

WATERFOWL HUNTING IN MINNESOTA

**A study of people who hunted for waterfowl in Minnesota
from 2000 through 2004**



Final Report

A cooperative study conducted by:

Minnesota Cooperative Fish and Wildlife Research Unit
Minnesota Department of Natural Resources

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from 2000 through 2004**

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Acknowledgements

This study was a cooperative effort supported by the Minnesota Department of Natural Resources, Division of Wildlife (DNR) and the U.S. Geological Survey through the Minnesota Cooperative Fish and Wildlife Research Unit at the University of Minnesota. We wish to thank David C. Fulton of the Minnesota Cooperative Fish and Wildlife Research Unit for his work on this project. We also thank Rick Nordby of the DNR for his assistance in working with the electronic licensing system. Finally, we thank the many waterfowl hunters who took the time to complete the survey and helped to further our understanding of this important clientele.

Suggested Citation

Schroeder, S. A., Lawrence, J. S., and Cordts, S. D. (2011). *Waterfowl hunting in Minnesota: A study of lapsed waterfowl hunters*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology.

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Executive Summary

This study used a mail survey of lapsed Minnesota waterfowl hunters to explore why individuals stopped waterfowl hunting in the state. The study used some questions from other surveys of (active) Minnesota waterfowl hunters to permit comparison with earlier studies. Survey questions addressed:

- Waterfowl hunting participation history in Minnesota
- Waterfowl hunting participation history elsewhere
- Satisfaction with Minnesota waterfowl hunting in the past
- Waterfowl hunting motivations
- Waterfowl hunting identity
- Waterfowl hunting involvement, and investment in equipment
- Waterfowl hunting constraints
- Waterfowl hunting constraint negotiation
- Intended future participation in waterfowl hunting
- Participation in other recreation activities
- Demographics.

The population of interest in this study included all individuals aged 20 - 59 years who had purchased a Minnesota waterfowl stamp during 2000-2004, but who had not purchased a stamp in 2005-2009. A random sample of 1,000 people who met this criterion was drawn in December 2009. Of the 1,000 questionnaires mailed, 438 full-length surveys were returned along with 38 one-page nonresponse surveys. We received an adjusted response rate of 48.6% for the main survey, and 52.8% including the shortened nonresponse surveys.

Respondents were about 40 years of age on average. Nearly 95% of respondents were male. About three-fourths of respondents were currently married, and about half of respondents had children living in their home. About one-third of respondents had a 4-year college degree or higher level of education. Average household income was \$78,000.

Waterfowl Hunting Background

About three-fourths (74.2%) of respondents had hunted in Minnesota between 2000 and 2004. Respondents who had not hunted in Minnesota during those years were excluded from further analysis. Number of seasons hunting in Minnesota ranged from 0 to 40 with a mean of 10.6. According to ELS records, 77.4% of respondents who had hunted between 2000 and 2004 purchased only one migratory waterfowl stamp during this period.

Over half of this sample of lapsed waterfowl hunters indicated that when they used to hunt for waterfowl in Minnesota that they targeted both ducks and geese. Over a third (37.7%) targeted ducks exclusively and 11.5% targeted geese exclusively. About 15% of respondents indicated that they still hunted for waterfowl.

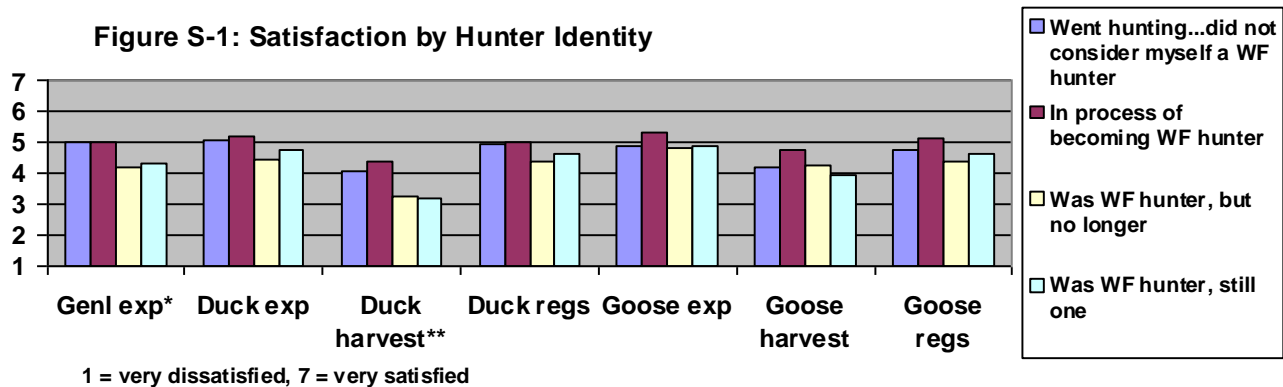
Satisfaction

Nearly 60% reported being satisfied with their general waterfowl hunting experience during their most recent waterfowl hunting season in Minnesota.

There were no significant differences in most measures of satisfaction comparing duck hunting and goose hunting among this sample of lapsed waterfowl hunters. However, satisfaction with duck-hunting harvest was significantly lower than satisfaction with goose-hunting harvest. Less than one-fourth were satisfied with the number of ducks they had seen during their most recent Minnesota waterfowl-hunting season, compared to about half who were satisfied with the number of geese they had seen in the field. There was no significant difference between respondents who indicated that they still hunted for waterfowl, and those who did not, in satisfaction measures for their most recent Minnesota waterfowl season.

In general, respondents who reported lower levels of involvement, skill and identity associated with waterfowl hunting reported higher levels of satisfaction, particularly with duck hunting (Figure S-1). There was no significant difference in satisfaction measures for the most recent Minnesota waterfowl-hunting season between individuals who still hunt for waterfowl and those who do not.

Figure S-1: Satisfaction by Hunter Identity

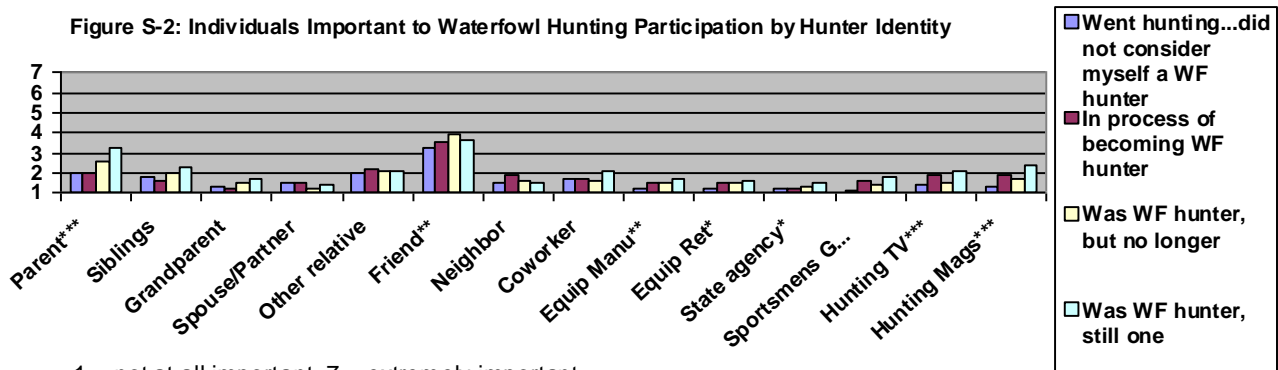


Results for these respondents' satisfaction measures with their most recent waterfowl-hunting season were compared to satisfaction measures from the 2005 and 2010 statewide waterfowl hunter surveys. In general, these respondents were more satisfied with their most recent waterfowl-hunting season than respondents to the 2005 survey were with their 2005 season. There were fewer differences in satisfaction between these lapsed Minnesota waterfowl hunters and active 2010 waterfowl hunters, although lapsed hunters were significantly more satisfied with their duck and goose harvest.

Individuals and Groups Important to Waterfowl Hunting Participation

We asked respondents how important a variety of individuals and groups were on their participation in waterfowl hunting. On average, friends were the most important group, followed by parents, other relatives, and siblings. Individuals who identified more strongly as waterfowl hunters and those who still hunted for waterfowl rated the importance of a number of groups and individuals to their waterfowl-hunting participation higher than respondents who no longer hunted waterfowl (Figure S-2). Those individuals and groups included: parent, grandparent, coworker, equipment manufacturer, state wildlife agency, sportsmen's groups, hunting-related TV shows, and hunting magazines.

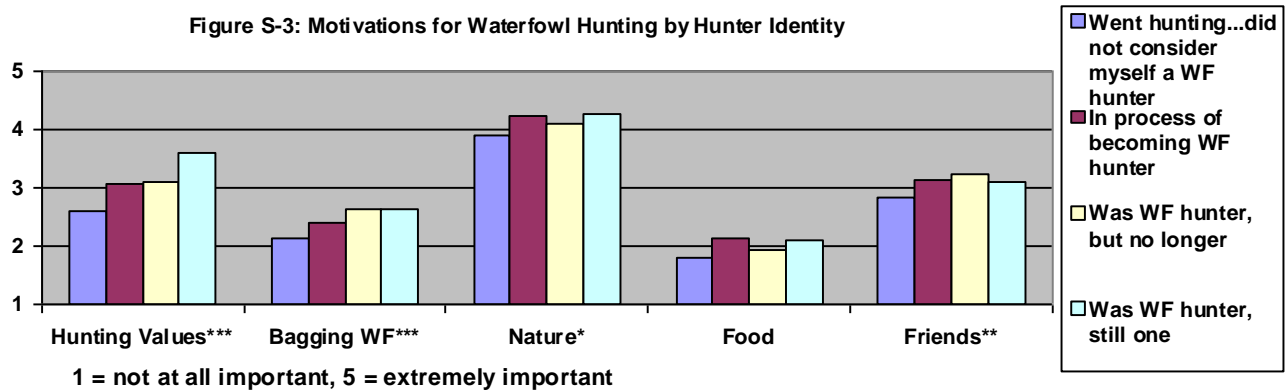
Figure S-2: Individuals Important to Waterfowl Hunting Participation by Hunter Identity



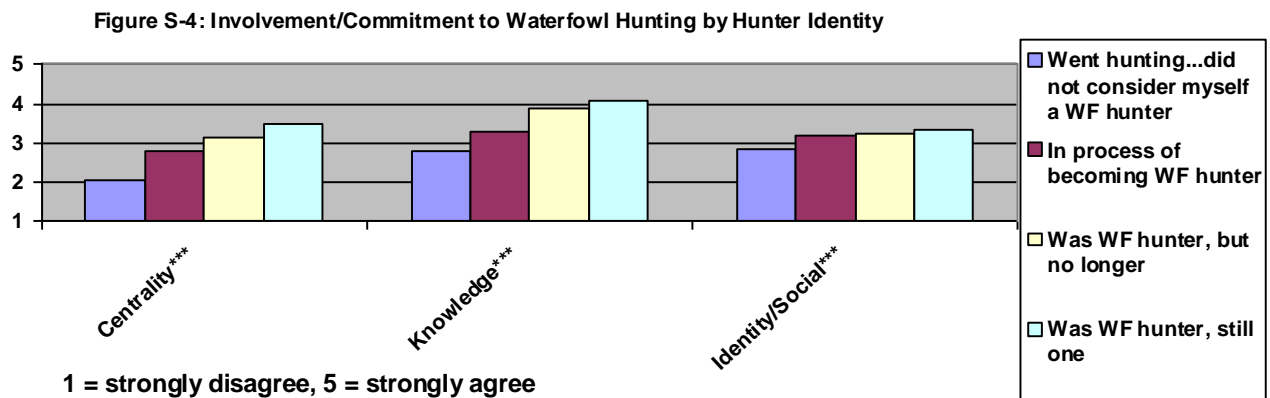
Motivations

Respondents reported how important outcomes of waterfowl hunting were to them. The three most important items were: (a) enjoying nature and the outdoors, (b) the excitement of hunting, and (c) the challenge of making a successful shot. The three least important items were: (a) getting food for my family, (b) a large daily duck bag limit, and (c) getting my limit. Compared to 2005 and 2010 statewide waterfowl survey results, these respondents felt most outcomes were significantly less important. We identified five motivation factors. Individuals who identified less strongly as waterfowl hunters generally rated motivation factors for participation lower as shown in Figure S-3.

Involvement/Commitment to Waterfowl Hunting



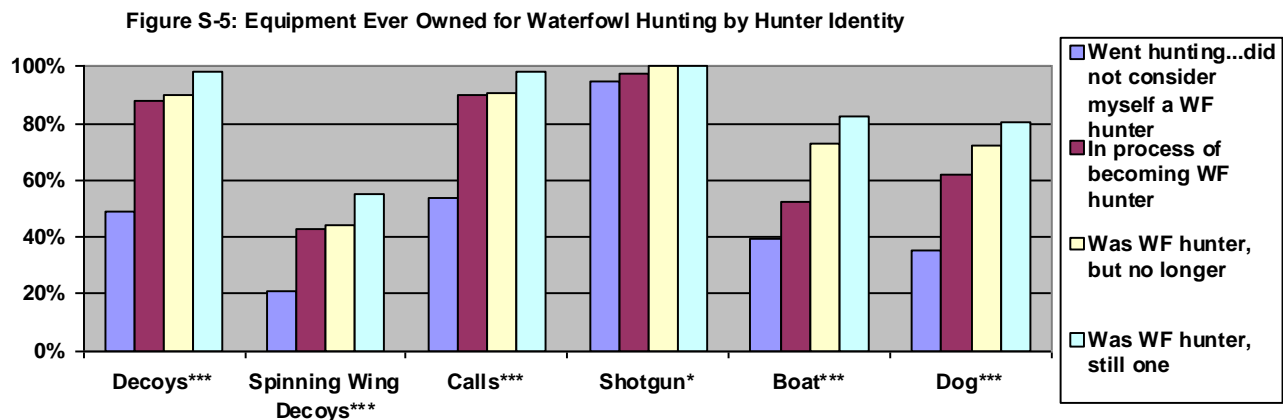
Respondents were asked to rate items addressing their involvement/commitment to waterfowl hunting. Respondents most strongly agreed that (a) waterfowl hunting was interesting to me, (b) waterfowl hunting was one of the most enjoyable things I did, (c) I was knowledgeable about waterfowl hunting, (d) the decision to go waterfowl hunting was primarily my own, and (e) I enjoyed discussing waterfowl hunting with my friends. Respondents disagreed most that: (a) a lot of my life was organized around waterfowl hunting, (b) waterfowl hunting had a central role in my life, (c) I did not really know much about waterfowl hunting, and (d) I found a lot of my life organized around waterfowl-hunting activities. We identified three waterfowl-hunting involvement factors that parallel other research on recreation involvement. Respondents who reported greater levels of involvement, skill and identity associated with waterfowl hunting reported stronger involvement and commitment to waterfowl hunting (Figure S-4).



Waterfowl-Hunting Equipment

Respondents answered a number of questions related to their ownership, in the past and currently, of different types of waterfowl-hunting equipment. Nearly all respondents currently owned a shotgun or had owned one in the past. Over three-fourths had owned waterfowl decoys or calls, and about two-thirds had owned duck-hunting boats or waterfowl-hunting dogs. About 40% had owned spinning-wing decoys. Looking at equipment that was owned in the past but not currently, we see that about 30% of respondents have gotten rid of their waterfowl decoys, battery-operated spinning-wing decoys, duck boats, and waterfowl-hunting dogs. Fewer respondents who owned waterfowl calls and shotguns reported that they no longer owned them.

There were significant differences in ownership of waterfowl-hunting equipment based on identity as a waterfowl hunter. Respondents who reported stronger identity as waterfowl hunters were more likely to report having ever owned each of the different types of equipment listed (Figure S-5). However, there were no significant differences by hunter identity in the reporting of past ownership.



Importance of Waterfowl Hunting

Respondents were also asked to indicate if they were casual, active, or committed waterfowl hunters when they hunted for waterfowl in Minnesota. They were provided brief descriptions of these definitions. The majority of respondents (50.6%) identified themselves as casual waterfowl hunters. Respondents answered a number of questions related to the importance of waterfowl hunting in their lives. On average, waterfowl hunting was less important to these respondents than to respondents to the 2005 and 2010 statewide surveys (Schroeder et al., 2007).

Constraints to Waterfowl Hunting

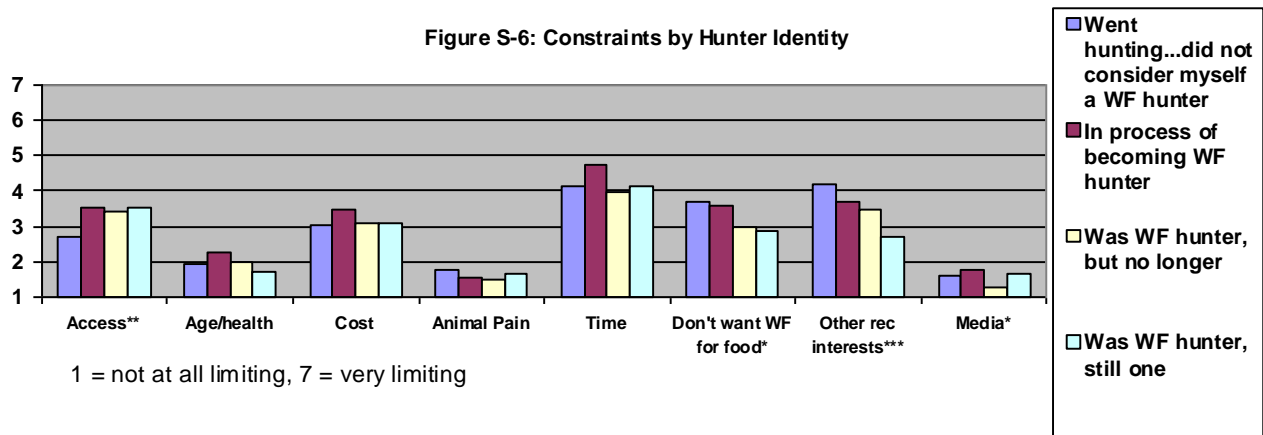
Respondents were asked to indicate if they could easily go waterfowl hunting, when they used to hunt for waterfowl in Minnesota and now. It appears that respondents are significantly more constrained in their ability to hunt now than when they used to hunt for waterfowl in Minnesota. Nearly 8 in 10 respondents said it was true that they could easily go waterfowl hunting when they used to hunt, and just over half said it was true now.

Respondents were asked to rate how much 32 constraint items limited their participation in waterfowl hunting in Minnesota during the past 5 years. The items identified as most limiting were: (a) work commitments, (b) waterfowl populations too low, (c) interest in other recreational activities, (d) not enough

leisure time, and (e) prefer other types of hunting. The items that were rated the least limiting were: (a) other people's concern for animals' pain and distress, (b) articles I read in national magazines, (c) articles I read in local newspapers or magazines, (d) poor health, (e) personal concern for animal pain and distress, (f) waterfowl hunting is too difficult, and (g) concern over wounding waterfowl.

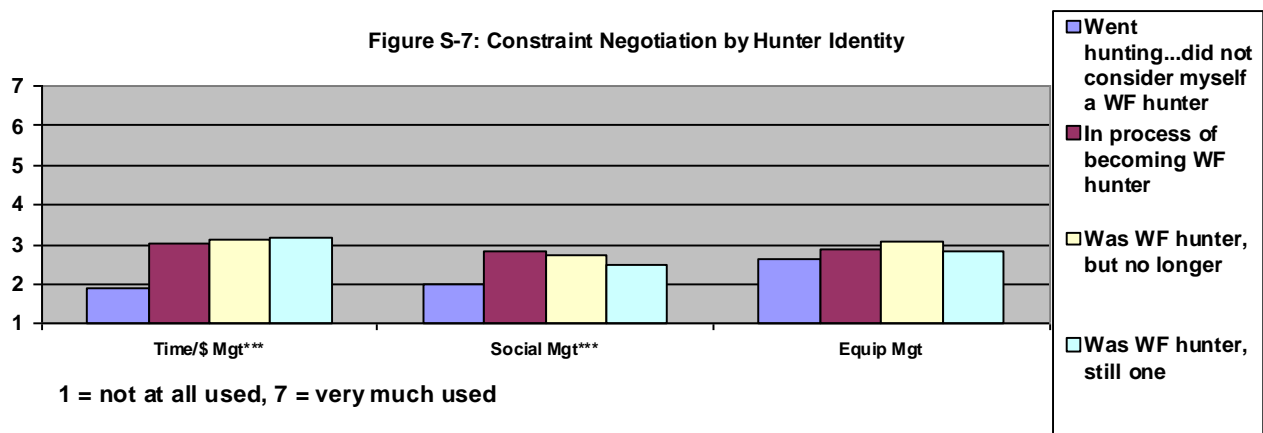
We identified eight constraint factors. There were no significant differences between individuals who still hunted for waterfowl those who no longer hunted waterfowl in constraint ratings. However, respondents who never identified as waterfowl hunters were significantly less constrained by access issues, yet more constrained by interests in other activities (Figure S-6).

Constraint Negotiation



Respondents were also asked to rate their use of negotiation strategies to maintain their participation in waterfowl hunting. Strategies were derived from previous recreation research on constraints and constraint negotiation. The strategies that respondents indicated using most were: (a) getting the equipment together beforehand so I could get out of the house on time, (b) cutting short hunting outings to make time for other responsibilities, (c) learning new ways to hunt waterfowl, and (d) improvising with the hunting equipment that I had. The strategies that were used least were: (a) having others take on more responsibilities around the house so that I could get out waterfowl hunting and (b) borrowing other hunters' equipment.

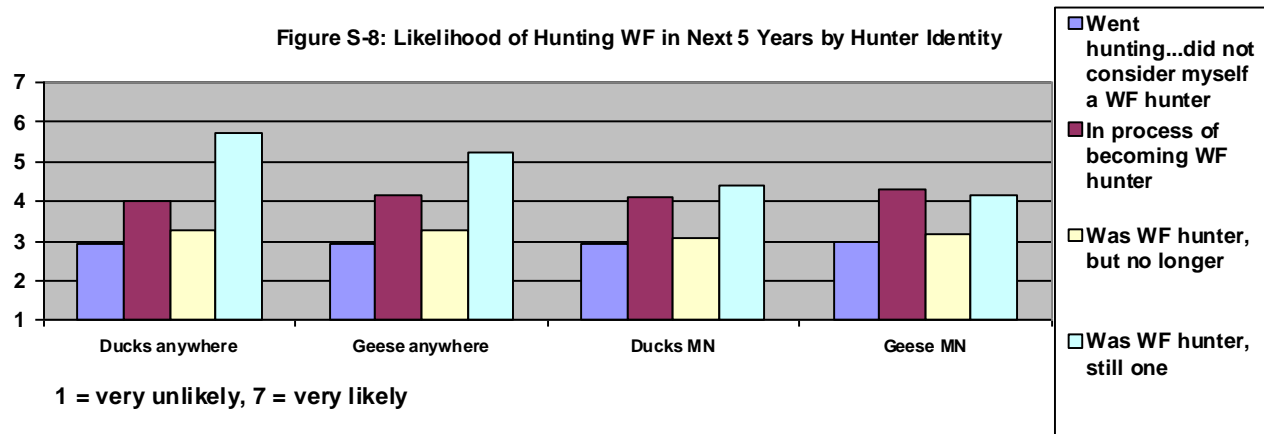
We identified three constraint negotiation strategies: (a) time and money management, (b) social management, and (c) equipment management. Individuals who never identified as waterfowl hunters reported significantly lower use of these strategies to maintain their participation in waterfowl hunting (Figure S-7).



Likelihood of Hunting Waterfowl in Minnesota in the Future

Respondents were asked to rate how likely they would be to hunt for ducks and geese again in the future, anywhere or specifically in Minnesota. Response was on the scale 1 (very unlikely) to 7 (very likely). On average, ratings were just less than the neutral/undecided point on the scale. Respondents were no more likely to hunt ducks versus geese either outside or in Minnesota. However, respondents reported a slightly stronger likelihood of hunting outside the state than in Minnesota for both ducks and geese.

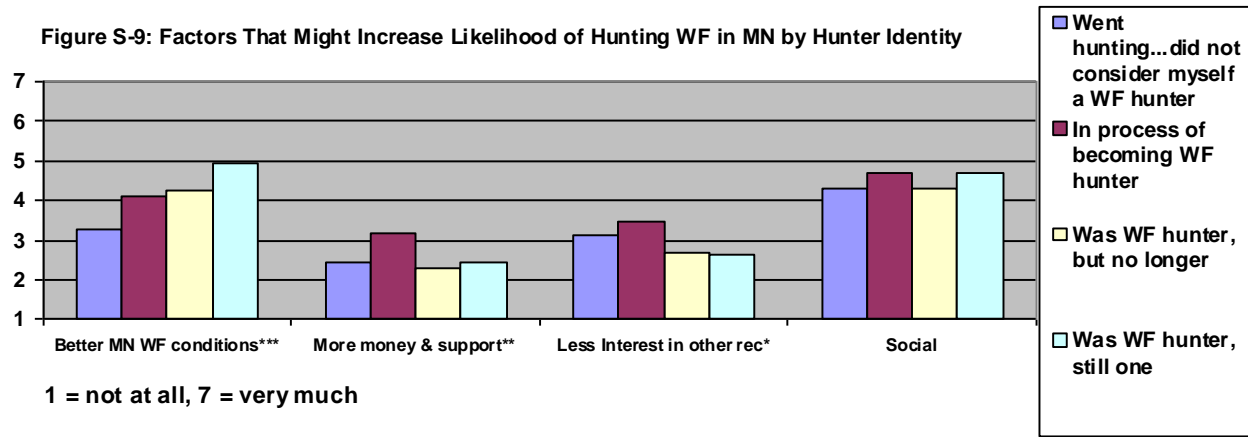
Compared to individuals who never identified as waterfowl hunters or those who did in the past but no longer do, respondents who still identified as waterfowl hunters and those who indicated that they were in the process of becoming waterfowl hunters reported significantly higher likelihoods of hunting waterfowl in the next 5 years (either in Minnesota or elsewhere) (Figure S-8).



Factors That Might Increase the Likelihood of Waterfowl Hunting in Minnesota Again

Respondents were asked to respond to 24 items addressing factors that might increase their likelihood of waterfowl hunting in Minnesota. The items that were rated most likely to bring them back were: (a) a son or daughter who wanted to go waterfowl hunting in Minnesota, (b) another family member who wanted to go waterfowl hunting in Minnesota, (c) a dramatic increase in duck populations in Minnesota, and (d) better duck-hunting opportunities in Minnesota. The items that were least likely to bring them back were: (a) improved health, physical ability to waterfowl hunt, (b) more support for waterfowl hunting at my job, (c) more support of waterfowl hunting in the community, (d) less interest in indoor leisure activities, (e) more support for waterfowl hunting from my friends, and (f) more support for waterfowl hunting from my family.

We identified four factors that might increase these lapsed hunters likelihood of hunting for waterfowl in Minnesota. Individuals who still identify as waterfowl hunters indicated that better Minnesota waterfowl-hunting conditions would encourage them to return to waterfowl hunting in Minnesota. Individuals who were in the process of becoming waterfowl hunters rated “more money and support” and “less interest in other activities” as factors that might re-engage them with Minnesota waterfowl hunting (Figure S-9).

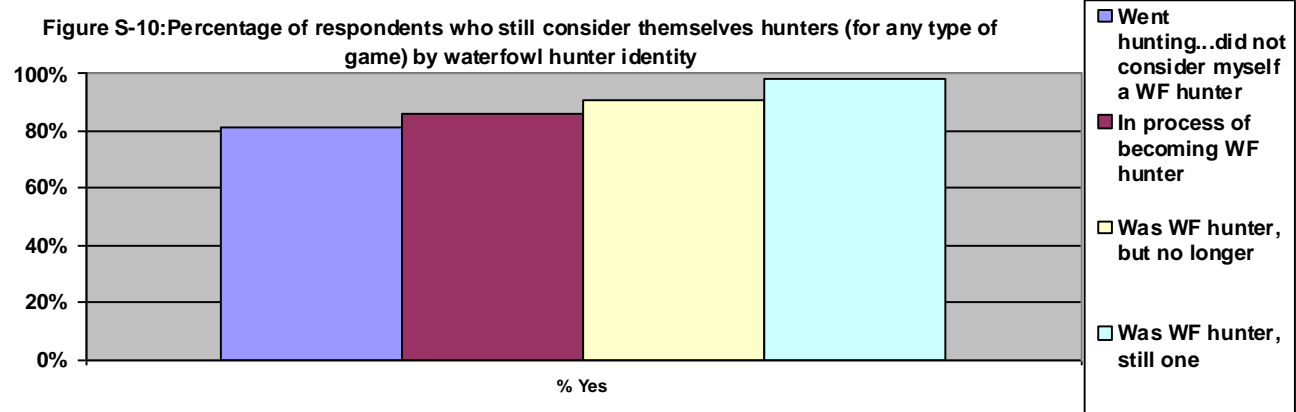


Trust in the Minnesota Department of Natural Resources for Waterfowl Management

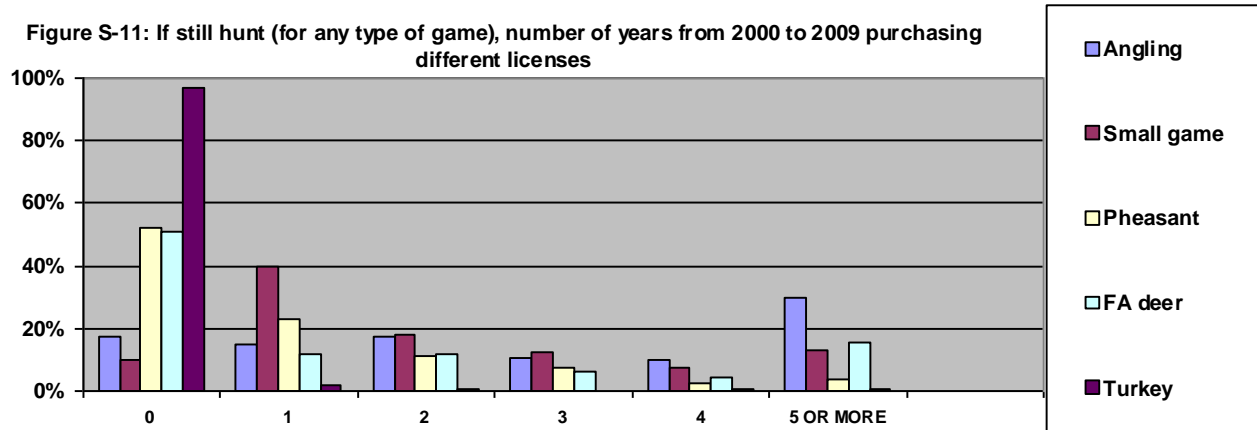
Respondents were asked to rate items addressing their trust in the Minnesota Department of Natural Resources for waterfowl management. All items were rated just above the neutral point on the scale. Respondents who reported greater levels of involvement, skill and identity associated with waterfowl hunting reported lower levels of trust in Minnesota Department of Natural Resources waterfowl management.

Participation in Other Types of Hunting

Nearly 9 of 10 respondents indicated that they still considered themselves to be hunters. Respondents who more strongly identified as waterfowl hunters were more likely to still consider themselves hunters (Figure S-10). Of those who still considered themselves to be hunters, about three-fourths had hunted in each of the previous 5 years. There was no significant difference in participation in other types of hunting by waterfowl-hunting identity.



On average, according to ELS records, respondents had most frequently purchased angling, firearm deer, and small game licenses. Over 90% had purchased a small game license (including individual and combo sport licenses), which is required for most individuals to hunt waterfowl in Minnesota. About half of respondents had purchased firearms deer licenses and pheasant stamps at least once during the 10 years of ELS records. Just over 80% of respondents had purchased an angling license (including all types of fishing licenses and individual and combo sport licenses) at least one of the 10 years. (See Figure S-11).



Survey recipients responded to items measuring public and private identity associated with hunting in general, not specifically related to waterfowl hunting. Items were derived from Nasco and Webb (2006). Respondents agreed most strongly that (a) I obtain personal satisfaction from participating in hunting and (b) I would feel a great sense of loss if I suddenly were unable to participate in hunting. Respondents disagreed that: (a) I often fear people will not like me as much if I do not hunt, (b) I fear not being recognized as a hunter if I quit hunting, (c) my popularity with others is related to my hunting participation, and (d) my primary reason for hunting is recognition as a hunter. Using scales of public identification versus private identification derived by Nasco and Webb (2006), we found that these lapsed waterfowl hunters had much stronger private than public identification as hunters. Both types of identity were rated lower in this sample of lapsed waterfowl hunters than Nasco and Webb (2006) found for current and retired college athletes. There was no significant difference in public and private hunter identification by waterfowl-hunting identity or current participation in waterfowl hunting.

Conclusions

In general, these lapsed Minnesota waterfowl hunters appear to have been less committed to the activity than the average Minnesota waterfowl hunter. The large majority of these lapsed waterfowl hunters still hunt other types of game, and a relatively small proportion of them still hunt for waterfowl elsewhere. Respondents who reported lower levels of involvement, skill, and identity associated with waterfowl hunting reported higher levels of satisfaction with their past Minnesota waterfowl hunting—particularly with regard to duck hunting. Similarly, respondents who reported greater levels of involvement, skill and identity associated with waterfowl hunting reported lower levels of trust in Minnesota Department of Natural Resources waterfowl management. In general, results suggest that it is unlikely that the majority of lapsed waterfowl hunters will return to waterfowl hunting in Minnesota, with the exception of individuals who still are hunting waterfowl elsewhere. For this segment of hunters, improved Minnesota waterfowl-hunting conditions might draw them back to hunting waterfowl in the state.

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Introduction

Minnesota has generally had the largest number of waterfowl hunters in the United States; however, hunter numbers have been declining in the past ten years and Texas and other states have had higher numbers of duck hunters. Beginning in 2000, we expanded our efforts to obtain quantitative information about opinions and motivations for this important clientele. Reports documenting hunter activity and opinions following the 2000, 2002, and 2005 waterfowl hunting seasons were completed (Fulton et al. 2002, Schroeder et al. 2004, Schroeder et al. 2007a). In addition, a series of surveys looking at hunter recruitment and retention were completed following the 2005 waterfowl hunting season (Schroeder et al. 2007b,c,d). We also completed an abbreviated survey following the 2007 waterfowl hunting season to understand hunter opinions on changes in duck bag limits (Schroeder et al. 2008). Information from these reports has been used to inform management decisions.

This study of former Minnesota waterfowl hunters was conducted to supplement the data gathered by the 2005 recruitment and retention surveys of Minnesota waterfowl hunters. The studies conducted following the 2005 season provided many insights into hunter participation and satisfaction; however, we did not survey former waterfowl hunters who no longer participated in the sport. Following the 2009 waterfowl season, 10 years of Electronic Licensing System (ELS) data were available to examine license purchase patterns and determine individuals who no longer purchase state migratory waterfowl stamps. Therefore, this study was conducted to gather information from these lapsed participants, information from this study is intended to allow the Minnesota Department of Natural Resources to better understand issues related to Minnesota waterfowl hunter retention and recruitment.

Study Purpose and Objectives

The questionnaire was designed to provide an understanding of why individuals stopped waterfowl hunting in Minnesota. Some questions were the same as other Minnesota waterfowl hunter surveys to permit comparison with earlier studies. Survey questions addressed:

- Waterfowl hunting participation history in Minnesota
- Waterfowl hunting participation history elsewhere
- Satisfaction with Minnesota waterfowl hunting in the past
- Waterfowl hunting motivations
- Waterfowl hunting identity
- Waterfowl hunting involvement, investment in equipment
- Waterfowl hunting constraints
- Waterfowl hunting constraint negotiation
- Intended future participation in waterfowl hunting
- Participation in other recreation activities
- Demographics: current & childhood residence (urban/rural), childhood socialization to hunting, age of initiation to hunting, age of initiation to waterfowl hunting, income, gender, age,

The questions used to address each objective are provided in the survey instrument (Appendix A) and discussed in more detail in the subsequent sections.

Methods

Sampling

The population of interest in this study included all individuals aged 20–59 years who had purchased a Minnesota waterfowl stamp during 2000-2004, but had not purchased a stamp in 2005-2009. Most individuals aged 18-64 years are required to have a Migratory Waterfowl Stamp to hunt waterfowl in Minnesota. The sampling frame used to draw the study sample was the Minnesota Department of Natural Resource's (DNR) ELS. A random sample of 1,000 individuals who purchased a Minnesota waterfowl stamp during 2000 - 2004, but not since then, was drawn in December 2009.

Data Collection

Data were collected using a mail-back survey following a process outlined by Dillman (2000) to enhance response rates. We constructed a relatively straightforward questionnaire, created personalized cover letters, and made multiple contacts with the targeted respondents. Potential study respondents were contacted four times between May and September 2010. In the initial contact, a cover letter, survey questionnaire, \$1.00 incentive, and business-reply envelope were mailed to all potential study participants. The personalized cover letter explained the purpose of the study and made a personal appeal for respondents to complete and return the survey questionnaire. Approximately 3 weeks later, a second letter with another copy of the survey and business-reply envelope was sent to all study participants who had not responded to the first mailing. Three weeks after the second mailing a third mailing that included a personalized cover letter and replacement questionnaire with business-reply envelope was sent to all individuals with valid addresses who had not yet replied. Finally, in order to assess nonresponse bias, a 1-page survey was sent to individuals who had not responded to the earlier mailings.

Survey Instrument

The data collection instrument was a 12-page self-administered survey with 10 pages of questions (Appendix A). The questionnaire addressed the following topics:

- Part 1: Your waterfowl-hunting background in Minnesota
- Part 2: Past waterfowl hunting
- Part 3: Your participation in Minnesota waterfowl hunting
- Part 4: Waterfowl hunting motivations and involvement
- Part 5: Waterfowl hunting constraints
- Part 6: Future waterfowl hunting
- Part 7: Minnesota DNR waterfowl management
- Part 8: General hunting participation and identity
- Part 9: Other outdoor activities
- Part 10: Demographic information

Data Entry and Analysis

Data were professionally keypunched and the data were analyzed on a PC using the Statistical Program for the Social Sciences (SPSS for Windows 17.0). We computed basic descriptive statistics and frequencies.

Survey Response Rate

Of the 1,000 questionnaires mailed, 84 were undeliverable, 9 were sent to individuals who had moved out of Minnesota, and 5 were sent to deceased individuals. Of the remaining 902 surveys, 22 contacted us to indicate that they were unwilling or unable to complete the survey, and 438 full-length surveys were returned. We also received 38 completed one-page surveys used to gauge nonresponse bias. Response rate was 48.6% for the main survey, and 52.8% including the shortened nonresponse surveys.

Examining Non-Response Bias

We received 38 shortened surveys (Appendix B) to assess nonresponse bias (8.5% response rate). This low response to the nonresponse survey, and reduced response rate to the main survey compared to surveys of active waterfowl hunters, likely reflects the nature of the study. Individuals who have not hunted for waterfowl in over 5 years likely have limited interest in responding to surveys about waterfowl hunting.

Respondents to the shortened nonresponse (late) survey were significantly younger than respondents to the main survey (33.5 versus 39.7 years, $t = 12.5$, $p < 0.001$). Nearly half (45.7%) of the respondents to the nonresponse survey did not hunt waterfowl between 2000 and 2004, compared to 25.8% for the main survey ($\chi^2 = 67.7$, $p < 0.001$). This suggests that a substantial proportion of our survey nonrespondents may not have actively hunted waterfowl during the 2000-2004 timeframe that was the focus of this study.

There were a number of observed differences between early and late respondents in purchase of licenses from the MNDNR ELS over the past 10 years. On average, late respondents had purchased significantly more: (a) migratory waterfowl stamps (1.4 versus 1.3, $t = 3.1$, $p < 0.01$), (b) firearms deer licenses (2.3 vs. 1.6, $t = 6.7$, $p < 0.001$), (c) archery deer licenses (0.6 vs. 0.3, $t = 5.4$, $p < 0.001$), (d) combination sports licenses (0.5 vs. 0.3, $t = 4.0$, $p < 0.001$), and (e) turkey licenses (0.2 vs. 0.1, $t = 3.4$, $p < 0.01$). Late respondents had purchased significantly fewer: (a) small game licenses (1.1 vs. 1.3, $t = 4.0$, $p < 0.001$) and pheasant stamps (0.8 vs. 1.0, $t = 3.2$, $p < 0.01$).

Of late survey respondents who did hunt between 2000-2004, respondents were somewhat more satisfied with waterfowl hunting during their most recent season, but even more unlikely to return to Minnesota waterfowl hunting than respondents to the main survey. Waterfowl hunting was somewhat less important to late survey respondents than to main survey respondents. However, late survey respondents were still active in hunting for other types of game; 100% of the late respondents who had hunted for waterfowl between 2000 and 2004 still hunted for other types of game.

Weights correcting potential nonresponse biases related to respondent age and license purchase history were calculated and applied to the data. There were a few statistically significant differences between the weighted and unweighted data, but weighting the data did not change results beyond the margin of error for the survey. Therefore, data were not weighted to correct for nonresponse bias in any of the results reported here.

Section 1: Waterfowl Hunting Background

Results for Parts 1 and 2 of the lapsed waterfowl hunter survey are reviewed below. These sections of the survey focused on waterfowl hunting background and past waterfowl hunting. We asked only individuals who hunted for waterfowl in Minnesota between 2000 and 2004 to complete Part 2 and the remainder of the survey.

Hunting Waterfowl Between 2000 and 2009

About three-fourths (74.2%) of respondents reported that they had hunted for waterfowl in Minnesota between 2000 and 2004 (Table 1-1). Respondents who had not hunted in Minnesota during those years were excluded from further analysis.

Past Waterfowl Hunting Experience

Respondents were asked the first year that they had hunted for waterfowl and the number of seasons that they had hunted (Table 1-2). On average respondents had begun hunting for waterfowl anywhere in 1986 and in Minnesota in 1987. First year hunted ranged from 1964 to 2004. Number of seasons hunted ranged from 0 to 41 with an average of 12.1 anywhere. Number of seasons hunting in Minnesota ranged from 0 to 40 with a mean of 10.6. According to ELS records, 77.4% of respondents who had hunted between 2000 and 2004 had only purchased one migratory waterfowl stamp during this period (Table 1-3).

Half (50.8%) of this sample of lapsed waterfowl hunters indicated that when they used to hunt for waterfowl in Minnesota that they targeted both ducks and geese (Table 1-4). Over a third (37.7%) targeted ducks exclusively and 11.5% targeted geese exclusively. About 15% of respondents (48 individuals) indicated that they still hunted for waterfowl (Table 1-5). Of these individuals that still hunted waterfowl, 28 (58.3%) had hunted for waterfowl in the past 5 years. Eighteen of those individuals had hunted in North Dakota in the past 5 years, and five had hunted in South Dakota. All other locations had been hunted by only one respondent. The 18 respondents who had hunted in North Dakota had hunted an average of 3.1 of the past 5 years. The five respondents who had hunted in South Dakota had hunted 4 of the previous 5 years.

There were 19 individuals who reported that they still hunted waterfowl, although they had not purchased a Minnesota waterfowl stamp from 2005-2009 and did not report hunting in another state or province. It is possible that they meet one of the exclusions for purchase of a state waterfowl stamp: (a) residents hunting on land occupied as their principal residence, (b) persons hunting on a licensed commercial shooting preserve, (c) persons taking only marked waterfowl released on a commercial shooting preserve, or (d) residents on military leave, but we considered them lapsed hunters who considered themselves still active.

Section 1: Waterfowl Hunting Background

Table 1-1: Hunt for waterfowl in Minnesota between 2000 and 2004¹

| % of respondents indicating they hunted for waterfowl in MN between 2000 and 2004 | | |
|---|-------|-------|
| n | Yes | No |
| 423 | 74.2% | 25.8% |

¹ Results include all respondents.

Table 1-2: First year, and number of seasons hunting...

| Where? | First year hunting | | Number of seasons | |
|--------------|--------------------|-----------|-------------------|-------|
| | Mean | Range | Mean | Range |
| Anywhere | 1986 | 1964-2004 | 12.1 | 1-41 |
| In Minnesota | 1987 | 1964-2004 | 10.6 | 1-40 |

Table 1-3: Number of years purchasing a migratory waterfowl stamp between 2000 and 2004.

| n | Number of years between 2000-2004 | | | |
|-----|-----------------------------------|-------|------|------|
| | 1 | 2 | 3 | 4 |
| 313 | 77.4% | 15.7% | 6.4% | 0.6% |

Table 1-4: When hunted for waterfowl in Minnesota, did you primarily hunt...

| n | Ducks | Geese | Both ducks and geese |
|-----|-------|-------|----------------------|
| 314 | 37.7% | 11.5% | 50.8% |

Table 1-5: Still hunt waterfowl and, if yes, hunt for waterfowl outside of Minnesota during past 5 years?

| | n | Yes | No |
|--|-----|-------|-------|
| Still hunt waterfowl? | 314 | 15.3% | 84.7% |
| Hunt for waterfowl outside of Minnesota during past 5 years? | 45 | 57.8% | 42.2% |

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

Study participants were asked to respond to a number of questions addressing their behavior and satisfaction with their most recent Minnesota waterfowl-hunting season, along with some questions about changes in satisfaction with waterfowl hunting in Minnesota.

Hunting Private Versus Public Land

Respondents were about evenly split between mostly hunting on privately owned areas (42.3%) and mostly hunting on public access areas (38.4%), with another 19.3% who hunted public and private land about the same (Table 2-1).

Satisfaction With the General Waterfowl Hunting Experience

Nearly 60% (57.7%) of the respondents reported being satisfied with the general waterfowl-hunting experience during their most recent waterfowl hunting season in Minnesota (Table 2-2). Over one-third (34.5%) were dissatisfied, and the remaining 7.8% were neither satisfied nor dissatisfied. The overall mean satisfaction score was 4.5 on a 7-point scale.

Satisfaction With Duck Hunting

Nearly two-thirds (61.6%) of these lapsed Minnesota waterfowl hunters were satisfied (slightly, moderately, or very) with their duck-hunting experience in their most recent hunting season in the state; about one-fifth (19.7%) were very satisfied. However, less than half (34.6%) were satisfied with their duck-hunting harvest; 53.4% reported being dissatisfied. Satisfaction with duck-hunting regulations was higher than satisfaction with harvest, with 51.0% of respondents reporting satisfaction with the regulations and 54.8% reporting satisfaction with the bag limit. However, more than one-fourth of respondents (28.5%) felt neither satisfied nor dissatisfied about the duck-hunting regulations, compared to only 10.4% who felt neutral about the duck-hunting experience and only 12.0% who felt neutral about the duck-hunting harvest. About 6 in 10 respondents were satisfied with habitat quality (62.6%) and access (57.8%). The mean scores for satisfaction with duck hunting experience, harvest, regulations, habitat quality and access, and bag limit were significantly different ($F=34.0$, $p<0.001$). Duck-harvest satisfaction ($\bar{x}=3.6$) was lower than the mean scores for experience and habitat quality ($\bar{x}=4.8$) along with regulations, habitat access, and bag limit ($\bar{x}=4.7$) (Table 2-2).

Satisfaction With Goose Hunting

Most goose hunters were satisfied (65.0%) with their general goose-hunting experience. A similar proportion (63.7%) of respondents were satisfied with goose habitat quality. About half (47.0%) of goose hunters were satisfied with their harvest and the regulations (50.8%). Similar proportions of respondents were satisfied with the bag limit (54.7%) and habitat access (54.7%). The mean score for goose-harvest satisfaction ($\bar{x}=4.3$) was lower than the mean scores for habitat access ($\bar{x}=4.6$), regulations and bag limits ($\bar{x}=4.7$), experience ($\bar{x}=4.9$), and habitat quality ($\bar{x}=5.0$) ($F=9.4$, $p<0.001$) (Table 2-2).

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

Comparison of Duck Hunting and Goose Hunting

There were no significant differences in most measures of satisfaction comparing duck hunting and goose hunting among this sample of lapsed waterfowl hunters (Table 2-3). However, satisfaction with duck-hunting harvest ($\bar{x} = 3.6$) was significantly lower than satisfaction with goose-hunting harvest ($\bar{x} = 4.2$) ($t = 5.3, p < 0.001$).

Satisfaction With Waterfowl Hunting in Minnesota Over Time

The majority of respondents (61.2%) indicated that their satisfaction with duck hunting had decreased over the time they had hunted for waterfowl in Minnesota. Forty-one percent indicated that their satisfaction with goose hunting had declined. Less than 6% of respondents indicated that their satisfaction with duck hunting had increased (Table 2-4).

Satisfaction With Number of Ducks and Geese Seen in the Field

Less than one-fourth (21.9%) were satisfied with the number of ducks they had seen during their most recent Minnesota waterfowl-hunting season. About half (51.6%) were satisfied with the number of geese they had seen in the field during their most recent Minnesota season (Table 2-5). Satisfaction with the number of geese seen in the field ($\bar{x} = 4.4$) was significantly higher than satisfaction with the number of ducks seen ($\bar{x} = 3.0$) ($t=10.1, p<0.001$).

Satisfaction Relative to Waterfowl Hunting Involvement, Skill, and Identity

In general, respondents who reported lower levels of involvement, skill and identity associated with waterfowl hunting reported higher levels of satisfaction, particularly with duck hunting. There was no significant difference in satisfaction measures for the most recent Minnesota waterfowl-hunting season between individuals who still hunt for waterfowl and those who do not.

Satisfaction Compared to Statewide Results

Results for these respondents' satisfaction measures with their most recent waterfowl-hunting season were compared to satisfaction measures from the 2005 statewide waterfowl hunter survey. In general, these respondents were more satisfied with their most recent waterfowl-hunting season than respondents to the 2005 survey were with their 2005 season. On average, respondents to this survey were more satisfied with (a) the general waterfowl-hunting experience, (b) the duck hunting experience, harvest and regulations, and (c) the goose hunting experience and regulations than were respondents to the 2005 statewide survey (Table 2-6) (Schroeder et al., 2007). They were also more satisfied with the number of ducks seen in the field (3.04 versus 2.49, $t = 5.37, p < 0.001$). There was no significant difference in satisfaction with the number of geese seen in the field (4.36 versus 4.37, $t = 0.09, n.s.$). Respondents indicated that their satisfaction with waterfowl hunting in Minnesota had decreased less than respondents to the 2005 statewide survey (2.22 versus 1.92, $t = 5.90, p < 0.001$). However, respondents to this survey reported that their satisfaction with goose hunting had decreased more over time compared to respondents to the 2005 statewide survey (2.66 versus 3.03, $t = 6.17, p < 0.001$).

Results for these lapsed waterfowl hunters' satisfaction measures with their most recent waterfowl-hunting season were also compared to satisfaction measures from the 2010 statewide waterfowl hunter survey. In general, these respondents were slightly more satisfied with their most recent waterfowl-hunting season than respondents to the 2010 survey were with their 2010 season. On average, respondents

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

to this survey were more satisfied with (a) the duck hunting experience, harvest and regulations, and (b) the goose hunting harvest than were respondents to the 2010 statewide survey (Table 2-6) (Schroeder et al., in press). There was no significant difference in satisfaction with the number of ducks seen in the field (3.04 versus 2.97, $t = 0.723$ n.s.) or geese seen in the field (4.36 versus 4.26, $t = 0.839$, n.s.).

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

Table 2-1: In your most recent waterfowl-hunting season in Minnesota, did you hunt...

| n | Mostly on privately owned areas | Mostly on public access areas | Public and private about the same |
|-----|---------------------------------|-------------------------------|-----------------------------------|
| 305 | 42.3% | 38.4% | 19.3% |

Table 2-2: Satisfaction with most recent Minnesota waterfowl-hunting season.

| | n | % of hunters ¹ indicating that level of satisfaction: | | | | | | | Mean ¹ |
|--------------------------------------|-----|--|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|-------------------|
| | | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied | |
| General waterfowl hunting experience | 270 | 7.8% | 12.6% | 14.1% | 7.8% | 13.7% | 30.7% | 13.3% | 4.5 |
| Ducks² | | | | | | | | | |
| hunting experience | 279 | 6.8% | 10.0% | 11.1% | 10.4% | 15.4% | 26.5% | 19.7% | 4.8 |
| hunting harvest | 283 | 16.3% | 20.8% | 16.3% | 12.0% | 13.4% | 13.1% | 8.1% | 3.6 |
| hunting regulations | 281 | 5.0% | 6.8% | 8.9% | 28.5% | 13.2% | 22.1% | 15.7% | 4.7 |
| habitat quality | 280 | 5.0% | 10.4% | 7.1% | 15.0% | 17.9% | 27.9% | 16.8% | 4.8 |
| habitat access | 279 | 7.2% | 8.6% | 10.4% | 16.1% | 13.3% | 25.1% | 19.4% | 4.7 |
| bag limit | 281 | 7.5% | 6.8% | 5.7% | 25.3% | 13.9% | 21.0% | 19.9% | 4.7 |
| Geese³ | | | | | | | | | |
| hunting experience | 220 | 5.9% | 5.9% | 7.3% | 15.9% | 17.3% | 30.9% | 16.8% | 4.9 |
| hunting harvest | 217 | 10.1% | 9.2% | 14.3% | 19.4% | 14.7% | 21.7% | 10.6% | 4.3 |
| hunting regulations | 218 | 3.7% | 7.3% | 9.6% | 28.4% | 12.8% | 25.2% | 12.8% | 4.7 |
| habitat quality | 217 | 3.2% | 6.0% | 5.1% | 22.1% | 18.0% | 28.6% | 17.1% | 5.0 |
| habitat access | 216 | 6.9% | 8.3% | 9.7% | 20.4% | 16.7% | 21.8% | 16.2% | 4.6 |
| bag limit | 218 | 8.3% | 6.0% | 8.7% | 22.5% | 13.8% | 21.6% | 19.3% | 4.7 |

¹ Mean is based on the following scale: 1 = very dissatisfied; 2 = moderately dissatisfied; 3 = slightly dissatisfied, 4 = neither; 5 = slightly satisfied; 6 = moderately satisfied; 7 = very satisfied.

² F=34.0, p<0.001 for one-way ANOVA comparing means among six types of duck-hunting satisfaction.

³ F=9.4, p<0.001 for one-way ANOVA comparing means among six types of goose-hunting satisfaction.

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

Table 2-3: Comparison (paired sample t-test) of duck-hunting and goose-hunting satisfaction for most recent Minnesota waterfowl season

| Satisfaction with... | N | Mean ¹ |
|-------------------------------|-----|-------------------|
| Duck-hunting experience | 193 | 4.6 |
| Goose-hunting experience | | 4.8 |
| t=1.6, n.s. | | |
| Duck-hunting harvest | 194 | 3.6 |
| Goose-hunting harvest | | 4.2 |
| p=5.3*** | | |
| Duck-hunting regulations | 194 | 4.5 |
| Goose-hunting regulations | | 4.6 |
| p=1.1, n.s. | | |
| Duck-hunting habitat quality | 193 | 4.8 |
| Goose-hunting habitat quality | | 4.9 |
| p=1.9, n.s. | | |
| Duck-hunting habitat access | 189 | 4.5 |
| Goose-hunting habitat access | | 4.5 |
| p=0.4, n.s. | | |
| Duck-hunting bag limit | 194 | 4.6 |
| Goose-hunting bag limit | | 4.6 |
| t=0.05, n.s. | | |

¹ Means are based on the following scale: 1 = very dissatisfied; 2 = moderately dissatisfied; 3 = slightly dissatisfied, 4 = neither; 5 = slightly satisfied; 6 = moderately satisfied; 7 = very satisfied.
n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Table 2-4: Over the time you hunted ducks and geese in Minnesota, did your overall satisfaction with duck and goose hunting in Minnesota decrease or increase?

| | n | % of hunters ¹ indicating... | | | | | Mean ¹ |
|-------------------------------------|-----|---|-----------|-----------------|-----------|-------------------|-------------------|
| | | Greatly decreased | Decreased | Stayed the same | Increased | Greatly increased | |
| Ducks | 294 | 22.8% | 38.4% | 33.3% | 4.8% | 0.7% | 2.2 |
| Geese | 239 | 10.9% | 30.1% | 43.5% | 13.0% | 2.5% | 2.7 |
| Wilcoxon signed rank test: Z=6.7*** | | | | | | | |

¹ Mean is based on the following scale: 1 = greatly decreased; 2 = decreased; 3 = stayed the same, 4 = increased; 5 = greatly increased.

² t=7.5*** paired samples t-test.

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 2: Most Recent Minnesota Waterfowl-Hunting Season

Table 2-5: Satisfaction with number of ducks and geese seen in the field during most recent Minnesota waterfowl hunting season

| | n | % of hunters ¹ indicating that level of satisfaction: | | | | | | | Mean ¹ |
|-------------------------------------|-----|--|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|-------------------|
| | | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied | |
| Ducks | 291 | 25.1% | 18.2% | 22.3% | 12.4% | 9.6% | 8.2% | 4.1% | 3.0 |
| Geese | 242 | 9.1% | 9.9% | 14.5% | 14.9% | 19.0% | 19.4% | 13.2% | 4.4 |
| Wilcoxon signed rank test: Z=8.3*** | | | | | | | | | |

¹ Mean is based on the following scale: 1 = very dissatisfied; 2 = moderately dissatisfied; 3 = slightly dissatisfied, 4 = neither; 5 = slightly satisfied; 6 = moderately satisfied; 7 = very satisfied.

² t=10.1*** paired samples t-test.

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Table 2-6: Comparison of Satisfaction Measures With Other Waterfowl Surveys.

| | 2009 Lapsed Waterfowl Hunter Survey Mean ¹ | 2005 Statewide Waterfowl Hunter Survey | | 2010 Statewide Waterfowl Hunter Survey | |
|--------------------------------------|---|--|---------------------|--|---------------------|
| | | Mean | t-test ² | Mean | t-test ³ |
| General waterfowl hunting experience | 4.53 | 4.18 | 2.98** | 4.40 | 1.083 n.s. |
| Ducks | | | | | |
| hunting experience | 4.76 | 4.35 | 3.63*** | 4.58 | 1.594 n.s. |
| hunting harvest | 3.57 | 3.07 | 4.41*** | 3.26 | 2.741** |
| hunting regulations | 4.67 | 4.38 | 2.90** | 4.42 | 2.498* |
| Geese | | | | | |
| hunting experience | 4.93 | 4.83 | 0.85 n.s. | 4.80 | 1.105 n.s. |
| hunting harvest | 4.27 | 3.93 | 2.72** | 3.89 | 3.043** |
| hunting regulations | 4.67 | 4.42 | 2.25* | 4.65 | 0.139 n.s. |

¹ Means are based on the following scale: 1 = very dissatisfied; 2 = moderately dissatisfied; 3 = slightly dissatisfied, 4 = neither; 5 = slightly satisfied; 6 = moderately satisfied; 7 = very satisfied.

² T-test comparing 2009 lapsed waterfowl hunter survey mean to 2005 statewide waterfowl hunter survey mean.

³ T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean.

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 3: Importance of Individuals and Groups to Participation in Waterfowl Hunting

Individuals and Groups Important to Waterfowl-Hunting Participation

We asked respondents how important a variety of individuals and groups were on their participation in waterfowl hunting. Response was on the scale 1 (not at all important), 2 (slightly important), 3 (somewhat important), 4 (very important), and 5 (extremely important). Individuals and groups included: (a) parent, (b) sibling, (c) grandparent, (d) spouse or significant other, (e) other relative, (f) friend(s), (g) neighbors, (h) coworkers, (i) hunting equipment manufacturers, (j) hunting equipment retailers, (k) state wildlife agency, (l) sportsmen's groups, (m) hunting-related TV shows, and (n) hunting magazines. On average, friends were the most important group ($\bar{x} = 3.6$), followed by parents ($\bar{x} = 2.5$), other relatives ($\bar{x} = 2.1$), and siblings ($\bar{x} = 2.0$) (Table 3-1).

Individuals who still hunted for waterfowl rated the importance of a number of groups and individuals to their waterfowl-hunting participation higher than respondents who no longer hunted waterfowl. Those individuals and groups included: parent (3.1 versus 2.4, $t = 2.7$, $p < 0.01$) grandparent (1.9 versus 1.4, $t = 3.4$, $p < 0.01$), coworker (2.3 versus 1.7, $t = 3.3$, $p < 0.01$), equipment manufacturer (1.7 versus 1.4, $t = 2.1$, $p < 0.05$), state wildlife agency (1.6 versus 1.3, $t = 2.8$, $p < 0.01$), sportsmen's groups (1.8 versus 1.4, $t = 2.7$, $p < 0.01$), hunting-related TV shows (2.1 versus 1.6, $t = 3.3$, $p < 0.01$), and hunting magazines (2.6 versus 1.7, $t = 5.4$, $p < 0.001$).

Section 3: Importance of Individuals and Groups to Participation in Waterfowl Hunting

Table 3-1: How much did each of the following individuals or groups play a role in helping you participate in waterfowl hunting?

| Factor | N | % of hunters indicating _____ important | | | | | Mean ¹ |
|---------------------------------|-----|---|----------|----------|-------|-----------|-------------------|
| | | Not at all | Slightly | Somewhat | Very | Extremely | |
| Friend(s) | 307 | 11.7% | 5.9% | 19.5% | 31.9% | 30.9% | 3.6 |
| Parent | 303 | 45.9% | 11.2% | 10.6% | 12.9% | 19.5% | 2.5 |
| Other relative | 302 | 56.3% | 8.3% | 13.2% | 15.9% | 6.3% | 2.1 |
| Sibling | 295 | 62.4% | 6.8% | 10.8% | 11.2% | 8.8% | 2.0 |
| Hunting magazines | 302 | 57.3% | 17.9% | 16.6% | 5.3% | 3.0% | 1.8 |
| Coworker(s) | 301 | 66.8% | 8.6% | 12.0% | 9.0% | 3.7% | 1.7 |
| Hunting-related TV shows | 302 | 61.6% | 18.9% | 13.2% | 5.0% | 1.3% | 1.7 |
| Neighbor(s) | 296 | 72.0% | 8.1% | 9.5% | 6.8% | 3.7% | 1.6 |
| Grandparent | 297 | 79.8% | 5.4% | 7.4% | 4.0% | 3.4% | 1.5 |
| Hunting equipment manufacturers | 301 | 72.4% | 13.6% | 10.6% | 2.7% | 0.7% | 1.5 |
| Hunting equipment retailers | 299 | 72.2% | 14.0% | 10.7% | 2.0% | 1.0% | 1.5 |
| Sportsmen's groups | 299 | 74.6% | 10.4% | 11.0% | 3.3% | 0.7% | 1.5 |
| Spouse or significant other | 298 | 85.6% | 3.4% | 3.7% | 3.4% | 4.0% | 1.4 |
| State wildlife agency | 296 | 81.1% | 9.5% | 6.8% | 2.0% | 0.7% | 1.3 |

¹ Mean is based on the scale: 1 = not at all unimportant, 2 = slightly important, 3 = somewhat important, 4= very important, 5 = extremely important.

Section 4: Motivations for and Involvement in Waterfowl Hunting

Motivations

Respondents were asked to report how important 26 aspects of waterfowl hunting were to them using the scale 1=not at all important to 5=extremely important (Table 4-1). The three most important items were: (a) enjoying nature and the outdoors (\bar{x} =4.4), (b) the excitement of hunting (\bar{x} =4.1) and (c) the challenge of making a successful shot (\bar{x} =4.0). The three least important items were: (a) getting food for my family (\bar{x} =1.9), (b) a large daily duck bag limit (\bar{x} =1.9), and (c) getting my limit (\bar{x} =2.0). The other 20 items were rated between 2.1 (slightly important) and 3.9 (very important) on the 5-point scale.

In general, respondents who reported greater levels of involvement, skill and identity associated with waterfowl hunting reported stronger motivations for participation in waterfowl hunting.

Using exploratory factor analysis, we identified five factors motivating these respondents' past participation in waterfowl hunting. They included: (a) nature (\bar{x} =4.1), (b) hunting knowledge and values (\bar{x} =3.1), (c) friends, solitude, shooting (\bar{x} =3.1), (d) bagging waterfowl (\bar{x} =2.5), and (e) food (\bar{x} =2.0).

Nine items loaded on the hunting knowledge and values factor (α =0.866) including: (a) developing my skills and abilities, (b) getting information about hunting seasons and conditions from the DNR or US Fish and Wildlife Service, (c) good behavior among other waterfowl hunters, (d) hunting areas open to the public, (e) hunting with a dog, (f) reducing tension and stress, (g) sharing my hunting skills and knowledge, (h) thinking about personal values, and (i) using my hunting equipment (decoys, boats, etc.). Five items loaded on the bagging waterfowl factor (α =0.823) including: (a) a large daily duck bag limit, (b) bagging ducks and geese, (c) killing waterfowl, (d) getting my limit, and (e) seeing a lot of ducks and geese. Two items loaded on the nature factor (α =0.677): (a) enjoying nature and the outdoors, and (b) getting away from crowds of people. Two items loaded on the food factor (α =0.843): (a) getting food for my family, and (b) getting my own food. Three items loaded on the friends, solitude, and shooting factor (α =0.507): (a) being with friends, (b) being on my own, and (c) shooting a gun.

Individuals who still hunted for waterfowl rated hunting knowledge and values as a significantly more important motivation for past Minnesota waterfowl hunting participation than respondents who no longer hunted waterfowl (3.5 versus 3.0, $t = 4.0$, $p < 0.001$).

Compared to the 2005 statewide waterfowl survey results, these respondents felt most outcomes were significantly less important (Table 4-1). Several items were not significantly different from the results for the 2005 statewide survey including "getting food for my family" and "getting my limit." Similarly, these respondents felt most outcomes were significantly less important than respondents to the 2010 statewide survey felt they were (Table 4-1).

Importance of Waterfowl Hunting

Respondents answered a number of questions related to the importance of waterfowl hunting in their lives. One question asked respondents to select one of five statements that indicated how important waterfowl hunting was to them. Over one-third of respondents (37.1%) indicated that waterfowl hunting was "no more important than my other recreational activities" (Table 4-2). Waterfowl hunting was less

Section 4: Motivations for and Involvement in Waterfowl Hunting

important to these respondents than to respondents to the 2005 and 2010 statewide surveys (Table 4-2) (Schroeder et al., 2007; Schroeder et al., in press).

Respondents were also asked to indicate if they were casual, active, or committed waterfowl hunters when they hunted for waterfowl in Minnesota. They were provided brief descriptions of these definitions. The majority of respondents (50.6%) identified themselves as casual waterfowl hunters (Table 4-3).

Next, we asked respondents to indicate if they were novice, intermediate, advanced, or expert waterfowl hunters, without any definition of these terms. More respondents identified themselves as intermediate (49.5%) or advanced (27.3%), than novice (19.6%) or expert (3.5%) and waterfowl hunters (Table 4-4).

Respondents were also asked to indicate how much they identified with waterfowl hunting, when they hunted for waterfowl in Minnesota. About 4 in 10 respondents indicated that “I was a waterfowl hunter, but I no longer consider myself one,” 24.9% indicated that “I went waterfowl hunting but I did not really consider myself a waterfowl hunter,” 20.1% indicated “I was a waterfowl hunter, and I still consider myself one,” and 14.1% indicated that “I was in the process of becoming a waterfowl hunter” (Table 4-5).

Involvement/Commitment to Waterfowl Hunting

Respondents were asked to rate 21 items addressing their involvement and commitment to waterfowl hunting, using the scale 1=strongly disagree to 5=strongly agree (Table 4-6). Respondents most strongly agreed that (a) waterfowl hunting was interesting to me ($\bar{x}=4.0$), (b) waterfowl hunting was one of the most enjoyable things I did ($\bar{x}=3.6$), (c) I was knowledgeable about waterfowl hunting ($\bar{x}=3.6$), (d) the decision to go waterfowl hunting was primarily my own ($\bar{x}=3.6$), and (e) I enjoyed discussing waterfowl hunting with my friends ($\bar{x}=3.6$). Respondents disagreed most that: (a) a lot of my life was organized around waterfowl hunting ($\bar{x}=2.4$), (b) waterfowl hunting had a central role in my life ($\bar{x}=2.4$), (c) I did not really know much about waterfowl hunting ($\bar{x}=2.4$), and (d) I found a lot of my life organized around waterfowl-hunting activities ($\bar{x}=2.4$).

Respondents who reported greater levels of skill and identity associated with waterfowl hunting reported stronger involvement and commitment to waterfowl hunting.

Using exploratory factor analysis, we identified three factors related to these respondents' past involvement in waterfowl hunting. They included: (a) centrality ($\bar{x}=2.9$), (b) knowledge ($\bar{x}=3.6$), and (c) identity/social ($\bar{x}=3.2$).

Ten items loaded on the centrality ($\alpha=0.935$) including: (a) waterfowl hunting was one of the most enjoyable things I did, (b) a lot of my life was organized around waterfowl hunting, (c) waterfowl hunting had a central role in my life, (d) waterfowl hunting was important to me, (e) I had a preference for waterfowl hunting over other leisure activities, (f) I found a lot of my life organized around waterfowl-hunting activities, (g) even if close friends recommended other recreational activities, I preferred waterfowl hunting, (h) I had acquired equipment that I could only use for waterfowl hunting, (i) I had close friendships based on a common interest in waterfowl hunting, and (j) compared to other waterfowl hunters, I owned a lot of waterfowl-hunting equipment. Four items loaded on the knowledge factor ($\alpha=0.758$) including: (a) I was knowledgeable about waterfowl hunting, (b) the decision to go waterfowl hunting was primarily my own, (c) I did not really know much about waterfowl hunting (reversed), and (d) I considered myself an educated consumer regarding waterfowl hunting. Five items loaded on the identity/social factor ($\alpha=0.659$): (a) most of my friends were in some way connected with waterfowl hunting, (b) when I was waterfowl hunting, others saw me the way I wanted them to see me, and (c) when

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I was waterfowl hunting I was really myself, (d) I enjoyed discussing waterfowl hunting with my friends, and (e) the decision to go waterfowl hunting was not entirely my own.

Compared to respondents who no longer hunted waterfowl, individuals who still hunted for waterfowl rated centrality (3.2 versus 2.8, $t = 3.1$, $p < 0.01$) and knowledge (3.8 versus 3.5, $t = 2.3$, $p < 0.05$) factors significantly higher.

Respondents to this survey rated nearly all items measuring involvement and commitment to waterfowl hunting significantly lower than respondents to the 2010 statewide waterfowl hunter survey did (Table 4-6).

Waterfowl-Hunting Equipment

Respondents answered a number of questions related to their ownership, in the past and currently, of different types of waterfowl-hunting equipment (Table 4-7). Nearly all respondents currently owned a shotgun or had owned one in the past. Over three-fourths had owned waterfowl decoys or calls, and about two-thirds owned duck-hunting boats or waterfowl-hunting dogs. About 40% had owned spinning-wing decoys. Looking at equipment that was owned in the past but not currently, we see that about 30% of respondents have gotten rid of their waterfowl decoys, battery-operated spinning-wing decoys, duck boats, and waterfowl-hunting dogs. Fewer respondents who owned waterfowl calls and shotguns reported that they no longer owned them.

There were significant differences in ownership of waterfowl-hunting equipment based on identity as a waterfowl hunter. Respondents who reported stronger identity as waterfowl hunters were more likely to currently own each of the different types of equipment listed. However, there were no significant differences by hunter identity in past ownership of all items listed with the exclusion of a waterfowl-hunting dog. It appears that while hunters with varying levels of identification with the activity acquired equipment for waterfowl hunting, those hunters who were less identified with the activity were more likely to get rid of waterfowl-hunting related equipment that they previously owned when their participation lapsed. Less identified individuals were less likely to have a dog in the past or currently.

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Table 4-1: Motivations for waterfowl hunting: Importance of...

| | n | % of hunters indicating _____ important | | | | | 2009 Lapsed WF Survey Mean ¹ | 2005 Statewide WF Survey | | 2010 Statewide WF Survey | |
|---|-----|---|----------|----------|-------|-----------|---|--------------------------|-----------|--------------------------|------------|
| | | Not at all | Slightly | Somewhat | Very | Extremely | | Mean ¹ | t-test | Mean ¹ | t-test |
| Enjoying nature and the outdoors | 313 | 0.6% | 0.3% | 9.9% | 41.9% | 47.3% | 4.35 | 4.59 | 5.92*** | 4.44 | 2.246* |
| The excitement of hunting | 310 | 3.2% | 2.6% | 15.2% | 39.7% | 39.4% | 4.09 | | | 4.34 | 4.492*** |
| The challenge of making a successful shot | 313 | 3.2% | 4.5% | 18.5% | 40.3% | 33.5% | 3.96 | | | 4.11 | 2.582* |
| Getting away from crowds of people | 311 | 3.9% | 6.4% | 17.7% | 39.5% | 32.5% | 3.90 | 4.39 | 8.18*** | 4.15 | 4.144*** |
| Being with friends | 310 | 4.8% | 2.6% | 22.6% | 45.5% | 24.5% | 3.82 | 3.96 | 2.44* | 3.99 | 2.976** |
| Good behavior among other waterfowl hunters | 312 | 8.0% | 9.0% | 15.1% | 34.3% | 33.7% | 3.77 | 4.43 | 9.52*** | 4.32 | 7.944*** |
| Seeing a lot of ducks and geese | 310 | 5.5% | 9.4% | 28.4% | 33.5% | 23.2% | 3.60 | 4.00 | 6.41*** | 3.92 | 5.141*** |
| Developing my skills and abilities | 309 | 7.8% | 7.4% | 35.0% | 33.7% | 16.2% | 3.43 | 3.56 | 2.09* | 3.41 | 0.329 n.s. |
| Reducing tension and stress | 312 | 12.2% | 12.2% | 28.5% | 27.2% | 19.9% | 3.30 | 3.82 | 7.22*** | 3.77 | 6.524*** |
| Hunting areas open to the public | 312 | 15.4% | 11.5% | 24.0% | 27.2% | 21.8% | 3.29 | 3.81 | 6.91*** | 3.74 | 5.988*** |
| Being with family | 303 | 25.1% | 9.9% | 15.5% | 28.1% | 21.5% | 3.11 | 4.01 | 10.49*** | 3.90 | 9.208*** |
| Thinking about personal values | 309 | 15.5% | 12.9% | 32.0% | 26.5% | 12.9% | 3.08 | 3.65 | 8.04*** | 3.50 | 5.906*** |
| Shooting a gun | 310 | 14.5% | 16.5% | 35.2% | 21.6% | 12.3% | 3.01 | | | 2.91 | 1.407 n.s. |
| Access to a lot of different hunting areas | 308 | 17.9% | 14.6% | 29.5% | 25.0% | 13.0% | 3.01 | 3.49 | 6.64*** | 3.27 | 3.617*** |
| Using my hunting equipment (decoys, boats, etc.) | 309 | 16.8% | 17.5% | 31.7% | 25.9% | 8.1% | 2.91 | 3.52 | 8.99*** | 3.41 | 7.367*** |
| Sharing my hunting skills and knowledge | 312 | 16.3% | 20.2% | 30.4% | 24.7% | 8.3% | 2.88 | 3.50 | 9.10*** | 3.49 | 8.951*** |
| Bagging ducks and geese | 311 | 14.1% | 20.9% | 34.4% | 24.4% | 6.1% | 2.87 | 3.00 | 1.98* | 3.10 | 3.553*** |
| Hunting with a dog | 311 | 27.7% | 13.5% | 24.1% | 16.4% | 18.3% | 2.84 | 3.40 | 6.75*** | 3.38 | 6.510*** |
| Having a long duck season | 313 | 21.4% | 16.6% | 33.2% | 23.3% | 5.4% | 2.75 | 3.24 | 7.33*** | 3.30 | 8.220*** |
| Being on my own | 308 | 28.2% | 19.5% | 27.3% | 15.6% | 9.4% | 2.58 | 2.96 | 5.07*** | 2.78 | 2.640** |
| Getting information about hunting seasons and conditions from the DNR or US Fish and Wildlife Service | 312 | 29.2% | 23.7% | 27.6% | 15.1% | 4.5% | 2.42 | 3.14 | 10.74*** | 2.99 | 8.505*** |
| Killing waterfowl | 307 | 37.1% | 23.5% | 26.7% | 10.4% | 2.0% | 2.16 | | | 2.43 | 4.302*** |
| Getting my own food | 310 | 45.5% | 20.6% | 19.4% | 11.0% | 3.5% | 2.06 | | | 2.30 | 3.496** |
| Getting my limit | 313 | 41.5% | 25.9% | 26.2% | 5.1% | 1.3% | 1.99 | 1.95 | 0.66 n.s. | 2.07 | 1.465 n.s. |
| A large daily duck bag limit | 307 | 45.3% | 25.1% | 21.5% | 6.8% | 1.3% | 1.94 | 2.07 | 2.25* | 2.19 | 4.290*** |
| Getting food for my family | 307 | 50.5% | 19.9% | 18.9% | 7.5% | 3.3% | 1.93 | 1.94 | 0.13 n.s. | 2.12 | 2.911** |

¹ Mean is based on the scale: 1 = not at all unimportant, 2 = slightly important, 3 = somewhat important, 4 = very important, 5 = extremely important.

Section 4: Motivations for and Involvement in Waterfowl Hunting

Table 4-2: Comparison of Importance of Waterfowl Hunting With Other Waterfowl Surveys.

| | 2009 Lapsed Waterfowl Hunter Survey | 2005 Statewide Waterfowl Hunter Survey | 2010 Statewide Waterfowl Hunter Survey |
|--|-------------------------------------|--|--|
| n | 313 | 2357 | 1879 |
| ...my most important recreational activity | 2.9% | 9.6% | 10.0% |
| ...one of my most important recreational activities | 29.4% | 53.2% | 47.6% |
| ...no more important than my other recreational activities | 37.1% | 26.2% | 29.0% |
| ...less important than my other recreational activities | 22.0% | 8.9% | 11.2% |
| ...one of my least important recreational activities. | 8.6% | 2.1% | 2.2% |
| | | X ² = 186.43*** | X ² = 136.32*** |

¹ Means are based on the following scale: 1 = very dissatisfied; 2 = moderately dissatisfied; 3 = slightly dissatisfied, 4 = neither; 5 = slightly satisfied; 6 = moderately satisfied; 7 = very satisfied.
n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Table 4-3: When you hunted for waterfowl in Minnesota, what type of waterfowl hunter did you consider yourself?

| N | % of hunters indicating... | | |
|-----|----------------------------|--------|-----------|
| | Casual | Active | Committed |
| 312 | 50.6% | 37.5% | 11.9% |

Table 4-4: When you hunted for waterfowl in Minnesota, how would you have described your waterfowl-hunting skills?

| N | % of hunters indicating... | | | |
|-----|----------------------------|--------------|----------|--------|
| | Novice | Intermediate | Advanced | Expert |
| 311 | 19.6% | 49.5% | 27.3% | 3.5% |

Table 4-5: When you hunted for waterfowl in Minnesota, how would you have identified with the activity of waterfowl hunting.

| N | % of hunters indicating... | | | |
|-----|--|--|--|--|
| | I went waterfowl hunting, but I did not really consider myself a waterfowl hunter. | I was in the process of becoming a waterfowl hunter. | I was a waterfowl hunter, but I no longer consider myself one. | I was a waterfowl hunter, and I still consider myself one. |
| 313 | 24.9% | 14.1% | 40.9% | 20.1% |

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Table 4-6: Involvement with and commitment to waterfowl hunting

| | N | % of respondents who... | | | | | Mean ¹ | 2010 Statewide WF Survey | |
|---|-----|-------------------------|----------|---------|-------|----------------|-------------------|--------------------------|---------------------|
| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | | Mean | t-test ² |
| Waterfowl hunting was interesting to me. | 307 | 1.6% | 1.3% | 13.0% | 62.2% | 21.8% | 4.0 | 4.39 | 8.916*** |
| Waterfowl hunting was one of the most enjoyable things I did. | 309 | 4.5% | 10.4% | 29.1% | 37.5% | 18.4% | 3.6 | 4.04 | 8.214*** |
| I was knowledgeable about waterfowl hunting. | 307 | 3.3% | 8.8% | 23.8% | 48.5% | 15.6% | 3.6 | 4.09 | 8.148*** |
| The decision to go waterfowl hunting was primarily my own. | 306 | 4.9% | 11.4% | 25.5% | 40.5% | 17.6% | 3.6 | 4.19 | 10.614*** |
| I enjoyed discussing waterfowl hunting with my friends. | 306 | 3.9% | 6.5% | 22.2% | 55.9% | 11.4% | 3.6 | 4.03 | 7.430*** |
| I considered myself an educated consumer regarding waterfowl hunting. | 307 | 5.5% | 10.4% | 27.0% | 47.2% | 9.8% | 3.5 | 3.93 | 8.416*** |
| Waterfowl hunting was important to me. | 306 | 4.2% | 11.4% | 33.7% | 36.9% | 13.7% | 3.4 | 4.16 | 12.465*** |
| I had acquired equipment that I could only use for waterfowl hunting. | 308 | 10.1% | 14.6% | 14.9% | 43.8% | 16.6% | 3.4 | 4.08 | 9.504*** |
| When I was waterfowl hunting I was really myself. | 305 | 3.9% | 11.5% | 41.0% | 35.4% | 8.2% | 3.3 | 3.82 | 9.376*** |
| I had close friendships based on a common interest in waterfowl hunting. | 307 | 11.7% | 16.3% | 25.4% | 35.2% | 11.4% | 3.2 | 3.61 | 6.307*** |
| I had a preference for waterfowl hunting over other leisure activities. | 305 | 6.6% | 22.3% | 32.8% | 32.5% | 5.9% | 3.1 | 3.43 | 5.844*** |
| Most of my friends were in some way connected with waterfowl hunting. | 303 | 11.9% | 20.8% | 26.1% | 34.7% | 6.6% | 3.0 | 3.06 | 0.413 n.s. |
| When I was waterfowl hunting, others saw me the way I wanted them to see me. | 307 | 14.0% | 13.0% | 37.5% | 25.7% | 9.8% | 3.0 | 3.60 | 8.437*** |
| You could tell a lot about a person when you see them waterfowl hunting. | 308 | 9.7% | 17.2% | 39.6% | 26.0% | 7.5% | 3.0 | 3.41 | 6.094*** |
| The decision to go waterfowl hunting was not entirely my own. | 307 | 15.0% | 25.7% | 23.1% | 30.6% | 5.5% | 2.9 | 2.35 | 7.636*** |
| Even if close friends recommended other recreational activities, I preferred waterfowl hunting. | 308 | 19.8% | 27.6% | 32.8% | 16.9% | 2.9% | 2.6 | 3.11 | 9.041*** |
| Compared to other waterfowl hunters, I owned a lot of waterfowl-hunting equipment. | 307 | 22.8% | 30.0% | 30.0% | 10.7% | 6.5% | 2.5 | 3.15 | 10.202*** |
| A lot of my life was organized around waterfowl hunting. | 307 | 23.1% | 33.6% | 27.7% | 12.1% | 3.6% | 2.4 | 2.75 | 5.786*** |
| Waterfowl hunting had a central role in my life. | 306 | 25.8% | 31.0% | 24.5% | 15.7% | 2.9% | 2.4 | 2.78 | 6.124*** |
| I did not really know much about waterfowl hunting. | 308 | 22.1% | 41.2% | 19.5% | 13.3% | 3.9% | 2.4 | 1.78 | 9.344*** |
| I found a lot of my life organized around waterfowl-hunting activities. | 305 | 21.6% | 33.8% | 28.5% | 13.4% | 2.6% | 2.4 | 2.69 | 4.544*** |

¹ Mean is based on the scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

² T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean.
n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

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Table 4-7: Which of the following types of equipment and supplies do you personally currently own or have you ever owned for waterfowl hunting ...

| Type of equipment or supplies | n | Owned in the past but not currently | Currently own | Ever owned ¹ |
|--|-----|-------------------------------------|---------------|-------------------------|
| Waterfowl decoys | 307 | 31.6% | 49.0% | 80.8% |
| Battery-operated, spinning wing decoy(s) | 307 | 30.2% | 10.1% | 40.4% |
| Duck or goose call | 307 | 17.7% | 65.3% | 82.7% |
| Shotgun | 307 | 7.1% | 91.9% | 98.0% |
| Duck hunting boat | 307 | 28.1% | 35.1% | 63.5% |
| Waterfowl hunting dog | 307 | 36.3% | 26.7% | 63.2% |

¹ Sum of past and current ownership data.

Section 5: Waterfowl Hunting Constraints

Constraints to Waterfowl Hunting

Respondents were asked to indicate if they could easily go waterfowl hunting, when they used to hunt for waterfowl in Minnesota and now. It appears that respondents are significantly more constrained in their ability to hunt now than when they used to hunt for waterfowl in Minnesota. Nearly 8 in 10 respondents (79.7%) said it was true that they could easily go waterfowl hunting when they used to hunt, and 55.3% said it was true now (Table 5-1).

Respondents were asked to rate how much 32 constraint items limited their participation in waterfowl hunting in Minnesota during the past 5 years (Table 5-2). Response was on the scale 1 (not at all) to 7 (very) limiting. The items identified as most limiting were: (a) work commitments ($\bar{x}=4.4$), (b) waterfowl populations too low ($\bar{x}=4.4$), (c) interest in other recreational activities ($\bar{x}=4.3$), (d) not enough leisure time ($\bar{x}=4.2$), and (e) prefer other types of hunting ($\bar{x}=4.0$). The items that were rated the least limiting were: (a) other people's concern for animals' pain and distress ($\bar{x}=1.4$), (b) articles I read in national magazines ($\bar{x}=1.5$), (c) articles I read in local newspapers or magazines ($\bar{x}=1.6$), (d) poor health ($\bar{x}=1.6$), (e) personal concern for animal pain & distress ($\bar{x}=1.7$), (f) waterfowl hunting is too difficult ($\bar{x}=1.7$), and (g) concern over wounding waterfowl ($\bar{x}=1.8$).

Using exploratory factor analysis, we identified eight factors related to constraints on respondents' past participation in waterfowl hunting. They included: (a) work and family ($\bar{x}=4.2$), (b) preference for other types of hunting or other activities ($\bar{x}=3.5$), (c) access ($\bar{x}=3.3$), (d) lack of need/desire for waterfowl for food ($\bar{x}=3.2$), (e) costs ($\bar{x}=3.1$), (f) age, health, and the difficulty of waterfowl hunting ($\bar{x}=2.0$), (g) concerns about hurting animals ($\bar{x}=1.6$), and (h) media ($\bar{x}=1.5$).

Five items loaded on the access factor ($\alpha=0.834$): (a) access to private land for hunting, (b) access to public land for hunting, (c) crowding at hunting areas, (d) no hunting opportunities near my home, (e) the timing of the waterfowl migration. Five items loaded on the age, health, and difficulty factor ($\alpha=0.739$): (a) age, (b) the amount of effort required to go hunting, (c) poor health, (d) having to get up too early in the morning, and (e) waterfowl hunting is too difficult. Three items loaded on the concern for hurting animals factor ($\alpha=0.825$): (a) personal concern for animal pain and distress, (b) other people's concern for animal pain and distress, and (c) concern over wounding waterfowl. Four items loaded on the cost factor ($\alpha=0.819$): (a) cost of equipment, (b) cost of licenses, (c) travel costs, and (d) waterfowl hunting regulations too restrictive. Three items loaded on the work and family factor ($\alpha=0.774$): (a) family commitments, (b) work commitments, and (c) not enough leisure time. Two items loaded on the lack of need/desire for waterfowl for food factor ($\alpha=0.906$): (a) no desire for waterfowl as food, and (b) no need for waterfowl as food. Three items loaded on the preference for other types of hunting or other activities factor ($\alpha=0.671$): (a) interest in other recreational activities, (b) prefer other types of hunting, and (c) having the right kind of equipment. Finally, two items loaded on the media factor ($\alpha=0.893$): (a) articles I read in national magazines and (b) articles I read in local newspapers or magazines.

There were no significant differences between individuals who still hunted for waterfowl those who no longer hunted waterfowl in constraint ratings.

These lapsed Minnesota waterfowl hunters rated a variety of constraints—other interests, family and work commitments, lack of desire or need for waterfowl for food, costs related to waterfowl hunting, and lack of access to public land and land near their homes to waterfowl hunt—as more limiting than respondents

Section 5: Waterfowl Hunting Constraints

to the 2010 statewide waterfowl hunter survey did. However, these respondents rated constraints related to waterfowl populations and the timing of the waterfowl migration as less limiting than respondents to the statewide survey rated them (Table 5-2).

Constraint Negotiation

Respondents were also asked to rate their use of 13 negotiation strategies to maintain their participation in waterfowl hunting (Table 5-3). Response was on the scale 1 (not at all) to 7 (very much). The strategies that respondents indicated using most were: (a) getting the equipment together beforehand so I could get out of the house on time ($\bar{x}=3.6$), (b) cutting short hunting outings to make time for other responsibilities ($\bar{x}=3.4$), (c) learning new ways to hunt waterfowl ($\bar{x}=3.3$), and (d) improvising with the hunting equipment that I had ($\bar{x}=3.0$). The strategies that were used least were: (a) having others take on more responsibilities around the house so that I could get out waterfowl hunting ($\bar{x}=1.7$), and (b) borrowing other hunters' equipment ($\bar{x}=2.0$).

Using exploratory factor analysis, we identified three factors related to constraint negotiation. They included: (a) time and money management ($\bar{x}=2.8$), (b) social management ($\bar{x}=2.5$), and (c) equipment management ($\bar{x}=2.9$).

Four items loaded on the time and money management ($\alpha=0.805$): (a) budgeting to save money for waterfowl hunting, (b) learning new ways to hunt waterfowl, (c) living within my means financially to save money for waterfowl hunting, and (d) getting work done earlier or staying up later to increase time for waterfowl hunting. Five items loaded on the social management factor ($\alpha=0.810$): (a) trying to find people to waterfowl hunt with, (b) asking for help to gain waterfowl hunting skills, (c) finding people with similar interests in waterfowl hunting, (d) waterfowl hunting with people who had similar work schedules, and (e) having others take on more responsibilities around the house so that I could get out waterfowl hunting. Three items loaded on the equipment management factor ($\alpha=0.642$): (a) improvising with the hunting equipment that I had, (b) borrowing other hunters' equipment, and (c) getting the equipment together beforehand so I could get out of the house on time.

Individuals who still hunted for waterfowl reported greater use of time and money management strategies to negotiate constraints to waterfowl hunting participation than respondents who no longer hunted waterfowl (3.4 versus 2.7, $t = 3.4$, $p < 0.01$).

When compared to current waterfowl hunters for the 2010 Minnesota waterfowl season, the lapsed Minnesota waterfowl hunters surveyed in this study reported greater use of equipment management strategies (i.e. borrowing hunting equipment or improvising with the equipment they had), but less use of time and money management strategies (Table 5-3).

Section 5: Waterfowl Hunting Constraints

Table 5-1: Constraints to waterfowl hunting: (a) how easy is was for you to go waterfowl hunting in Minnesota when you used to hunt for waterfowl in Minnesota and (b) how easy it would be for you to go waterfowl hunting in Minnesota now?

| | n | % of hunters indicating: | | | | | | | Mean ¹ | 2010 Statewide WF survey | |
|--|-----|--------------------------|------------------|----------------|---------|---------------|-----------------|-----------------|-------------------|--------------------------|---------------------|
| | | Definitely false | Moderately false | Slightly false | Neutral | Slightly true | Moderately true | Definitely true | | Mean | t-test ² |
| When I used to hunt for waterfowl in Minnesota, if I wanted to, I could easily go. | 306 | 2.9% | 3.9% | 5.6% | 7.8% | 16.3% | 24.5% | 38.9% | 5.6 | | |
| Now, if I wanted to go waterfowl hunting in Minnesota, I could easily go. | 307 | 10.4% | 12.4% | 12.1% | 9.8% | 16.3% | 10.7% | 28.3% | 4.6 | 5.62 | 8.949*** |
| Wilcoxon signed ranks test = 9.1*** | | | | | | | | | t = 10.3*** | | |

¹ Mean is based on the scale: 1 = definitely false, 2 = moderately false, 3 = slightly false, 4 = neutral, 5 = slightly true, 6 = moderately true, 7 = definitely true.

² T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean.

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

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Table 5-2: How much did the following factors limit your waterfowl hunting in Minnesota during the past 5 years?

| | n | How limiting? | | | | | | | Mean ² | 2010 Statewide | |
|---|-----|---------------|-------|-------|-------|-------|-------|-------|-------------------|----------------|---------------------|
| | | Not at all | | | | | | Very | | Mean | t-test ¹ |
| Work commitments | 305 | 19.7% | 5.9% | 6.2% | 13.4% | 14.4% | 19.0% | 21.3% | 4.4 | 4.28 | 0.909 n.s. |
| Waterfowl populations too low | 304 | 15.1% | 9.5% | 7.9% | 17.4% | 11.5% | 15.8% | 22.7% | 4.4 | 4.81 | 3.477** |
| Interest in other recreational activities | 299 | 14.7% | 6.4% | 8.0% | 22.1% | 17.4% | 18.7% | 12.7% | 4.3 | 3.45 | 7.511*** |
| Not enough leisure time | 305 | 19.3% | 5.9% | 11.5% | 14.4% | 11.8% | 18.4% | 18.7% | 4.2 | 3.63 | 4.915*** |
| Prefer other types of hunting | 304 | 23.7% | 8.6% | 8.6% | 15.1% | 11.5% | 17.1% | 15.5% | 4.0 | 2.96 | 11.941*** |
| Family commitments | 307 | 24.1% | 10.4% | 8.8% | 12.4% | 12.7% | 16.3% | 15.3% | 3.9 | 3.63 | 2.092* |
| Crowding at hunting areas | 301 | 26.9% | 8.6% | 8.0% | 16.3% | 10.6% | 14.3% | 15.3% | 3.8 | 3.69 | 0.768 n.s. |
| Access to private land for hunting | 306 | 32.0% | 9.5% | 7.8% | 11.8% | 9.2% | 10.5% | 19.3% | 3.7 | 3.47 | 1.347 n.s. |
| Access to public land for hunting | 301 | 31.9% | 9.3% | 11.3% | 16.9% | 12.3% | 8.0% | 10.3% | 3.3 | 2.89 | 3.729*** |
| Cost of equipment | 306 | 29.4% | 13.1% | 11.1% | 14.7% | 13.1% | 9.5% | 9.2% | 3.3 | 3.08 | 2.220* |
| Cost of licenses | 306 | 28.1% | 13.7% | 13.1% | 18.0% | 10.8% | 7.8% | 8.5% | 3.3 | 2.90 | 3.298** |
| No need for waterfowl as food | 304 | 35.2% | 12.8% | 5.6% | 18.4% | 6.3% | 7.6% | 14.1% | 3.3 | 2.21 | 8.383*** |
| No hunting opportunities near my home | 304 | 38.5% | 11.8% | 5.9% | 11.2% | 8.6% | 10.2% | 13.8% | 3.3 | 2.78 | 3.621*** |
| Travel costs | 303 | 28.7% | 13.9% | 14.9% | 15.8% | 10.9% | 6.9% | 8.9% | 3.2 | 3.33 | 0.902 n.s. |
| No desire for waterfowl as food | 305 | 30.8% | 13.4% | 9.5% | 20.3% | 8.9% | 9.5% | 7.5% | 3.2 | 2.15 | 9.367*** |
| Availability of waterfowl hunting partners | 305 | 32.5% | 13.4% | 12.5% | 15.7% | 11.5% | 8.5% | 5.9% | 3.1 | 2.60 | 4.457*** |
| Waterfowl hunting regulations too restrictive | 305 | 35.4% | 16.7% | 11.8% | 20.3% | 5.2% | 6.6% | 3.9% | 2.8 | 2.70 | 0.851 n.s. |
| The amount of effort required to go hunting | 304 | 39.1% | 13.5% | 12.8% | 14.8% | 10.9% | 6.9% | 2.0% | 2.7 | 2.38 | 3.468** |
| The timing of the waterfowl migration | 304 | 44.1% | 12.8% | 10.2% | 16.4% | 6.3% | 5.6% | 4.6% | 2.6 | 3.41 | 7.337*** |
| Amount of planning required to go hunting | 304 | 43.1% | 14.1% | 13.5% | 17.1% | 7.6% | 3.3% | 1.3% | 2.5 | 2.15 | 3.482** |
| Having the right kind of equipment | 303 | 47.2% | 15.8% | 6.9% | 13.2% | 6.6% | 6.9% | 3.3% | 2.5 | 2.02 | 4.576*** |
| The type of people that hunt waterfowl | 301 | 55.5% | 13.6% | 9.6% | 12.3% | 3.7% | 3.0% | 2.3% | 2.1 | 2.15 | 0.187 n.s. |
| Having the right breed of dog | 304 | 65.8% | 9.5% | 3.3% | 7.6% | 2.3% | 6.9% | 4.6% | 2.1 | 1.86 | 2.269* |
| Age | 302 | 63.2% | 8.3% | 7.6% | 13.2% | 5.3% | 1.7% | 0.7% | 2.0 | 1.86 | 1.266 n.s. |
| Having to get up too early in the morning | 305 | 61.6% | 13.4% | 6.9% | 8.5% | 4.3% | 3.3% | 2.0% | 2.0 | 1.73 | 2.802** |
| Concern over wounding waterfowl | 305 | 63.3% | 17.7% | 6.2% | 7.2% | 1.0% | 3.3% | 1.3% | 1.8 | 1.90 | 1.270 n.s. |
| Personal concern for animal pain & distress | 304 | 69.7% | 14.8% | 5.3% | 5.9% | 1.3% | 0.7% | 2.3% | 1.7 | 1.61 | 0.601 n.s. |
| Waterfowl hunting is too difficult | 304 | 67.8% | 14.5% | 7.9% | 5.6% | 2.6% | 0.7% | 1.0% | 1.7 | 1.56 | 1.553 n.s. |
| Poor health | 304 | 80.9% | 6.9% | 2.0% | 3.9% | 1.6% | 2.3% | 2.3% | 1.6 | 1.51 | 0.459 n.s. |
| Articles I read in local newspapers or magazines | 305 | 74.4% | 11.5% | 3.3% | 7.9% | 1.6% | 0.3% | 1.0% | 1.6 | 1.51 | 0.713 n.s. |
| Articles I read in national magazines | 304 | 77.0% | 10.2% | 3.9% | 7.2% | 1.3% | 0.0% | 0.3% | 1.5 | 1.44 | 0.524 n.s. |
| Other people's concern for animals' pain and distress | 306 | 81.0% | 9.2% | 3.9% | 4.2% | 0.0% | 0.7% | 1.0% | 1.4 | 1.49 | 1.770 n.s. |

¹ T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean.
n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 5: Waterfowl Hunting Constraints

Table 5-3: Constraint negotiation: how much did you use the following strategies to maintain your waterfowl hunting participation and satisfaction?

| | n | HOW MUCH YOU USED THE FOLLOWING STRATEGIES TO MAINTAIN YOUR PARTICIPATION IN WATERFOWL HUNTING? | | | | | | | Mean ¹ | 2010 Statewide WF survey | |
|---|-----|---|-------|-------|-------|-------|-------|-------|-------------------|--------------------------|------------|
| | | Not at all | | | | | | Very | | Mean | t-test |
| Getting the equipment together beforehand so I could get out of the house on time. | 304 | 30.3% | 8.9% | 8.2% | 12.8% | 14.1% | 11.8% | 13.8% | 3.6 | 4.11 | 1.770 n.s. |
| Cutting short hunting outings to make time for other responsibilities. | 300 | 26.7% | 12.3% | 13.0% | 17.7% | 14.0% | 9.3% | 7.0% | 3.4 | 3.53 | 1.517 n.s. |
| Learning new ways to hunt waterfowl. | 304 | 25.3% | 15.1% | 11.8% | 16.8% | 17.4% | 6.6% | 6.9% | 3.3 | 3.35 | 0.163 n.s. |
| Improvising with the hunting equipment that I had. | 304 | 36.2% | 10.9% | 11.2% | 15.5% | 11.8% | 9.9% | 4.6% | 3.0 | 2.77 | 2.404* |
| Getting work done earlier or staying up later to increase time for waterfowl hunting. | 304 | 35.2% | 15.8% | 11.5% | 15.5% | 11.8% | 5.6% | 4.6% | 2.9 | 3.43 | 5.162*** |
| Waterfowl hunting with people who had similar work schedules. | 304 | 35.5% | 16.4% | 7.9% | 19.7% | 10.2% | 6.6% | 3.6% | 2.9 | 3.05 | 1.728 n.s. |
| Finding people with similar interests in waterfowl hunting. | 304 | 33.2% | 19.7% | 14.1% | 15.1% | 9.5% | 4.6% | 3.6% | 2.8 | 2.84 | 0.773 n.s. |
| Trying to find people to waterfowl hunt with. | 304 | 35.9% | 18.4% | 13.2% | 14.8% | 9.5% | 5.6% | 2.6% | 2.7 | 2.66 | 0.509 n.s. |
| Budgeting to save money for waterfowl hunting. | 304 | 42.4% | 17.8% | 12.8% | 10.5% | 10.5% | 3.0% | 3.0% | 2.5 | 2.84 | 3.516** |
| Living within my means financially to save money for waterfowl hunting. | 303 | 41.6% | 17.5% | 10.9% | 16.2% | 7.9% | 3.0% | 3.0% | 2.5 | 2.88 | 3.704*** |
| Asking for help to gain waterfowl hunting skills. | 304 | 40.8% | 20.1% | 11.5% | 11.2% | 9.5% | 4.6% | 2.3% | 2.5 | 2.40 | 1.196 n.s. |
| Borrowing other hunters' equipment. | 302 | 58.9% | 14.6% | 8.9% | 6.6% | 5.3% | 3.3% | 2.3% | 2.0 | 1.70 | 3.707*** |
| Having others take on more responsibilities around the house so that I could get out waterfowl hunting. | 304 | 64.8% | 19.4% | 5.6% | 5.6% | 2.0% | 1.6% | 1.0% | 1.7 | 2.04 | 4.882*** |

¹ Mean is based on the scale: 1 = not at all limiting, 7 = very limiting

¹ T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean. 2010 statewide survey asked how much hunters use strategies to maintain waterfowl hunting participation.

Section 6: Future Waterfowl Hunting

Likelihood of Hunting Waterfowl in Minnesota in the Future

Respondents were asked to rate how likely they would be to hunt for ducks and geese again in the future, anywhere or specifically in Minnesota (Table 6-1). Response was on the scale 1 (very unlikely) to 7 (very likely). On average, ratings were just less than the neutral/undecided point on the scale. There was no difference in the likelihood of hunting ducks versus geese in the future. However, respondents reported a slightly stronger likelihood of hunting outside the state than in the state for both ducks ($t = 4.2$, $p < 0.001$) and geese ($t = 3.2$, $p < 0.01$).

Respondents who reported having intermediate or advanced hunting skills reported a somewhat stronger likelihood of waterfowl hunting in the future compared to respondents who reported having novice or expert hunting skills. Respondents who indicated that they were still waterfowl hunters, or “in the process of becoming a waterfowl hunter” reported a somewhat stronger likelihood of waterfowl hunting in the future compared to respondents who “went hunting but did not really consider myself a waterfowl hunter” or “was a waterfowl hunter but no longer consider myself one.”

Compared to respondents who no longer hunted waterfowl, individuals who still hunted for waterfowl reported a significantly higher likelihood of hunting in the next 5 years for: (a) ducks anywhere (6.0 versus 3.4, $t = 8.2$, $p < 0.001$), (b) geese anywhere (5.7 versus 3.3, $t = 7.6$, $p < 0.001$), (c) ducks in Minnesota (4.4 versus 3.3, $t = 3.5$, $p < 0.01$), and (d) geese in Minnesota (4.4 versus 3.3, $t = 3.4$, $p < 0.01$).

Factors That Might Increase the Likelihood of Waterfowl Hunting in Minnesota Again

Respondents were asked to respond to 24 items addressing factors that might increase their likelihood of waterfowl hunting in Minnesota (Table 6-2). Response was on the scale 1 (not at all) to 7 (very much). The items that were rated most likely to bring them back were: (a) a son or daughter who wanted to go waterfowl hunting in Minnesota ($\bar{x} = 4.8$), (b) another family member who wanted to go waterfowl hunting in Minnesota ($\bar{x} = 4.7$), (c) a dramatic increase in duck populations in Minnesota ($\bar{x} = 4.6$), and (d) better duck-hunting opportunities in Minnesota ($\bar{x} = 4.5$). The items that were least likely to bring them back were: (a) improved health, physical ability to waterfowl hunt. ($\bar{x} = 2.0$), (b) more support for waterfowl hunting at my job ($\bar{x} = 2.1$), (c) more support of waterfowl hunting in the community ($\bar{x} = 2.2$), (d) less interest in indoor leisure activities ($\bar{x} = 2.4$), (e) more support for waterfowl hunting from my friends ($\bar{x} = 2.4$), and (f) more support for waterfowl hunting from my family ($\bar{x} = 2.4$).

Using exploratory factor analysis, we identified four factors related that might increased lapsed hunters likelihood of waterfowl hunting in Minnesota. They included: (a) Minnesota waterfowl hunting conditions ($\bar{x} = 4.1$), (b) more money and support ($\bar{x} = 2.5$), (c) less interest in other activities ($\bar{x} = 2.9$), and (d) social ($\bar{x} = 4.4$).

Nine items loaded on the Minnesota waterfowl hunting conditions factor ($\alpha = 0.944$): (a) a dramatic increase in duck populations in Minnesota, (b) improved access for waterfowl hunting on private land in Minnesota, (c) more public land to hunt waterfowl in Minnesota, (d) improved access for waterfowl hunting on public land in Minnesota, (e) less crowding at waterfowl hunting areas in Minnesota, (f) better waterfowl habitat in Minnesota, (g) more opportunities to hunt geese in Minnesota, and (h) better duck-

Section 6: Future Waterfowl Hunting

hunting opportunities in Minnesota. Eight items loaded on the more money and support factor ($\alpha=0.880$): (a) more money in my budget for waterfowl hunting, (b) having better waterfowl hunting equipment, (c) more support for waterfowl hunting from my family, (d) more support for waterfowl hunting from my friends, (e) more support for waterfowl hunting in the community, (f) more support for waterfowl hunting at my job, and (g) improved health, physical ability to waterfowl hunt. Three items loaded on the less interest in other activities factor ($\alpha=0.819$): (a) less interest in other types of hunting, (b) less interest in other types of outdoor recreation, and (c) less interest in indoor leisure activities. Three items loaded on the social factor ($\alpha=0.785$): (a) friend(s) who wanted to go waterfowl hunting in Minnesota, (b) a son or daughter who wanted to go waterfowl hunting in Minnesota, and (c) another family member who wanted to go waterfowl hunting in Minnesota.

Individuals who still hunted for waterfowl reported that improvements in Minnesota waterfowl hunting conditions would have a significantly higher influence on their likelihood of hunting for waterfowl in Minnesota again (4.8 versus 4.0, $t = 2.7$, $p < 0.01$).

Section 6: Future Waterfowl Hunting

Table 6-1: Likelihood of hunting waterfowl in the future.

| | n | % of hunters indicating... | | | | | | | Mean ¹ |
|---------------------|-----|----------------------------|-------------------|-------------------|-----------|-----------------|-----------------|-------------|-------------------|
| | | Very Unlikely | Somewhat Unlikely | Slightly Unlikely | Undecided | Slightly Likely | Somewhat Likely | Very Likely | |
| Anywhere | | | | | | | | | |
| Ducks | 301 | 25.6% | 10.0% | 7.6% | 16.3% | 12.6% | 13.3% | 14.6% | 3.8 ² |
| Geese | 304 | 27.6% | 9.9% | 7.2% | 16.1% | 11.5% | 14.5% | 13.2% | 3.7 ³ |
| | | | | | | | | | t = 1.0 n.s. |
| In Minnesota | | | | | | | | | |
| Ducks | 302 | 30.5% | 10.3% | 7.0% | 19.2% | 11.9% | 12.3% | 8.9% | 3.4 ² |
| Geese | 304 | 30.3% | 9.2% | 7.6% | 19.1% | 12.5% | 13.2% | 8.2% | 3.5 ³ |
| | | | | | | | | | t = 0.3 n.s. |

¹ Mean is based on the scale: 1 = very unlikely, 2 = somewhat unlikely, 3 = slightly unlikely, 4 = undecided, 5 = slightly likely, 6 = somewhat likely, 7 = very likely.

² t = 4.2***

³ t = 3.2**

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 6: Future Waterfowl Hunting

Table 6-2: Factors that might increase likelihood of waterfowl hunting in Minnesota again.

| | n | HOW MUCH WOULD THE FOLLOWING CHANGES INCREASE YOUR LIKELIHOOD OF PARTICIPATING IN WATERFOWL HUNTING AGAIN IN MINNESOTA? | | | | | | | Mean ₁ | 2010 Statewide WF survey | |
|--|-----|---|-------|-------|-------|-------|-----------|-------|-------------------|--------------------------|---------------------|
| | | Not at all | | | | | Very much | | | Mean | t-test ² |
| A son or daughter who wanted to go waterfowl hunting in Minnesota. | 304 | 15.8% | 6.3% | 5.3% | 9.9% | 13.5% | 17.8% | 31.6% | 4.8 | 4.43 | 2.832** |
| Another family member who wanted to go waterfowl hunting in Minnesota. | 304 | 12.8% | 5.6% | 7.2% | 12.8% | 19.7% | 20.4% | 21.4% | 4.7 | 4.49 | 1.648 n.s. |
| A dramatic increase in duck populations in Minnesota. | 305 | 16.4% | 7.2% | 5.9% | 12.1% | 15.4% | 14.4% | 28.5% | 4.6 | 6.03 | 11.405*** |
| Better duck-hunting opportunities in Minnesota. | 305 | 19.7% | 5.2% | 3.9% | 13.8% | 15.1% | 17.0% | 25.5% | 4.5 | 5.61 | 8.663*** |
| More free time. | 303 | 20.1% | 6.3% | 5.9% | 13.2% | 15.2% | 15.5% | 23.8% | 4.4 | | |
| Better waterfowl habitat in Minnesota. | 304 | 20.7% | 5.9% | 9.2% | 13.5% | 12.5% | 15.5% | 22.7% | 4.3 | 5.53 | 9.807*** |
| More public land to hunt waterfowl in Minnesota | 299 | 22.4% | 6.4% | 9.7% | 13.4% | 13.4% | 11.4% | 23.4% | 4.2 | 4.77 | 4.621*** |
| Improved access for waterfowl hunting on public land in Minnesota. | 305 | 22.3% | 7.2% | 8.9% | 10.5% | 16.4% | 12.8% | 22.0% | 4.2 | 4.53 | 3.239** |
| Improved access for waterfowl hunting on private land in Minnesota. | 305 | 24.6% | 8.5% | 8.5% | 8.9% | 14.1% | 11.1% | 24.3% | 4.1 | 4.44 | 2.908** |
| Less crowding at waterfowl hunting areas in Minnesota. | 304 | 25.3% | 6.3% | 8.9% | 11.5% | 14.8% | 11.2% | 22.0% | 4.1 | 4.42 | 4.618*** |
| Friend(s) who wanted to go waterfowl hunting in Minnesota. | 303 | 22.1% | 7.9% | 8.6% | 18.2% | 19.1% | 12.5% | 11.6% | 3.9 | | |
| More opportunities to hunt geese in Minnesota. | 302 | 27.2% | 7.9% | 5.0% | 15.6% | 12.3% | 11.9% | 20.2% | 3.9 | 4.60 | 4.981*** |
| More money in my budget for waterfowl hunting. | 305 | 28.5% | 11.8% | 8.9% | 15.7% | 14.1% | 8.2% | 12.8% | 3.5 | | |
| Better behavior by hunters at waterfowl hunting areas in Minnesota. | 304 | 26.0% | 12.2% | 14.1% | 20.1% | 11.8% | 3.0% | 12.8% | 3.4 | | |
| Less interest in other types of outdoor recreation. | 304 | 33.9% | 11.2% | 5.3% | 21.1% | 11.8% | 10.5% | 6.3% | 3.2 | | |
| Less interest in other types of hunting. | 305 | 35.4% | 11.5% | 7.5% | 21.0% | 9.5% | 8.2% | 6.9% | 3.1 | | |
| Having better waterfowl hunting equipment. | 303 | 38.6% | 14.5% | 9.9% | 15.8% | 11.6% | 5.3% | 4.3% | 2.8 | | |
| Improving my waterfowl hunting skills. | 305 | 39.0% | 15.4% | 11.5% | 15.7% | 11.5% | 3.0% | 3.9% | 2.7 | | |
| More support for waterfowl hunting from my family. | 304 | 47.0% | 19.4% | 6.3% | 12.5% | 7.2% | 3.0% | 4.6% | 2.4 | 2.55 | 1.395 n.s. |
| More support for waterfowl hunting from my friends. | 304 | 48.0% | 18.1% | 9.5% | 10.2% | 7.9% | 2.0% | 4.3% | 2.4 | | |
| Less interest in indoor leisure activities. | 301 | 47.5% | 15.0% | 8.0% | 16.9% | 5.0% | 3.3% | 4.3% | 2.4 | | |
| More support of waterfowl hunting in the community. | 304 | 53.0% | 17.8% | 7.6% | 12.5% | 4.6% | 1.0% | 3.6% | 2.2 | | |
| More support for waterfowl hunting at my job. | 303 | 57.4% | 16.5% | 5.9% | 8.6% | 6.9% | 1.7% | 3.0% | 2.1 | | |
| Improved health, physical ability to waterfowl hunt. | 304 | 63.5% | 15.1% | 4.9% | 5.9% | 3.9% | 2.3% | 4.3% | 2.0 | 2.20 | 2.566* |

¹ Mean is based on the scale: 1 = not at all limiting, 7 = very limiting.

³ T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean. 2010 statewide survey asked what factors might *improve your satisfaction* with waterfowl hunting in Minnesota.

n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 7: Minnesota Department of Natural Resources Waterfowl Management

Trust in the Minnesota Department of Natural Resources for Waterfowl Management

Respondents were asked to respond to 6 items measuring trust in the Minnesota Department of Natural Resources for waterfowl management (Table 7-1). Response was on the 5-point scale 1 (strongly disagree) to 5 (strongly agree). All items were rated just above the neutral point on the scale.

Respondents who reported greater levels of involvement, skill and identity associated with waterfowl hunting reported lower levels of trust in Minnesota Department of Natural Resources waterfowl management.

Current Minnesota waterfowl hunters surveyed in the 2010 statewide waterfowl survey reported lower levels of trust in the Minnesota DNR than the lapsed waterfowl hunters surveyed here (Table 7-1).

Section 7: Minnesota DNR Waterfowl Management

Table 7-1: Trust in Minnesota Department of Natural Resources waterfowl management.

| | N | % of respondents who... | | | | | Mean ¹ | 2010 Statewide WF survey | |
|---|-----|-------------------------|----------|---------|-------|----------------|-------------------|--------------------------|---------------------|
| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | | Mean | t-test ² |
| The Minnesota DNR does a good job of managing waterfowl in Minnesota. | 300 | 7.0% | 10.7% | 43.7% | 34.0% | 4.7% | 3.2 | 2.90 | 5.289*** |
| When deciding about waterfowl management in Minnesota, the Minnesota DNR will be open and honest in the things they do and say. | 300 | 4.7% | 12.0% | 46.7% | 32.0% | 4.7% | 3.2 | 3.13 | 1.376 n.s. |
| The Minnesota DNR can be trusted to make decisions about waterfowl management that are good for the resource. | 301 | 7.3% | 9.3% | 38.5% | 39.2% | 5.6% | 3.3 | 3.12 | 2.615** |
| The Minnesota DNR will make decisions about waterfowl management in a way that is fair. | 301 | 3.7% | 10.0% | 38.5% | 41.9% | 6.0% | 3.4 | 3.17 | 3.858*** |
| The Minnesota DNR has waterfowl managers and biologists who are well-trained for their jobs. | 300 | 3.3% | 3.7% | 44.3% | 39.0% | 9.7% | 3.5 | 3.44 | 0.817 n.s. |
| The Minnesota DNR listens to waterfowl hunters' concerns. | 301 | 6.6% | 13.3% | 45.8% | 29.9% | 4.3% | 3.1 | 2.93 | 3.549*** |

¹ Mean is based on the scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

² T-test comparing 2009 lapsed waterfowl hunter survey mean to 2010 statewide waterfowl hunter survey mean. n.s.=not significant, *p<0.05, **p<0.01, ***p<0.001

Section 8: General Hunting Participation and Identity

Participation in Other Types of Hunting

Nearly 9 of 10 respondents (89.0%) indicated that they still considered themselves to be hunters (Table 8-1). Individuals who no longer considered themselves to be hunters reported lower hunting-related motivations (when they used to hunt), but they reported similar levels of motivations related to being in nature and being with friends. There was little difference in the reported constraints faced by those who still considered themselves hunters and those who did not, except that those who no longer considered themselves hunters reported a higher level of constraint related to other interests constraining their hunting participation. Of those who still considered themselves to be hunters, 77.6% had hunted in each of the previous 5 years (Table 8-2).

We reviewed the past 10 years of ELS license sales to see how many of different types of hunting licenses that survey respondents had purchased. On average, respondents had most frequently purchased firearm deer licenses ($\bar{x}=1.7$) and small game licenses ($\bar{x}=1.3$) (Table 8-3). About three-fourths of respondents had purchased a small game license and about half of respondents had purchased firearms deer licenses and pheasant stamps at least once during the 10 years of ELS records. Just over 60% of respondents had purchased an individual angling license at least one of the 10 years.

Public and Private Hunting Identity

Survey recipients responded to 10 items to measure public and private identity associated with hunting in general, *not specifically related to waterfowl hunting* (Table 8-4). Items were derived from Nasco and Webb, 2006. Response was on the scale 1 (strongly disagree) to 5 (strongly agree). Respondents agreed most strongly that (a) I obtain personal satisfaction from participating in hunting ($\bar{x}=4.6$) and (b) I would feel a great sense of loss if I suddenly were unable to participate in hunting ($\bar{x}=4.1$). Respondents disagreed that: (a) I often fear people will not like me as much if I do not hunt ($\bar{x}=1.4$), (b) I fear not being recognized as a hunter if I quit hunting ($\bar{x}=1.7$), (c) my popularity with others is related to my hunting participation ($\bar{x}=1.8$), and (d) my primary reason for hunting is recognition as a hunter ($\bar{x}=1.9$). Using scales of public identification versus private identification derived by Nasco and Webb (2006), we found that these lapsed waterfowl hunters had much stronger private ($\bar{x}=3.7$) than public ($\bar{x}=1.7$) identification as hunters. However, both types of identity were rated lower in this sample of lapsed waterfowl hunters than Nasco and Webb (2006) found for private identity ($\bar{x}=4.1$, $t=8.0$, $p<0.001$) and public identity ($\bar{x}=2.4$, $t=17.7$, $p<0.001$) in their sample of current and retired college athletes

There was no significant difference between individuals who still hunted for waterfowl and respondents who no longer hunted waterfowl in their public or private hunting identity.

Section 8: General Hunting Participation and Identity

Table 8-1: Still consider yourself a hunter?

| n | Yes | No |
|-----|-------|-------|
| 300 | 89.0% | 11.0% |

Table 8-2: If still a hunter, how many of the previous 5 years have you hunted for any type of game?

| % of respondents indicating __ years: | | | | | | Mean |
|---------------------------------------|------|------|------|------|-------|------|
| 0 | 1 | 2 | 3 | 4 | 5 | |
| 2.3% | 2.7% | 5.0% | 6.2% | 6.2% | 77.6% | 4.4 |

¹ Results include only respondents who indicate that they still consider themselves a hunter.

Table 8-3: If still a hunter, how many years purchased different types of licenses.

| License type | % of respondents who purchased a license __ years between 2000 and 2009... | | | | | | | | | | | Mean |
|-------------------------|--|-------|-------|-------|------|------|------|------|------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Angling ³ | 17.6% | 14.7% | 17.6% | 10.5% | 9.9% | 6.4% | 7.3% | 5.8% | 6.4% | 2.6% | 1.3% | 2.3 |
| Small game ⁴ | 9.6% | 39.6% | 18.2% | 12.1% | 7.3% | 4.2% | 3.8% | 1.6% | 2.6% | 0.0% | 1.0% | 3.2 |
| Pheasant | 51.9% | 23.1% | 11.3% | 7.5% | 2.7% | 0.7% | 1.2% | 0.8% | 0.7% | 0.0% | 0.0% | 1.0 |
| Firearm deer | 50.7% | 11.8% | 11.5% | 6.0% | 4.2% | 5.7% | 2.9% | 2.6% | 3.3% | 1.2% | 0.0% | 1.7 |
| Archery deer | 87.4% | 8.1% | 2.3% | 0.8% | 0.4% | 0.3% | 0.4% | 0.0% | 0.4% | 0.0% | 0.0% | 0.2 |
| Turkey | 96.6% | 1.9% | 0.7% | 0.0% | 0.4% | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.1 |

¹ Results include only respondents who indicate that they still consider themselves a hunter.

² Results derived from MNDNR ELS database

³ Angling includes all types of fishing licenses plus individual and combination sport licenses.

⁴ Small game includes small game licenses plus individual and combination sport licenses.

Section 8: General Hunting Participation and Identity

Table 8-4: If still a hunter, how much do you agree or disagree with the following statements about hunting in general?

| | N | % of respondents who... | | | | | Mean ² |
|---|-----|-------------------------|----------|---------|-------|----------------|-------------------|
| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | |
| I obtain personal satisfaction from participating in hunting. | 267 | 0.4% | 0.7% | 5.6% | 29.2% | 64.0% | 4.6 |
| I would feel a great sense of loss if I suddenly were unable to participate in hunting. | 267 | 5.2% | 6.7% | 9.7% | 25.1% | 53.2% | 4.1 |
| I participate in hunting because I am good at it. | 265 | 1.9% | 5.7% | 27.5% | 38.9% | 26.0% | 3.8 |
| Being a hunter is an important part of who I am. | 267 | 8.2% | 9.7% | 18.7% | 29.2% | 34.1% | 3.7 |
| It is very important for me to have success hunting. | 267 | 10.9% | 19.5% | 31.8% | 25.8% | 12.0% | 3.1 |
| Hunting helps me express my emotions and feelings. | 267 | 16.1% | 16.5% | 32.6% | 16.5% | 18.4% | 3.0 |
| My primary reason for hunting is recognition as a hunter. | 266 | 46.2% | 26.7% | 19.2% | 3.4% | 4.5% | 1.9 |
| My popularity with others is related to my hunting participation. | 266 | 49.2% | 28.6% | 15.8% | 5.6% | 0.8% | 1.8 |
| I fear not being recognized as a hunter if I quit hunting. | 265 | 56.6% | 27.5% | 11.7% | 2.3% | 1.9% | 1.7 |
| I often fear people will not like me as much if I do not hunt. | 267 | 68.2% | 24.0% | 6.0% | 1.1% | 0.7% | 1.4 |

¹ Results include only respondents who indicate that they still consider themselves a hunter.

² Mean is based on the scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Section 9: Participation in Other Outdoor Activities

Participation in Other Outdoor Activities

Respondents were asked to indicate whether they had ever participated in a list of outdoor activities in Minnesota. Participation rates in listed outdoor activities ranged from a low of 22.9% for cross-country skiing to 97.3% for fishing (Table 9-1). Over three-fourths of respondents had participated in fishing, motorized boating, and camping. Between one-half and three-fourths had participated in recreation at local parks, off-road vehicle driving, visiting Minnesota state parks, wildlife watching, visiting federal lands, and snowmobiling.

If individuals had ever participated in an outdoor activity in Minnesota, they were asked to indicate how many of the previous 5 years they had done that activity. On average, respondents who had fished had fished 4.5 of the previous 5 years (Table 9-2). Respondents had participated in fishing, wildlife-watching, motor boating, and recreation in local parks over 4 of the previous 5 years. Respondents who had ever cross-country skied had cross-country skied an average of 2.2 of the previous 5 years. For all other activities, respondents had participated an average of between 3 and 4 of the previous 5 years.

Section 9: Participation in Other Outdoor Activities

Table 9-1: Have you ever participated in the following activities in Minnesota?

| Activity | n | Yes | No |
|---|-----|-------|-------|
| Fishing | 299 | 97.3% | 2.7% |
| Motorized boating | 294 | 85.4% | 14.6% |
| Camping | 296 | 78.4% | 21.6% |
| Recreation at local parks | 294 | 73.7% | 26.3% |
| All-terrain vehicle driving | 296 | 66.2% | 33.8% |
| Recreation at Minnesota state parks | 296 | 63.5% | 36.5% |
| Non-motorized boating or canoeing | 297 | 61.3% | 38.7% |
| Bird or wildlife watching | 294 | 57.5% | 42.5% |
| Recreation on federal lands (e.g. national forests) | 297 | 56.9% | 43.1% |
| Snowmobiling | 298 | 54.7% | 45.3% |
| Cross-country skiing | 297 | 22.9% | 77.1% |

Table 9-2: If ever participated in activity in Minnesota, how many of the previous 5 years have you participated?

| | % of respondents indicating __ years: | | | | | | Mean |
|---|---------------------------------------|-------|-------|-------|------|-------|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | |
| Fishing | 1.0% | 2.0% | 5.8% | 8.2% | 5.1% | 77.8% | 4.5 |
| Bird or wildlife watching | 1.2% | 3.5% | 4.0% | 8.7% | 2.3% | 80.3% | 4.5 |
| Motorized boating | 1.2% | 2.7% | 6.3% | 7.4% | 6.6% | 75.8% | 4.4 |
| All-terrain vehicle driving | 1.0% | 5.5% | 8.5% | 10.5% | 5.5% | 69.0% | 4.2 |
| Recreation at local parks | 2.3% | 4.1% | 11.8% | 8.6% | 4.1% | 69.2% | 4.2 |
| Camping | 4.3% | 5.6% | 10.3% | 15.8% | 5.1% | 59.0% | 3.9 |
| Recreation at Minnesota state parks | 1.6% | 3.7% | 19.5% | 23.7% | 6.3% | 45.3% | 3.7 |
| Non-motorized boating or canoeing | 3.8% | 7.1% | 24.0% | 15.8% | 6.0% | 43.2% | 3.5 |
| Recreation on federal lands (e.g. national forests) | 2.9% | 11.6% | 19.8% | 16.9% | 6.4% | 42.4% | 3.4 |
| Snowmobiling | 6.1% | 12.1% | 21.2% | 13.3% | 3.6% | 43.6% | 3.3 |
| Cross-country skiing | 14.1% | 32.4% | 19.7% | 11.3% | 2.8% | 19.7% | 2.2 |

Section 10: Sociodemographic Information

Respondents were 39.6 years of age on average ($n = 314$). Nearly 95% of respondents were male ($n = 305$). On average respondents had lived in Minnesota for 37.6 years ($n = 304$), had lived on a farm or ranch for 8.2 years prior to age 18 ($n = 303$), and had lived on a farm or ranch for an average of 9.2 years since turning age 18 ($n = 301$). About half of respondents had children living in their home ($n = 304$). About one-third of respondents had a 4-year college degree or higher level of education (Table 10-1). About three-fourths of respondents were currently married (Table 10-2). Average household income was \$78,000 ($n = 266$).

Section 10: Sociodemographics

Table 10-1: Education¹

| Percent of respondents whose highest level of education was... | | | | | | | | |
|--|------------------|------------------------------|-------------------------------------|--------------------|--------------|-----------------------|----------------------|-----------------|
| Grade school | Some high school | High school diploma (or GED) | Some vocational or technical school | Associate's degree | Some college | 4-year college degree | Some graduate school | Graduate degree |
| 0.0% | 1.3% | 16.6% | 11.6% | 21.5% | 16.9% | 19.5% | 4.3% | 8.3% |

Table 10-2: Marital status¹

| n | % of respondents | | | |
|-----|------------------|---------------------|-----------------------|---------|
| | Single | Divorced or widowed | Living with a partner | Married |
| 302 | 13.9% | 5.3% | 5.6% | 75.2% |

References Cited

- Dillman, D. (2000). *Mail and Internet surveys: The tailored design method*. New York: John Wiley & Sons, Inc.
- Fulton, D. C., Vlaming, J., Lawrence, J. S. & Price, E. W. (2002). *The 2000 waterfowl hunting season in Minnesota: A study of hunters' opinions and activities*. Final Report to Minnesota Department of Natural Resources. USGS Minnesota Cooperative Fish and Wildlife Research Unit, University of Minnesota, St. Paul, MN.
- Nasco, S. A. & Webb, W. M. (2006). Toward an expanded measure of athletic identity: The inclusion of public and private dimensions. *Journal of Sport & Exercise Psychology*, 28, 434-453.
- Schroeder, S.A., Fulton, D.C., & Lawrence, J.S. (2004). *The 2002 Waterfowl Hunting Season in Minnesota: A Study of Hunters' Opinions and Activities*. Final Report to Minnesota Department of Natural Resources. USGS Minnesota Cooperative Fish and Wildlife Research Unit, University of Minnesota, St. Paul, MN.
- Schroeder, S. A., Fulton, D. C., Lawrence, J. S., & Cordts, S. D. (2007). *The 2005 Waterfowl Hunting Season in Minnesota: A Study of Hunters' Opinions and Activities*. Final Report to Minnesota Department of Natural Resources. USGS Minnesota Cooperative Fish and Wildlife Research Unit, University of Minnesota, St. Paul, MN.
- Schroeder, S. A., Fulton D. C., Lawrence, J. S., & Cordts, S. D. (2007). *Waterfowl hunting in Minnesota: A study of new waterfowl hunters' opinions and activities*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. 49 pp.
- Schroeder, S. A., Fulton, D. C., Lawrence, J. S., & Cordts, S. D. (2007). *Waterfowl hunting in North Dakota: A survey of Minnesota residents who hunt waterfowl in North Dakota*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. 85 pp.
- Schroeder, S. A., Lawrence, J. S., & Cordts, S. D. (In press). *The 2010 Waterfowl Hunting Season in Minnesota: A Study of Hunters' Opinions and Activities*. Final Report to Minnesota Department of Natural Resources. USGS Minnesota Cooperative Fish and Wildlife Research Unit, University of Minnesota, St. Paul, MN.
- Schroeder, S. A., Lawrence, J. S., & Cordts, S. D. (2007). *Waterfowl hunting in Minnesota: A follow-up study of respondents to the 2001 waterfowl survey*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. 152 pp.
- Schroeder, S. A., Lawrence, J.S., & Cordts, S. D. (2008). *The 2007 Waterfowl Hunting Season in Minnesota: A Study of Hunters' Opinions and Activities*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Dept. of Fisheries, Wildlife, and Conservation Biology. 30 pp.

Appendix A: Survey Instrument

WATERFOWL HUNTING IN MINNESOTA

**A study of people who hunted for waterfowl in Minnesota
from 2000 through 2004**



**A cooperative study conducted by the University of Minnesota for the
Minnesota Department of Natural Resources**

Your help on this study is greatly appreciated!

Please return your completed questionnaire in the enclosed envelope. The envelope is self-addressed and no postage is required. Thanks!

Minnesota Cooperative Fish and Wildlife Research Unit,
Department of Fisheries, Wildlife and Conservation Biology
University of Minnesota
St. Paul, Minnesota 55108-6124
(612) 624-3479
sas@umn.edu

Part I. Your Waterfowl Hunting Background in Minnesota

Q1. You have been identified as someone who purchased a Minnesota waterfowl stamp between 2000 and 2004, but not since then. Did you hunt for waterfowl in Minnesota during any of the years from 2000 through 2004? (Please check one.)

- No. _____ →
- Yes. (Please continue with Q2 and complete the rest of the survey.)

(Please stop here and return your survey.)

Part II. Past Waterfowl Hunting

Q2. When you hunted for waterfowl in Minnesota, did you primarily hunt for: (Please check one.)

- Ducks
- Geese
- Both ducks and geese

Q3. Estimate the first year and total number of seasons that you hunted for waterfowl, anywhere:

_____ First year hunting waterfowl _____ Number of seasons

Q4. Estimate the first year and total number of seasons that you hunted for waterfowl, in Minnesota:

_____ First year hunting waterfowl _____ Number of seasons

Q5. Do you still hunt for waterfowl? (Check one.)

- No. (If no, please skip to Q7.)
- Yes. (If yes, please answer Q6.)



Q6. During the past 5 years, have you hunted for waterfowl in places outside of Minnesota?

- No.
- Yes. (If yes, please list where you hunted and check the years you hunted there.)

| State or country | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------|------|------|------|------|------|
| | | | | | |
| | | | | | |
| | | | | | |

Q7. In your most recent waterfowl-hunting season in Minnesota, did you hunt... (Check one of the following.)

- mostly on privately owned areas
- mostly on public access areas (Wildlife Management Areas, Waterfowl Production Areas, public access waters)
- public and private about the same

Q8. During your most recent Minnesota waterfowl-hunting season, how satisfied or dissatisfied were you with the following? (Please circle one response for each. If you did not hunt ducks or geese, circle "9" in the right column.)

| | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied | Did not hunt ducks/geese |
|--------------------------------------|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|--------------------------|
| General waterfowl hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |

DUCKS:

| | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|
| hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting harvest | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting regulations | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat quality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat access | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| bag limit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |

GEESE:

| | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|
| hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting harvest | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting regulations | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat quality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat access | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| bag limit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |

Q9. Over the time that you hunted ducks and geese in Minnesota, did your overall satisfaction with duck and goose hunting in Minnesota decrease or increase? (Circle one response for each.)

| | Greatly decreased | Decreased | Stayed the same | Increased | Greatly increased | Did not hunt ducks/geese |
|-------|-------------------|-----------|-----------------|-----------|-------------------|--------------------------|
| Ducks | 1 | 2 | 3 | 4 | 5 | 9 |
| Geese | 1 | 2 | 3 | 4 | 5 | 9 |

Q10. During your most recent Minnesota waterfowl hunting season, how satisfied or dissatisfied were you with the number of ducks and geese you saw in the field? (Circle one response for each.)

| | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied | Did not hunt ducks/geese |
|-----------------------------|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|--------------------------|
| Number of ducks <u>seen</u> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| Number of geese <u>seen</u> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |

Part III. Your Participation in Minnesota Waterfowl Hunting

Q11. When you hunted for waterfowl in Minnesota, what type of waterfowl hunter were you: (Please check one.)

- Casual** (for example, waterfowl hunting was incidental to your other outdoor and recreational interests, you only went waterfowl hunting when asked by a family member or friend, or waterfowl hunting was not a particularly important outdoor activity)
- Active** (for example, you infrequently traveled away from home specifically to waterfowl hunt, or for you waterfowl hunting was an important but not primary outdoor activity)
- Committed** (for example, you were willing to travel on short notice to go waterfowl hunting, you purchased ever-increasing amounts of equipment to hunt waterfowl, or waterfowl hunting was a primary outdoor activity)

Q12. When you hunted for waterfowl in Minnesota, how important was waterfowl hunting to you? (Please check one.)

- It was my most important recreational activity.
- It was one of my most important recreational activities.
- It was no more important than my other recreational activities.
- It was less important than my other recreational activities.
- It was one of my least important recreational activities.

Q13. Describe your waterfowl hunting skills, when you hunted for waterfowl in Minnesota. (Please check one.)

- Novice
- Intermediate
- Advanced
- Expert

Q14. Thinking back to when you hunted for waterfowl in Minnesota, how would you have described your identification with the activity of waterfowl hunting. (Please check one.)

- I went waterfowl hunting, but I did not really consider myself a waterfowl hunter.
- I was in the process of becoming a waterfowl hunter.
- I was a waterfowl hunter, but I no longer consider myself one.
- I was a waterfowl hunter, and I still consider myself one.

Q15. How much did each of the following individuals or groups play a role in helping you participate in waterfowl hunting: (Please circle one response for each.)

| | Not at all | Slightly | Moderately | Very | Extremely |
|---------------------------------|------------|----------|------------|------|-----------|
| Parent | 1 | 2 | 3 | 4 | 5 |
| Sibling | 1 | 2 | 3 | 4 | 5 |
| Grandparent | 1 | 2 | 3 | 4 | 5 |
| Spouse or significant other | 1 | 2 | 3 | 4 | 5 |
| Other relative | 1 | 2 | 3 | 4 | 5 |
| Friend(s) | 1 | 2 | 3 | 4 | 5 |
| Neighbor(s) | 1 | 2 | 3 | 4 | 5 |
| Coworker(s) | 1 | 2 | 3 | 4 | 5 |
| Hunting equipment manufacturers | 1 | 2 | 3 | 4 | 5 |
| Hunting equipment retailers | 1 | 2 | 3 | 4 | 5 |
| State wildlife agency | 1 | 2 | 3 | 4 | 5 |
| Sportsmen's groups | 1 | 2 | 3 | 4 | 5 |
| Hunting-related TV shows | 1 | 2 | 3 | 4 | 5 |
| Hunting magazines | 1 | 2 | 3 | 4 | 5 |

Part IV. Waterfowl Hunting Motivations and Involvement

Q16. Thinking back to when you used to hunt for waterfowl in Minnesota, please tell us how much each of the following experiences motivated your participation. (Please circle one response for each.)

| | Not at all important | Slightly important | Somewhat important | Very important | Extremely important |
|---|-----------------------------|---------------------------|---------------------------|-----------------------|----------------------------|
| Enjoying nature and the outdoors | 1 | 2 | 3 | 4 | 5 |
| Getting away from crowds of people | 1 | 2 | 3 | 4 | 5 |
| Getting food for my family | 1 | 2 | 3 | 4 | 5 |
| Shooting a gun | 1 | 2 | 3 | 4 | 5 |
| A large daily duck bag limit | 1 | 2 | 3 | 4 | 5 |
| Access to a lot of different hunting areas | 1 | 2 | 3 | 4 | 5 |
| Bagging ducks and geese | 1 | 2 | 3 | 4 | 5 |
| Being on my own | 1 | 2 | 3 | 4 | 5 |
| Being with friends | 1 | 2 | 3 | 4 | 5 |
| Developing my skills and abilities | 1 | 2 | 3 | 4 | 5 |
| Being with family | 1 | 2 | 3 | 4 | 5 |
| Killing waterfowl | 1 | 2 | 3 | 4 | 5 |
| Getting information about hunting seasons and conditions from the DNR or US Fish and Wildlife Service | 1 | 2 | 3 | 4 | 5 |
| Getting my limit | 1 | 2 | 3 | 4 | 5 |
| Good behavior among other waterfowl hunters | 1 | 2 | 3 | 4 | 5 |
| Having a long duck season | 1 | 2 | 3 | 4 | 5 |
| Hunting areas open to the public | 1 | 2 | 3 | 4 | 5 |
| Hunting with a dog | 1 | 2 | 3 | 4 | 5 |
| Reducing tension and stress | 1 | 2 | 3 | 4 | 5 |
| Seeing a lot of ducks and geese | 1 | 2 | 3 | 4 | 5 |
| Sharing my hunting skills and knowledge | 1 | 2 | 3 | 4 | 5 |
| Thinking about personal values | 1 | 2 | 3 | 4 | 5 |
| Using my hunting equipment (decoys, boats, etc.) | 1 | 2 | 3 | 4 | 5 |
| Getting my own food | 1 | 2 | 3 | 4 | 5 |
| The excitement of hunting | 1 | 2 | 3 | 4 | 5 |
| The challenge of making a successful shot | 1 | 2 | 3 | 4 | 5 |

Q17. Thinking back to when you used to hunt for waterfowl in Minnesota, indicate how much you agree or disagree with the following statements about waterfowl hunting. *Circle one response for each:*

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| Waterfowl hunting was one of the most enjoyable things I did. | 1 | 2 | 3 | 4 | 5 |
| I was knowledgeable about waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| The decision to go waterfowl hunting was primarily my own. | 1 | 2 | 3 | 4 | 5 |
| A lot of my life was organized around waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| Waterfowl hunting had a central role in my life. | 1 | 2 | 3 | 4 | 5 |
| Most of my friends were in some way connected with waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| When I was waterfowl hunting, others saw me the way I wanted them to see me. | 1 | 2 | 3 | 4 | 5 |
| I did not really know much about waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| I considered myself an educated consumer regarding waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| Waterfowl hunting was interesting to me. | 1 | 2 | 3 | 4 | 5 |
| Waterfowl hunting was important to me. | 1 | 2 | 3 | 4 | 5 |
| You could tell a lot about a person when you see them waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| When I was waterfowl hunting I was really myself. | 1 | 2 | 3 | 4 | 5 |
| I enjoyed discussing waterfowl hunting with my friends. | 1 | 2 | 3 | 4 | 5 |
| The decision to go waterfowl hunting was not entirely my own. | 1 | 2 | 3 | 4 | 5 |
| I had a preference for waterfowl hunting over other leisure activities. | 1 | 2 | 3 | 4 | 5 |
| I found a lot of my life organized around waterfowl-hunting activities. | 1 | 2 | 3 | 4 | 5 |
| Even if close friends recommended other recreational activities, I preferred waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| I had acquired equipment that I could only use for waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| I had close friendships based on a common interest in waterfowl hunting. | 1 | 2 | 3 | 4 | 5 |
| Compared to other waterfowl hunters, I owned a lot of waterfowl-hunting equipment. | 1 | 2 | 3 | 4 | 5 |

Q18. Please check which of the following types of equipment and supplies you personally currently own or have ever owned for waterfowl hunting. (Please check one for each).

| | Owned in the past but not currently | Currently own |
|--|-------------------------------------|--------------------------|
| Waterfowl decoys | <input type="checkbox"/> | <input type="checkbox"/> |
| Battery-operated, spinning wing decoy(s) | <input type="checkbox"/> | <input type="checkbox"/> |
| Duck or goose call | <input type="checkbox"/> | <input type="checkbox"/> |
| Shotgun | <input type="checkbox"/> | <input type="checkbox"/> |
| Duck hunting boat | <input type="checkbox"/> | <input type="checkbox"/> |
| Waterfowl hunting dog | <input type="checkbox"/> | <input type="checkbox"/> |

Part V. Waterfowl Hunting Constraints

Many factors may limit peoples’ interest in waterfowl hunting and ability to hunt for waterfowl in Minnesota. We are interested in (a) how easy is was for you to go waterfowl hunting in Minnesota when you used to hunt for waterfowl in Minnesota and (b) how easy it would be for you to go waterfowl hunting in Minnesota now? (Circle one response for each.)

| | Definitely False | Moderately False | Slightly False | Neutral | Slightly True | Moderately True | Definitely True |
|--|------------------|------------------|----------------|---------|---------------|-----------------|-----------------|
| Q19. When I used to hunt for waterfowl in Minnesota, if I wanted to, I could easily go. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Q20. Now, if I wanted to go waterfowl hunting in Minnesota, I could easily go. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Q21. How much did the following factors limit your waterfowl hunting in Minnesota during the past 5 years? Circle one response for each:

| | HOW LIMITING? | | | | | | |
|---|---------------|---|---|---|---|---|------|
| | Not at all | | | | | | Very |
| Family commitments | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Work commitments | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Access to private land for hunting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Access to public land for hunting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Crowding at hunting areas | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Cost of equipment | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Cost of licenses | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Travel costs | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Waterfowl hunting regulations too restrictive | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Availability of waterfowl hunting partners | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Interest in other recreational activities | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Waterfowl populations too low | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| No desire for waterfowl as food | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| No need for waterfowl as food | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Personal concern for animal pain & distress | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Other people’s concern for animals’ pain and distress | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not enough leisure time | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| The type of people that hunt waterfowl | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Amount of planning required to go hunting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| The amount of effort required to go hunting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| No hunting opportunities near my home | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| The timing of the waterfowl migration | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Poor health | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Prefer other types of hunting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having the right kind of equipment | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having the right breed of dog | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having to get up too early in the morning | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Concern over wounding waterfowl | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Waterfowl hunting is too difficult | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Articles I read in national magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Articles I read in local newspapers or magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Q22. Thinking back to when you used to hunt for waterfowl in Minnesota, how much did you use the following strategies to maintain your waterfowl hunting participation and satisfaction. *Circle one response for each:*

| <u>When you hunted for waterfowl in Minnesota...</u> | HOW MUCH YOU USED THE FOLLOWING STRATEGIES TO MAINTAIN YOUR PARTICIPATION IN WATERFOWL HUNTING? | | | | | | |
|---|--|---|---|------------------|---|---|---|
| | Not at all | | | Very much | | | |
| Budgeting to save money for waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Learning new ways to hunt waterfowl. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Trying to find people to waterfowl hunt with. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Living within my means financially to save money for waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Cutting short hunting outings to make time for other responsibilities. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Getting work done earlier or staying up later to increase time for waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Asking for help to gain waterfowl hunting skills. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Finding people with similar interests in waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Waterfowl hunting with people who had similar work schedules. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having others take on more responsibilities around the house so that I could get out waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Borrowing other hunters' equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Improvising with the hunting equipment that I had. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Getting the equipment together beforehand so I could get out of the house on time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Part VI. Future Waterfowl Hunting

Q23. Please indicate how likely it is you will hunt ducks or geese during the next 5 years anywhere.
(Please circle one response for each activity.)

| | Very Unlikely | Somewhat Unlikely | Slightly Unlikely | Undecided | Slightly Likely | Somewhat Likely | Very Likely |
|-------|---------------|-------------------|-------------------|-----------|-----------------|-----------------|-------------|
| Ducks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Geese | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Q24. Please indicate how likely it is you will hunt ducks or geese during the next 5 years in Minnesota.
(Please circle one response for each activity.)

| | Very Unlikely | Somewhat Unlikely | Slightly Unlikely | Undecided | Slightly Likely | Somewhat Likely | Very Likely |
|-------|---------------|-------------------|-------------------|-----------|-----------------|-----------------|-------------|
| Ducks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Geese | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Q25. We are interested in what factors might increase your likelihood of participating in waterfowl hunting again in Minnesota. Circle one response for each:

| | HOW MUCH WOULD THE FOLLOWING CHANGES INCREASE YOUR LIKELIHOOD OF PARTICIPATING IN WATERFOWL HUNTING AGAIN IN MINNESOTA? | | | | | | |
|--|---|---|---|---|---|---|-----------|
| | Not at all | | | | | | Very Much |
| A dramatic increase in duck populations in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Improved access for waterfowl hunting on private land in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More public land to hunt waterfowl in Minnesota | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Friend(s) who wanted to go waterfowl hunting in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| A son or daughter who wanted to go waterfowl hunting in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Another family member who wanted to go waterfowl hunting in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Improved access for waterfowl hunting on public land in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Less crowding at waterfowl hunting areas in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Better behavior by hunters at waterfowl hunting areas in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More money in my budget for waterfowl hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Improving my waterfowl hunting skills. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Having better waterfowl hunting equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More support for waterfowl hunting from my family. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More support for waterfowl hunting from my friends. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More support of waterfowl hunting in the community. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More support for waterfowl hunting at my job. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Improved health, physical ability to waterfowl hunt. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More free time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Less interest in other types of hunting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Less interest in other types of outdoor recreation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Less interest in indoor leisure activities. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Better waterfowl habitat in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| More opportunities to hunt geese in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Better duck-hunting opportunities in Minnesota. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Part VII. Minnesota DNR Waterfowl Management

Q26. How do you feel about the Minnesota Department of Natural Resources (DNR)? Please circle one response for each of the following statements:

| | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|-------------------|----------|----------------------------|-------|----------------|
| The Minnesota DNR does a good job of managing waterfowl in Minnesota. | 1 | 2 | 3 | 4 | 5 |
| When deciding about waterfowl management in Minnesota, the Minnesota DNR will be open and honest in the things they do and say. | 1 | 2 | 3 | 4 | 5 |
| The Minnesota DNR can be trusted to make decisions about waterfowl management that are good for the resource. | 1 | 2 | 3 | 4 | 5 |
| The Minnesota DNR will make decisions about waterfowl management in a way that is fair. | 1 | 2 | 3 | 4 | 5 |
| The Minnesota DNR has waterfowl managers and biologists who are well-trained for their jobs. | 1 | 2 | 3 | 4 | 5 |
| The Minnesota DNR listens to waterfowl hunters' concerns. | 1 | 2 | 3 | 4 | 5 |

Part VIII. General Hunting Participation and Identity

Q27. Do you still consider yourself a hunter?

- No. (If no, please skip to Q30.)
- Yes. (If yes, please answer Q28 and Q29.)

Please note these questions refer to hunting in general, NOT waterfowl hunting in particular!!

→ **Q28. If yes, in how many of the previous 5 years (2005-2009) have you hunted for any type of game? (Circle one number.)**

Number of years: 0 1 2 3 4 5

→ **Q29. Please indicate how much you agree or disagree with the following statements about hunting in general, NOT specifically about waterfowl hunting. (Please circle one response for each.)**

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|-------------------|----------|---------|-------|----------------|
| I obtain personal satisfaction from participating in hunting. | 1 | 2 | 3 | 4 | 5 |
| I participate in hunting because I am good at it. | 1 | 2 | 3 | 4 | 5 |
| I often fear people will not like me as much if I do not hunt. | 1 | 2 | 3 | 4 | 5 |
| My primary reason for hunting is recognition as a hunter. | 1 | 2 | 3 | 4 | 5 |
| Being a hunter is an important part of who I am. | 1 | 2 | 3 | 4 | 5 |
| I fear not being recognized as a hunter if I quit hunting. | 1 | 2 | 3 | 4 | 5 |
| I would feel a great sense of loss if I suddenly were unable to participate in hunting. | 1 | 2 | 3 | 4 | 5 |
| Hunting helps me express my emotions and feelings. | 1 | 2 | 3 | 4 | 5 |
| It is very important for me to have success hunting. | 1 | 2 | 3 | 4 | 5 |
| My popularity with others is related to my hunting participation. | 1 | 2 | 3 | 4 | 5 |

Part IX. Other Outdoor Activities

Q30. Please indicate whether you have ever participated in the following outdoor activities in Minnesota. If you have, indicate how many years during the previous 5 years that you participated.

| Have you ever participated in ___ in Minnesota | Please circle no or yes. | | If yes, please circle how many years you participated during the previous 5 years, | | | | | |
|---|--------------------------|-----|--|---|---|---|---|---|
| Fishing | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Camping | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Bird or wildlife watching | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Snowmobiling | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Cross-country skiing | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Motorized boating | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Non-motorized boating or canoeing | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| All-terrain vehicle driving | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Recreation at Minnesota state parks | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Recreation on federal lands (e.g. national forests) | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |
| Recreation at local parks | no | yes | 0 | 1 | 2 | 3 | 4 | 5 |

Part X. Demographic Information

Q31. How many years have you lived in Minnesota?

_____ years

Q32. How many years did you live on a farm or ranch, or in a non-suburban rural area from birth until age 17?

_____ years

Q33. How many years have you lived on a farm or ranch, or in a non-suburban rural area from age 18 until now?

_____ years

Q34. What is the highest level of education you have completed? (Check one.)

- | | |
|--|---|
| <input type="checkbox"/> Grade school | <input type="checkbox"/> Some college |
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Four-year college (bachelor's) degree |
| <input type="checkbox"/> High school diploma or GED | <input type="checkbox"/> Some graduate school |
| <input type="checkbox"/> Some vocational or technical school | <input type="checkbox"/> Graduate (master's or doctoral) degree |
| <input type="checkbox"/> Vocational or technical school (associate's) degree | |

Q35. What is your gender? (Check one.)

- Male
 Female

Q36. What was your approximate total (gross) household income before taxes last year?

\$ _____

Q37. Which of the following best describes your current marital status? (Check one.)

- Single
 Divorced or widowed
 Living with a partner
 Married

Q38. Do you currently have children (under age 19) living with you? (Check one.)

- Yes
 No

Appendix B: Nonresponse survey

FOLLOW-UP SURVEY ON WATERFOWL HUNTING IN MINNESOTA

A study of people who hunted for waterfowl in Minnesota from 2000 through 2004

Dear survey recipient,

During the past few months, we have sent you several survey mailings. We are sending you this one-page survey because we are concerned that people who have not responded may differ from those who have already responded. We appreciate your willingness to complete this short survey as we conclude this effort to better understand the opinions of waterfowl hunters in Minnesota.

Sincerely,

David Fulton, Ph.D., Associate Professor

Q1. You have been identified as someone who purchased a Minnesota waterfowl stamp between 2000 and 2004, but not since then. Did you hunt for waterfowl in Minnesota during any of those years? (Please check one.)

- No. _____ → (Please stop here and return your survey.)
- Yes. (Please continue with Q2 and complete the rest of the survey.)

Q2. When you hunted for waterfowl in Minnesota, did you primarily hunt for: (Please check one.)

- Ducks
- Geese
- Both ducks and geese

Q3. Estimate the first year and total number of seasons that you hunted for waterfowl, anywhere:

_____ First year hunting waterfowl _____ Number of seasons

Q4. Estimate the first year and total number of seasons that you hunted for waterfowl, in Minnesota:

_____ First year hunting waterfowl _____ Number of seasons

Q5. Do you still hunt for waterfowl? (Check one.)

- No.
- Yes.

PLEASE CONTINUE THE SURVEY ON THE BACK OF THE PAGE →→→

Q6. During your most recent Minnesota waterfowl-hunting season, how satisfied or dissatisfied were you with the following? (Please circle one response for each. If you did not hunt ducks or geese, circle "9" in the right column.)

| | Very dissatisfied | Moderately dissatisfied | Slightly dissatisfied | Neither | Slightly satisfied | Moderately satisfied | Very satisfied | Did not hunt ducks/geese |
|--------------------------------------|-------------------|-------------------------|-----------------------|---------|--------------------|----------------------|----------------|--------------------------|
| General waterfowl hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| DUCKS: | | | | | | | | |
| hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting harvest | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting regulations | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat quality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat access | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| bag limit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| GEESE: | | | | | | | | |
| hunting experience | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting harvest | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| hunting regulations | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat quality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| habitat access | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |
| bag limit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 |

Q7. When you hunted for waterfowl in Minnesota, how important was waterfowl hunting to you? (Please check one.)

- It was my most important recreational activity.
- It was one of my most important recreational activities.
- It was no more important than my other recreational activities.
- It was less important than my other recreational activities.
- It was one of my least important recreational activities.

Q8. Describe your waterfowl hunting skills, when you hunted for waterfowl in Minnesota. (Please check one.)

- Novice
- Intermediate
- Advanced
- Expert

Q9. Please indicate how likely it is you will hunt ducks or geese during the next 5 years in Minnesota. (Please circle one response for each activity.)

| | Very Unlikely | Somewhat Unlikely | Slightly Unlikely | Undecided | Slightly Likely | Somewhat Likely | Very Likely |
|-------|---------------|-------------------|-------------------|-----------|-----------------|-----------------|-------------|
| Ducks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Geese | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Q10. Do you still consider yourself a hunter (for any type of game)?

- No.
- Yes.

Please write any additional comments on additional sheets.

Please complete this questionnaire and return it in the postage-paid return envelope to: Minnesota Cooperative Fish and Wildlife Research Unit, University of MN, 200 Hodson Hall; 1980 Folwell Avenue; St. Paul, MN 55108