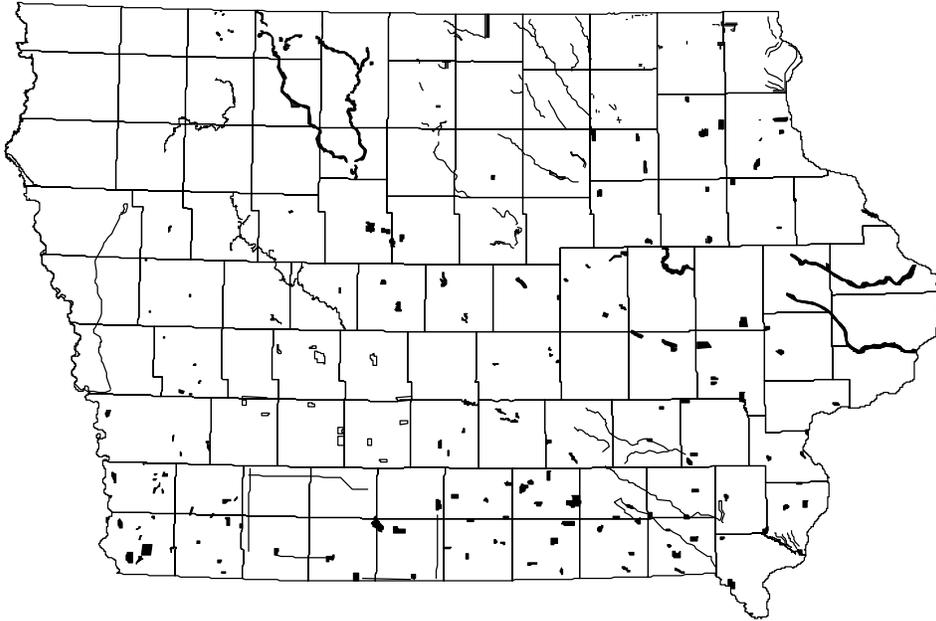
Many DNR staff contributed time to this effort, of which we would like to specifically acknowledge the dedicated work of the following individuals: Mimi Habhab, Stephanie Shepherd, Tom Litchfield, Bill Bunger, Peter Fritzell, Dr. Dale Garner and Willie Suchy. Along with the support that committee members received from their respective organizations and staff, we would like to acknowledge Dana Chittick (IA Insurance Institute), Deanna Maifield (IA DOT), Steve McCann (IDED), William Dayton (IA Meat Processors Association) and Randy Taylor (IA Bowhunters Association) for extra efforts to gather and present information at the meetings. Finally we would be remiss if we did not acknowledge the outstanding job that Dr. Jean Eells (E Resources Group) did to facilitate these meetings.

The support for this effort has been outstanding and encouraging and we look forward to the implementation of these recommendations so that we can better manage Iowa's Whitetail deer population.

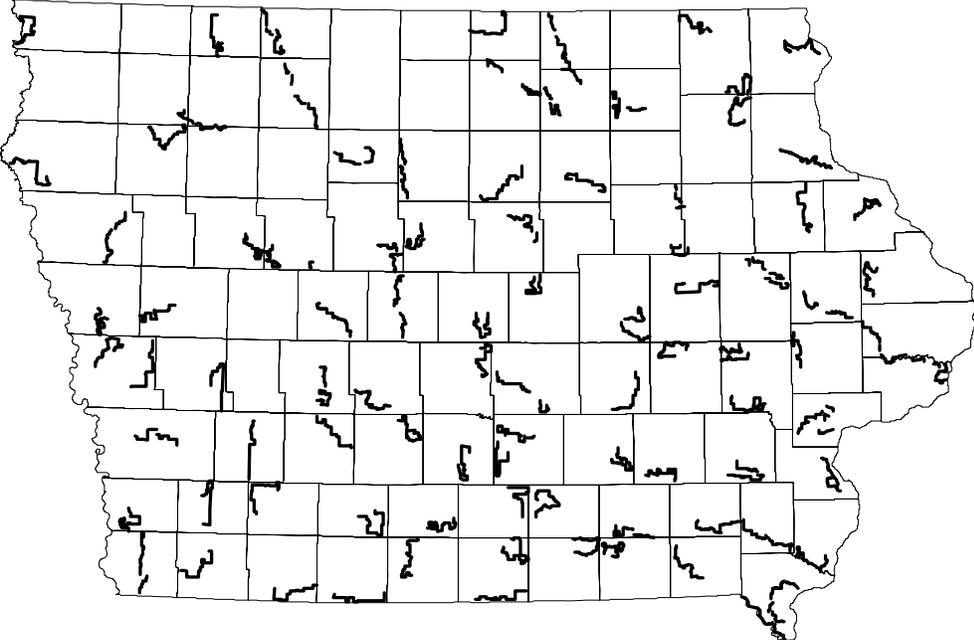

Richard Leopold
Director, Iowa Department of Natural Resources


Ken Herring
Acting Chair, Deer Study Advisory Committee

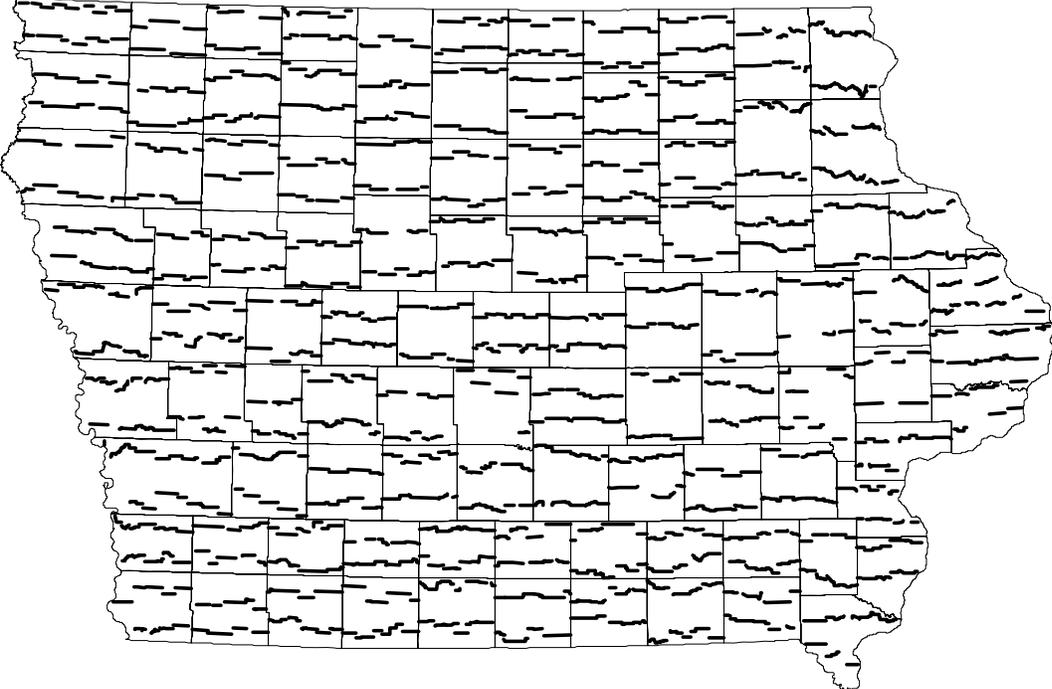
Appendix II. Aerial survey areas. Some surveys that follow rivers are difficult to see as they follow along the border of the state or county.



Appendix III. The spotlight survey routes conducted from 1978 to the present.



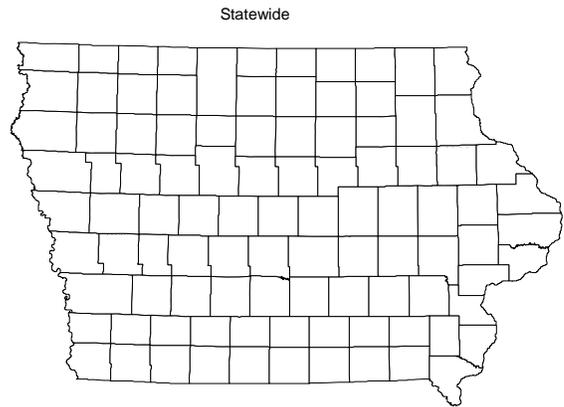
The spotlight survey routes conducted since 2006.



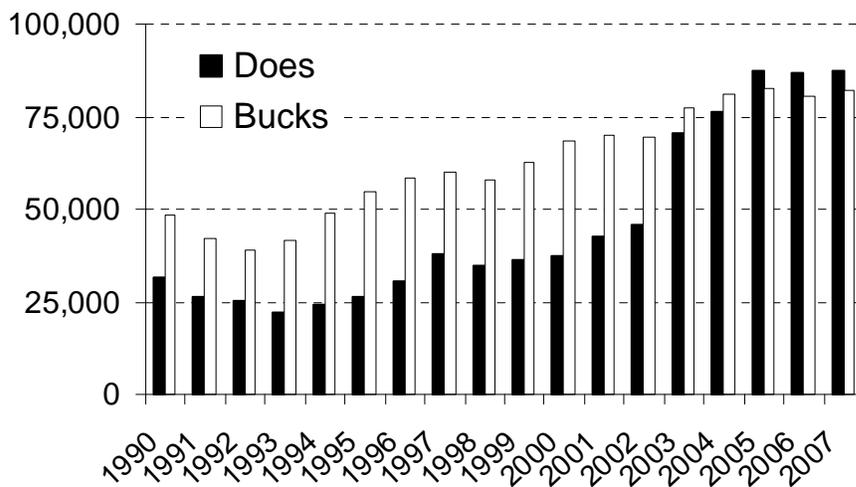
Appendix IV. Deer Population Update after the 2007/2008 season: Statewide

The following graphs show the deer harvest numbers and the predicted population.

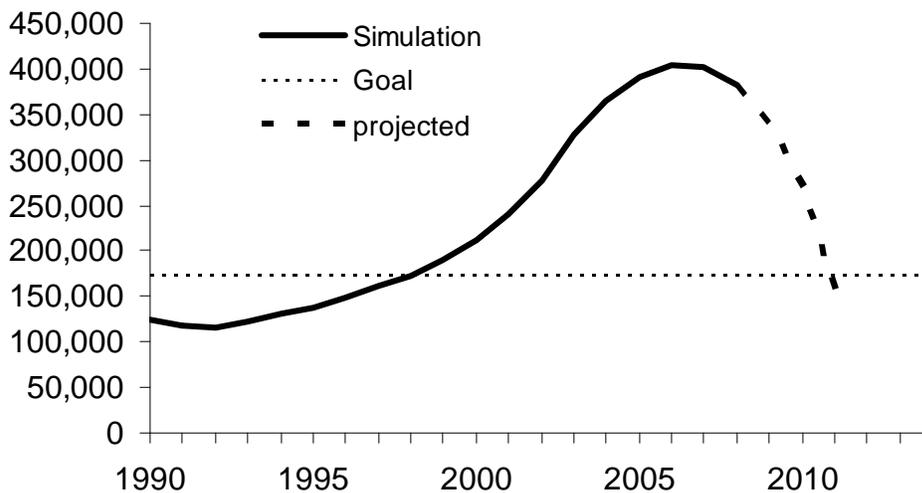
The increased level of doe harvest over the past 3 years should reduce deer numbers to the department's goal. In 2007 over 60% of the deer harvested were antlerless deer. The number of antlerless licenses available in 2008 was increased by 11,050.



Deer Harvest



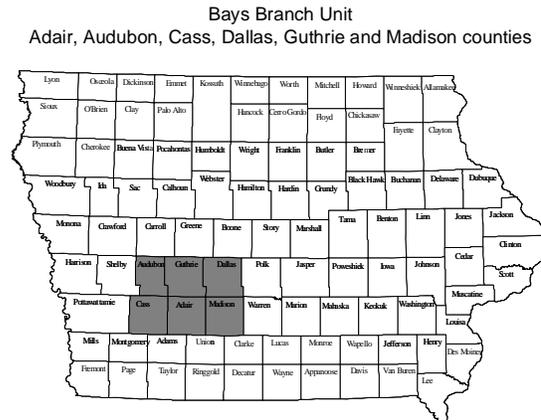
Simulated Deer Numbers



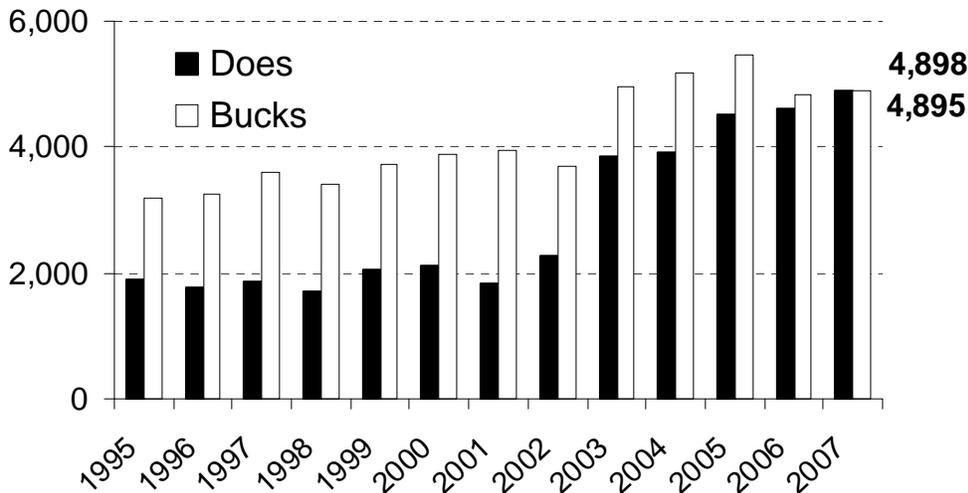
Deer Population Update: Adair, Audubon, Cass, Dallas, Guthrie and Madison counties

The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest over the past 3 years appears to have started to level off the growth of the deer population. The number of doe harvested will need to be increased by 35% to reach the department's goal. In 2007 nearly 60% of the deer harvested were antlerless deer.

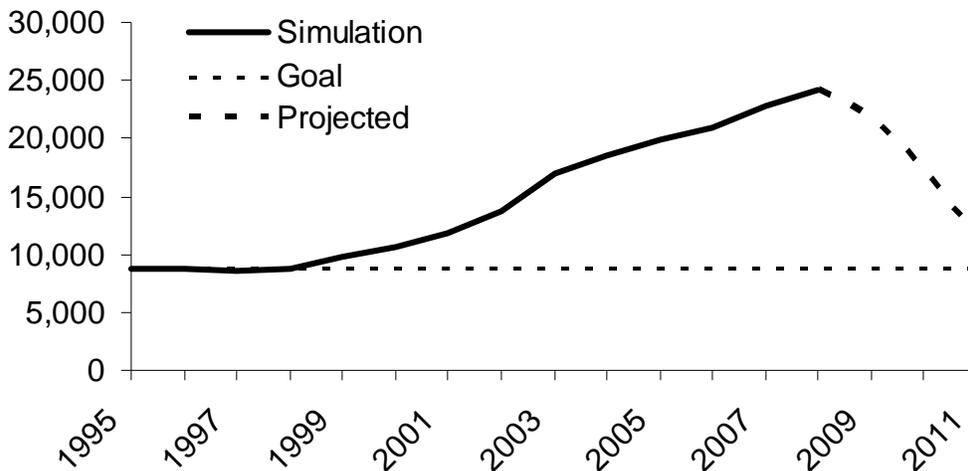


Deer Harvest



Simulated Deer Numbers

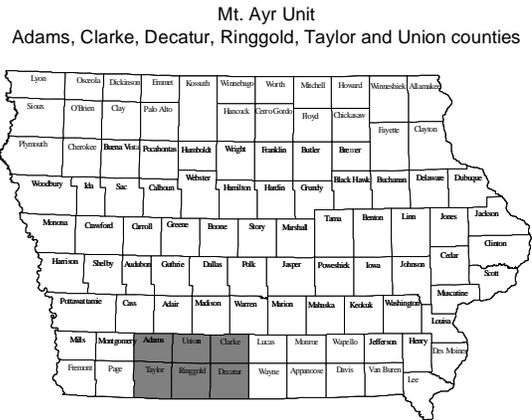
The number of antlerless licenses available was increased by 2,350 in 2008 which is intended to begin to reduce deer numbers to the department's management goal.



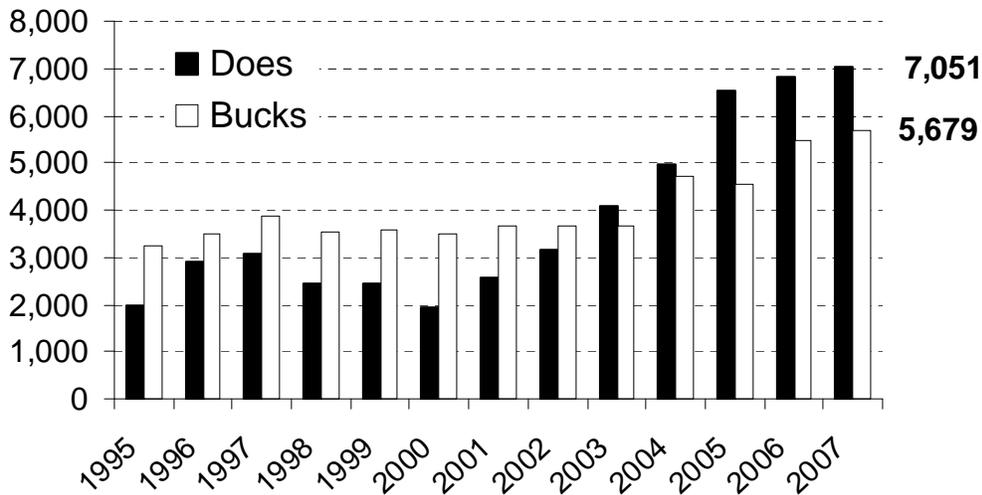
Deer Population Update: Adams, Clarke, Decatur, Ringgold, Taylor and Union counties

The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest over the past 3 years has started to reduce deer numbers to the department's goal. In 2007 over 60% of the deer harvested were antlerless deer.

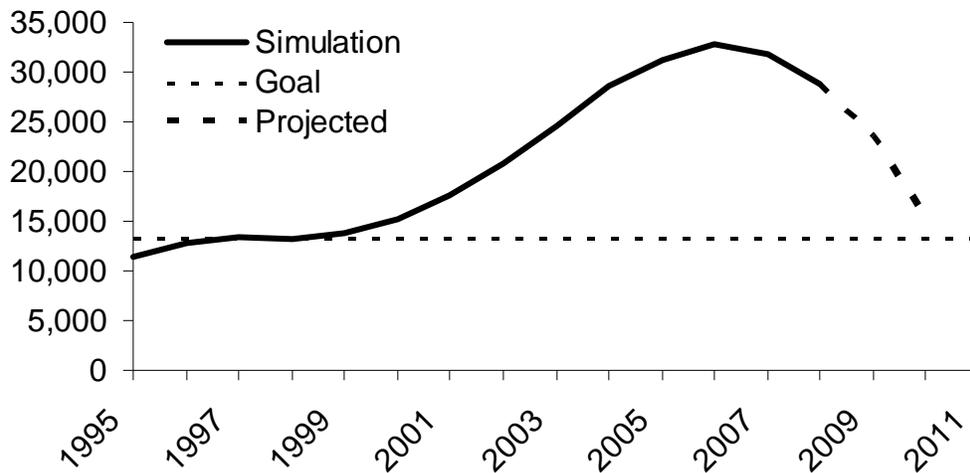


Deer Harvest



Simulated Deer Numbers

The number of antlerless licenses available were increased by 850 in 2008 which is intended to more quickly reduce deer numbers to the department's management goal.



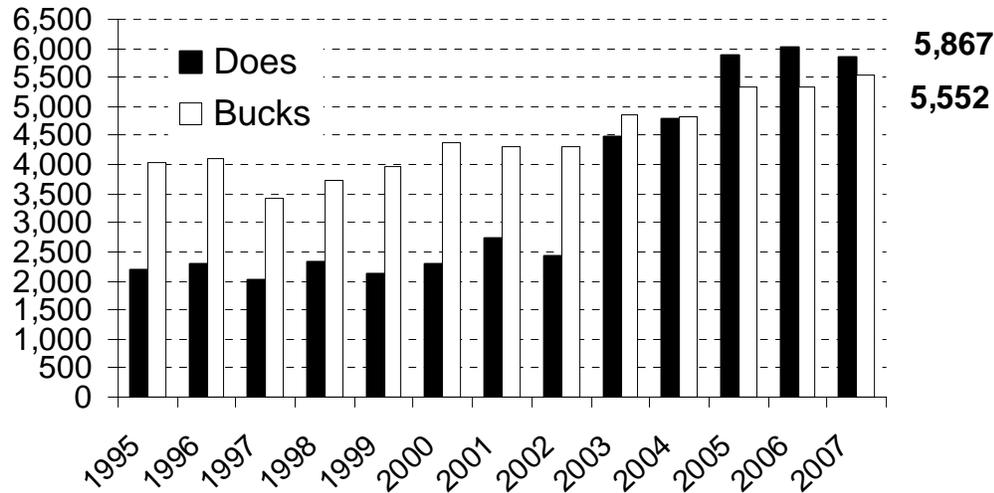
Deer Population Update: Allamakee, Chickasaw, Howard and Winneshiek counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 3 years appears to have started to reduce deer numbers towards the department's goal. In 2007 nearly 60% of the deer taken were antlerless deer.

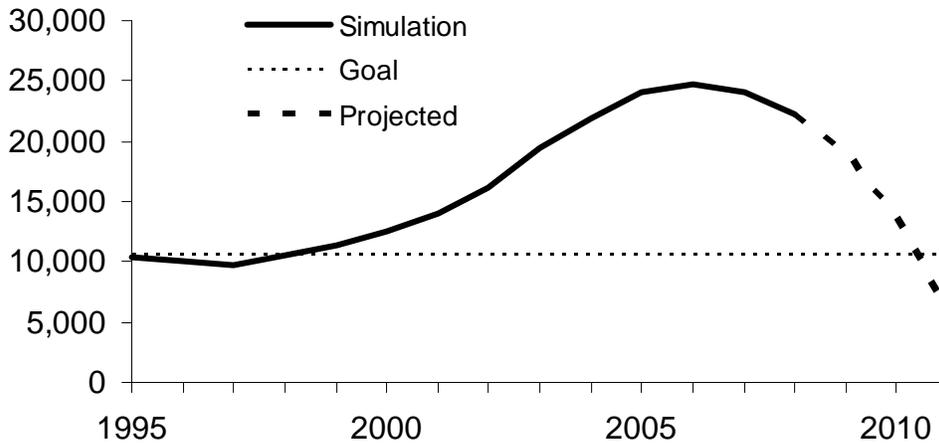


Deer Harvest



Simulated Deer Numbers

The increased harvest is intended to reduce deer numbers to the department's management goal.

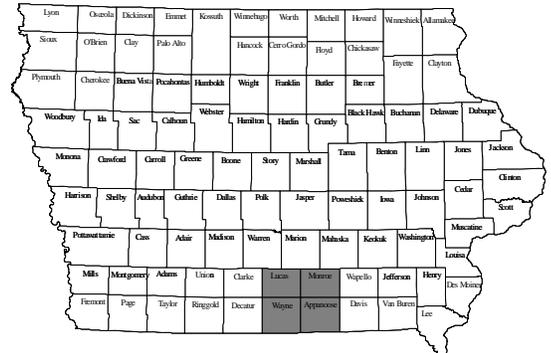


Deer Population Update: Appanoose, Lucas, Monroe and Wayne counties

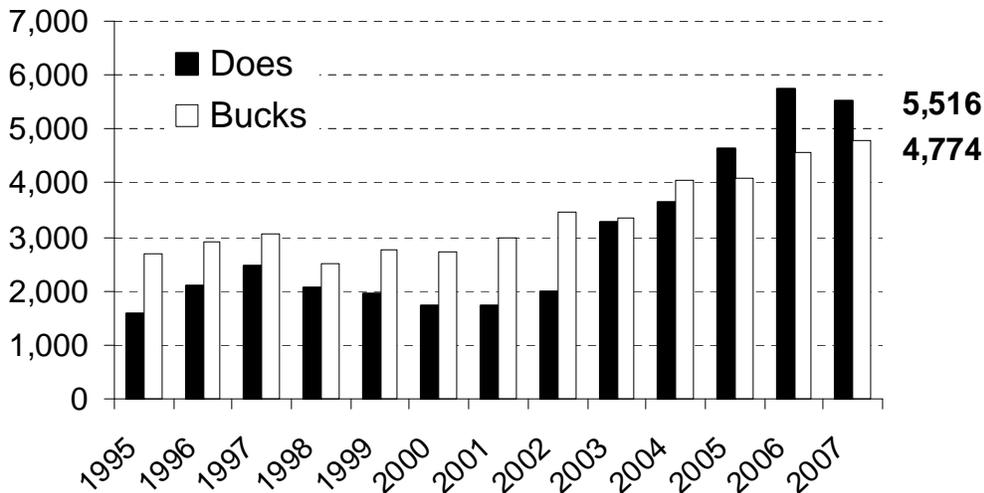
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest over the past 3 years appears to have started reducing deer numbers to the department's goal. In 2007 over 60% of the deer harvested were antlerless deer.

Rathbun Unit
Appanoose, Lucas, Monroe and Wayne counties

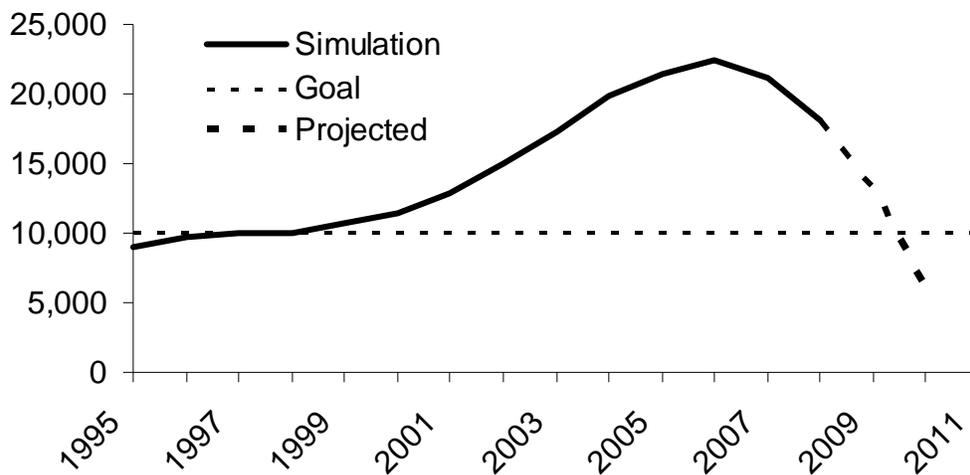


Deer Harvest



Simulated Deer Numbers

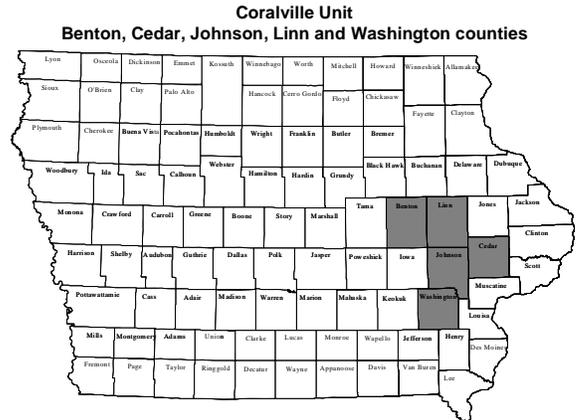
The number of antlerless licenses available was increased by 900 for 2008 which is intended to more quickly reduce deer numbers to the department's management goal.



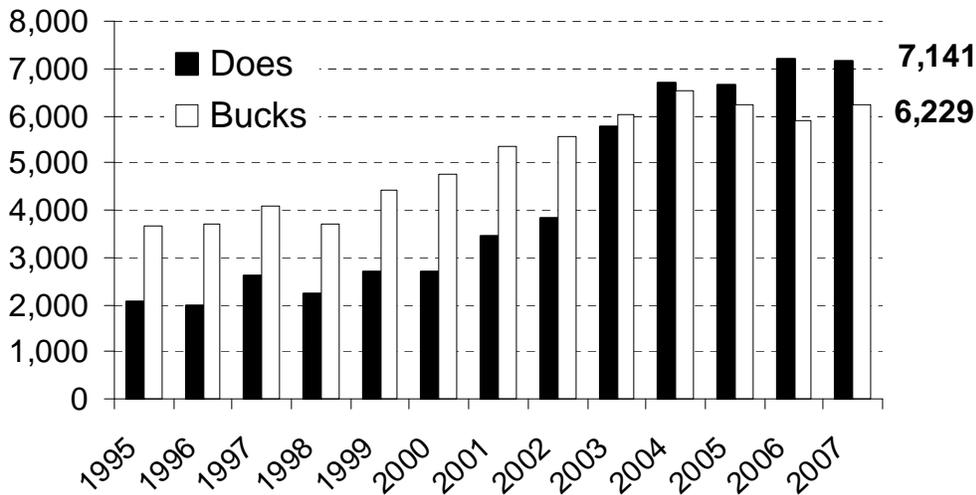
Deer Population Update: Benton, Cedar, Johnson, Linn and Washington counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 3 years appears to have deer numbers headed to the department's goals. In 2007 around 65% of the deer taken were antlerless deer.

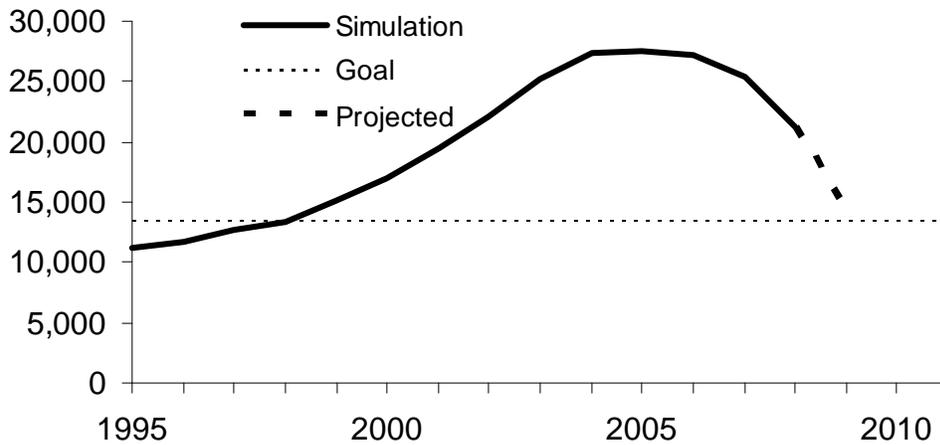


Deer Harvest



Simulated Deer Numbers

There will be 300 additional antlerless licenses available in Cedar county in 2008 which is intended to more quickly reduce deer numbers to the department's goal.

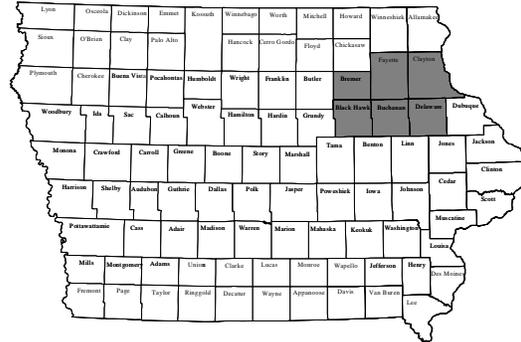


Deer Population Update: Black Hawk, Bremer, Buchanan, Clayton, Delaware and Fayette counties

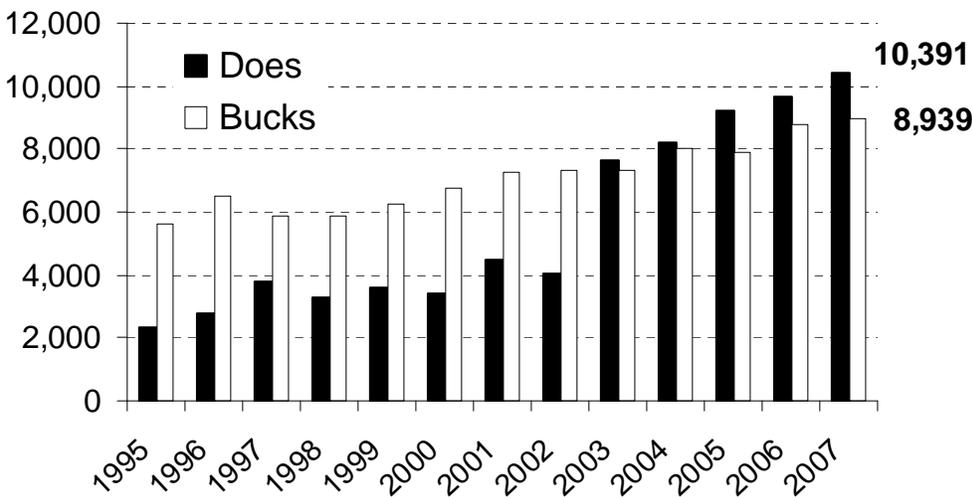
The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 5 years appears to have started reducing deer numbers toward the department's goals. In 2007 nearly 65% of the deer taken were antlerless deer.

Sweet Marsh Unit
Black Hawk, Bremer, Buchanan, Clayton, Delaware and Fayette counties

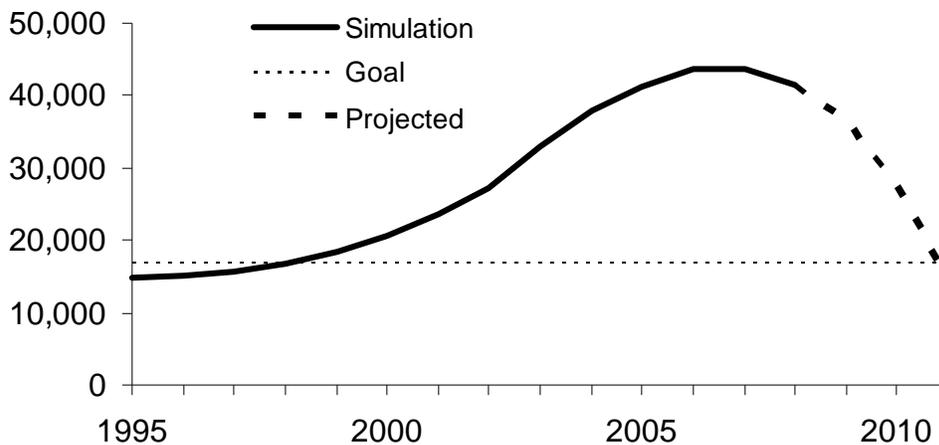


Deer Harvest



Simulated Deer Numbers

There were 1,400 additional antlerless licenses available in 2008 which is intended to more quickly reduce deer numbers to the department's management goal.

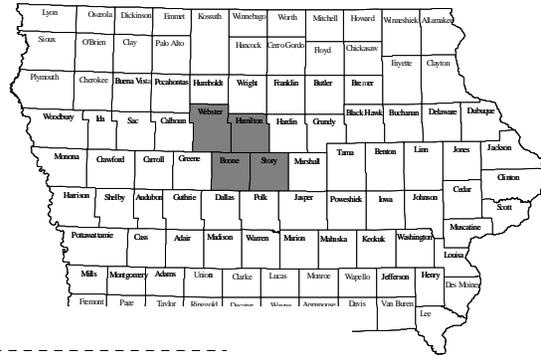


Deer Population Update: Boone, Hamilton, Story and Webster counties

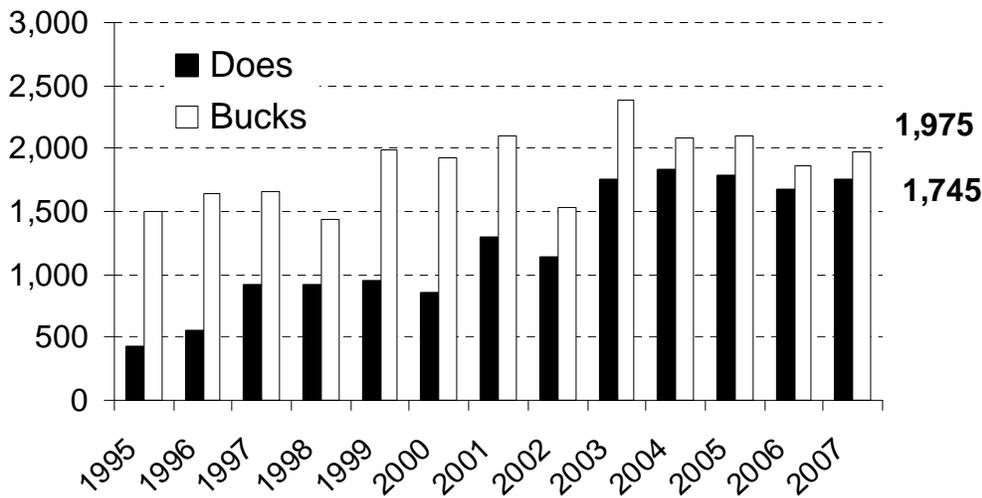
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest over the past 3 to 5 years appears to have leveled off deer numbers. The doe harvest will need to be increased by 10% to reach the department's goal. In 2007 over 50% of the deer harvested were antlerless deer.

Saylorville Unit
Boone, Hamilton, Story and Webster counties

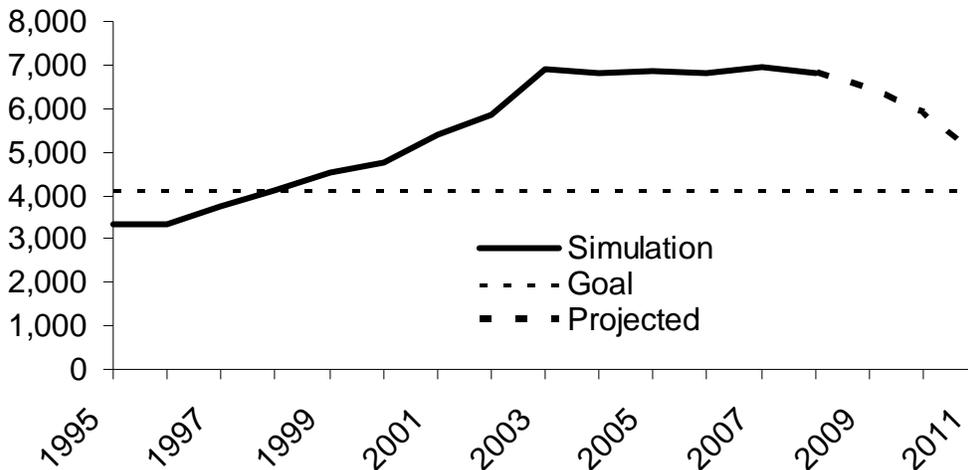


Deer Harvest



Simulated Deer Numbers

The number of antlerless licenses available was increased by 250 in Boone and Story counties in 2008 which is intended to reduce deer numbers to the department's management goal.

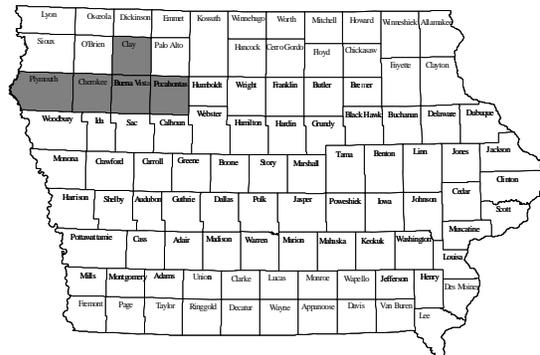


Deer Population Update: Buena Vista, Cherokee, Clay, Plymouth and Pocahontas counties

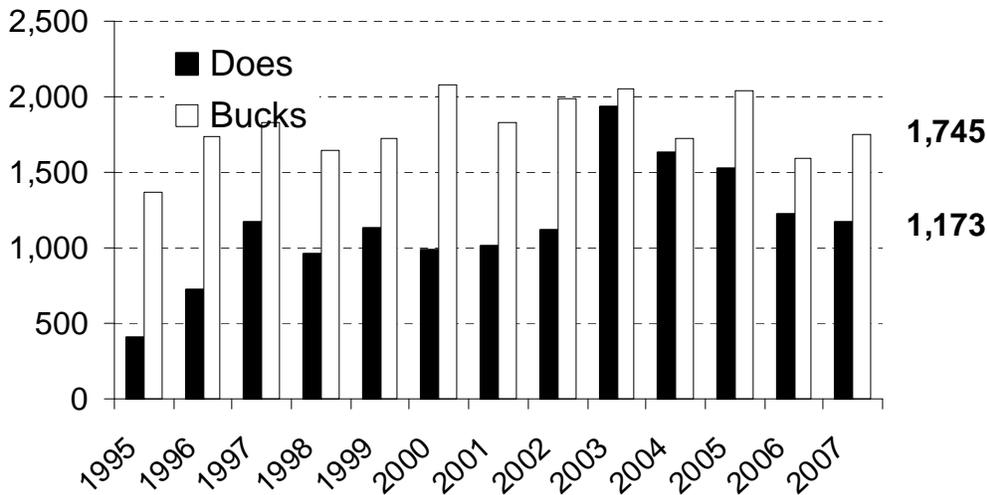
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goal. In 2007 just less than 50% of the deer harvested were antlerless deer.

Ruthven Unit
Buena Vista, Cherokee, Clay, Plymouth and Pocahontas counties

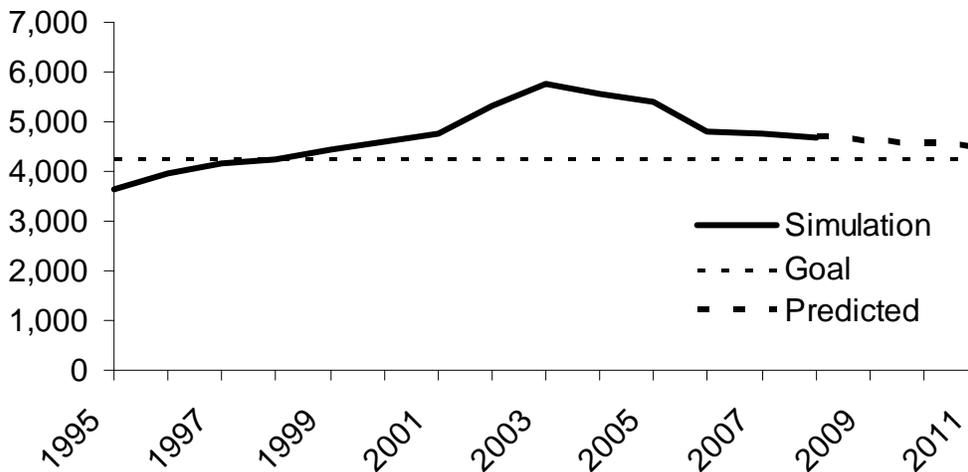


Deer Harvest



Simulated Deer Numbers

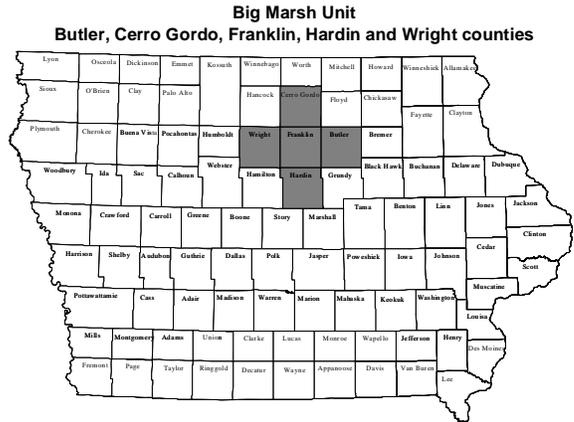
Current levels of harvest should keep the deer numbers close to the department's management goal.



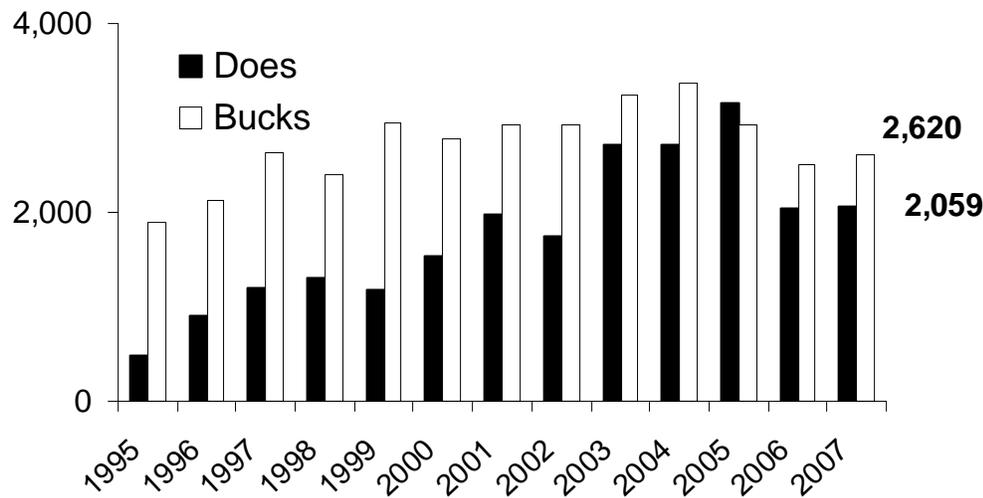
Deer Population Update: Butler, Cerro Gordo, Franklin, Hardin and Wright counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goals. In 2007 just under 50% of the deer taken were antlerless deer.

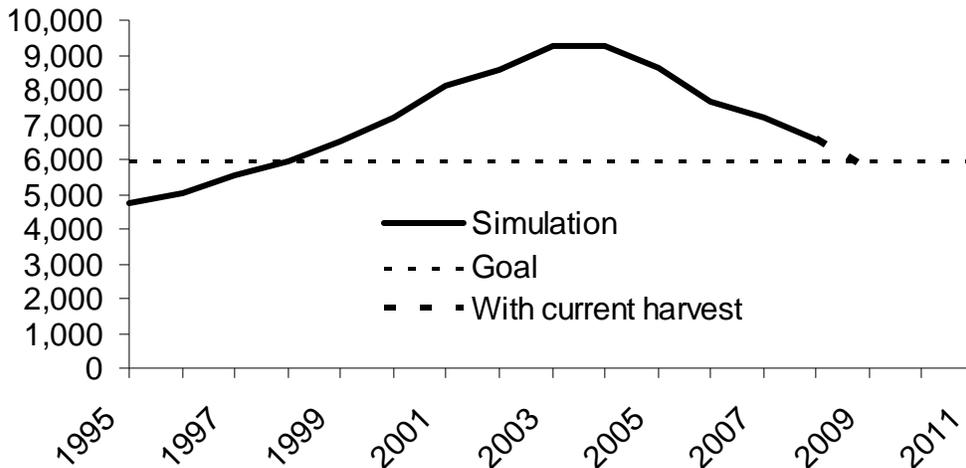


Deer Harvest



Simulated Deer Numbers

The current level of harvest should keep deer numbers near the department's management goal.

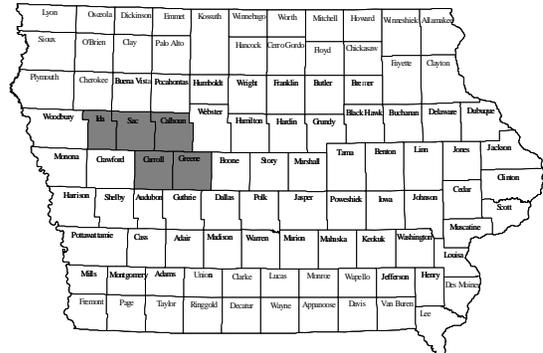


Deer Population Update: Calhoun, Carroll, Greene, Ida and Sac counties

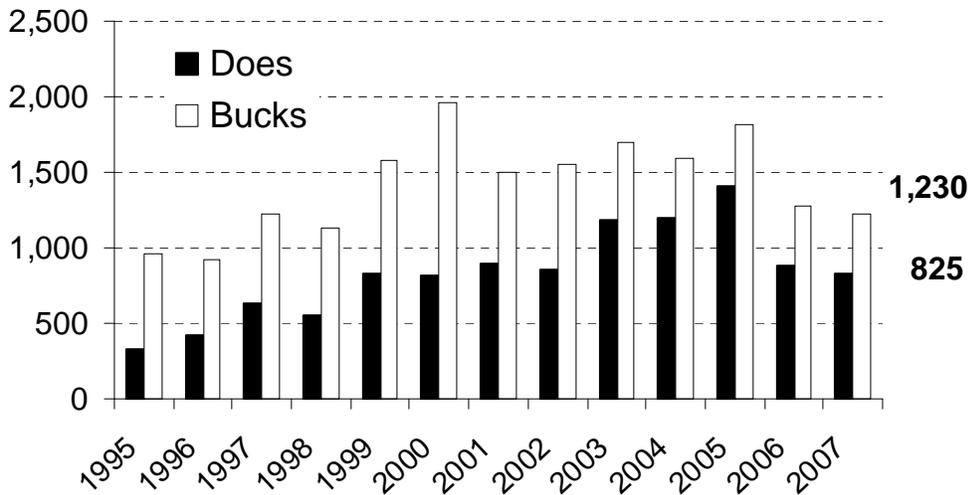
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goal. In 2007 nearly 50% of the deer harvested were antlerless deer.

Black Hawk Unit
Calhoun, Carroll, Greene, Ida and Sac counties

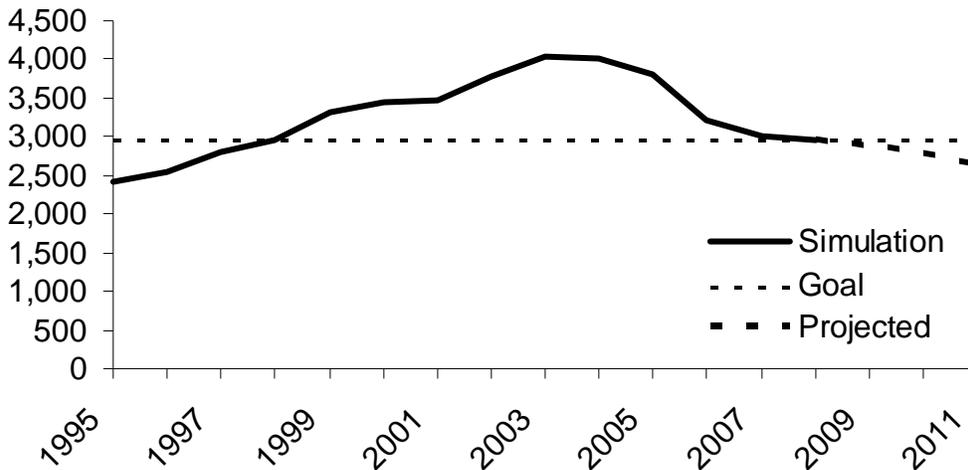


Deer Harvest



Simulated Deer Numbers

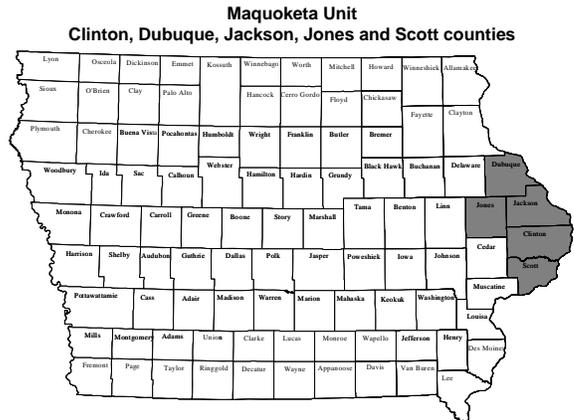
Current levels of harvest should keep deer numbers near the department's management goals.



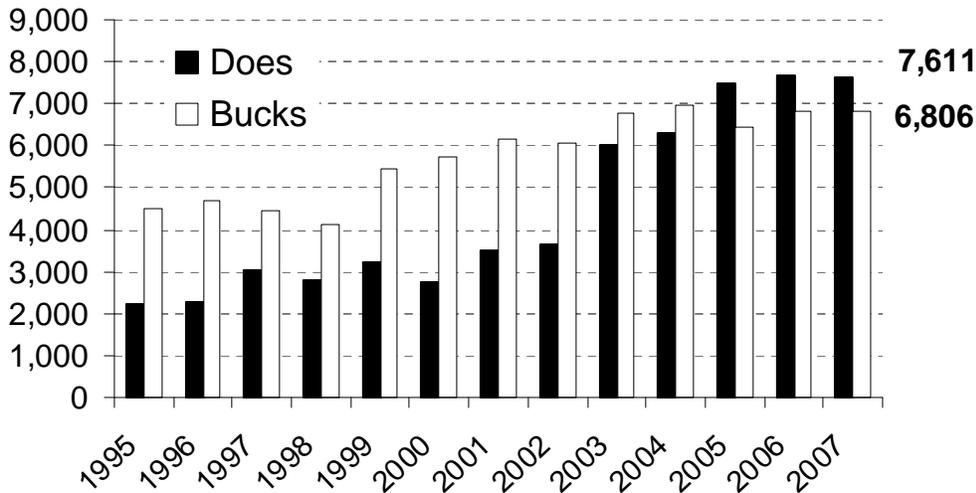
Deer Population Update: Clinton, Dubuque, Jackson, Jones and Scott counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 3 years appears to have started to reduce deer numbers toward the department's goals. In 2007 over 60% of the deer taken were antlerless deer.

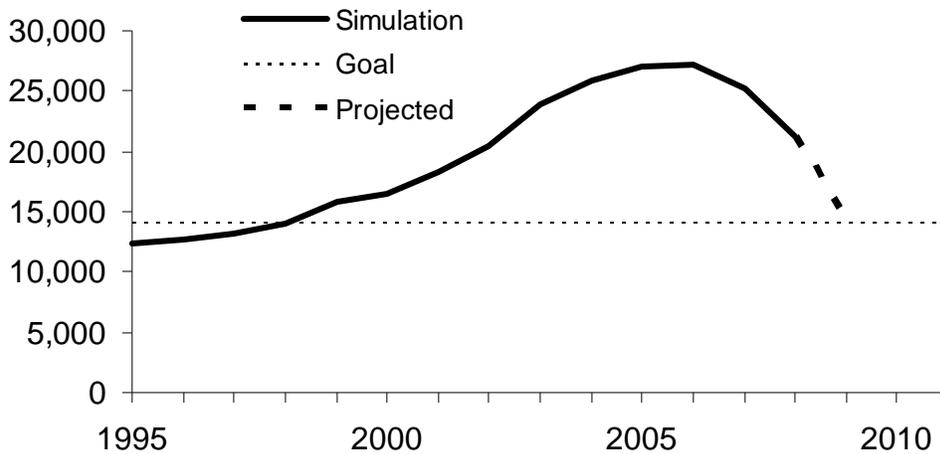


Deer Harvest



Simulated Deer Numbers

Current levels of harvest should reduce deer numbers to near the department's management goals.

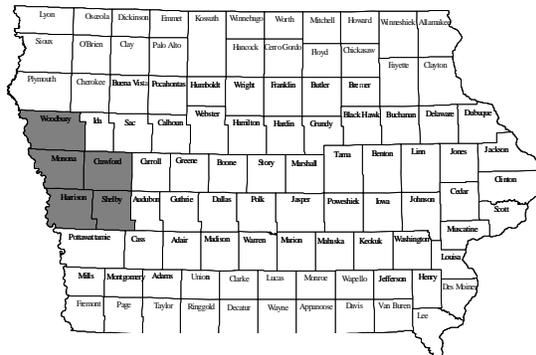


Deer Population Update: Crawford, Harrison, Monona, Shelby and Woodbury counties

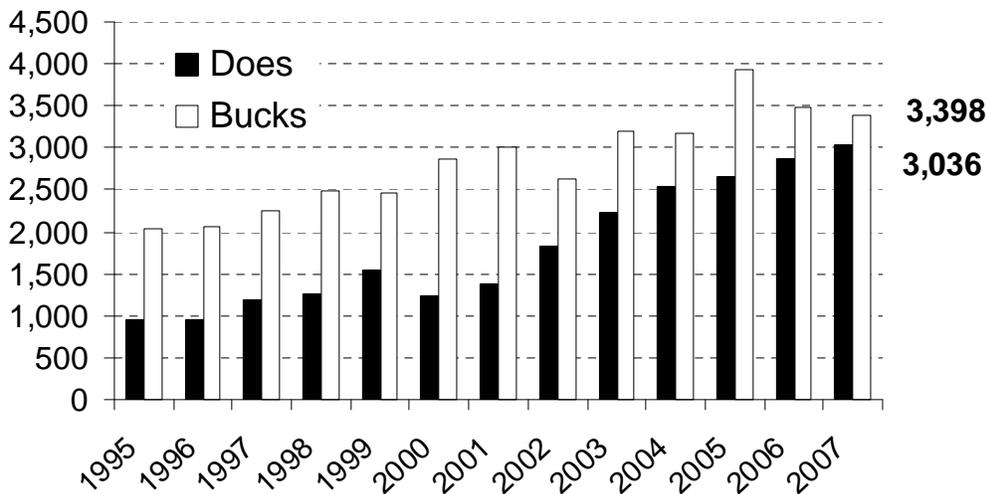
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest last year appears to have started leveling off deer numbers. The number of does harvested will need to be increased by 25% to reduce deer numbers to the department's goal. In 2007 nearly 60% of the deer harvested were antlerless deer.

Missouri River Unit
Crawford, Harrison, Monona, Shelby and Woodbury counties

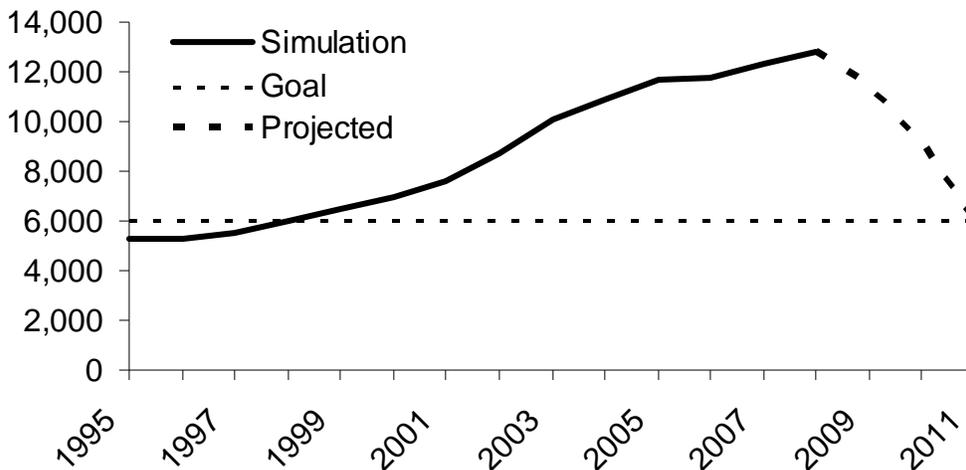


Deer Harvest



Simulated Deer Numbers

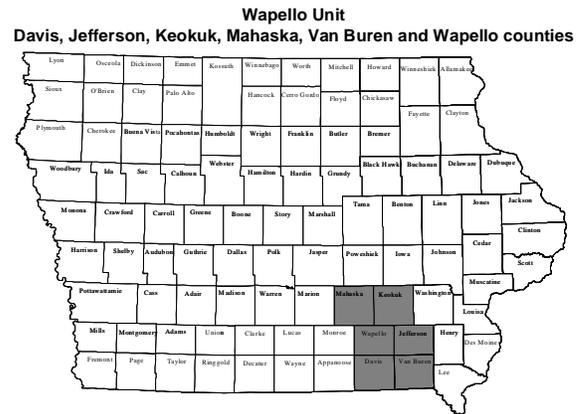
The number of antlerless licenses available was increased by 1,050 in 2008 which is intended to reduce deer numbers toward the department's management goal.



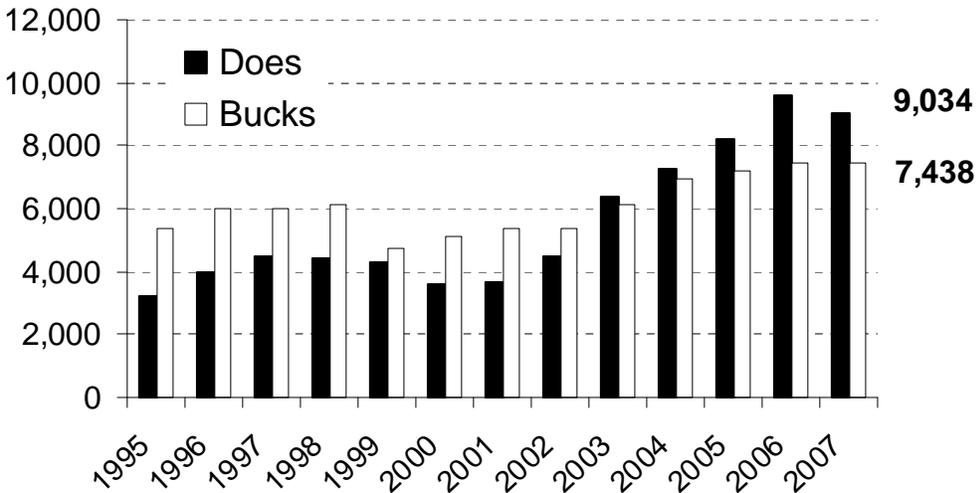
Deer Population Update: Davis, Jefferson, Keokuk, Mahaska, Van Buren and Wapello counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 2 to 3 years appears to have leveled off deer numbers and started reducing them towards the department's goal. In 2007 around 65% of the deer taken were antlerless deer.

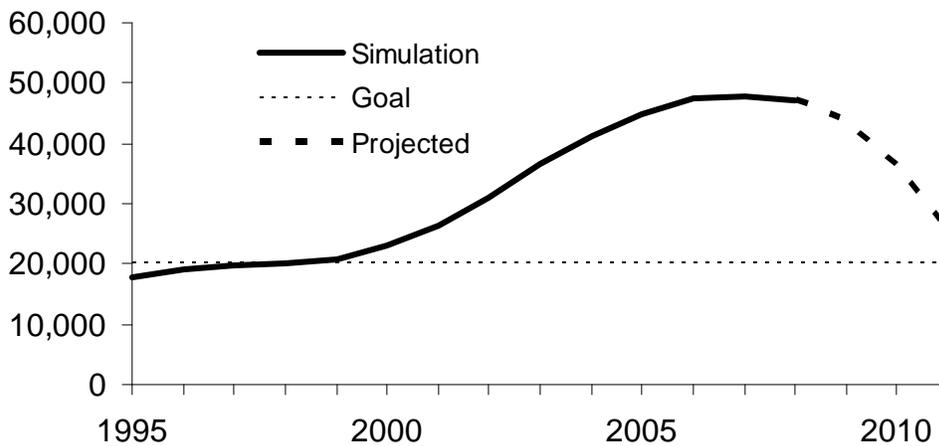


Deer Harvest



Simulated Deer Numbers

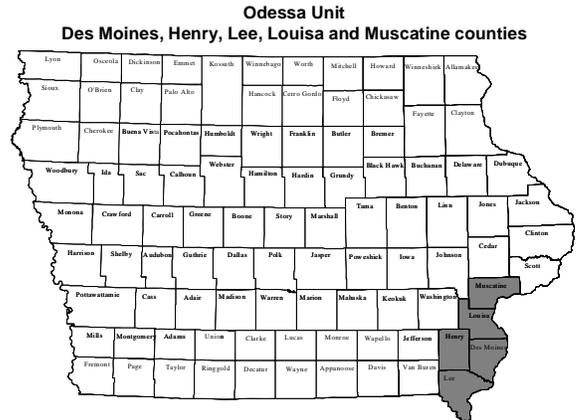
The number of additional antlerless licenses available was increased by 1,450 in 2008 which is intended to more quickly reduce deer numbers towards the department's management goal.



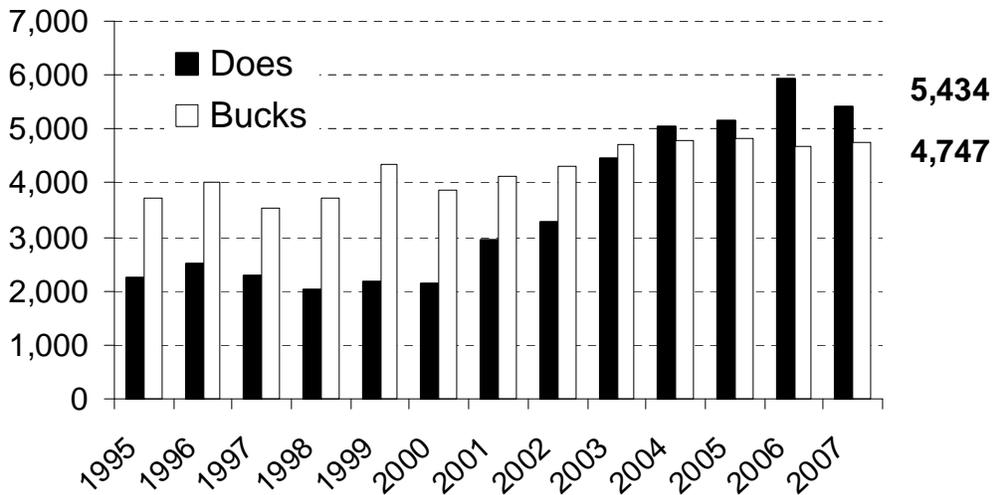
Deer Population Update: Des Moines, Henry, Lee, Louisa and Muscatine counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 3 years appears to have started reducing deer numbers toward the department's goals. In 2007 over 60% of the deer taken were antlerless deer.

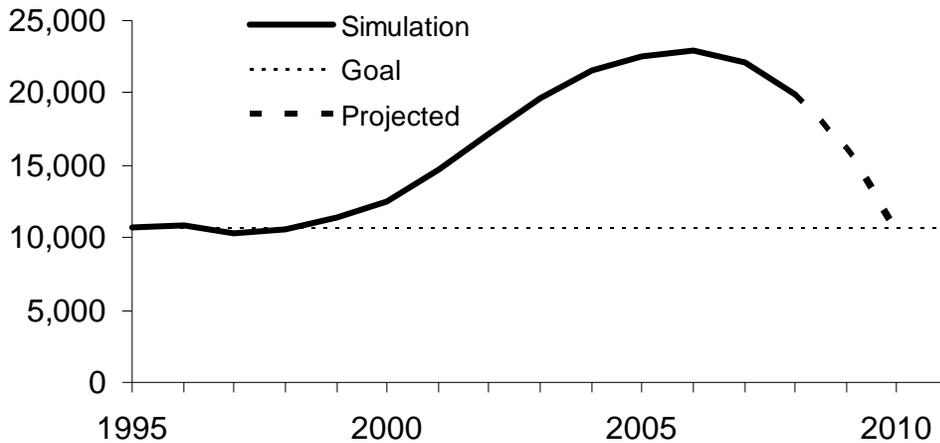


Deer Harvest



Simulated Deer Numbers

Current levels of harvest should reduce deer numbers to the department's management goal.

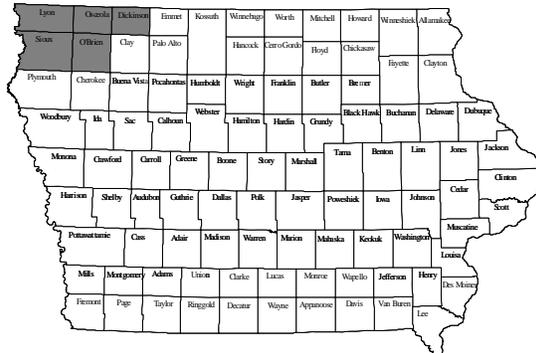


Deer Population Update: Dickinson, Lyon, O'Brien, Osceola and Sioux counties

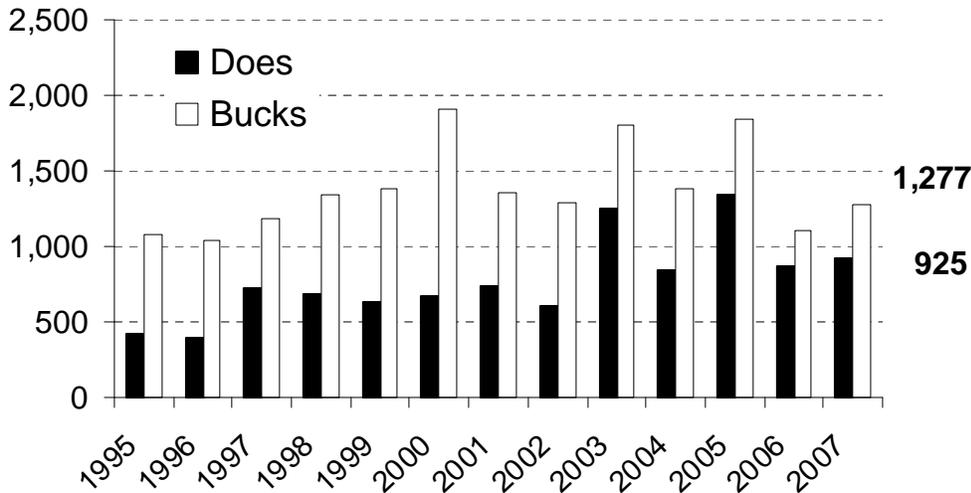
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goal. In 2007 nearly 50% of the deer harvested were antlerless deer.

Big Sioux Unit
Dickinson, Lyon, O'Brien, Osceola and Sioux counties

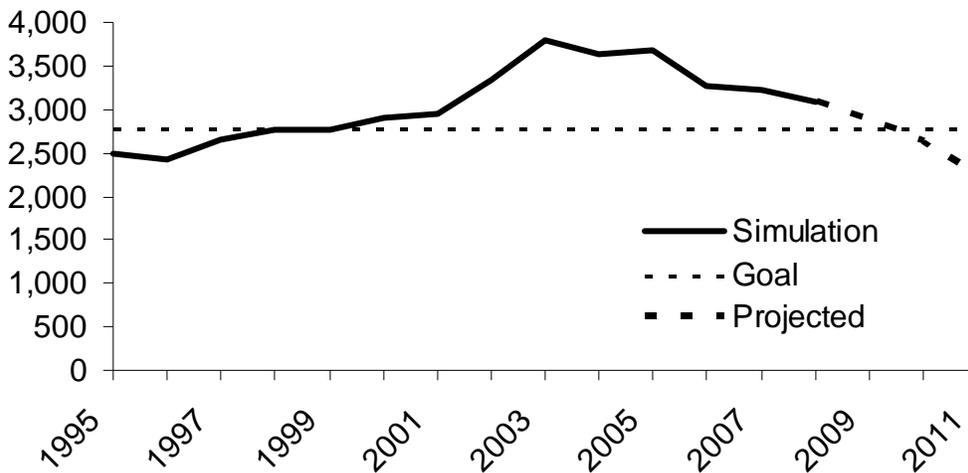


Deer Harvest



Simulated Deer Numbers

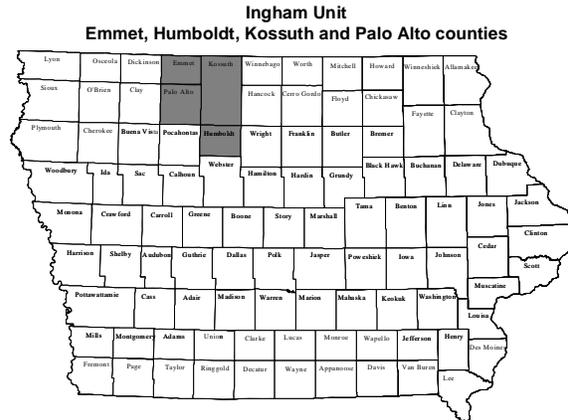
Current levels of harvest should keep deer numbers near the department's management goal.



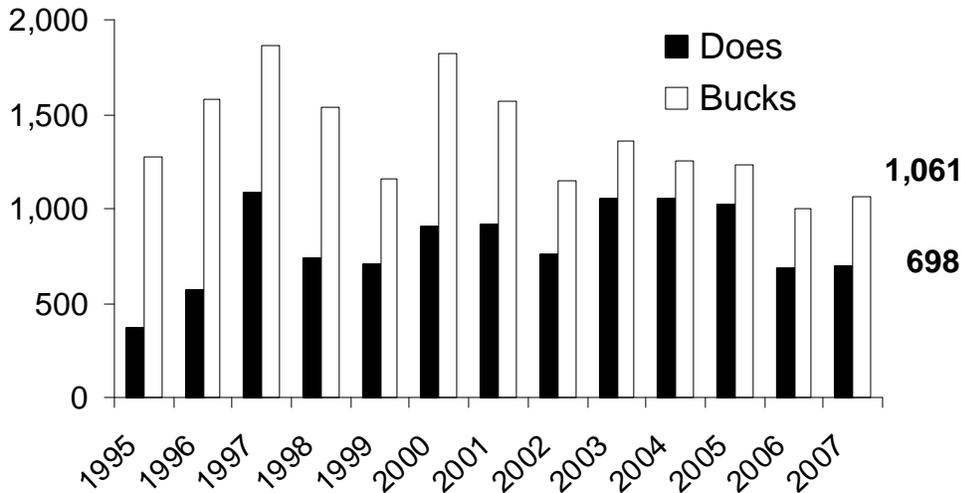
Deer Population Update: Emmet, Humboldt, Kossuth and Palo Alto counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goals. In 2007 just less than 50% of the deer taken were antlerless deer.

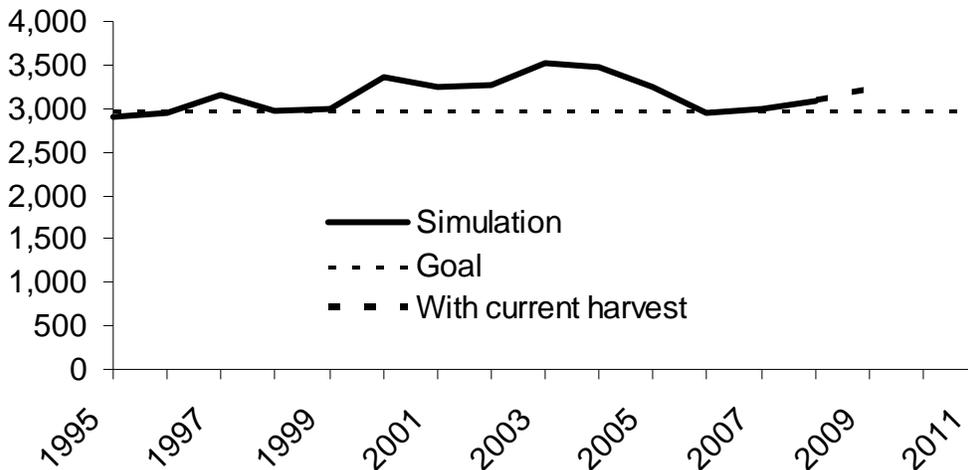


Deer Harvest



Simulated Deer Numbers

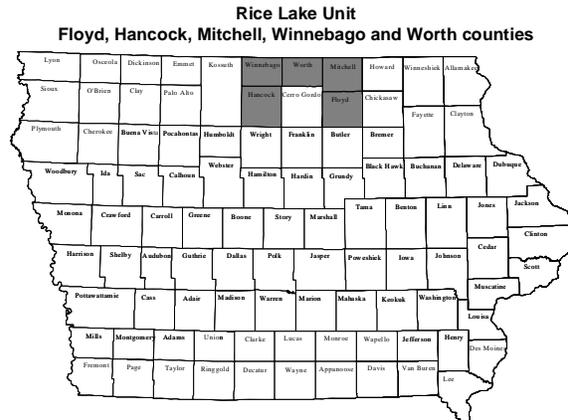
Current levels of harvest should keep deer numbers near the department's management goal.



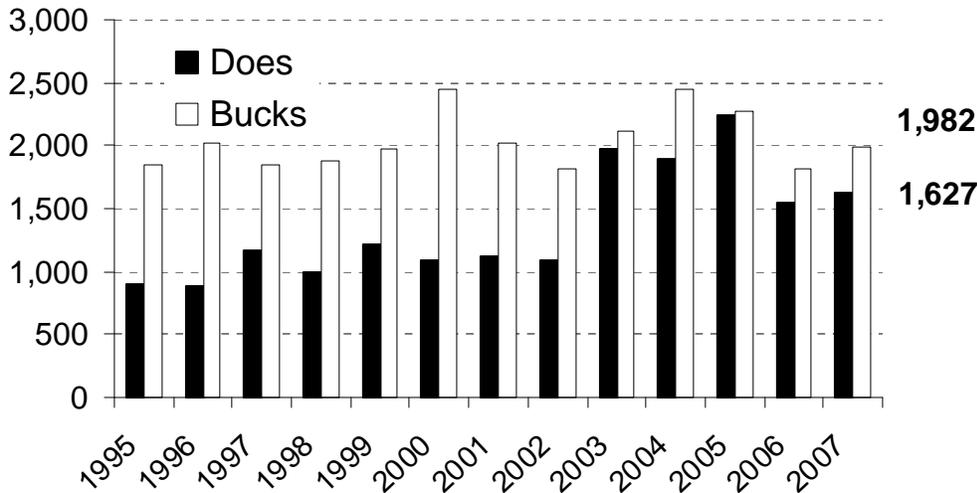
Deer Population Update: Floyd, Hancock, Mitchell, Winnebago and Worth counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest 3 to 5 years ago appears to have reduced deer numbers to near the department's goals. In 2007 just less than 50% of the deer taken were antlerless deer.

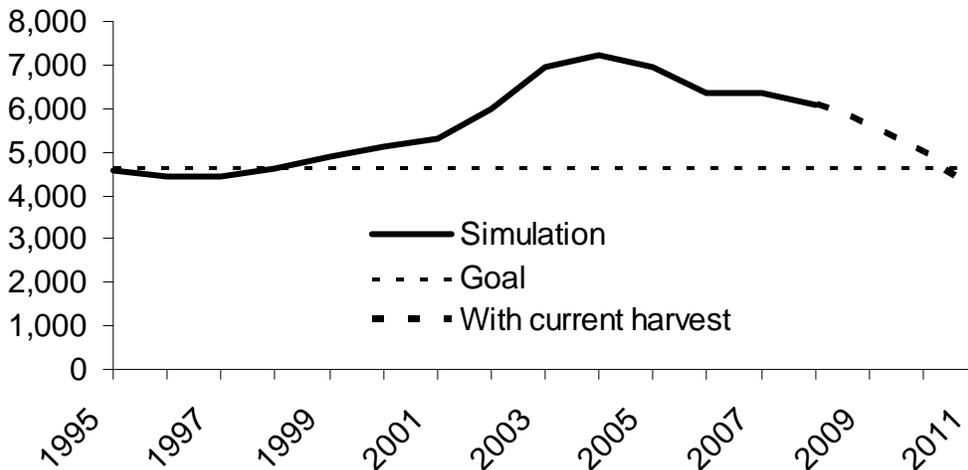


Deer Harvest



Simulated Deer Numbers

Current levels of harvest should reduce deer numbers to near the department's management goal.

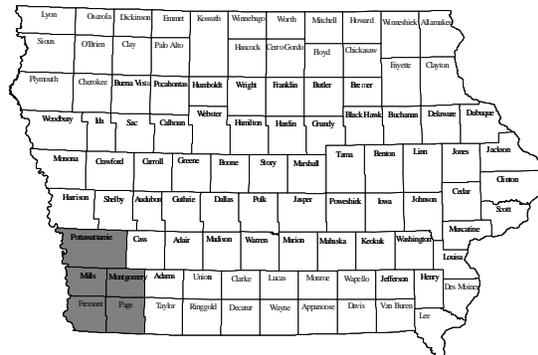


Deer Population Update: Fremont, Mills, Montgomery, Page and Pottawattamie counties

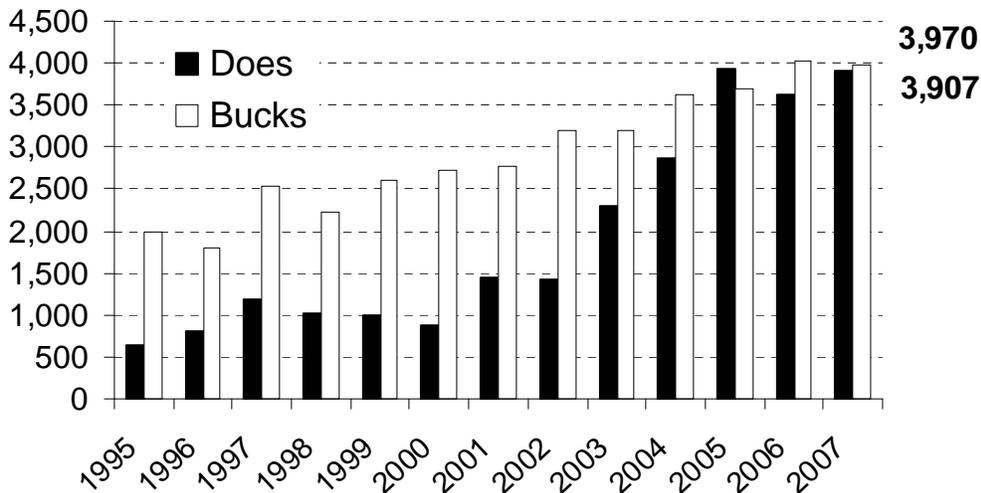
The following graphs show the deer harvest numbers and the predicted population.

The increased doe harvest over the last 3 years ago appears to have leveled off the deer herd. Doe harvest will need to be increased by 15% to reduce deer numbers towards the department's goal. In 2007 nearly 60% of the deer harvested were antlerless deer.

Riverton Unit
Fremont, Mills, Montgomery, Page and Pottawattamie counties

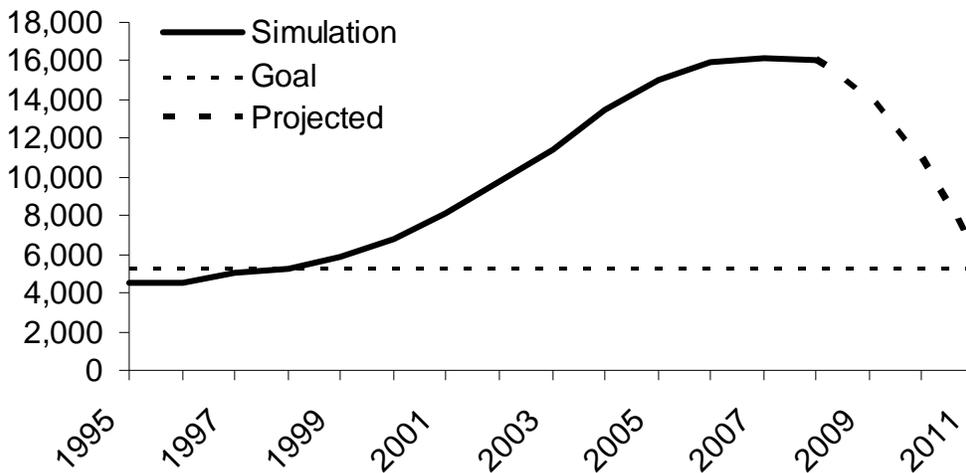


Deer Harvest



Simulated Deer Numbers

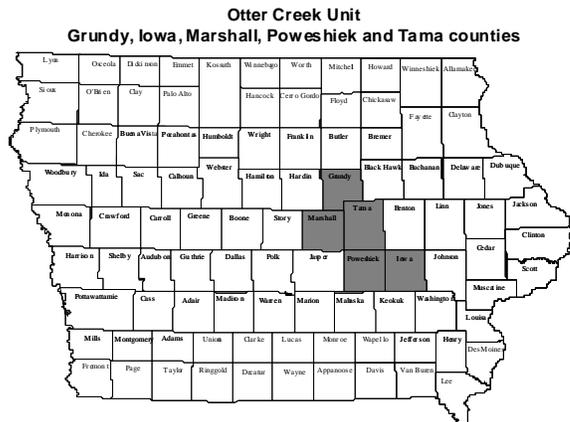
The number of antlerless deer licenses was increased by 1,000 in 2008 which is intended to reduce deer numbers towards the department's management goal.



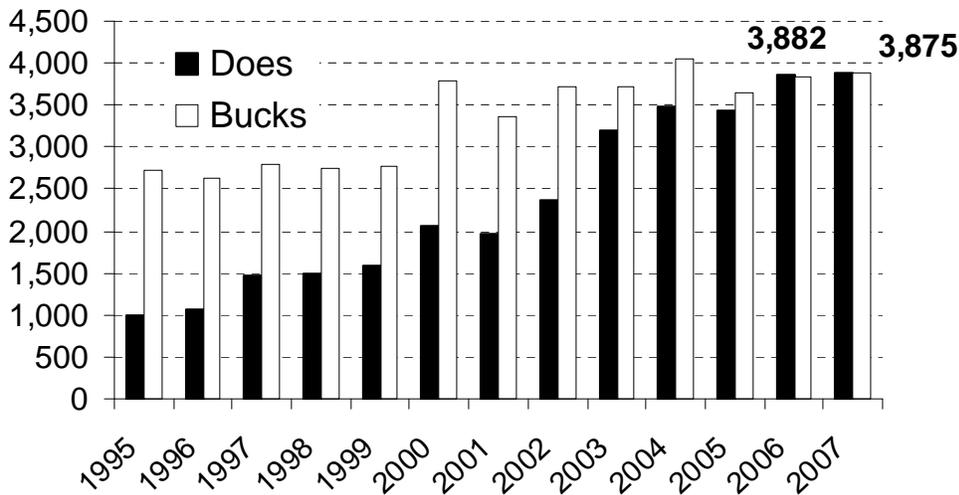
Deer Population Update: Grundy, Iowa, Marshall, Poweshiek and Tama counties

The following graphs show the deer harvest numbers and predicted population.

The increased doe harvest over the past 2 years appears to have reduced deer numbers to near the department's goals. In 2007 around 60% of the deer taken were antlerless deer.



Deer Harvest



Simulated Deer Numbers

The number of antlerless deer licenses available was increased by 150 in Marshall county in 2008 which is intended to keep deer numbers near the department's management goal.

