



## FACTORS AFFECTING THE SALE OF ANTLERLESS DEER HUNTING LICENSES IN THE NORTHEAST LOWER PENINSULA

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### ABSTRACT

*Deer hunters that had purchased an antlerless deer hunting license in 1998 but not in 2001 for Northeast Lower Peninsula (NELP) were contacted to determine why they had not purchased a license. These former license buyers were also asked whether they would have been more likely to purchase an antlerless license in 2001 if baiting had been allowed. The primary reasons that people did not purchase an antlerless deer hunting license in 2001 were because the person hunted elsewhere (28%) and deer numbers were too low in the NELP to provide an enjoyable hunt (26%). Other common reasons for not purchasing an antlerless license included: bait could not be used (20%) and the person lacked time to hunt (17%). About (31%) of the former license buyers indicated they would have been more likely to purchase a license in 2001 if baiting had been allowed.*

### INTRODUCTION

In 1995, bovine tuberculosis (TB) was confirmed in free-ranging deer (*Odocoileus virginianus*) in the Northeast Lower Peninsula (NELP) of Michigan. Since then, deer management in the NELP has attempted to eradicate bovine TB in deer (Table 1). Since 1998, the focus of the bovine TB eradication efforts has been primarily in a 5-county area in the NELP (Alpena, Montmorency, Oscoda, Alcona and Presque Isle counties, Figure 1).

In 1998, supplemental feeding was banned in the NELP because it had been implicated in congregating wild deer and therefore contributing to the spread of bovine TB. Also beginning in 1998, deer hunters in the NELP could not use more than five gallons of bait per day to hunt deer. In 1999, baiting was banned entirely in the NELP. In 2001, however, limited baiting was reinstated experimentally in a portion of the NELP.



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Hunters were limited to 1 gallon of bait per day from October 1-November 30, 2001, in portions of Alcona, Alpena, Montmorency, and Oscoda counties (i.e., core area designated as Deer Management Unit [DMU] 452, Figure 1). Outside the core area in the NELP, baiting was still banned in 2001.

Additional hunting seasons were also established in the NELP to reduce deer numbers so the deer could be supported by the natural environment without supplemental feeding and to eliminate bovine TB. In 1998, deer hunters in the NELP could harvest deer during expanded hunting seasons (i.e., early and late antlerless seasons). An unlimited number of antlerless deer hunting licenses were also made available beginning in 1998 to encourage hunters to harvest additional deer. In 2001, however, the number of antlerless licenses available was limited in portions of the NELP (i.e., only 81,000 antlerless licenses were available for use on public lands in Montmorency, Oscoda, and Presque Isle counties).

The expanded hunting opportunities initially increased the number of deer hunters and deer harvest in the NELP (Figures 2 and 3). Since 1998, however, the number of people buying antlerless licenses and the number of deer harvested has steadily declined. It was unknown why people had stopped purchasing antlerless licenses. Thus, determining why people had stopped buying antlerless licenses was the primary reason for this survey. A secondary objective was to determine whether hunters would have been more likely to purchase an antlerless license in 2001 if baiting had not been restricted.

## **METHODS**

Following the 2001 deer hunting season, a questionnaire was sent to 5,991 randomly selected people that had purchased an antlerless deer hunting license in 1998 but not in 2001 (i.e., former license buyers). People receiving the questionnaire were asked to confirm that they did not purchase an antlerless deer hunting license in 2001 and report the reasons why they had not purchased an antlerless license. People receiving the questionnaire indicated which of 15 reasons listed on the questionnaire were the most important; respondents also had the option to provide additional reasons (Appendix A). In addition, people were asked to report whether they hunted deer on public or private lands. Finally, people were asked whether they would have been more likely to purchase an antlerless license if they could have used bait to hunt deer.

The importance of each reason was measured by determining the proportion of respondents that indicated that the reason was very important. Answers from the respondents were extrapolated to all former license buyers in the NELP using a stratified random sampling design that included two strata (Cochran 1977). Hunters were stratified based on how frequently they had purchased an antlerless deer hunting license since 1998. The first group (stratum) consisted of former license buyers that had never purchased another antlerless license since 1998. The second group of hunters included former license buyers that had purchased an antlerless license in at least one other year since 1998 (Table 2). A 95% confidence limit (CL) was calculated for each estimate. This confidence limit can be added and subtracted from the estimate

to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies that the true value would be within this interval 95 times out of 100. Estimates were not adjusted for possible nonresponse or response biases.

Questionnaires were mailed initially during early February 2002, and a reminder note and three follow-up questionnaires were mailed to nonrespondents. Although 5,991 people were sent the questionnaire, 358 surveys were undeliverable resulting in an adjusted sample size of 5,633. Questionnaires were returned by 3,674 people, yielding a 65% adjusted response rate.

## RESULTS

The average age of the former antlerless license buyers (age on October 1, 1998) was 39 years, and 91% of these people were men. About  $95 \pm 1\%$  of the former license buyers ( $62,173 \pm 451$ ) verified that they had not purchased an antlerless license in 2001. About  $39 \pm 2\%$  of these people hunted on public lands only,  $31 \pm 2\%$  hunted on private lands only, and  $30 \pm 2\%$  hunted on both public and private lands (Figure 4).

The primary reasons that these people did not purchase an antlerless deer hunting license in 2001 were either because they hunted outside the 5-county area (28%) or they felt that the deer population was too low for an enjoyable hunt (26%) (Table 3, Figure 5). Periodic license buyers were more likely to have stopped buying a license because the deer population was too low than the people that had not purchased an antlerless license since 1998 (Figure 6). Moreover, periodic license buyers were less likely to report they had stopped buying an antlerless license because they currently hunted antlerless deer outside the 5-county area than hunters that had not purchased an antlerless license since 1998.

Former license buyers also frequently reported that they did not purchase an antlerless license in 2001 because they could not use bait to hunt (20%) (Table 3, Figure 5). This reason was cited more frequently among hunters that had purchased an antlerless license periodically in the 5-county area than among hunters that only purchased a license in 1998 (Figure 6).

Nearly 17% of the former license buyers did not purchase an antlerless deer hunting license because they lacked the time to hunt. About 11% of the hunters decided not to buy a license because they only wanted to harvest a buck.

Additionally, 11 of the reasons reported for not purchasing a license were cited by  $\leq 10\%$  of the former license buyers. An unanticipated event prevented nearly 10% of the former license holders from buying an antlerless license. About 9% of the former license buyers reported that too many hunters in their hunting area caused them to stop buying an antlerless license. Nearly 9% of the former license buyers did not buy another license because they had been unsuccessful in taking a deer during previous years.

About 7% of the hunters did not purchase an antlerless license because they forgot to apply for a license, and 7% of the former license buyers stopped buying licenses because they were concerned about the risk of bovine TB. Nearly an equal percentage of hunters stopped buying a license because they were unsuccessful in the drawing for a license on public lands, and could not obtain permission to hunt in the 5-county area (6%), or because they were not interested in harvesting another deer (6%). About 5% of the hunters did not purchase a license because they were unfamiliar with a location where they could hunt deer, while 4% of the hunters did not buy a license because they had moved their residence. Relatively few hunters (3%) indicated that they did not buy a license because it cost too much to hunt deer (Table 3, Figure 5).

Hunters were asked whether they would have been more likely to purchase an antlerless license in 2001 in the NELP if they could have used bait. About  $31 \pm 2\%$  of hunters indicated that they would be more likely to purchase this license if they could have used bait.

## DISCUSSION

Most of the former license buyers were men (94%), and their average age was 43 years (Frawley 2001). The average age of former license buyers was not different than the average age of people that had purchased an antlerless license in 2001; however, a higher percentage of the former license buyers were females (6 versus 4%). The lower hunter retention rate among females was consistent with statewide participation trends (Frawley 2001). Former license buyers were more likely to hunt on public lands than people currently hunting deer in the NELP. Only 20% of the people hunting deer in the NELP during 2001 hunted primarily on public lands (Frawley 2002); whereas, 39% of the former license buyers hunted only on public lands.

The most common reasons that former license buyers stopped buying licenses were because these people hunted outside the 5-county area in 2001 or because they felt that the deer numbers in the NELP were too low to provide an enjoyable hunt.

The baiting ban was also frequently reported as a very important reason why former license buyers stopped buying antlerless licenses. After bait was banned throughout the NELP in 1999, most deer hunters in the NELP disapproved and reported that they wanted to use bait. Only 30% of the hunters in the NELP wanted to continue the baiting ban (Frawley 2000). However, 38% of the hunters wanted to confine baiting to portions of the hunting seasons, and 20% of the people hunting in the NELP did not want any baiting restrictions.

As deer numbers have declined, fewer hunters have purchased antlerless licenses, and more hunters have chosen to hunt outside the NELP. Moreover, most people that continued to hunt in the NELP want to maximize their hunting effort in the face of the declining deer population by using bait. Thus, the behavior of Michigan deer hunters appeared to be predictable because it was motivated largely by short-term goals (i.e., maximize hunter success). Unfortunately for the hunters, lowering the deer numbers in

the NELP has been an objective for eradicating bovine TB in the NELP and is unlikely to be reversed soon.

## ACKNOWLEDGEMENTS

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Table 1. Deer management activities in Northeast Lower Peninsula (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties) during 1997-2001.

Year	Area <sup>a</sup>	Feeding and baiting restrictions	Early firearm season dates	Late firearm season dates	Antlerless deer license quota	Acres required for private lands antlerless license	Cost of antlerless license	Antlerless deer licenses sold	People buying an antlerless deer license <sup>b</sup>
1997	Core area <sup>c</sup>	None	None	None	7,000	40	\$3.50	6,272	5,588
1997	5-county area, minus core area <sup>c</sup>	None	None	None	16,756	40	\$3.50	15,040	14,368
1997	5-county area, including core area <sup>c</sup>	None	None	None	23,756	40	\$3.50	21,312	19,849
1998	5-county area	Feeding banned; baiting: 5 gallons/day	Oct. 17-26; private lands only	Dec. 11-Jan. 3; public and private lands	Unlimited	40	\$3.50	120,919	87,393
1999	5-county area	Feeding and baiting banned	Oct. 16-25; private lands only	Dec. 18-Jan. 2; public and private lands	Unlimited	40	\$3.50	86,214	62,359
2000	5-county area	Feeding and baiting banned	Oct. 14-23; private lands only	Dec. 16-Jan. 1; public and private lands	Unlimited	40	\$3.00	69,946	52,138

Table 1 (Continued). Deer management activities in Northeast Lower Peninsula (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties) during 1997-2001.

Year	Area <sup>a</sup>	Feeding and baiting restrictions	Early firearm season dates	Late firearm season dates	Antlerless deer license quota	Acres required for private lands antlerless license	Cost of antlerless license	Antlerless deer licenses sold	People buying an antlerless deer license <sup>b</sup>
2001	Core area	Feeding banned; baiting: 1 gallon/day (Oct. 1-Nov. 30)	Oct. 13-22; private lands only	Dec. 17-Jan. 1; private lands only	Unlimited	40	\$3.50	17,244	13,210
2001	5-county area, minus core area	Feeding banned; baiting banned outside core area; 1 gallon/day in core	Oct. 13-22; private lands only	Dec. 17-Jan. 1; private lands only	Unlimited private lands; restricted public land <sup>d</sup>	5	\$3.50	33,299	23,467
2001	5-county area, including core area only	Feeding banned; baiting banned outside core area; 1 gallon/day in core	Oct. 13-22; private lands only	Dec. 17-Jan. 1; private lands only	Unlimited private lands; restricted public land <sup>d</sup>	5	\$3.50	50,543	35,187

<sup>a</sup>Core area included portions of Alcona, Alpena, Montmorency, and Oscoda counties; however, the core areas differed slightly between 1997 and 2001. The 5-county area included Alcona, Alpena, Montmorency, Oscoda, and Presque Isle counties (Figure 1).

<sup>b</sup>A person was counted only once, regardless of how many licenses they purchased.

<sup>c</sup>In 1997, the core area included DMU 452, and the area outside the core area included DMUs 36, 37, 45, 46, 47, 48, 49, 50, 51, 53, 68, 70, 71, and 72.

<sup>d</sup>An unlimited number of antlerless deer hunting licenses were available for use on private lands. An unlimited number of antlerless licenses valid on public lands were available in Alcona and Alpena counties, but only 81,000 antlerless licenses for use on public lands were available in Montmorency, Oscoda, and Presque Isle counties.

Table 2. The number of people that purchased an antlerless deer hunting license in 1998 for the NELP (Alpena, Montmorency, Oscoda, Alcona, or Presque Isle counties), summarized by whether they purchased another license in subsequent years.

Group (Stratum)	Total number of people in group	Number of people included in sample	Number of questionnaires that were undeliverable	Number of questionnaires returned	Response rate (%)
Hunters that never purchased another license since 1998	38,961	2,866	226	1,596	60%
Hunters that sporadically purchased a license since 1998 but did not purchase a license in 2001	26,809	3,125	132	2,078	69%
Hunters that purchased a license in both 1998 and 2001	21,623	0	NA	NA	NA
Total	87,393	5,991	358	3,674	65%

Table 3. Reasons that former antlerless deer hunting license buyers did not purchase an antlerless license in 2001.

Reason	Former antlerless license buyers (%)					
	Non-license buyers since 1998		Sporadic license buyers since 1998		Combined	
	% <sup>a</sup>	95% CL <sup>b</sup>	% <sup>a</sup>	95% CL <sup>b</sup>	% <sup>a</sup>	95% CL <sup>b</sup>
Lacked time to hunt	18%	2%	15%	2%	17%	1%
Unanticipated event	9%	1%	11%	1%	10%	1%
Deer population too low	23%	2%	31%	2%	26%	1%
Unsuccessful in drawing	6%	1%	7%	1%	6%	1%
Hunted outside the area	30%	2%	25%	2%	28%	2%
Too many hunters in area	9%	1%	9%	1%	9%	1%
Moved residence	5%	1%	4%	1%	4%	1%
Could not use bait	18%	2%	23%	2%	20%	1%
Unable to obtain permission	7%	1%	6%	1%	6%	1%
Only wanted a buck	11%	2%	11%	1%	11%	1%
No longer deer hunt	7%	1%	5%	1%	6%	1%
Unfamiliar with area	5%	1%	4%	1%	5%	1%
Unsuccessful hunt in past years	8%	1%	10%	1%	9%	1%
Bovine TB risk	9%	1%	5%	1%	7%	1%
Forgot to apply	6%	1%	10%	1%	7%	1%
Too expensive	2%	1%	4%	1%	3%	1%

<sup>a</sup>The percentage of former license buyers that indicated that a reason for not purchasing an antlerless deer hunting license was very important.

<sup>b</sup>95% confidence limit.

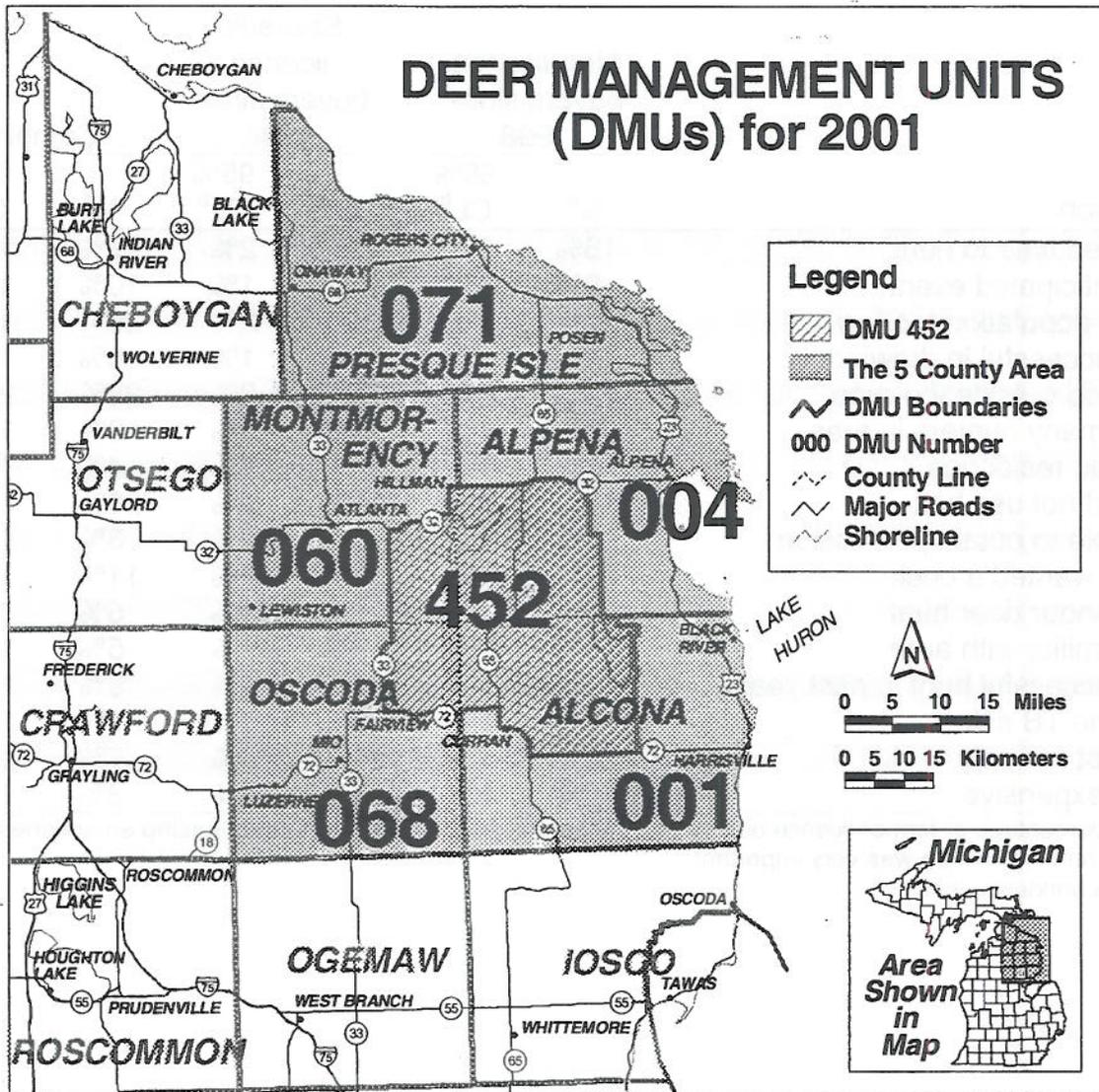


Figure 1. Area in Northeast Lower Peninsula (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties) that has been the primary focus of the bovine TB eradication program. Deer Management Unit 452 was considered the core area.

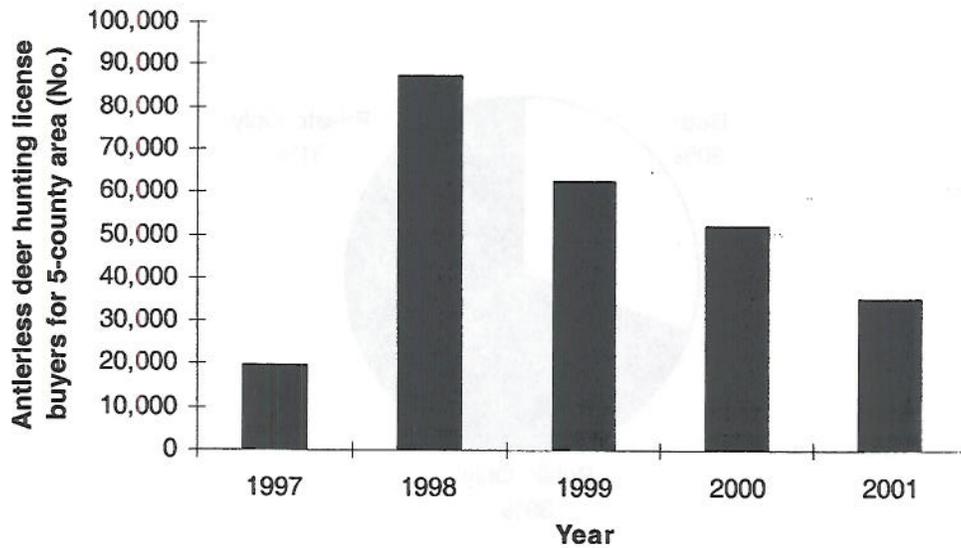


Figure 2. Number of people purchasing an antlerless deer hunting license in Northeast Lower Peninsula (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties), 1997-2001. Each person was counted only once no matter how many licenses they purchased.

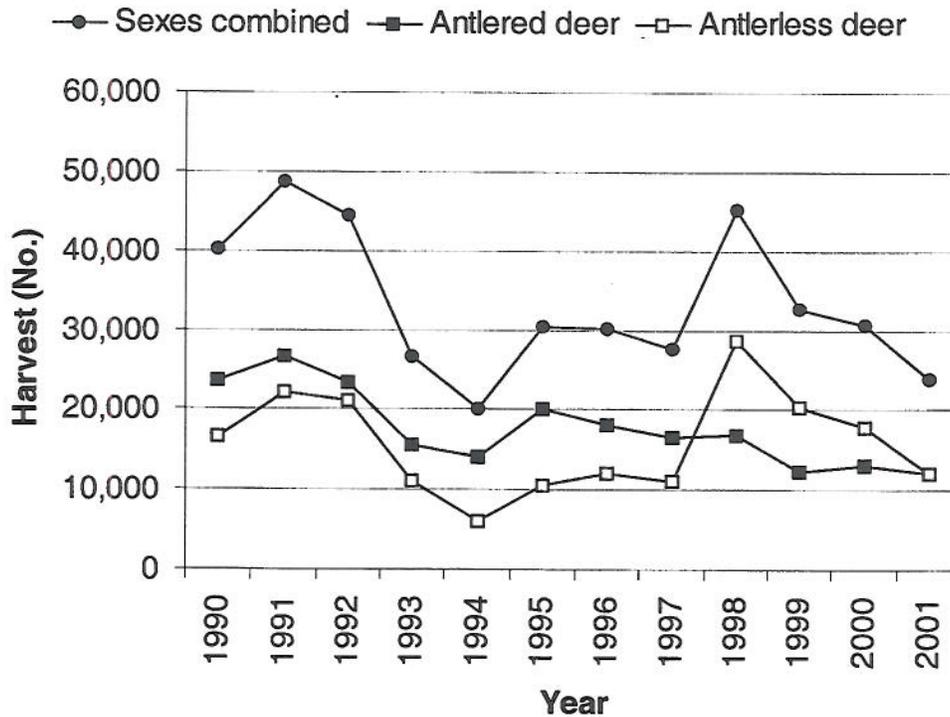


Figure 3. Number of deer harvested in the Northeast Lower Peninsula (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties), 1990-2001. The deer harvest includes deer taken during archery, regular firearm, muzzleloader, early antlerless, late antlerless, and youth deer hunting seasons.

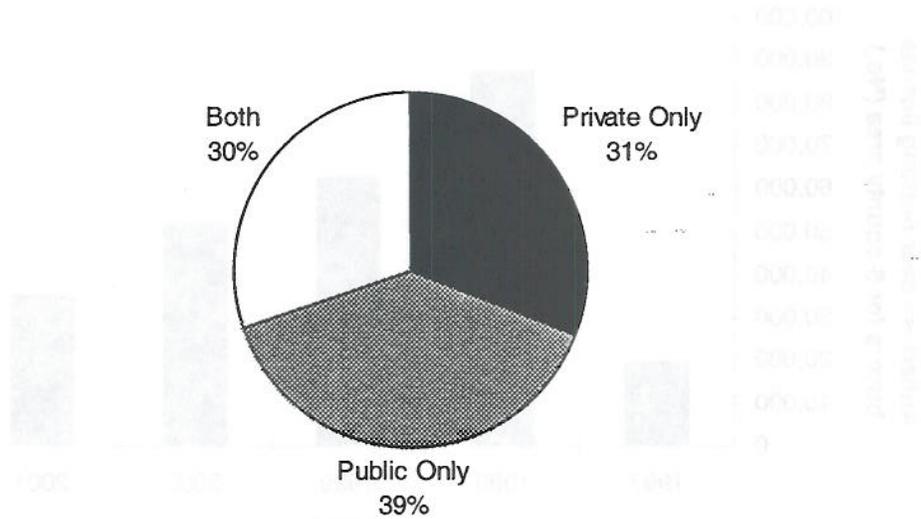


Figure 4. Land type where former antlerless deer hunting license buyers normally hunted in the Northeast Lower Peninsula (5-county area).



Figure 5. Number of deer harvested in the Northeast Lower Peninsula (5-county area) from 1987 to 2007. The Y-axis represents the number of deer harvested, ranging from 0 to 100,000. The X-axis represents the year from 1987 to 2007. The solid line with circles represents antlerless deer, the dashed line with squares represents antlered deer, and the dotted line with triangles represents total deer.

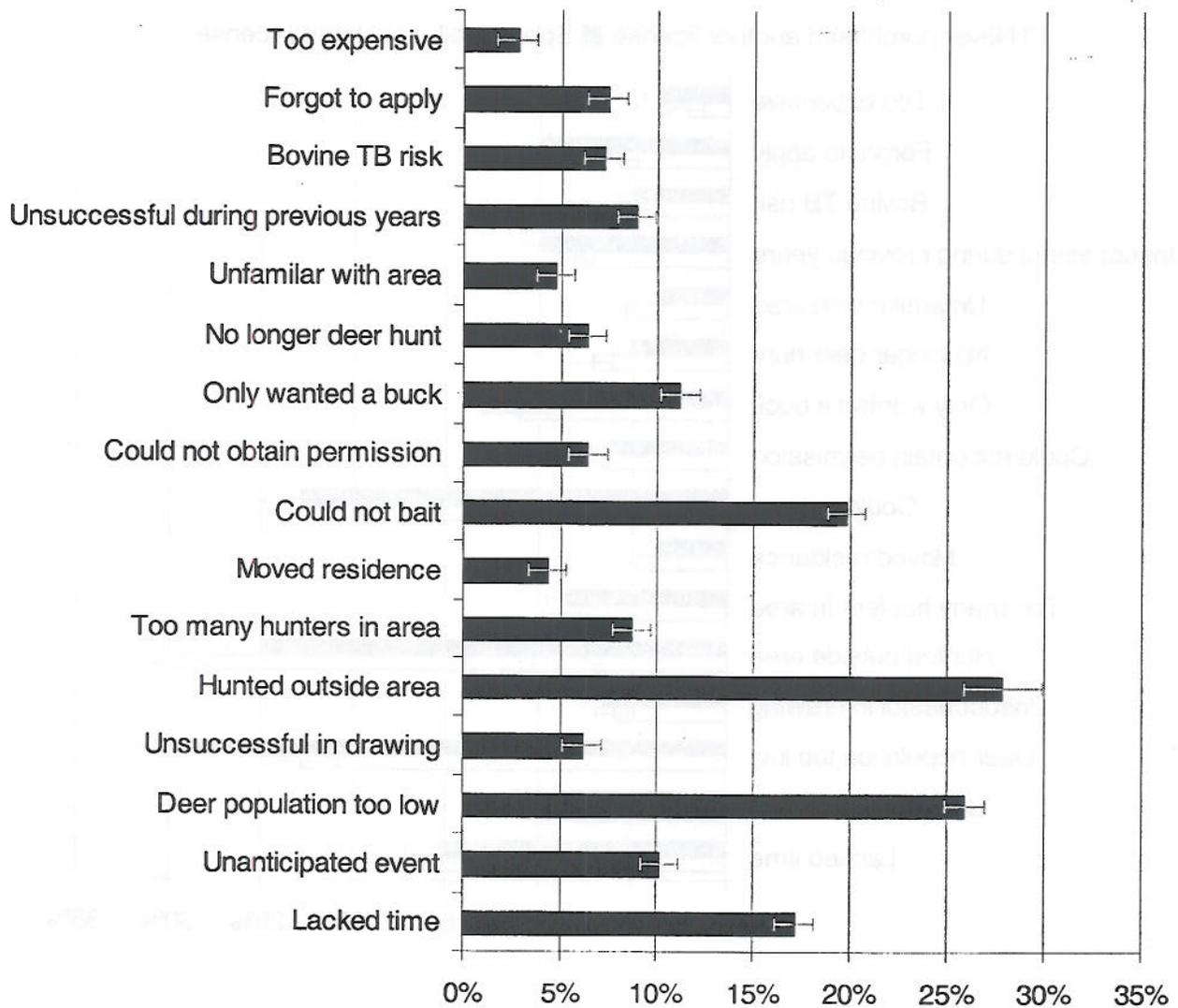


Figure 5. Reasons that former license buyers did not buy an antlerless deer hunting license for the 5-county area (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties) in the NELP during 2001. People could indicate more than one reason as a very important reason for why they had stopped buying a license.

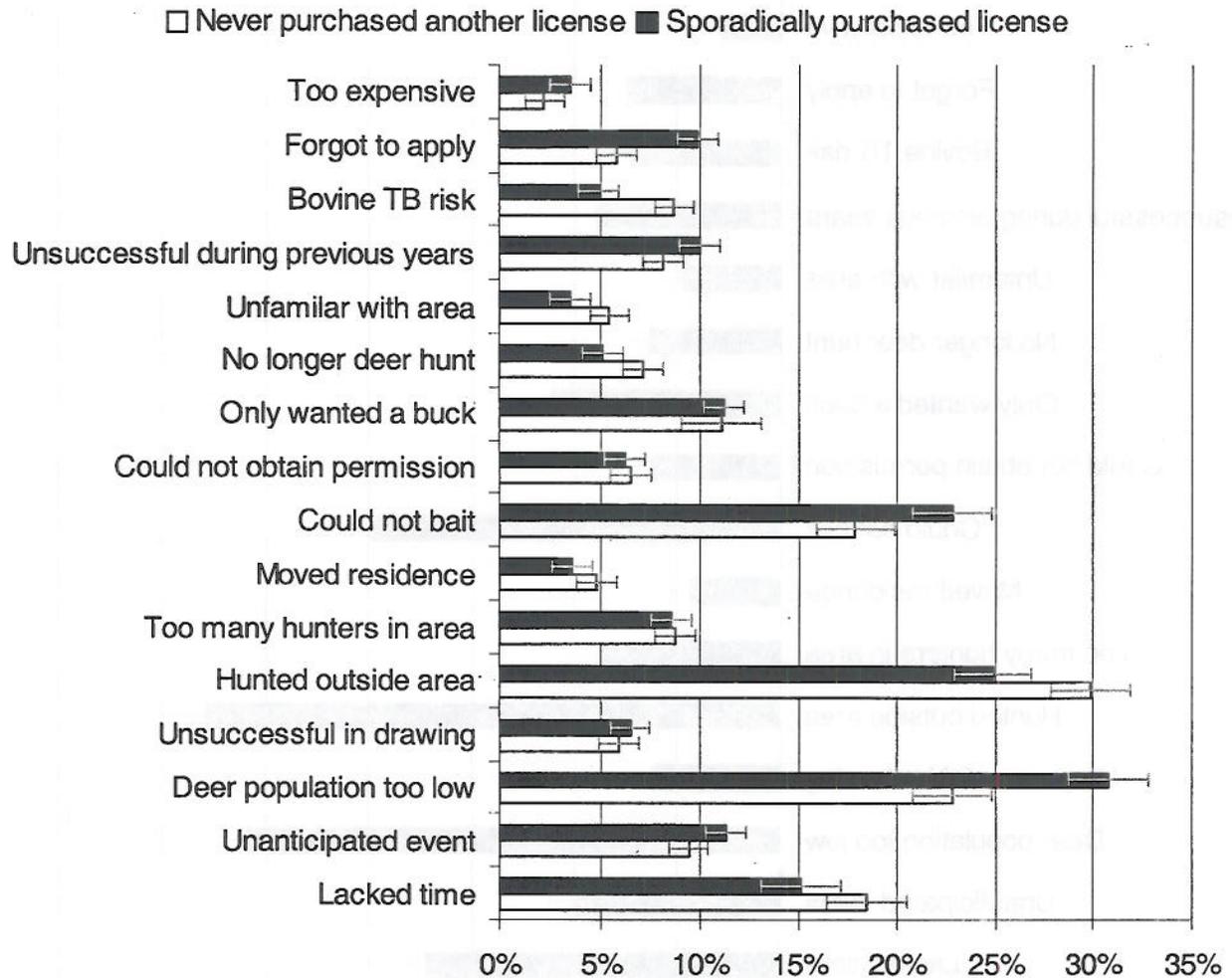


Figure 6. Reasons that former license buyers did not buy an antlerless deer hunting license for the 5-county area (Alpena, Montmorency, Oscoda, Alcona, and Presque Isle counties) in the NELP during 2001. Reasons were summarized separately for people that had never purchased another antlerless license since 1998 and for people that had sporadically purchased a license since 1998.

## Appendix A

### Questionnaire used for the Michigan deer hunter opinion survey.

Michigan Department of Natural Resources  
 Division of Wildlife Management  
 Michigan Deer Hunter Survey  
 2005

Please check the appropriate response for each statement.

1 = Strongly Dislike  
 2 = Dislike  
 3 = Neither Like nor Dislike  
 4 = Like  
 5 = Strongly Like

Statement	1	2	3	4	5
1. Hunting is a waste of time.	<input type="checkbox"/>				
2. Hunting is a good way to spend my leisure time.	<input type="checkbox"/>				
3. Hunting is a good way to spend my money.	<input type="checkbox"/>				
4. Hunting is a good way to spend my energy.	<input type="checkbox"/>				
5. Hunting is a good way to spend my time with my family.	<input type="checkbox"/>				
6. Hunting is a good way to spend my time with my friends.	<input type="checkbox"/>				
7. Hunting is a good way to spend my time with my children.	<input type="checkbox"/>				
8. Hunting is a good way to spend my time with my grandchildren.	<input type="checkbox"/>				
9. Hunting is a good way to spend my time with my neighbors.	<input type="checkbox"/>				
10. Hunting is a good way to spend my time with my community.	<input type="checkbox"/>				
11. Hunting is a good way to spend my time with my country.	<input type="checkbox"/>				
12. Hunting is a good way to spend my time with my world.	<input type="checkbox"/>				
13. Hunting is a good way to spend my time with my future.	<input type="checkbox"/>				
14. Hunting is a good way to spend my time with my past.	<input type="checkbox"/>				
15. Hunting is a good way to spend my time with my present.	<input type="checkbox"/>				



# MICHIGAN ANTLERLESS DEER HUNTER SURVEY

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.



***It is important that you complete and return this questionnaire even if you did not hunt or purchase a deer hunting license in 2001.***

1. In 2001, did you purchase an antlerless deer hunting license to hunt in Alcona, Alpena, Montmorency, Oscoda, or Presque Isle counties? (See figure of the 5-county area in northeast Lower Peninsula on the reverse side.)

<sup>1</sup>  Yes (skip the remaining questions and please return the questionnaire)      <sup>2</sup>  No (If "No," go to question number 2)

2. How important was each of the following reasons why you did not purchase an antlerless deer hunting license in 2001 for the 5-county area?

Reasons	Very important	Important	Slightly important	Not important
A. I did not have time to hunt antlerless deer.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
B. An illness or another unanticipated event prevented me from hunting.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
C. The deer population was too low to provide an enjoyable hunt.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
D. I was unsuccessful in the drawing for an antlerless deer hunting license on public lands.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
E. I hunted antlerless deer in another area (outside the 5-county area).	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
F. There was too much competition and interference from other hunters in my hunting area in the 5-county area.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
G. I moved my residence, so could not hunt in the 5-county area.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
H. I could not use bait where I wanted to hunt.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
I. I could not obtain permission from a landowner to hunt antlerless deer.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
J. I only wanted to harvest a buck and was not interested in taking an antlerless deer.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
K. I am no longer interested in harvesting any deer.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
L. I was not familiar with a hunting location in the 5-county area.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
M. I did not harvest an antlerless deer in previous years.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
N. The risk of bovine tuberculosis in the deer herd caused me to stop hunting in the 5-county area.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
O. I forgot to apply for or to purchase an antlerless deer hunting license.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
P. Other (please specify) _____	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

Questions continued on reverse side.

3. Prior to 2001 when you purchased an antlerless license for the 5-county area, where did you hunt?

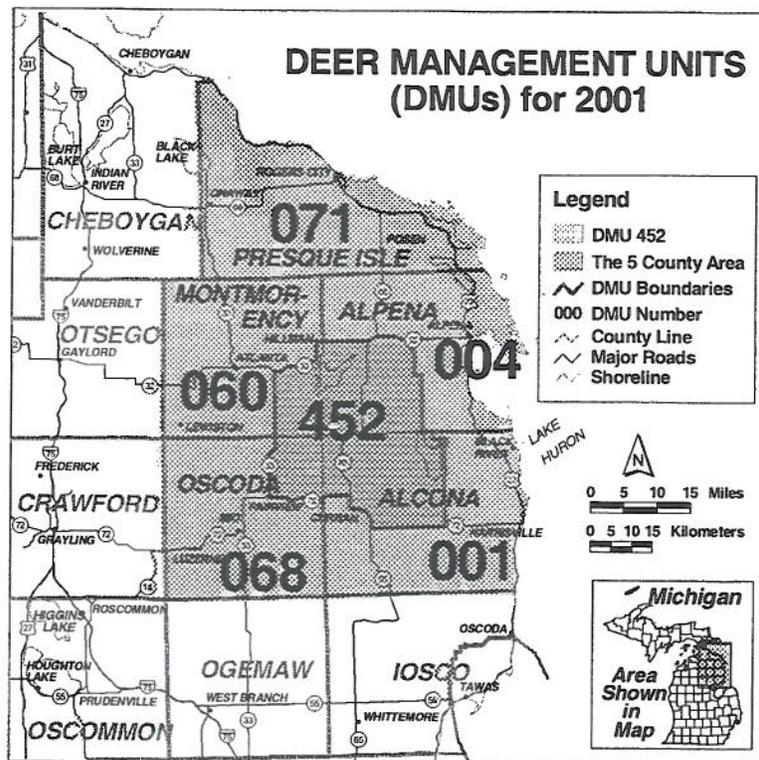
- Private lands only   
  Public lands only   
  Both public and private lands   
  Not sure   
  I did not hunt

4. Do you normally deer hunt in area labeled as Deer Management Unit 452 in the figure below?

- Yes (skip the remaining question and please return the questionnaire)   
  No (If "No", go to question number 5)

5. Would you have been more likely to purchase an antlerless license in 2001 for the 5-county area if you could have used bait?

- Yes   
  No   
  Uncertain



The five-county area includes Alcona, Alpena, Montmorency, Oscoda, and Presque Isle counties in the northeast Lower Peninsula. As you complete this questionnaire, please keep in mind that the boundaries for Deer Management Unit 452 have changed during the last several years. Thus, refer to the figure for the current boundaries. When answering question number 4, be certain that your answer corresponds to the current DMU boundaries. For a more detailed description of the boundaries for DMU 452, see the description below.

**Deer management unit 452 (core area)** includes portions of Montmorency, Alpena, Alcona, and Oscoda counties bounded by a line beginning at the junction of highway M-32 and highway M-33 in eastern Montmorency county, then easterly on highway M-32 past the city of Hillman and crossing the Montmorency-Alpena county line to King Settlement road near the city of Paxton, southerly on King Settlement road to Henry road, continue southerly on King Settlement road to Werth road, easterly on Werth road to Hubbard Lake road, southerly on Hubbard Lake road to Hubbert road at the Alpena-Alcona county line, easterly on Hubbert road to the continuation of Hubbard Lake road (also known as Scout road), southerly on Hubbard Lake road to Spruce road, continue southerly on Hubbard Lake road to highway M-72, westerly on highway M-72 past the city of Curran and crossing the Alcona-Oscoda county line to highway M-72 and highway M-33 near the city of Fairview, northerly on highway M-33 crossing the Oscoda-Montmorency county line to the point of beginning.

**Return the completed questionnaire in the enclosed postage-paid envelope.**

**Thanks for your assistance.**

