

MINNESOTA DNR WILDLIFE MANAGEMENT AREA USER STUDY (2015-2016 SEASON)



Final Report

A cooperative study conducted by:

Minnesota Cooperative Fish and Wildlife Research Unit

Minnesota Department of Natural Resources



MINNESOTA DNR WILDLIFE MANAGEMENT AREA USER STUDY (2015-2016 SEASON)

Prepared by:

Kelsie LaSharr

Graduate Research Assistant

Minnesota Cooperative Fish and Wildlife Research Unit

Department of Fisheries, Wildlife, and Conservation Biology

University of Minnesota

Louis Cornicelli

Wildlife Research Manager

Minnesota Department of Natural Resources

Acknowledgements

This study was a cooperative effort supported by the Minnesota Department of Natural Resources (DNR), Section of Wildlife and the U.S. Geological Survey through the Minnesota Cooperative Fish and Wildlife Research Unit at the University of Minnesota. An enormous thank you goes to the Minnesota DNR staff, especially those involved with Wildlife Management Area management. We think David Fulton for providing technical assistance throughout this project. We give special thanks to Bob Welsh for his help with implementation of this project; John Giudice, Dave Staples, and Eric Walberg for their notes on study design and analysis; and Nathan Mullendore, Ross Hier (retired), and Curt Vacek for their input on survey design. We also thank the student technicians from the UMN Twin Cities, Morris, and Crookston who drove the routes. Most of all I thank the many Minnesota hunters and supporters of the Wildlife Management Area program who took the time to complete the survey. Their feedback, comments, and insight will help managers further understand the preferences for hunting experiences and management strategies, as well as the economic benefits accumulated through the use of WMA sites. This study was funded by MNDNR and through the Federal Aid in Wildlife Restoration Act.

Suggested Citation

LaSharr, K. & Cornicelli L. (2017). *Survey of Minnesota Wildlife Management Area Users Participating in the 2015-2016 Seasons*. Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife and Conservation Biology. University of Minnesota, St. Paul, MN 55108

Contact Information

- 1) David Fulton, Principal Investigator
Minnesota Cooperative Fish and Wildlife Research Unit
University of Minnesota
200 Hodson Hall, 1980 Folwell Avenue
St. Paul, MN 55108
(612) 624-3479 (phone)
(612) 625-5299 (fax)
dcfulton@umn.edu

Executive Summary

We used a self-administered mail-back questionnaire to gather information about visitors' use preferences and participation rates at Wildlife Management Areas (WMAs) in Minnesota during the 2015-2016 hunting season. We recruited potential study participants in the field on weekends during the hunting season (September 26 through December 6, 2015) and randomly using individuals from the Minnesota Department of Natural Resources' (DNR) ELS system. For the ELS recruitment, we only considered individuals who purchased both a pheasant stamp and a small game hunting license for the 2015-2016 hunting season. We ultimately sent questionnaires to 1,375 individuals, with 11 undeliverable, and a total of 949 surveys returned, a 70% return rate. We also sent a shortened questionnaire to non-respondents to determine if there was any non-response bias.

The questionnaire included the following topic areas:

- Hunting participation during the 2015-2016 season on WMAs
- Economics of hunting WMAs
- WMA hunting participation and hunt satisfaction
- Land types hunted (other than WMAs) and crowding
- Participation in activities on WMAs
- User beliefs about WMAs
- Respondents' constraints that prevent WMA use
- Important components for WMA maintenance and satisfactory experiences
- Sources of information for locating WMAs
- Opposition or support of management actions for WMAs
- Use of lead shot
- WMA user demographic characteristics

Demographics of WMA Users during the fall 2015 hunting season

The average user in this study was a 51 year old, white male. We found the average survey respondent was 14 years old the first time they went hunting; however, less than half of respondents indicated they took a dependent hunting with them. In addition, 47% of respondents come from childhood communities with less than 5,000 people, but only 40% of respondents currently live in communities of that same size.

Hunting participation on WMAs

We found respondents had the highest interest in pheasant hunting (80%), followed by duck hunting (37%) and firearm deer hunting (31%). We also found lowest participation for hunting individual species are rabbits (6%), squirrels (5%), and fall turkey (3%). Lac Qui Parle, Kandiyohi, and Stearns counties were included in the top 5 counties reported for pheasant, waterfowl, and deer (firearm, archery, and muzzleloader seasons combined) hunting. We found respondents spent the most time hunting deer (combined seasons, $\bar{x} = 7.11$ days) when compared to waterfowl ($\bar{x} = 5.92$ days) and pheasant ($\bar{x} = 5.07$ days). However, respondents were more likely to visit a higher number of WMAs on a single trip when hunting pheasant ($\bar{x} = 2.19$ WMAs/trip) than compared to either deer ($\bar{x} = 1.53$ WMAs/trip) or waterfowl ($\bar{x} = 1.37$ WMAs/trip).

Economics of Hunting WMAs

A separate report on the travel-cost benefits of using WMAs in Minnesota is in preparation.

Hunter Satisfaction

We found hunters were generally content with their hunting experiences at WMAs, with an average rating of 4.60 across all species on a 7-point scale ranging from “Very Dissatisfied” to “Very Satisfied”. Spring turkey hunters had the highest satisfaction ($\bar{x} = 5.37$), followed closely by fall turkey ($\bar{x} = 5.00$), and archery deer hunters ($\bar{x} = 4.90$). Respondents also noted a very high general satisfaction of experiences at WMAs with an overall mean of 5.08. This is higher than the average satisfaction scores for most individual species (Figure ES- 1). Over half of respondents (55%) recorded being moderately to extremely satisfied with their WMA overall experiences.

Land Types and Crowding Effects

We assessed crowding on different land ownership types using a 9-point scale, ranging from “Not Crowded At All” to “Extremely Crowded”. We found that WMA ($\bar{x} = 4.23$) and Waterfowl Production Areas (WPA; $\bar{x} = 4.14$) hunters reported the highest level of crowding, followed by Walk-In Access hunters (WIA; $\bar{x} = 3.38$). As expected, private land hunters reported the lowest crowding levels ($\bar{x} = 1.56$) (Figure ES- 2). In addition, 38.4% of users indicated that they use Private Land “None” of the time, demonstrating the importance of having public land available for hunting use.

We also asked hunters to rate their likelihood of returning to use a WMA in the future using a 7-point scale ranging from “Extremely Unlikely” to “Extremely Likely”. The overwhelming majority ($\bar{x} = 6.29$) indicated they planned to return to a WMA; in fact, 64% were “Extremely Likely” to return to a WMA (64%). Conversely, only 5.6% of respondents indicated they were “Slightly to Extremely Unlikely” to not return to a WMA.

Participation in Activities on WMAs

We found WMA hunters infrequently participated in activities on these properties outside the hunting season. Overall, 63% did not use WMAs for any activity outside the hunting season. For those who did, viewing wildlife/bird watching (not while hunting and fishing) was reported most often (30%; $n = 286$), followed by training with my dog (19%; $n = 178$). Picnicking had the lowest number of participants (2.7%; $n = 26$) during non-hunting seasons. However, it is important to note that these responses are self-reported and do not account for non-hunting users who were not represented in our study. In terms of seasonality for non-hunting activities, Fall was most popular (September 1st – November 30th) with 34% of respondents using WMAs during this time. The lowest response of non-hunting activities was Winter (December 1st – February 28th) with 20% of respondents using WMAs (Figure ES- 3).

Wildlife Management Area User Beliefs about WMAs

We found a large majority of respondents agree that the number of WMAs should be increased (86%). Respondents indicated they understood the rules for using WMAs (89%), WMAs provide an easy place to go hunting (88%), and also provide a place to take kids hunting (83%). More than half of the respondents agreed WMAs provide high quality hunting experiences (63%); however, they also feel that WMAs are too crowded (62%) and not enough WMAs are located near them (61%).

Respondents' constraints that prevent usage of WMAs

In order to determine which restrictions prevent visitors from using WMAs, we asked respondents to describe which constraints were the most limiting. Respondents answered on a 9-point scale ranging from “Not a Constraint” to “Extreme Constraint”. We found the most moderate to extreme constraints (ranked 6 or higher) to hunting WMAs for the following categories: 1) Not enough game (54%), 2) Lack of time (53%), and 3) Family/relationship responsibilities (28%). The least important constraints were 1) Difficulties due to age (7.4%), 2) Poor health (5.5%), and 3) Too much equipment needed (2.7%), (Figure ES- 4).

Important components for WMA maintenance and satisfactory experiences

We determined respondents' opinions about the upkeep and maintenance of WMAs, using a 7-point scale ranging from “Extremely Disagree” to “Extremely Agree”, and found the majority of respondents had a nearly consensus view. The three highest scoring components where the participant marked “Moderately Agree or Extremely Agree” were 1) Providing habitat for wildlife (96%), 2) Maintain habitat for game species (95%), and 3) Ensuring natural and undeveloped lands will exist for future generations (91%). While respondents rated all statements as important, the following had the lowest scores for “Moderately Agree or Extremely Agree”: 1) Maintaining scenic beauty (58%), 2) Providing educational learning opportunities (53%), and 3) Providing diverse recreational activities (49%). These statements show that WMA users believe strongly in the WMA program to support wildlife, including game species specifically.

Sources of information for locating WMAs

We found two sources of information to be “Moderately to Extremely Important” for more than half of respondents 1) spotting WMA signs in the field (60%) and using WMA boundary maps (57.3%). Most other sources of information were found to be less important to WMA users.

Support of Management Actions for WMAs

We asked hunters about their preferences for management actions and found that 85% “Moderately to Extremely Support” creating more WMAs, while 77% of users “Moderately to Extremely Support” wetland restoration/recovery efforts. The least supported management action was to provide exhibits to help visitors learn about WMAs (18%).

Use of Lead Shot

Our results show about half of respondents indicated that they never use lead shot (Figure ES- 5). However, we found a bimodal distribution of support for a future lead shot ban. Interestingly, respondents were more concerned about the effects of lead shot on wildlife ($\bar{x} = 4.82$) than they were on human health ($\bar{x} = 4.73$; 7-point scale ranging from “Extremely Oppose” to “Extremely Support”).

Table ES 1. Survey Response Rates

Sample Type	Surveys administered	Surveys returned	Response rate (%)	Non-response surveys administered	Non-response surveys returned	Response rate (%)
Field Intercept	443	288	65%	149	69	46%
Postcard	932	661	71%	269	72	27%
Total	1375	949	70%	418	141	34%

Figure ES- 1. Hunt Satisfaction

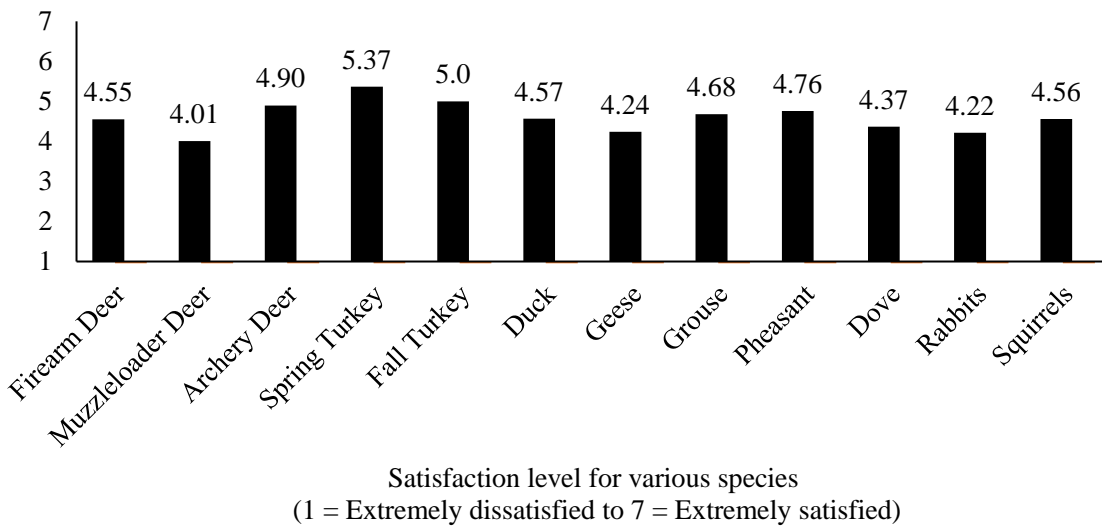


Figure ES- 2. Crowding effects on different land types.

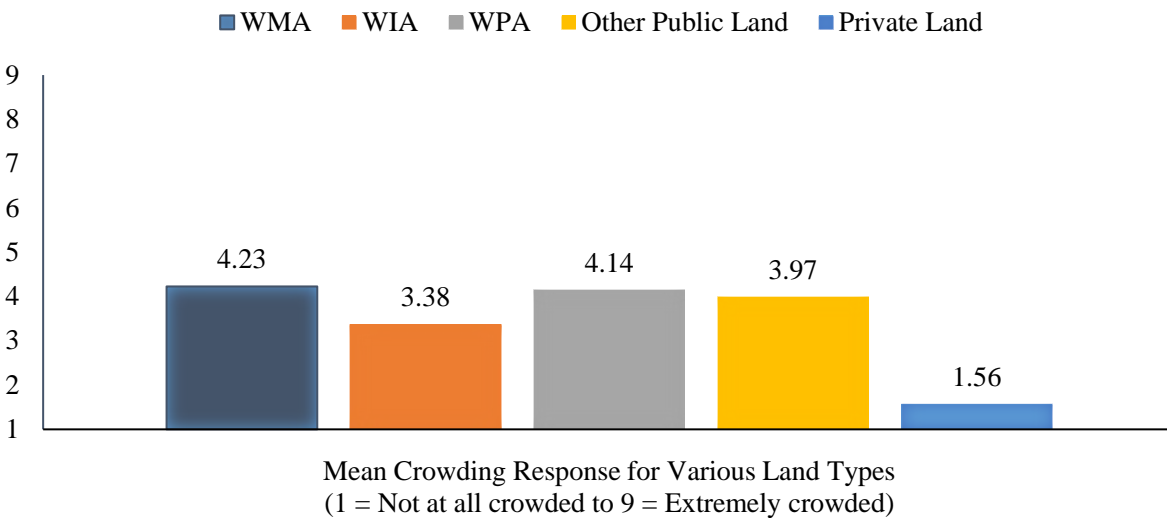


Figure ES- 3. Seasons of visitation for non-hunting activities.

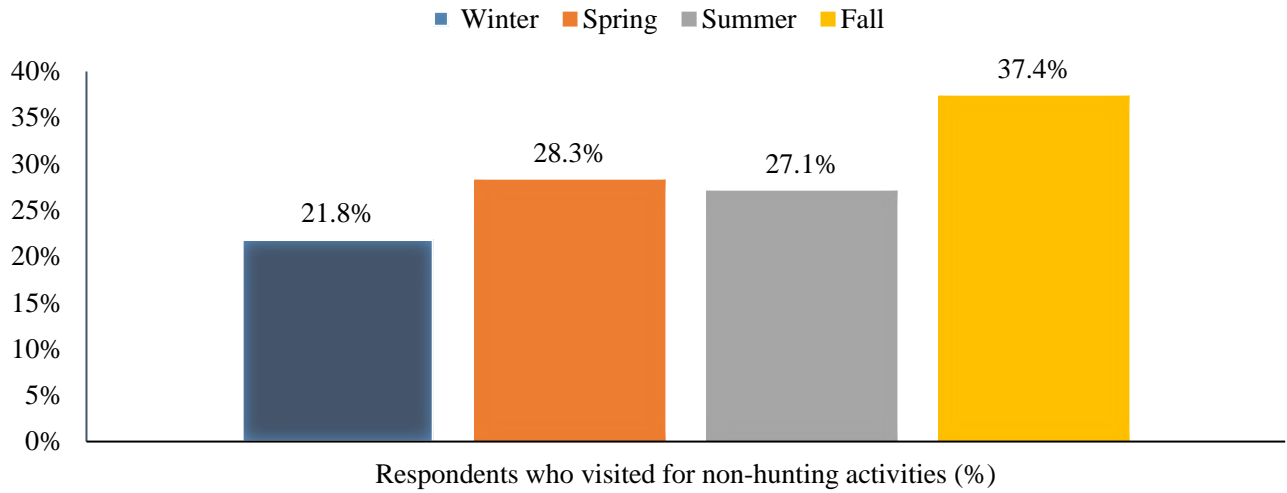


Figure ES- 4. Constraints and limitations to hunting.

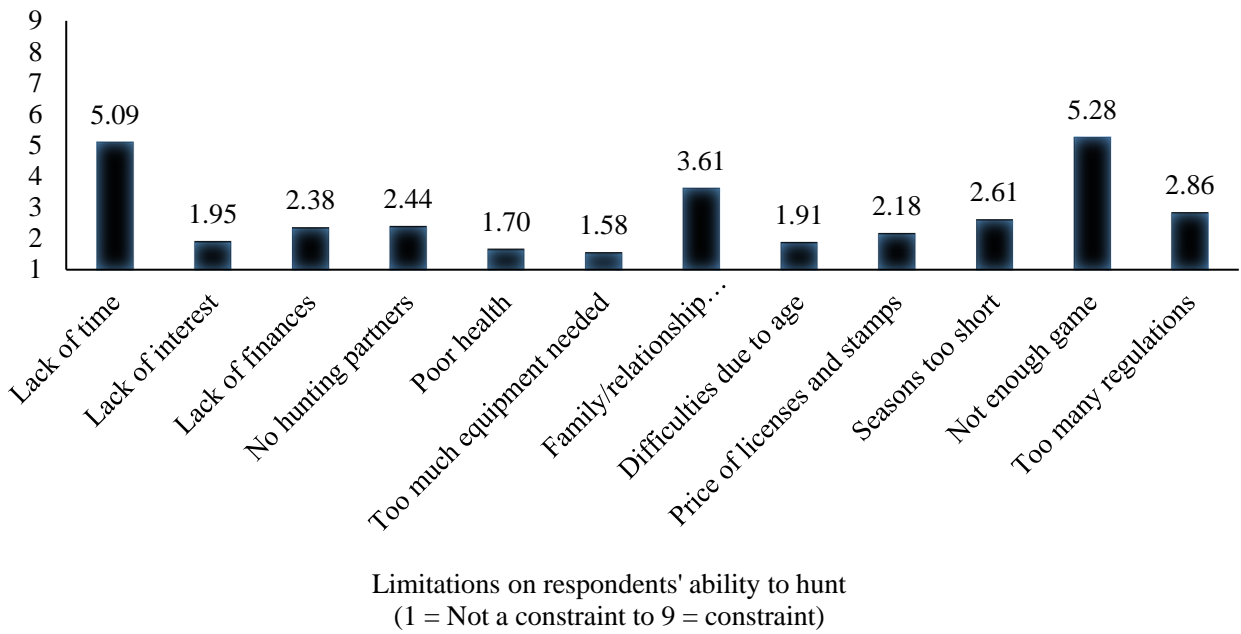


Figure ES- 5. Lead shot use by WMA hunters.



Table of Contents

ACKNOWLEDGEMENTS	I
SUGGESTED CITATION.....	I
CONTACT INFORMATION.....	I
EXECUTIVE SUMMARY	II
<i>Demographics of WMA Users during the fall 2015 hunting season.....</i>	<i>ii</i>
<i>Hunting participation on WMAs.....</i>	<i>ii</i>
<i>Economics of Hunting WMAs.....</i>	<i>iii</i>
<i>Hunter Satisfaction</i>	<i>iii</i>
<i>Land Types and Crowding Effects</i>	<i>iii</i>
<i>Participation in Activities on WMAs.....</i>	<i>iii</i>
<i>Wildlife Management Area User Beliefs about WMAs.....</i>	<i>iii</i>
<i>Respondents’ constraints that prevent usage of WMAs</i>	<i>iv</i>
<i>Important components for WMA maintenance and satisfactory experiences.....</i>	<i>iv</i>
<i>Sources of information for locating WMAs.....</i>	<i>iv</i>
<i>Support of Management Actions for WMAs.....</i>	<i>iv</i>
<i>Use of Lead Shot</i>	<i>iv</i>
<i>Table ES 1. Survey Response Rates</i>	<i>v</i>
<i>Figure ES- 1. Hunt Satisfaction.....</i>	<i>v</i>
<i>Figure ES- 2. Crowding effects on different land types.....</i>	<i>v</i>
<i>Figure ES- 3. Seasons of visitation for non-hunting activities.....</i>	<i>vi</i>
<i>Figure ES- 4. Constraints and limitations to hunting.....</i>	<i>vi</i>
<i>Figure ES- 5. Lead shot use by WMA hunters.</i>	<i>vii</i>
INTRODUCTION.....	1
STUDY PURPOSE AND OBJECTIVES	1
METHODS	2
<i>Selecting study sites</i>	<i>2</i>
<i>Figure M1. Sampling Grids for Choosing WMA Sites.....</i>	<i>3</i>
<i>Data collection – Sample population.....</i>	<i>4</i>
<i>Table M1-1. Normal Weekend Sampling Schedule.....</i>	<i>5</i>
<i>Table M1-2. Heavy Use Weekend Sampling Schedule.....</i>	<i>5</i>
<i>Table M1-3. Special Correction Factor Schedule.</i>	<i>5</i>
<i>Actual daily activities.....</i>	<i>6</i>
<i>Visitor Use of WMAs.....</i>	<i>6</i>
<i>Data Collection – Mail Survey.....</i>	<i>6</i>
<i>Survey Instrument</i>	<i>7</i>
<i>Comparisons to Previous Survey Work</i>	<i>7</i>
<i>Survey Questionnaire Items</i>	<i>7</i>
<i>Data Entry and Analysis</i>	<i>12</i>
GENERAL RESULTS	12
<i>Survey response rate</i>	<i>12</i>
<i>Comparing differences between the intercepted population and the postcard-recruited population. 13</i>	<i>13</i>

<i>Table M2-1. Demographic differences between sample populations</i>	15
<i>Table M2-2. Satisfaction differences between sample populations</i>	15
<i>Non-response check</i>	13
<i>Table M3-1. Reasons for not participating in the original mailing</i>	16
SECTION 1: WILDLIFE MANAGEMENT AREA HUNTING EXPERIENCES	17
FINDINGS:	17
<i>Hunt participation and lands hunted</i>	17
<i>Crowding</i>	17
<i>Species pursued and hunt effort</i>	17
<i>Future Participation</i>	18
<i>Table 1- 1. Land types used during 2015 hunting season</i>	18
<i>Table 1- 2. Crowding effects at different land types during 2015 hunting season</i>	18
<i>Table 1- 3. For those species hunted, the average number of days spent hunting on WMAs</i>	19
<i>Table 1- 4. For those species hunted, the average number of animals bagged on WMAs</i>	19
<i>Table 1- 5. Satisfaction of species hunted on WMAs</i>	20
<i>Table 1- 6. Correlation between satisfaction of hunting individual species/seasons against age, education, and income</i>	20
<i>Table 1- 7. Relationship between satisfaction and species bagged, future participation for each species pursued</i>	21
<i>Table 1- 8. Likelihood of respondents to return to a WMA based on overall hunt satisfaction</i>	21
<i>Figure 1- 1. Species hunted as reported by respondents</i>	22
SECTION 2: COUNTY-SPECIFIC INFORMATION ON DEER, PHEASANT, AND WATERFOWL HUNTING	24
FINDINGS:	24
<i>County-specific information</i>	24
<i>County-specific pheasant information</i>	24
<i>County-specific waterfowl information</i>	24
<i>County-specific deer information</i>	24
<i>Table 2- 1. County-specific information for pheasant hunting</i>	25
<i>Table 2- 2. County-specific information for waterfowl hunting</i>	26
<i>Table 2- 3. County-specific information for deer hunting</i>	27
SECTION 3: PARTICIPATION IN ACTIVITIES ON WMAS	28
FINDINGS:	28
<i>WMA Use during non-hunting seasons</i>	28
<i>Non-hunting use on WMAs during all four seasons</i>	28
<i>Table 3- 1. Activity difference during hunting and non-hunting seasons</i>	29
<i>Table 3- 2. Participation in non-hunting activities</i>	29
<i>Table 3- 3. Seasons of visitation for non-hunting activities</i>	30
SECTION 4: WILDLIFE MANAGEMENT AREA USER BELIEFS ABOUT WMAS	31
FINDINGS:	31
<i>Beliefs about using WMAs in Minnesota</i>	31
<i>Perceived constraints to using WMAs</i>	31
<i>Maintenance beliefs about WMAs</i>	32
<i>Important conditions for satisfactory conditions for hunting on WMAs</i>	32

<i>Table 4- 1. Hunter beliefs about using WMAs in Minnesota.</i>	33
<i>Table 4- 2. Hunter beliefs about the state of WMAs in Minnesota.</i>	34
<i>Table 4- 3. Beliefs about limitations/constraints to using WMAs.</i>	35
<i>Table 4- 4. Important components for WMA maintenance.</i>	36
SECTION 5: WILDLIFE MANAGEMENT AREA INFORMATION SOURCES AND MANAGEMENT ACTIONS	38
FINDINGS:	38
<i>Sources for locating information on WMAs</i>	38
<i>Opinions on WMA management actions</i>	38
<i>Table 5- 1. Sources of information for locating WMAs.</i>	39
<i>Table 5- 2. Hunter preferences for management actions on WMAs.</i>	40
SECTION 6: USE OF LEAD SHOT	41
FINDINGS:	41
<i>Beliefs about lead shot and levels of use</i>	41
<i>Likelihood of supporting a lead shot ban</i>	41
<i>Table 6- 1. Beliefs about lead shot.</i>	42
<i>Figure 6- 1. Hunter preferences for lead shot use.</i>	43
<i>Figure 6- 2. Likelihood to support a lead shot ban in a few years.</i>	43
SECTION 7: WILDLIFE MANAGEMENT AREA USER DEMOGRAPHIC CHARACTERISTICS	44
FINDINGS:	44
<i>Hunt participation and lands hunted</i>	44
<i>Table 7- 1. Manner in which survey invitation was received</i>	45
<i>Table 7- 2. Manner in which survey invitation was received</i>	45
<i>Table 7- 3. Age of hunters now and at time of first hunt</i>	45
<i>Table 7- 5. Income ranges of respondents.</i>	45
<i>Table 7- 6. Educational backgrounds of respondents</i>	46
<i>Table 7- 7. Ethnic backgrounds of respondents</i>	46
<i>Table 7- 8. Size of community where respondents lived in their childhoods and where they currently live</i>	46
REFERENCES	47
APPENDIX A: FULL SURVEY INSTRUMENT	48
APPENDIX B: LETTERS FOR CONTACTING PARTICIPANTS IN THE FIELD	60
APPENDIX C: LETTERS FOR CONTACTING PARTICIPANTS VIA MAIL	63
APPENDIX D: FOLLOW-UP “NON-RESPONSE” SURVEY FOR PARTICIPANTS WHO DID NOT RESPOND TO THE ORIGINAL SURVEY	65
APPENDIX E: COMMENTS FROM RESPONDENTS	67

Introduction

The Wildlife Management Area (WMA) land classification was created as part of the Outdoor Recreation Act of 1975 (Minnesota Statutes [MS 86A](#)). They were established “to protect lands and waters that have a high potential for wildlife production, to develop and manage these lands and waters for the production of wildlife, public hunting, fishing and trapping, and other compatible outdoor recreational uses”. The WMA system is administered by the Minnesota Department of Natural Resources (MNDNR), Section of Wildlife and is currently comprised of about 1,440 units totaling over 1.3 million acres. Given the breadth of the WMA system, DNR staff were interested in understanding how people use these lands, which activities they enjoy pursuing, and the number of individuals recreating during peak hunting seasons. WMAs are used most frequently during fall hunting seasons for both big and small game.

Understanding who uses WMAs can be a difficult undertaking due to the unrestricted access at individual WMAs, as no visitation fees or registrations are required. Additionally, WMAs are often small in size, widely dispersed across the landscape, and are typically bordered by privately owned property. Some WMAs have established parking spots, but most WMAs can be accessed from a multitude of points around the perimeter. The majority of WMA visitors will often never encounter agency or law enforcement personnel on a typical visit. DNR staff were interested to learn how people use the WMA system, the number of people who recreate, and what activities they pursue. WMAs are historically used most prominently during hunting seasons, and in order to maximize study effort and minimize costs, data collection occurred during the fall-winter 2015 hunting season.

This project is a two-part research endeavor to:

1. Understand visitor use of WMAs
 - a. Number of people using WMAs in a given season
2. Determine what motivations, satisfactions, and opinions these users have about various activities
 - a. What activity interests and participation levels are sought by users
 - b. Understand beliefs/values/satisfactions associated with using WMAs

With this information, DNR managers will be able to further understand their constituents and identify areas where management can be focused so that participation and satisfaction can be increased.

Study Purpose and Objectives

The survey assessed a series of topics that are important to WMA users and wildlife managers. The survey sought to understand who uses WMAs (demographics) as well as which activities they are pursuing during the fall and winter of 2015 on WMAs. Because hunters will make up the majority of the users during this time frame, specific questions about hunter experiences, satisfactions, and motivations will help to understand a “typical” WMA user during this time period. In addition, efforts were made to understand the drivers behind hunter recruitment and retention, to help determine what WMA regional managers can do to increase hunter participation.

This survey also includes an economic component that will help to gauge the monetary value of these lands. In addition, a travel-cost analysis will be performed to determine what hunters are willing to pay to use these areas (to be published at another time). Survey questions were included that help investigate non-market values and benefits associated with using and hunting on WMAs. In order to understand the

perceptions of management and availability, respondents were asked their opinions about disturbance management, availability of resources for locating, and the use of lead shot on WMAs. These responses will help regional managers understand what people are seeking when they visit these areas.

Methods

Selecting study sites

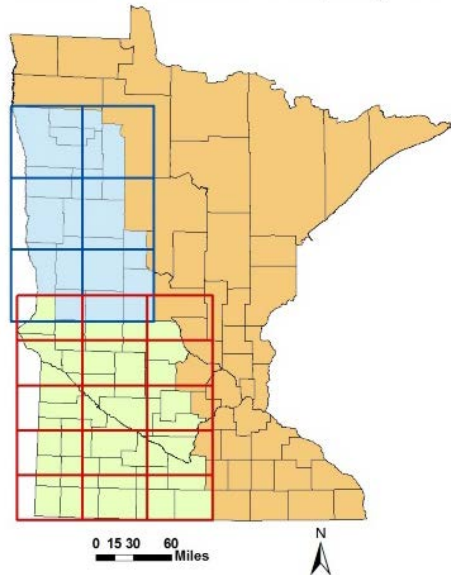
. Our study area covered 43 counties located in the prairie pothole region of western Minnesota and contained 1,061 WMAs. We divided the study area into 2 regions (northwestern and southwestern) based on the size and abundance of WMAs found in these areas. The northern study area is best characterized by larger counties, and fewer but larger WMAs. Conversely, the southern study area has smaller counties and more, albeit smaller WMAs. WMAs that were considered 'Major Units' and were eliminated from this study due to the difficulties in analyzing areas of that size and their potential influence on the overall results. In addition, a study on major units is going through a separate planning process. In the northwestern region, excluded units include Red Lake WMA, Roseau River WMA, and Thief Lake WMA. In the southwestern region, excluded units include Lac Qui Parle WMA and Talcot Lake WMA. Additionally, WMAs that had sampling restrictions, such as those located on an island, were also eliminated. Several WMAs were comprised of multiple parcels and during the initial sorting process, the parcel with the highest acreage was used to determine WMA selection. However, all parcels for an individual WMA were sampled during the field season.

Due to the large number of WMAs in Minnesota, it would be too costly to sample every one, so we opted to sample a portion of the total WMAs within our study area.. The selection of WMAs for this study was conducted using ArcMap 10.2. WMA boundaries were downloaded from MN DNR website ([MNDNR WMAs](#)) initially over the summer 2015. WMA boundaries and parking locations were re-downloaded for map revision on September 28, 2015([MN Geospatial Commons](#)) . The northwest study area contains much larger counties and fewer, but larger WMAs, and was overlaid with a 2x3 grid, while the larger southwest study area, with smaller counties (and more, smaller WMAs), was overlaid with a 3x5 grid using the "Grid Index Features" tool. This resulted in 21 grid blocks situated over 43 counties (Figure M1).

Figure M1. Sampling Grids for Choosing WMA Sites

Overlay of northwest and southwest grid blocks on corresponding counties. Note the larger counties in the northwest were sampled with larger, fewer grids, while the smaller counties in the southwest were sampled using a higher number of smaller grids.

Minnesota Route Sampling Grid



Within each of the twenty-one grid blocks, we created a sampling cluster by randomly selecting 1 WMA and then identified the 9 nearest neighbors using the ‘Select by Circle’ tool. The ‘Find Route’ tool was used to identify the most efficient routes between WMAs, using downloaded parking lot and road locations. This resulted in 210 WMAs across western Minnesota divided over 21 driving routes, each with ten WMAs. Six driving routes were used for the northwestern study area, while fifteen driving routes were located in the southwestern study area, respective to the original sampling grids. 210 WMAs represent 19.8% of the possible 1,061 WMAs in within the study areas.

Visual observations were designed after Fulton and Anderson (2003), modified from techniques recommended by Gregoire and Buyoff (1999) and Watson et al. (2000). Observers drove a specified route over a set time period of four hours. It was too costly, both economically and logistically to have observers remain at a single location throughout an entire day¹. Instead, sampling intensity focused on increasing number of sites observed, instead of increasing the amount of efforts spent at individual sites. In addition to visual observations of vehicles (parties), including recording unique identifying information (license plate IDs), field technicians left intercept letters on WMA-associated vehicles. These letters briefly explained the project and future survey. On the back of the letter, we invited WMA visitors to document their party information (ages of visitors, time spent at individual sites, date), as well as contact information for future survey mailings. Accompanying the intercept letters were self-addressed stamped envelopes for visitors to return their invitations to the researchers. Returned intercept letters were used to create a database of WMA visitors who were later sent surveys in spring 2016.

1. We surveyed a subset of WMAs intensively (from sunrise to sunset) to estimate probability of intercept, which we defined as the average proportion of total user groups per site-day to convert observed counts (point-in-time) to expected total user groups per site day.

Of the 210 originally selected WMAs, 5 were inaccessible to the field technicians or blocked to hunter use. In addition, it quickly became clear that some clusters had shorter routes and sampling occurred significantly faster than others. A revised version of the WMA routes was designed after the first weekend to compensate for inaccessible WMAs and add additional WMAs to the shorter routes. This was done to establish equal effort for the technicians sampling different clusters. After the revision, a total of 228 WMAs were sampled every weekend.

Data collection – Sample population

Because sample WMAs were organized into driving routes, efforts were taken to ensure the same WMAs were not sampled at the same time of day each week. Technicians alternated driving routes forwards and backwards from week to week, as well as the order that assigned routes were visited each weekend. This ensured the same WMAs were not repeatedly observed early in the morning or later in the afternoon when traffic was likely to be reduced. A survey protocol was developed to record vehicle counts and license plate information in order to count unique visitors. Each technician ($n = 18$) surveyed 2 routes per weekend (1 route per day) for a minimum of 4 hours per route. Sampling occurred over an 11-week period from September 26, 2015 (Waterfowl Opener) to December 6, 2015. The sampling period included a minimum of 8 weekend days for each WMA.

Normal weekend. Route start times for sampling varied throughout the season, based on legal starting times for hunting (pheasant restrictions) or on daylight (started at a later time as daylight became shorter). On weekends, each technician drove their two routes (one route per day) for a minimum of four hours per driving route (Table M1-1).

Table M1-1. Normal Weekend Sampling Schedule.

<i>Normal Weekend:</i>	
Saturday	Drive Route A (forwards) starting at 7:00 AM
Sunday	Drive Route B (forwards) starting at 7:00 AM
<i>Following Weekend:</i>	
Saturday	Drive Route B (backwards) starting at 7:00 AM
Sunday	Drive Route A (backwards) starting at 7:00 AM

Heavy-Use Weekends (October 10-11, October 17-18, November 7-8, November 13-15). On weekends that were expected to be especially busy, WMAs were sampled more intensively, with a morning shift and an afternoon shift on Saturday, and one route sampled on Sunday morning. This helped to account for afternoon hunters who may not have been utilized WMAs earlier in the morning (Table M1-2).

Table M1-2. Heavy Use Weekend Sampling Schedule.

<i>Heavy Use Weekends:</i>	
Saturday	Drive Route A (forwards) from 7:00 to 11:00 AM, and drive Route B (forwards) from 1:00 to 5:00PM.
Sunday	Drive Route B (backwards) from 7:00 to 11:00AM
<i>Following Weekend:</i>	
Saturday	Drive Route B (forwards) from 7:00 to 11:00 AM, and drive Route A (forwards) from 1:00 to 5:00PM.
Sunday	Drive Route A (backwards) from 7:00 to 11:00AM

Special correction factor weekends. In order to determine the difference between morning and afternoon use on a normal weekend, a few randomly selected WMAs were checked continuously over a 12 hour period (Table M1-3). This correction factor will help to extrapolate missing data from the afternoons when routes were not driven (due to high cost and high effort for the technicians).

Table M1-3. Special Correction Factor Schedule.

<i>Special Correction Factor:</i>	
Saturday	Drive WMAs 001-005, and check once an hour from 7:00AM to 7:00PM.

A total of 18 technicians assisted with this project. When possible, a technician was assigned two driving routes (about 20 WMAs) that they would survey throughout an entire season. Due to the observation schedule, the data collected will only allow for estimates of visitor use during fall weekend time periods. Previous data collected in 2001 (Fulton and Anderson 2003) during the winter and spring shows that recreation use levels during non-hunting seasons are <5% of fall use levels.

Actual daily activities

Each technician would begin their day by reviewing their assigned driving route. Start times differed throughout the season based on sunrise time, and regulations (i.e., you cannot begin pheasant hunting before 9:00am, so it made little sense to begin sampling at 6:30am). A student would arrive at their first site, and first check any DNR maintained parking spots, as this is the most likely place to find vehicles. Next they would drive in a circle around the WMA on any neighboring public access roads. Any vehicles parked along likely roads or fence lines would also be considered a WMA user. After checking all possible access points, the observer would note on their driving sheet any vehicles, their license plate ID, and distribute intercept letters to WMA-associated cars. Each intercept letter that was distributed in the field was assigned a unique identifier, based on the WMA location, the date, and a sequential number for each car found at each site.

WMA_ID-Month&Day-Car ID = 001-0926-01

This allowed us to track returned intercept letters to their origination point. This routine was completed at each WMA, and sampling effort was completed over a 4 hour period. If any observers finished early, they were instructed to drive backwards on their assigned route and look for any new visitors, in order to keep sampling effort even across all routes.

We distributed 2,046 invitations and 405 were returned (20% invitation return rate), which yielded 443 individuals who provided information to receive a WMA visitor survey. These individuals had the opportunity to return their survey via postal-mail (referred to as G, for green invitation) or through an online survey instrument (referred to as Q for Qualtrics). We consolidated these groups to represent respondents who were contacted in the field.

Given the small sample population (n = 443), we opted to recruit additional respondents into the study using individuals who purchased both a small game license and pheasant stamp. We randomly selected 5,000 people from the MNDNR ELS database and sent them an invitation letter that explained the study, asked if they hunted WMAs, and if they would they be willing to participate in the WMA user study. Each intercept letter included a postcard (with a unique ID), that could be returned with an affirmation they were willing to participate. In total, 88 were undeliverable and 932 were returned (these individuals were designated as P for Postcard). This brought our effective sample population to 1,375.

Visitor Use of WMAs

A separate report of visitor estimation for WMAs in Minnesota is in preparation.

Data Collection – Mail Survey

Data were collected using mail-back surveys following a process adapted by Dillman (2008) to increase response rates. Respondents were sent questionnaire-booklets with personalized cover letters, and included a business-reply envelope to return their responses. Potential respondents were sent multiple contacts four times between March 2016 and July 2016. The cover letter explained the purpose of the study and requested respondents to complete and return the survey. The back of the personalized cover letter contained a map of all of the counties in Minnesota, to help respondents address questions in regards to where they specifically hunted during the 2015-2016 hunting season. About 5 weeks after the first mailing, a second mailing (identical to the first) was sent to individuals with valid addresses who had not yet returned their survey-booklets. A third mailing was sent approximately 4 weeks after the first mailing, containing identical information as a final attempt to elicit responses from those who had not participated in the study yet. Any surveys returned after July 1st were not included in the results. Surveys

were collected and double-entered into an Excel template. At the end of July 2016, a shortened 1 page, two-sided survey and a business reply envelope was sent to individuals who had not responded by July 1st to identify any non-response bias within the sample (Appendix B). Any respondents who returned their non-response surveys after August 31st were not included in the results.

Survey Instrument

Wildlife Management Area respondents returned a self-administered mail-back questionnaire with twelve sections of questions (Appendix A). The questionnaire included the following topics:

- Hunting participation in the fall and winter 2015-2016 on WMAs
- Economics of hunting WMAs
- WMA hunting participation and hunt satisfaction
- Land types hunted (other than WMAs) and crowding
- Participation in activities on WMAs
- User beliefs about WMAs
- Respondents' constraints that prevent WMA use
- Important components for WMA maintenance and satisfactory experiences
- Sources of information for locating WMAs
- Opposition or support of management actions for WMAs
- Use of lead shot
- WMA user demographic characteristics

Comparisons to Previous Survey Work

This survey instrument was designed to be used in comparison with other surveys that had been completed in the past. This allows for comparisons between different groups of users, based on their interests, to see if there are drastic differences across groups in Minnesota. These studies include Surveys of Minnesota Walk-In Access Users Participating in the 2013-2014 Seasons (Cross 2014), Small Game Hunter Lead Shot Study (Schroeder et al. 2008), and Minnesota Waterfowl Production Areas 2001 Visitor Use Study (Vlaming et al. 2003). If survey questions overlap, they will be noted in the next section, Survey Questionnaire Items.

Survey Questionnaire Items

Hunting on WMAs during the 2015-2016 hunting season

Respondents indicated whether or not they had hunted on a WMA during the 2015-2016 hunting season, and were asked to give more details about hunting pheasant, waterfowl, and deer on these properties. They could report up to 5 counties they hunted most frequently for each species. For each county, they were asked to list the number of different WMAs visited per trip, number of days hunted, number of animals taken, and what types of land they hunted on most frequently.

Survey for comparison: Vlaming et al. 2003

Economics of hunting WMAs

The next component asked respondents about their spending habits when they use WMAs. In order to gain the most accurate information, respondents were asked to answer questions in regards to a WMA trip they remembered the most vividly. In order to help with recall, they were asked to list the county and

WMA name, and include the dates for this trip. Next they were asked to list how much money they spent at home getting ready for the trip as well as what they spent during travel and at their destination for a variety of items. These purchases included: (a) Lodging, including camping at a privately-owned campground; (b) Grocery or convenience store food and drink; (c) Restaurant/bar meals and drinks; (d) Gasoline or other fuels; (e) Other transportation costs; (f) Hunting equipment (shells, decoys, blinds); (g) Licenses, stamps, Walk-In-Access Validation; (h) Entertainment (including casinos); (i) Shopping (gifts, clothes, etc.); and (j) Other (free response for respondents to write in any expenditures we didn't cover). Respondents were asked to list how many people were covered by these expenditures, and identify if any of the party were dependents. This information will be used in a travel-cost benefit analysis (in a separate publication) to understand the how much WMAs are worth to those who use them.

WMA hunting participation and hunt satisfaction

Respondents were then asked about their satisfaction with general hunting experiences for 12 different species. Respondents ranked their satisfaction levels with each species using a 7-point scale where: 1 = Very Dissatisfied; 2 = Moderately Dissatisfied; 3 = Slightly Dissatisfied; 4 = Neutral; 5 = Slightly Satisfied; 6 = Moderately Satisfied; 7 = Very Satisfied; and 9 = Did not hunt this species. They were also given space to provide how many days they spent hunting each species, and the number of animals bagged over the whole season. Species included in this question were: firearm deer, muzzleloader deer, archery deer, spring turkey, fall turkey, duck, geese, grouse, pheasant, dove, rabbits, and squirrels. Respondents were then asked to report how satisfied or dissatisfied they were with their overall experiences at WMAs in Minnesota on the same 7-point scale.

Survey for comparison: Cross 2014

Land types hunted (other than WMAs) and crowding

Respondents were asked how often they hunted on various land types in Minnesota during the 2015-2016 hunting season. Graphic displays of the signage normally seen in the field were provided for Wildlife Management Areas, Walk-in Access Areas, and Waterfowl Production Areas. No pictures were provided for Other Public Land or Private Land. They were asked to rank their use of these land types on a 4-point scale ranging from "None; Some; Most; and All". Respondents were then asked to rank how crowded they felt on these various land types. We utilized standard single-item scale that has been used previously on other recreational activity surveys (Vaske and Shelby 2008; Shelby and Vaske 2007, see Question 14 on the survey in Appendix A). On a 9-point scale where 1 = Not at all crowded; 3= Slightly crowded; 6 = Moderately crowded; 9 = Extremely crowded; or NA = Did not hunt that particular type of land. They were finally asked on a 7-point scale running from 1 = Extremely Unlikely to 7 = Extremely Likely, how likely they were to return to use a WMA in the future.

Survey for comparison: Cross 2014

Participation in activities on WMAs

DNR wildlife managers are also interested in knowing how often WMAs are used, both during and outside of the hunting season. Respondents were asked to indicate how often they participated in 7 hunting season activities, and 6 non-hunting season activities on a 4-point scale from "None to All" or Did not participate in this activity. Hunting season activities included: (a) Hunted a WMA with one or more people; (b) Hunted a WMA with one or more dogs; (c) Hunted by myself on a WMA; (d) Hunted on more than one WMA per day; (e) Moved to another WMA if the first one had cars present; (f) Used the

same WMA on consecutive trips; and (g) Scouted a WMA prior to opening day of hunting season. Non-hunting season activities included: (a) Visited a WMA with one or more people; (b) Visited a WMA with one or more dogs; (c) Visited a WMA by myself; (d) Visited more than one WMA per day; (e) Moved to another WMA if the first one had cars present; and (f) Visited the same WMA between trips.

Respondents were then asked to identify the number of days they spent participating in 8 non-hunting activities on WMAs using a 4 point scale from “1-5 days last year; 6-10 days last year; 11-30 days last year; >31 days last year; or I did not participate in this activity”. Non-hunting activities included (a) Viewing wildlife/bird watching (*not while hunting/fishing*); (b) Berry/nut/mushroom/plant collecting; (c) Sightseeing/observing on WMA; (d) Picnicking; (e) Hiking/walking/running; (f) Training my dog; (g) Photographing nature; and (h) Looking for antler sheds . And finally respondents were asked to identify which seasons they visit WMAs for non-hunting activities during various seasons: winter (December 1st to February 28th); spring (March 1st to May 31st); summer (June 1st to August 31st); or fall (September 1st to November 30th).

User beliefs about WMAs

Respondents were asked how much they agreed or disagreed with 10 statements about using WMAs using a 7-point scale where 1 = Extremely Disagree; 2 = Moderately Disagree; 3 = Slightly Disagree; 4 = Neutral; 5 = Slightly Agree; 6 = Moderately Agree; and 7 = Extremely Agree. These statements about using WMAs included (a) I wouldn't substitute any other area for doing the types of things I do at WMAs; (b) Doing what I do at WMAs is more important to me than doing it in any other place; (c) No other place can compare to WMAs; (d) I get more satisfaction out of visiting WMAs than from visiting any other place; (e) WMAs are the best places for what I like to do; (f) I identify strongly with WMAs; (g) I feel like WMAs are a part of me; (h) I am very attached to WMAs; (i) WMAs provide my only opportunity to hunt on Minnesota; and (j) I would not continue hunting if I could not access WMAs.

Respondents were also asked about 16 different beliefs about WMAs in Minnesota using the same 7-point scale ranging from “Extremely Disagree” to “Extremely Agree”. These statements included: (a) WMAs provide me with an important place to hunt deer; (b) WMAs provide me with an important place to hunt pheasant; (c) WMAs provide me with an important place to hunt waterfowl; (d) WMAs provide me with an important place to hunt small game other than waterfowl and pheasants; (e) The quality of hunting on WMAs is not as good as other locations; (f) There are NOT enough WMAs near me; (g) WMAs are too crowded; (h) WMAs provide a place to take kids hunting; (i) Most of the WMAs I know about are too small; (j) Most of the WMAs I know about are too far away; (k) I understand the rules for using WMAs; (l) WMAs provide an easy place to go hunting; (m) WMAs provide high quality hunting experiences; (n) The number of WMA sites should be increased; (o) Hunting on WMAs is better than hunting on Walk-In Access lands; and (p) Hunting on WMAs is better than hunting on private lands that I have access to.

Surveys for comparison: Cross 2014, Vlaming et al. 2003

Respondents' constraints that prevent WMA use

Due to the decrease in small game/waterfowl hunter numbers (as measured by declines in waterfowl and pheasant hunting stamps), managers are interested in knowing what is preventing users from accessing WMAs. Using a 9-point scale ranging from 1 = Not a constraint; 4 = Slight constraint; 6 = Moderate constraint; 9 = Extreme constraint, and NA = Does not apply, respondents were asked to answer how much they were affected by 12 different scenarios. These scenarios included: (a) Lack of time; (b) Lack of interest; (c) Lack of finances; (d) No hunting partners; (e) Poor health; (f) Too much equipment needed; (g) Family and relationship responsibilities; (h) Difficulties due to age; (i) Price of licenses and

stamps; (j) Seasons too short; (k) Not enough game; and (l) Too many regulations. These questions were loosely based on previous work conducted by Miller and Vaske (2003).

Important components for WMA maintenance and satisfactory experiences

Because these lands are maintained for the public benefit, it is important to know what users are looking for in regards to maintenance of WMAs. Using a 7-point scale ranging from 1 = Extremely Unimportant; 2 = Moderately Unimportant; 3 = Slightly Unimportant; 4 = Neutral; 5 = Slightly Important; 6 = Moderately Important; and 7 = Extremely Important. These statements include (a) Maintaining habitat for game species; (b) Maintaining a diversity of native plants and animals; (c) Providing habitat for wildlife; (d) Improving ecosystem health; (e) Improving water quality; (f) Restoring native wetland landscapes; (g) Restoring native prairies; (h) Maintaining scenic beauty; (i) Providing diverse recreational opportunities; (j) Providing access to public lands at no charge; (k) Providing educational and learning opportunities; (l) Ensuring natural and undeveloped lands will exist for future generations; (m) Supporting local economies and businesses; (n) Preserving a part of our history; and (o) Providing a place where all people are welcome.

We are also interested in which components are important to users in order to achieve a satisfactory experience while using WMAs. Using the same 7-point scale from the maintenance question, we asked about 24 different topics, including: (a) Enjoying nature and the outdoors; (b) Getting away from crowds of people; (c) Getting food for my family; (d) Shooting a gun; (e) Access to a lot of different hunting areas; (f) Harvesting an animal; (g) Being on my own; (h) Being with friends; (i) Developing my skills and abilities; (j) Being with family; (k) Good behavior among other hunters; (l) Reducing tension and stress; (m) Seeing a lot of wild game; (n) Sharing my hunting skills and knowledge; (o) Thinking about personal values; (p) Using my hunting equipment (calls, blinds, guns, etc.); (q) Getting my own food; (r) The excitement of hunting; (s) The challenge of making a successful shot; (t) Hunting provides an enjoyable way to get exercise; (u) The prospect of hunting motivates me to stay physically healthy; (v) Hunting on WMAs reduces stress in my normal work and home life; (w) I feel better physically, after I have spent time hunting; and (x) I feel better mentally, after I have spent time hunting.

Survey for comparison: Vlaming et al. 2003

Sources of information for locating WMAs

Respondents were asked to indicate how important different sources of information were for locating and hunting WMAs. The 7-point scale ranged from: 1 = Extremely Unimportant; 2 = Moderately Unimportant; 3 = Slightly Unimportant; 4 = Neutral; 5 = Slightly Important; 6 = Moderately Important; and 7 = Extremely Important; and NA = Did not know about. They were provided with 14 different sources where they could gain information about WMAs. These include: (a) DNR Recreation Compass – Desktop Version; (b) DNR Recreation Compass – Mobile Version; (c) The DNR website on WMAs in general; (d) The printable WMA hunting atlas from the DNR website; (e) Hardcopy of the Walk-In Access hunting atlas; (f) GPS data downloaded for WMAs; (g) PRIM Atlas; (h) Google maps for WMAs; (i) Google Earth data for WMAs; (j) WMA detail maps; (k) Commercial cell phone app; (l) Just spot the WMA boundary signs in the field; (m) Plat books; and (n) Other (free-responses allowed for any sources we didn't cover).

Survey for comparison: Cross 2014

Opposition or support of management actions for WMAs

Respondents were asked to choose if they opposed or supported various management decisions that could occur at WMAs. This was conducted on a 7-point scale ranging from: 1 = Extremely Oppose; 2 = Moderately Oppose; 3 = Slightly Oppose; 4 = Neutral; 5 = Slightly Support; 6 = Moderately Support; and 7 = Extremely Support. Respondents were given 12 different management options that they could choose to support or oppose. These included: (a) Build trails for disabled access; (b) Provide exhibits to help visitors learn about WMAs; (c) Create more wildlife food plots; (d) Prairie (grassland) maintenance/enhancement; (e) Wetland restoration/recover effort; (f) Conservation grazing as a management tool for prairie(grassland) maintenance/enhancement; (g) Provide WMA maps; (h) Create more WMAs; (i) Remove trees to promote native prairie (grassland) maintenance/enhancement; (j) Remove trees to reduce predation on pheasants/small game; (k) Use of prescribed burns in the SPRING to promote prairie (grassland) maintenance/enhancement; and (l) Use of prescribed burns in the FALL to promote prairie maintenance/enhancement.

Survey for comparison: Vlaming et al. 2003

Use of lead shot

Respondents were also asked about their opinions in regards to using and banning lead shot on WMAs. These questions corresponded to a similar survey conducted by Schroeder et al (2008). We first asked respondents how often they use lead shot when they hunt small game on WMAs. Responses included: “Never use lead; Occasionally use lead; Mostly use lead; and Always use lead (except for waterfowl).” Respondents were also asked how much they agreed with various statements about using lead shot at the current time. We used a 7-point scale ranging from: 1 = Extremely Disagree; 2 = Moderately Disagree; 3 = Slightly Disagree; 4 = Neutral; 5 = Slightly Agree; 6 = Moderately Agree; and 7 = Extremely Agree. The 12 statements included: (a) Alternatives to lead shot are very difficult to find; (b) Alternatives to lead shot are too expensive; (c) I think lead is more effective than alternatives; (d) I think alternatives to lead shot might damage my shotgun; (e) I do not think lead shot causes any problems for wildlife; (f) I am concerned about the effects of lead on wildlife; (g) I am concerned about the effects of lead on human health; (h) I do not think the lead from hunting is an environmental problem; (i) I think hunters have a responsibility to NOT USE lead shot; (j) I think I have a personal responsibility to NOT USE lead shot; (k) It is not my responsibility to stop using lead shot; and (l) A ban on lead shot is an unnecessary government regulations.

Finally, respondents were asked how likely they would support a ban on using lead shot to hunt small game on WMAs in the next few years using a 7-point scale ranging from 1 = Extremely Unlikely to 7 = Extremely Likely.

Survey for comparison: Schroeder et al. 2008

WMA user demographic characteristics

Finally, respondents were asked to provide demographic information so that regional managers can understand who in particular is using WMAs. This could be useful in targeting under-represented groups, or establishing connections with those who already use WMAs frequently. Respondents were asked how they received an invitation to complete this survey, as well as basic demographic information including:

(a) Gender; (b) Age; (c) Age when first hunted; (d) Total years spent hunting; (e) Whether dependents hunted with participant this past year; (f) Whether spouses or partners hunted with participant this past year; (g) Education; (h) Income; (i) Ethnicity; and (j) Size of childhood and current communities.

Data Entry and Analysis

Data were double-entered into Excel 2010 and comparisons between databases were completed in Excel to look for discrepancies. Further data cleaning and manipulation was completed in Program R (version 3.2.5). Statistical analyses and tables were completed in Program R.

Analysis was performed and reported for 43 counties in western Minnesota on WMA visitor input. Data was analyzed in the aggregate. Analysis of the survey focused on descriptive statistics, including reporting frequencies, average responses, chi-square test statistics, and F-statistics from an analysis of variance, when appropriate.

In addition, another publication will be completed to analyze the land valuation and economic components using the methods described by Knoche and Lupi (2007, 2012, 2013). To determine land valuation, a random utility travel cost model will be created from the following variables: price, species populations, WMA Access, populations within sampling grids, size of sampling grids. We will also attempt to quantify the utility derived from a particular site, economic benefits from hunting at particular sites, and per-trip benefits. A conditional logit model will be used to determine which variables have the greatest effect on the model.

General Results

Field Observations

Technicians made 2,493 observations over the field season, where they observed 2,093 cars at our selected WMAs. This resulted in an average 0.83 cars seen at each stop (averaged over all sites throughout the entire field season). The average size of an observed WMA was 274.9 acres, which is very comparable to the average size for all WMAs in our study area, 278.8 acres. Returned intercept letters from hunters indicated that the average party size for each car was 1.9 people, and they stayed for 3.9 hours, on average. We utilized wildlife managers' experience and knowledge about WMA users to investigate potential trends in visitor use based on site attributes. Our best-supported predictive model for mean user groups/day included positively correlated fixed effects for the presence of pheasants, distance to a major road, and WMA size.

Analysis is on-going; final results will be presented in a future report.

Survey response rate

Of the 1,375 full-length surveys that were sent out, 11 were undeliverable and 1 requested not to participate due to his guardian's concerns for his status as a minor. This resulted in 1,363 viable surveys, of which 593 were returned during the first wave, 267 were returned after the second wave of mailing, and 95 were returned after the third and final wave of mailing (Cut-off date was July 1st, 2016). This resulted in 949 surveys returned, a 70% return rate. This can be further broken down by respondent type. For respondents who were contacted in the field, 288 out of 443 respondents completed the original survey (65%). For respondents who were contacted with a mailed letter due to their status as a pheasant stamp and small game license holder, 661 out of 932 completed the original survey (71%). Non-response

surveys were sent to 418 respondents, of which 4 were undeliverable. Of the 414 viable surveys, 141 were returned on or before August 31st, a 34% return rate.

Comparing differences between the intercepted population and the postcard-recruited population

One concern about conducting our study with samples from two potentially different populations is that the groups would not be similar enough to interpret the combined results. We used t-tests and chi-square analyses to compare demographic and satisfaction differences between the two groups – the field intercepted population and the postcard population to determine if significant differences existed (Table M2-1, Table M2-2) .

Only a two demographic questions demonstrated a statistical difference between the field-intercepted and the postcard-recruited respondents, and these were Education ($p = 0.045$) and Income ($p = 0.011$). In addition, satisfaction and participation in regards to individual species/seasons was found to be very similar between the two groups. Only two species had a significant difference between the field-intercepted and the postcard-recruited respondents. For grouse hunters, field-intercepted respondents had a higher satisfaction rating in hunting satisfaction than postcard-recruited respondents ($\bar{x} = 5.21, 4.51$ respectively, $p = 0.025$). In addition, pheasant hunters also had a higher hunting satisfaction response from field-intercepted respondents when compared to postcard-recruited respondents ($\bar{x} = 5.04, 4.66$ respectively, $p = 0.016$). Only 58% of field-intercepted respondents indicated the hunted pheasants as compared to 70% of postcard-recruited respondents. This outcome was expected given we recruited individuals who purchased a small game license and a pheasant stamp; however, it is unlikely this difference influenced overall survey results.

Non-response check

We compared participant interests, land-type used, opinions about lead shot, age, gender, and community size between original respondents and those who were sent an additional, shortened survey (Appendix B). Respondents for the non-response study were asked to identify all applicable reasons for not participating in the original study. Many respondents chose more than one reason for not completing the original mailing (Table M3-1). We compared responses to the full-length survey to determine any additional non-response bias. A high number of respondents indicated that they had returned the survey (23%, or 47 respondents).

Results of the shortened non-response survey indicate that respondents who did not respond to the original mailing followed similar trends in terms of hunting on a WMA during the 2015-2016 hunting season. About one in ten of the respondents on the shortened survey indicated that they did not hunt on a WMA during the 2015-2016 season.

Non- respondents had a higher overall satisfaction combined mean score of 4.85 on a 7-scale. Non-response rates for individual species and seasons also matched up nicely. Again, pheasants were the most often recorded (70.4%) from the non-response survey. This was followed by waterfowl and firearm deer, displaying a very similar trend to the original survey results.

Non- respondents averaged fewer days hunting on WMAs for every species except doves. In addition, non- respondents had a lower mean for the overall satisfaction of experiences at WMAs. All 142 respondents participated in this question, and the overall mean was 4.87 (original respondents $\bar{x} = 5.09$). However, non- respondents are very likely to return to use WMAs in the future, with a mean score of 6.07 percent. Non- respondents had very similar mean scores for the land-types used during the 2015 hunting season when compared to the responses from the original sample.

Non-respondents were only slightly less likely to support a ban on lead shot with a mean score of 3.97 on the 7.0 point scale. Non-respondents were less likely than the original respondents to use lead shot with a mean lead shot use score of 1.8 on the 4.0 scale (original survey $\bar{x} = 2.0$). The non-response participants had similar demographic statistics compared to the original sample population, with 92% of non-response participants identifying as male (originally 96%), and 3.5% of non-response participants identifying as female. Non-respondents had almost identical responses for both their current and childhood communities. Ages were also very similar, with a mean age of 48.4 years (original survey $\bar{x} = 50.8$), their first time hunting at 11.9 years (original survey $\bar{x} = 14.2$), and they have been hunting for 35.86 years (original survey $\bar{x} = 35.8$).

Table M2-1. Demographic differences between sample populations

Demographic variable	Field-intercept mean	Postcard-recruited mean	p-value
Average Age ¹	51.5 years	50.5 years	0.289
Age at first hunt ¹	13.7 years	14.4 years	0.500
Income ¹	\$72,654	\$82,228	0.011
Miles Driven ¹	98.3 miles	101.0 miles	0.710
Male ²	96%	97%	0.336
Took a dependent ²	45%	46%	0.874
Took a spouse/partner ²	18%	18%	0.860
Proportion of pheasant hunters ¹	58%	70%	<.001
Percent duck hunters ¹	37%	29%	0.012
Percent firearm deer hunters ¹	38%	22%	<.001
Percent archery deer hunters ¹	15%	11%	0.09
Percent muzzleloader deer hunters ¹	12%	7%	0.016
Education ²	5.7 (out of 10)	6.1 (out of 10)	0.006

¹ Students t-test; ²Chi-square analysis

Table M2-2. Satisfaction differences between sample populations

Species	p-value ¹	Field-intercept mean		Postcard-recruited mean	
		Mean satisfaction	% responded	Mean satisfaction	% responded
Firearm Deer	0.310	4.69	38%	4.45	22%
Muzzleloader Deer	0.340	3.76	12%	4.20	6.7%
Archery Deer	0.703	4.98	15%	4.85	11%
Spring Turkey	0.335	5.13	10%	5.5	8.5%
Fall Turkey	0.176	4.43	2.4%	5.23	2.5%
Duck	0.167	4.76	37%	4.47	29%
Geese	0.996	4.24	27%	4.24	18%
Grouse	0.025*	5.21	11%	4.51	15%
Pheasant	0.016*	5.04	58%	4.66	70%
Dove	0.454	4.76	8.7%	4.03	4.4%
Rabbits	0.558	4.00	5.9%	4.34	4.4%
Squirrels	0.726	4.44	6.3%	4.65	3.5%

¹ Students t-test

*p < 0.05, **p < 0.01, ***p < 0.001

Table M3-1. Reasons for not participating in the original mailing

	Responses
I am not that interested in WMAs	1.9%
I do not use WMAs enough to provide useful input	6.8%
I did not have enough time	11.2%
The original survey was too long	22.8%
I never received the earlier mailings	1.0%
I misplaced the earlier mailings	3.9%
I intended to complete it, but did not get to it	20.9%
Challenge of returning snail-mail	0.0%
I returned it	22.8%
The info and questions were too complicated	6.3%
Concerns about how the info would be used	2.4%
Total Responses	206

Section 1: Wildlife Management Area Hunting Experiences

Findings:

Hunt participation and lands hunted

Overall, 87.7% of respondents indicated that they had hunted a WMA during the 2015-2016 hunting season. Across the study area, multiple land types are available for hunting. Because these lands vary in habitat quality, juxtaposition on the landscape, and species availability, managers are interested in knowing where hunters pursue game. In order to determine land type use, respondents were asked to record how often they spent hunting different land types using a 4-point scale ranging from “None” to “All” (Table 1-1). Frequency of use varied among land types, with 87.7% indicating they did at least some of their hunting on WMA lands and 8.9% hunters did all of their hunting on those lands. A majority of respondents did not hunt WIAs (66%) or other public lands (69%) during the 2015 hunting season, which is likely a reflection of their limited availability in the study area. The highest mean use, based on the 4-point scale, came from WMA use ($\bar{x} = 2.4$) followed by Private land use ($\bar{x} = 2.0$), (Table 1- 1).

Crowding

Hunters were asked about crowding effects on different land types on a 9-point scale from “Not Crowded At All” to “Extremely Crowded” (Table 1- 2). WMAs had the highest level of crowding ($\bar{x} = 4.2$), followed closely by WPAs” ($\bar{x} = 4.1$). Private land was the least crowded ($\bar{x} = 1.6$), which makes sense given posting precludes public access. Interestingly WIA areas were the least crowded public lands ($\bar{x} = 3.4$), (Table 1- 2).

Species pursued and hunt effort

Respondents were asked to report the species they hunted, the number of days, and animals bagged while hunting on WMAs. As expected, respondents pursued pheasants (80%), followed by ducks (37%), and firearm deer (31%) most often. Conversely, rabbits (6%), squirrels (5%), and fall turkeys (3%) were hunted least often (Figure 1- 1).

For each species, respondents were asked to estimate the number of days they hunted and animals harvested on a WMA for each of the species they hunted (Table 1- 3). Overall, archery deer hunters spent the most time on WMAs ($\bar{x} = 13.3$ days), followed by pheasant hunters ($\bar{x} = 8.6$ days) and goose hunters ($\bar{x} = 8.5$ days). Firearm deer hunters spent an average of 4.5 days hunting on WMAs (9-day deer season), which was consistent with values reported on other Minnesota deer hunter surveys (Table 1- 3).

For the species with a statewide bag limit of 1 (deer and turkey), mean success was generally consistent with statewide harvest success as reported in the 2015 deer and turkey harvest reports (Table 1- 4). Overall, 38% of firearm deer hunters bagged a deer, while 22% of archery deer, 14% of muzzleloader deer hunters was successful. For turkeys, 24% of spring hunters and 21% of fall hunters were successful. For species with a daily bag limit, mean harvest was 8.8 for ducks, 2.1 for geese, and 3.8 for pheasant (Table 1- 4). Hunt Satisfaction

Respondents were asked to indicate their satisfaction with the overall WMA hunting experience and for the species they hunted on WMAs. Satisfaction was measured on a 7-point scale from “Extremely Dissatisfied” to “Extremely Satisfied”. When asked about overall experiences, nearly three-quarters of respondents (71%) were satisfied with their WMA experience. Of those, 42% were moderately or 13% extremely satisfied with their WMA experience (Figure 1- 2).

Respondents were then asked to rate their satisfaction with individual species or seasons a 7-point scale ranging from “Very Dissatisfied” to “Very Satisfied” (Table 1-6). Satisfaction related to species hunted varied

Section 1: Wildlife Management Area Hunting Experiences

significantly across species (F-statistic = 205.5). Spring turkey hunters ($\bar{x} = 5.4$) were the most satisfied, followed closely by fall turkey hunters ($\bar{x} = 5.0$), and archery deer hunters ($\bar{x} = 4.9$). Muzzleloader deer hunters ($\bar{x} = 4.0$) and rabbit hunters ($\bar{x} = 4.2$) had the highest level of “very dissatisfied” with their experiences (Table 1-5).

With the exception of pheasant ($r = .221$, $p < .001$), there was no relationship between satisfaction with the overall WMA hunting experience and satisfaction with hunting individual species (Table 1-6). However, satisfaction for each species/season was positively related to the number of animals bagged. Of the 12 items, only fall turkey, squirrel, and dove yielded non-significant results. By species, the strongest relationship was for rabbits ($r = .464$), grouse ($r = .399$), and archery deer ($r = .323$) (Table 1-7).

Future Participation

Respondents were also asked to rate their likelihood of returning to hunt on a WMA again in the future. Responses were on a 7-point scale ranging from “Extremely Unlikely” to “Extremely Likely” (Table 1-). Of the respondents who replied ($n = 846$), 92% of respondents indicated they would return to a WMA in the future. As expected, individuals who expressed dissatisfaction with their overall WMA experience were less likely to return than individuals who were satisfied (74% vs. 97%) (Table 1- 8). Similar to satisfaction, there was also a positive relationship between the number of animals bagged and future participation (Table 1- 7).

Table 1- 1. Land types used during 2015 hunting season.

Land Type	None	Some	Most	All	Mean ¹
Wildlife Management Area (WMA)	12.3%	44.0%	34.8%	8.9%	2.40
Private Land	38.4%	30.9%	28.5%	2.3%	1.95
Waterfowl Production Area (WPA)	44.9%	36.6%	16.0%	2.5%	1.76
Walk-in-Access Area (WIA)	65.6%	28.2%	5.4%	0.7%	1.41
Other Public Land	69.2%	21.6%	7.9%	1.3%	1.41
	X ² =986.9***			F=275.6***	

¹ Mean based on scale: 1 = None, 4 = All.

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

Table 1- 2. Crowding effects at different land types during 2015 hunting season.

Land Type	n	Not crowded at all		Slightly Crowded		Moderately Crowded		Extremely Crowded		Mean	
		1	2	3	4	5	6	7	8		9
WMA	842	13.4%	13.1%	13.4%	17.0%	12.0%	11.9%	12.0%	5.0%	2.3%	4.23
WPA	530	14.0%	13.8%	16.4%	14.2%	10.2%	14.2%	10.9%	3.2%	3.2%	4.14
Other Public Land	318	15.7%	14.8%	13.5%	15.4%	16.7%	9.1%	9.1%	3.8%	1.9%	3.97
WIA	341	22.9%	19.9%	17.6%	11.7%	10.0%	8.2%	3.5%	4.1%	2.1%	3.38
Private Land	582	73.7%	14.4%	3.8%	3.3%	2.4%	0.9%	0.7%	0.5%	0.3%	1.56
		X ² =885.5***							F=225.3***		

¹ Mean based on scale: 1 = Not at all crowded, 9 = Extremely crowded.

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

Section 1: Wildlife Management Area Hunting Experiences

Table 1- 3. For those species hunted, the average number of days spent hunting on WMAs.

Species	n	Mean Days Hunted ¹	Median Days Hunted	Maximum Days Hunted ²
Deer – Archery	108	13.27	9.5	85
Pheasant	590	8.62	5	70
Geese	168	8.51	5	50
Duck	275	7.96	5	50
Deer – Muzzleloader	73	5.86	5	16
Grouse	115	5.15	3	30
Rabbits	39	4.97	3	25
Deer – Firearm	224	4.50	4	9
Squirrels	33	4.91	3	25
Dove	49	3.67	2	15
Turkey - Fall	19	3.47	3	10
Turkey – Spring	82	3.28	3	10
		F=249.5***		

¹ Statistics only include hunters who responded with a value of 1 or more days spent hunting on WMAs

²Outliers that extended beyond allowable days per season were eliminated

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

Table 1- 4. For those species hunted, the average number of animals bagged on WMAs.

Species	n	Mean Animals Bagged	Median Animals Bagged	Maximum Animals Bagged ¹
Duck	297	8.81	5	66
Dove	54	4.20	0	55
Pheasant	628	3.83	1	45
Squirrels	41	2.15	0	20
Geese	199	2.12	0	36
Rabbits	46	1.98	0	18
Grouse	132	1.89	1	19
Deer – Firearm	256	0.38	0	3
Deer – Muzzleloader	78	0.14	0	1
Deer – Archery	112	0.22	0	2
Turkey – Spring	86	0.24	0	1
Turkey - Fall	24	0.21	0	2
		F=71.82***		

¹Extreme (and improbable) outliers removed

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

Section 1: Wildlife Management Area Hunting Experiences

Table 1- 5. Satisfaction of species hunted on WMAs.

Species	n	Extremely Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Moderately Satisfied	Extremely Satisfied	Mean ¹
Turkey – Spring	86	3.5%	3.5%	3.5%	15.1%	15.1	34.9	24.4	5.37
Turkey - Fall	24	4.2%	0.0%	12.5%	25.0	16.7	16.7	25.0	5.00
Deer – Archery	112	5.4%	1.8%	14.3%	17.0%	15.2	30.4	16.1	4.90
Pheasant	628	7.8%	9.1%	8.4%	8.4	17.8	36.8	11.6	4.76
Grouse	132	6.8%	8.3%	8.3%	16.7	17.4	31.1	11.4	4.68
Duck	297	6.1%	11.1%	11.1%	14.8	18.2	25.6	13.1	4.57
Squirrels	41	7.3%	9.8%	7.3%	26.8	9.8	22.0	17.1	4.56
Deer – Firearm	256	8.6%	10.5%	9.0%	17.2%	11.3	30.5	12.9	4.55
Dove	54	9.3%	11.1%	11.1%	20.4	13.0	20.4	14.8	4.37
Geese	199	7.5%	9.0%	14.6%	23.6	19.1	18.1	8.0	4.24
Rabbits	46	15.2%	6.5%	8.7%	19.6	19.6	21.7	8.7	4.22
Deer – Muzzleloader	78	16.7%	12.8%	9.0%	16.7%	11.5	25.6	7.7	4.01
$\chi^2=138.13^{***}$								$F=205.5^{***}$	

¹ Mean based on scale: 1 = Extremely dissatisfied, 7 = Extremely satisfied.

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

Table 1- 6. Correlation between satisfaction of hunting individual species/seasons against age, education, and income.

		Age	Education	Income
	n	r		
Deer hunters (firearm only)	256	0.115 n.s.	-0.087 n.s.	-0.032 n.s.
Deer hunters (archery only)	78	0.304**	-0.108 n.s.	-0.050 n.s.
Deer hunters (muzzleloader only)	112	0.200*	0.009 n.s.	-0.035 n.s.
Spring Turkey hunters	86	-0.054 n.s.	0.037 n.s.	0.110 n.s.
Fall Turkey hunters	24	0.384 n.s.	0.085 n.s.	-0.011 n.s.
Duck hunters	297	-0.047 n.s.	-0.007 n.s.	-0.035 n.s.
Goose hunters	199	0.041 n.s.	0.030 n.s.	-0.158*
Grouse hunters	132	0.010 n.s.	0.206*	-0.289**
Pheasant hunters	628	-0.004 n.s.	0.008 n.s.	-0.065 n.s.
Dove hunters	54	-0.074 n.s.	-0.189 n.s.	0.136 n.s.
Rabbit hunters	46	0.154 n.s.	0.223 n.s.	-0.158 n.s.
Squirrel hunters	41	0.339*	0.003 n.s.	0.010 n.s.

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

Section 1: Wildlife Management Area Hunting Experiences

Table 1- 7. Relationship between satisfaction and species bagged, future participation for each species pursued.

Species / Season	Overall Satisfaction with experiences at WMAs	Animals Bagged			Likelihood of Future Participation		
		n	r	p	n	r	p
Deer – Firearm	.112	219	.270**	<.001	253	.323**	<.001
Deer – Muzzleloader	.089	65	.248*	.046	78	.502**	<.001
Deer – Archery	.087	95	.323**	.001	112	.041	.559
Turkey – Spring	.077	69	.293*	.014	86	.356**	.001
Turkey - Fall	.143	19	.028	.909	24	0.362	.082
Duck	.013	235	.256**	<.001	296	.241**	<.001
Geese	-.024	148	.229**	.005	198	.241**	<.001
Grouse	.097	106	.399**	<.001	132	.257**	.003
Pheasant	.221**	497	.289**	<.001	624	.284**	<.001
Dove	.023	41	.305	.052	53	.281*	.041
Rabbits	.117	32	.464**	.008	46	.301*	.042
Squirrels	-.020	27	.365	.061	41	-.055	.732

*p < 0.05, **p < 0.01, ***p < 0.001

Table 1- 8. Likelihood of respondents to return to a WMA based on overall hunt satisfaction.

Satisfaction level	n	Future Participation		
		Unlikely	Neutral	Likely
Dissatisfied	145	17.9%	8.3%	73.8%
Neutral	92	3.3%	8.7%	88.0%
Satisfied	588	2.7%	0.3%	96.9%
Total	825	5.5%	2.7%	91.9%

Section 1: Wildlife Management Area Hunting Experiences

Figure 1- 1. Species hunted as reported by respondents.

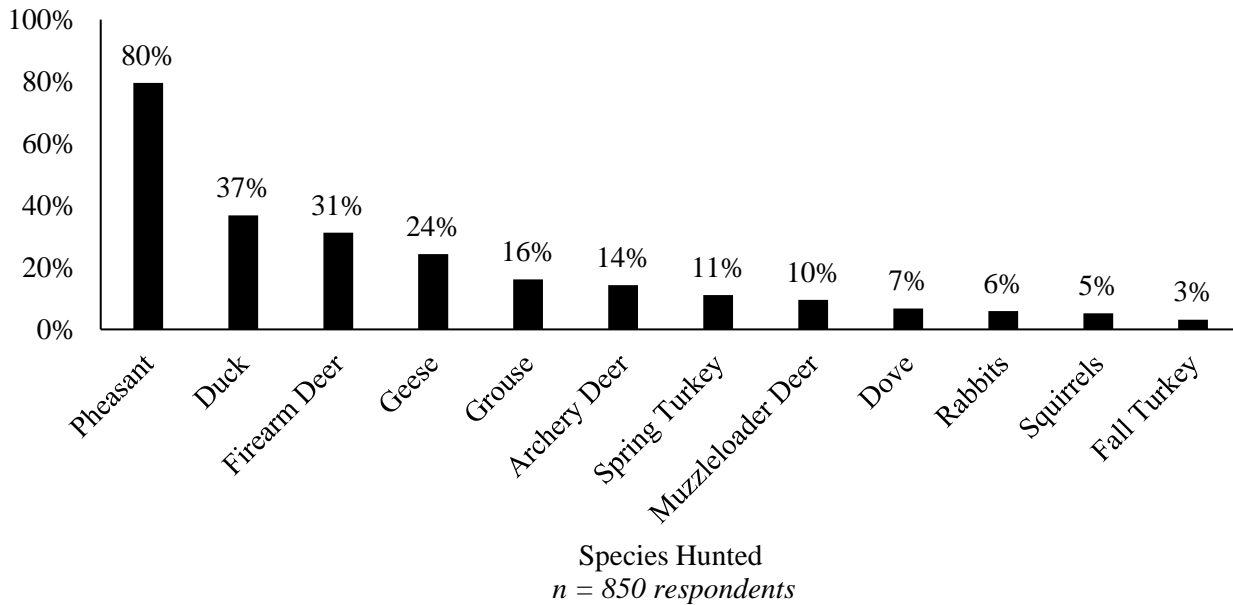
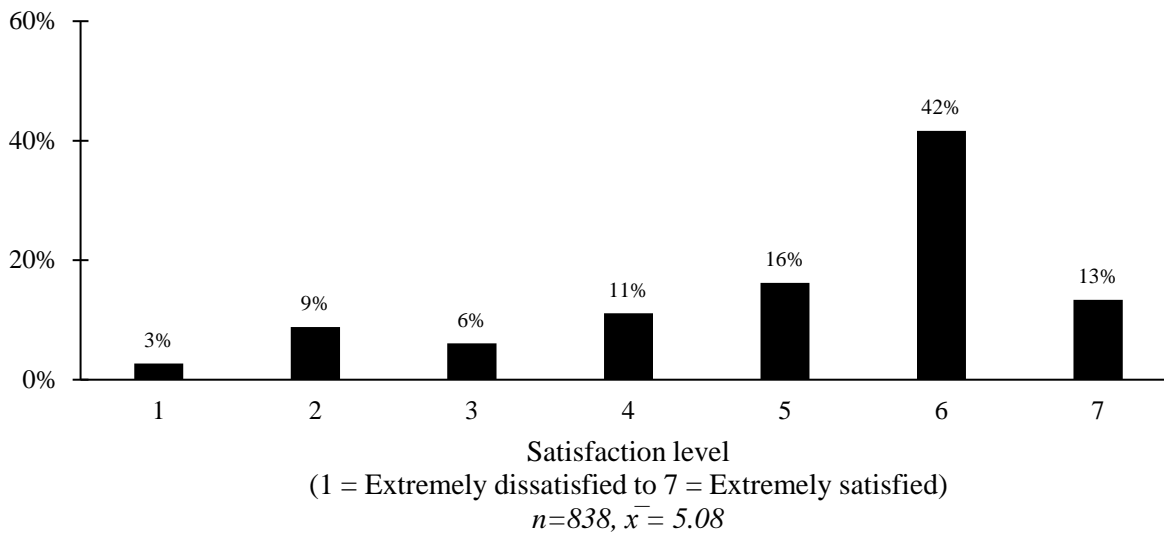
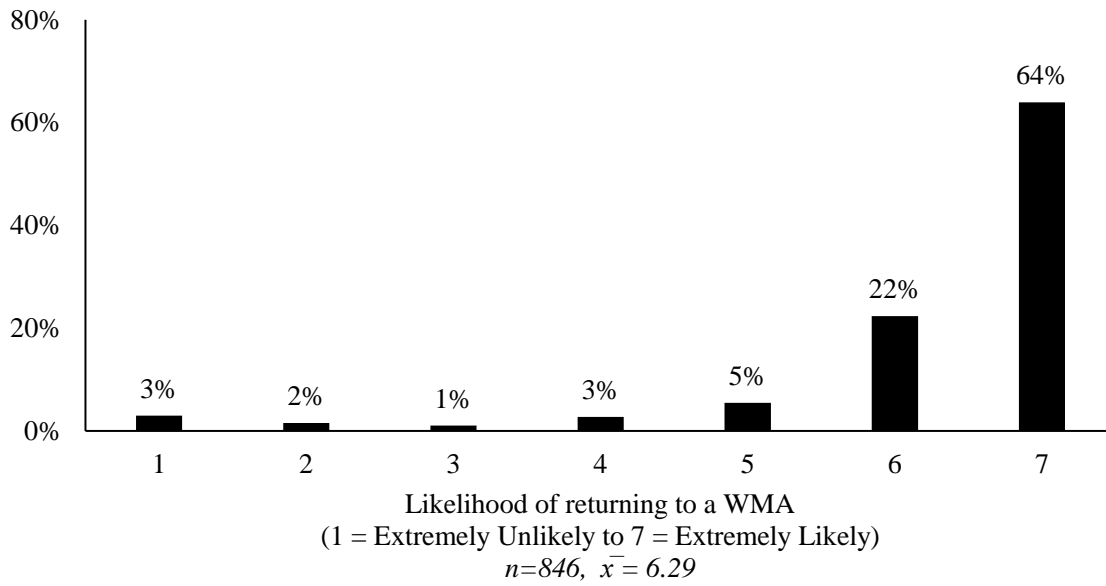


Figure 1- 2. Percent satisfaction with overall WMA hunting experience in Minnesota during the 2015-16 season.



Section 1: Wildlife Management Area Hunting Experiences

Figure 1- 3. Percent likelihood of returning to a WMA in the following year.



Section 2: County-specific information on deer, pheasant, and waterfowl hunting

Findings:

County-specific information

As most Minnesota hunters pursue deer, pheasants, and/or waterfowl, we asked a more detailed series of questions related to where (county, land type) and how often they pursued those species. For each species, respondents were asked to list the top 5 counties they hunted, the land type they hunted, the number of different WMAs visited per trip, the number of days hunted, and the number of animals taken. Since there were 5 possible responses for each species, the data were consolidated and then analyzed in the aggregate. It is important to note that these results may not be generalizable for statewide, county-specific information since this was a survey of people who used WMAs.

County-specific pheasant information

Overall, pheasant hunting was the most popular hunting activity, as 73% of respondents indicated they pursued that species. They recorded visiting 76 different counties and 1,437 WMA visits during the 2015-16 hunting season. Lac Qui Parle County was visited most frequently, followed by Kandiyohi and Lyon. Pheasant hunters visited an average of 2.19 WMAs visited per trip, hunted 5.07 days per county, and bagged 2.29 pheasants per county (Table 2- 1).

County-specific waterfowl information

County-specific information about waterfowl hunters was provided by 35% of respondents. They visited 77 different counties and 527 WMAs during the 2015-2016 hunting season. Lac Qui Parle county was visited most frequently, followed by Kandiyohi and Ottertail. Waterfowl hunters visited an average of 1.37 WMAs per trip, hunted 5.92 days per county, and bagged 7.61 waterfowl per county (Table 2- 2).

County-specific deer information

Finally, deer (pursued during firearm, archery, and muzzleloader seasons) were sought after by 44% of respondents. They visited a total of 82 counties and 599 WMAs during the 2015-2016 season. Kandiyohi was the most commonly visited county, followed by Lac Qui Parle and Stearns. Deer hunters visited an average of 1.53 WMAs per county, spent 7.11 days hunting deer, and harvested an average of 0.41 deer per county (Table 2- 3).

Section 2: County-specific information on deer, pheasant, and waterfowl hunting

Table 2- 1. County-specific information for pheasant hunting.

Pheasant County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged		Pheasant County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged
Lac Qui Parle	80	3.36	7.51	6.35		Fillmore	12	2.27	3.64	2.18
Kandiyohi	65	2.40	6.69	3.19		Freeborn	12	2.00	10.25	3.58
Lyon	65	3.17	5.16	4.05		Traverse	12	3.08	5.73	6.00
Stearns	54	2.19	5.60	3.22		Waseca	12	1.91	4.25	2.42
Murray	53	2.75	4.49	3.78		Faribault	11	2.45	5.91	2.40
Yellow Medicine	49	2.81	3.76	2.60		Sherburne	11	2.09	5.70	0.73
Cottonwood	48	2.90	5.04	3.17		Mille Lacs	10	1.50	2.10	1.10
Jackson	48	3.09	5.09	3.83		Rock	10	2.43	7.67	2.22
Lincoln	47	3.04	4.94	3.94		Steele	10	2.11	4.88	1.70
Meeker	47	2.20	5.00	1.72		Benton	8	1.14	1.57	1.00
Pope	41	2.33	5.41	3.38		Morrison	7	1.20	2.17	2.43
Brown	40	2.40	6.26	3.51		Mower	7	1.43	5.71	1.71
Douglas	36	2.83	4.91	1.80		Becker	6	2.17	8.83	4.20
Swift	36	2.11	5.17	3.35		Isanti	6	2.67	2.50	1.17
Watonwan	34	2.52	4.64	2.52		Kanabec	6	1.60	3.00	1.17
Big Stone	33	3.22	4.09	2.91		Chisago	5	1.00	1.60	0.40
Grant	32	3.16	4.39	2.52		Goodhue	5	2.20	9.80	1.80
Ottertail	32	2.70	4.81	2.07		Olmsted	5	1.75	5.00	3.40
McLeod	31	2.17	3.83	1.39		Dodge	4	1.75	5.50	5.00
Blue Earth	28	2.44	6.23	2.40		Polk	4	1.00	1.25	1.00
Nobles	25	2.96	5.16	4.54		Anoka	3	1.33	2.00	0.00
Stevens	25	2.28	3.00	1.04		Wabasha	3	2.00	5.00	1.50
Wright	25	2.59	6.00	1.39		Aitkin	2	1.00	1.00	0.00
Chippewa	24	2.61	5.43	3.57		Mahnomen	2	1.50	2.00	0.50
Redwood	24	2.04	2.79	2.00		Pine	2	1.50	2.00	4.00
Clay	23	2.05	5.30	1.95		St. Louis	2	1.00	6.00	0.50
Pipestone	21	3.48	6.10	4.60		Washington	2	2.00	6.50	0.00
Renville	20	1.79	5.45	2.55		Winona	2	4.00	7.00	1.50
Le Sueur	19	1.84	3.74	0.89		Carlton	1	5.00	30.00	0.00
Martin	18	2.67	6.47	7.06		Cass	1	4.00	4.00	0.00
Scott	18	2.82	5.11	0.89		Clearwater	1	3.00	1.00	1.00
Todd	18	2.56	7.17	3.00		Hennepin	1	1.00	1.00	3.00
Sibley	16	1.47	2.50	0.75		Houston	1	1.00	3.00	0.00
Wilkin	16	2.27	6.56	4.00		Hubbard	1	-	1.00	1.00
Nicollet	15	1.69	4.85	2.23		Kittson	1	0.00	2.00	0.00
Rice	14	1.85	4.08	1.71		Norman	1	1.00	10.00	5.00
Carver	13	1.67	4.77	1.17		Pipestone	1	1.00	2.00	4.00
Dakota	13	1.46	5.23	1.08		Wadena	1	2.00	10.00	0.00
						Total	1437	2.19	5.07	2.29

Section 2: County-specific information on deer, pheasant, and waterfowl hunting

Table 2- 2. County-specific information for waterfowl hunting.

County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged		County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged
Lac Qui Parle	32	1.93	5.55	11.47		Redwood	5	0.80	1.60	2.20
Kandiyohi	25	1.33	5.13	6.88		Dakota	4	1.67	7.25	5.25
Ottertail	25	1.48	6.52	8.24		Isanti	4	1.25	3.50	4.75
Big Stone	19	1.72	6.33	14.24		Itasca	4	1.00	7.25	8.75
Stearns	19	1.56	5.53	9.17		Mille Lacs	4	1.00	2.25	2.25
Wright	19	1.65	8.17	11.71		Renville	4	1.00	4.50	4.25
Douglas	18	2.08	5.82	7.88		Sherburne	4	1.25	5.00	5.50
Nicollet	18	1.29	5.00	7.76		Anoka	3	2.00	2.50	3.00
Grant	17	1.31	5.06	6.88		Clearwater	3	1.00	5.33	12.67
Lyon	16	1.43	6.87	8.06		Crow Wing	3	1.00	15.00	10.00
Pope	15	1.54	7.14	8.53		Goodhue	3	1.00	2.33	5.33
Blue Earth	13	2.00	8.92	6.23		Hennepin	3	1.00	3.50	4.50
Polk	12	2.58	5.92	7.50		Morrison	3	1.00	3.67	7.67
Swift	11	2.33	9.09	16.00		Red Lake	3	0.33	3.33	4.67
Meecker	10	1.75	3.38	6.89		Watonwan	3	2.67	6.67	12.33
Stevens	10	1.70	4.00	7.90		Wilkin	3	1.50	3.00	2.00
Traverse	10	2.56	4.60	11.89		Chisago	2	0.50	1.50	3.00
Yellow Medicine	10	2.00	4.11	6.33		Hubbard	2	2.00	2.50	2.00
Jackson	9	1.71	8.89	11.25		Nobles	2	0.00	3.00	9.00
Aitkin	8	1.25	4.00	3.13		Steele	2	0.00	10.50	3.50
Carver	8	1.14	4.29	6.57		Todd	2	4.00	15.50	8.00
Cass	8	1.00	3.75	5.50		Wabasha	2		2.00	8.00
Scott	8	0.86	13.00	5.38		Washington	2	0.00	3.00	6.50
Waseca	8	1.50	8.43	9.57		Winona	2	3.00	3.00	5.00
Becker	7	2.00	4.43	3.67		Cook	1	4.00	-	-
Clay	7	2.29	4.00	8.57		Fillmore	1	2.00	15.00	4.00
Lincoln	7	1.57	4.86	6.57		Houston	1	0.00	1.00	0.00
Murray	7	2.00	9.14	18.83		Kanabec	1	0.00	1.00	1.00
Rice	7	1.29	7.67	8.00		Kittson	1	2.00	4.00	2.00
Sibley	7	1.71	8.14	11.14		Mahnomen	1	0.00	5.00	14.00
Cottonwood	6	1.50	9.83	9.00		Mower	1	0.00	15.00	10.00
Faribault	6	1.20	8.60	8.17		Norman	1	1.00	10.00	12.00
Le Sueur	6	1.20	5.67	13.50		Olmsted	1	0.00	1.00	4.00
Marshall	6	1.00	4.00	14.67		Pennington	1	0.00	2.00	0.00
Martin	6	4.00	19.33	21.00		Pine	1	0.00	0.00	2.00
McLeod	6	1.40	3.60	2.80		Pipestone	1	1.00	2.00	0.00
Brown	5	0.80	6.00	8.60		St. Louis	1	0.00	10.00	40.00
Chippewa	5	1.20	3.40	6.60		Wadena	1	2.00	10.00	0.00
Freeborn	5	0.67	7.75	3.50		Total	527	1.37	5.92	7.61

Section 2: County-specific information on deer, pheasant, and waterfowl hunting

Table 2- 3. County-specific information for deer hunting.

County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged		County	N	Mean WMAs Visited	Mean Days Hunted	Mean Animals Bagged
Kandiyohi	31	1.63	8.21	0.46		Stevens	6	2.80	5.80	0.25
Lac Qui Parle	27	1.83	6.88	0.29		Wilkin	6	2.60	7.67	0.33
Stearns	27	1.36	6.44	0.62		Cass	5	1.33	6.00	0.50
Ottertail	26	1.41	8.04	0.55		Fillmore	5	0.75	6.60	0.20
Polk	22	3.25	7.33	0.32		Hubbard	5	1.75	6.80	0.50
Todd	18	1.31	7.94	0.53		Lyon	5	1.33	3.50	0.75
Clay	16	2.33	7.94	0.50		Marshall	5	2.00	5.40	0.40
Swift	15	1.33	7.27	0.29		Nobles	5	3.00	3.60	0.50
Meeker	14	1.08	7.86	0.54		Red Lake	5	1.50	9.25	0.33
Douglas	12	1.56	3.18	0.64		Rice	5	1.00	2.40	0.40
Pope	12	2.00	8.09	0.36		Scott	5	1.00	7.40	0.00
Murray	11	3.33	4.09	0.45		St. Louis	5	0.25	12.00	0.20
Morrison	10	0.33	2.89	0.22		Wadena	5	1.25	3.80	0.60
Wright	10	1.25	10.00	0.30		Waseca	5	0.75	6.00	1.25
Aitkin	9	0.63	5.33	0.38		Anoka	4	0.33	1.67	0.50
Big Stone	9	2.78	4.50	0.25		Faribault	4	3.00	4.00	0.00
Blue Earth	9	2.63	10.00	0.67		Kanabec	4	0.50	3.50	0.00
Brown	9	0.88	5.63	0.29		Mille Lacs	4	2.00	2.25	0.00
Chippewa	9	2.43	16.75	0.50		Olmsted	4	0.50	9.75	0.50
Cottonwood	9	2.13	10.11	0.44		Pipestone	4	1.25	8.25	0.50
Grant	9	2.57	7.50	0.86		Roseau	4	1.75	3.50	0.75
Houston	9	2.00	7.38	1.38		Hennepin	3	0.33	5.67	0.00
Martin	9	2.40	6.14	0.43		Kittson	3	2.33	6.33	0.00
Pine	9	0.43	3.89	0.25		Le Sueur	3	1.67	5.67	0.67
Beltrami	8	2.17	4.71	0.57		Mahnomen	3	1.00	9.33	0.33
McLeod	8	0.60	2.29	0.43		Norman	3	1.67	7.67	0.67
Yellow Medicine	8	1.33	4.00	0.00		Sherburne	3	1.33	5.33	0.33
Becker	7	2.14	3.57	0.25		Steele	3	0.67	17.00	0.00
Crow Wing	7	1.14	6.71	0.33		Watonwan	3	3.50	5.67	0.33
Itasca	7	0.33	6.71	0.57		Benton	2	0.00	3.00	0.50
Nicollet	7	0.33	3.83	0.33		Carver	2	0.50	5.50	0.00
Winona	7	1.60	10.50	0.00		Chisago	2	0.00	2.50	1.00
Carlton	6	1.40	6.50	0.17		Isanti	2	5.00	4.50	0.00
Clearwater	6	1.75	12.60	0.20		Mower	2	2.50	20.00	0.00
Dakota	6	1.20	5.67	0.60		Pennington	2	1.00	4.50	0.00
Freeborn	6	0.75	4.40	0.20		Traverse	2	-	2.00	1.00
Jackson	6	2.33	4.33	1.33		Wabasha	2	3.00	1.00	1.00
Lincoln	6	1.00	6.20	1.00		Washington	2	3.00	70.00	0.50
Redwood	6	2.00	8.60	0.60		Goodhue	1	1.00	1.00	0.00
Renville	6	0.80	8.20	0.20		Koochiching	1	0.00	7.00	0.00
Sibley	6	0.67	6.17	0.20		Lake	1	0.00	2.00	0.00
						Total	599	1.53	7.11	0.41

Section 3: Participation in Activities on WMAs

Findings:

WMA Use during non-hunting seasons

Wildlife Management Areas are heavily used throughout fall hunting seasons; however, managers are also interested in learning how WMA are used and which activities are sought during non-hunting seasons. Respondents were asked to indicate how often they visited WMAs in general and subsequently participated in activities both during and outside the hunting seasons. Visitation and activities were measured on a 4-point scale, ranging from “None” to “All”. During the hunting season, at least ‘some’ activity was reported for all the items, with “Hunted a WMA with one or more people” ($\bar{x} = 2.73$) and “Hunted a WMA with one or more dogs” ($\bar{x} = 2.69$) had the highest mean scores. Interestingly, 74% indicated they did at least some of their hunting alone and 40% did not scout a WMA prior to hunting. Conversely, rates of WMA visitation outside the hunting season were much lower and while slightly more than half (54%) visited a WMA outside the hunting season all items scaled below 2.0 (Table 3- 1).

For non-hunting activities, respondents were asked to identify how many days they spent participating in each activity during the last 12 months. Respondents were asked to indicate how often they participated in these activities on a 4-point scale ranging from “1-5 days last year” to “>31 days last year”. The activities with the highest response rates were “Viewing wildlife/bird watching (not while hunting)” (30.0% response, $\bar{x} = 1.6$) and “Sightseeing/observing on a WMA” (29.6% response, $\bar{x} = 1.5$). Activities such as wildlife photography, picnicking, and berry/nut/mushroom/plant collecting were rarely pursued (Table 3- 2).

Non-hunting use on WMAs during all four seasons

It is also important for managers to know when users are seeking non-hunting experiences. In Table 3- 3, respondents chose which season they are most likely to visit for non-hunting activities. The highest response rate was Fall (September 1st – November 30th) with 34%. The lowest response rate was Winter (December 1st – February 28th) with 19.5% or respondents indicating that they visited a WMA.

Section 3: Participation in Activities on WMAs

Table 3- 1. Activity difference during hunting and non-hunting seasons.

	n	None	Some	Most	All	Mean ¹
During the Hunting Season						
Hunted a WMA with one or more people	839	7.6%	41.1%	21.6%	29.7%	2.73
Hunted a WMA with one or more dogs	792	15.5%	25.0%	34.5%	25.0%	2.69
Moved to another WMA if the first one had cars present	786	20.6%	38.7%	17.4%	23.3%	2.43
Used the same WMA on consecutive trips	803	16.3%	49.9%	9.7%	24.0%	2.41
Hunted on more than one WMA per day	796	17.1%	49.1%	12.6%	21.2%	2.38
Hunted by myself on a WMA	779	24.6%	48.4%	6.5%	20.4%	2.23
Scouted a WMA prior to opening day of hunting season	775	40.4%	35.7%	8.3%	15.6%	1.99
$X^2=669.8^{***}$					$F=2.775^*$	
Outside the Hunting Season						
Visited a WMA by myself	630	46.3%	40.8%	4.8%	8.1%	1.75
Visited a WMA with one or more people	610	53.0%	39.7%	1.6%	5.7%	1.60
Visited more than one WMA per day	602	61.6%	30.1%	2.2%	6.1%	1.53
Visited a WMA with one or more dogs	575	68.0%	21.9%	4.9%	5.2%	1.47
Visited the same WMA between trips	576	67.2%	26.2%	2.3%	4.3%	1.44
Moved to another WMA if the first one had cars present	586	76.8%	12.6%	4.9%	5.6%	1.39
$X^2=210.05^{***}$					$F=0.695$ n.s.	

¹ Mean based on scale: 1 = Extremely dissatisfied, 7 = Extremely satisfied.

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

Table 3- 2. Participation in non-hunting activities.

	n	1-5 days last year	6-10 days last year	11-30 days last year	>31 days last year	Mean ¹
Training my dog	178	59.6%	21.9%	11.8%	6.7%	1.66
Photographing nature	86	60.5%	24.4%	7.0%	8.1%	1.63
Viewing wildlife/bird watching (<i>not while hunting/fishing</i>)	286	63.3%	22.0%	9.4%	5.2%	1.57
Hiking/walking/running	229	62.9%	23.6%	10.0%	3.5%	1.54
Sightseeing/observing on WMA	281	65.1%	22.8%	7.8%	4.3%	1.51
Berry/nut/mushroom/plant collecting	89	67.4%	23.6%	9.0%	0.0%	1.42
Looking for antler sheds	131	74.0%	16.0%	6.1%	3.8%	1.40
Picnicking	26	80.8%	15.4%	0.0%	3.8%	1.27
$X^2=259.89^{***}$				$F=71.11^{***}$		

¹ Mean based on scale: 1 = "1-5 days last year", 4 = ">31 days last year"

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

Section 3: Participation in Activities on WMAs

Table 3- 3. Seasons of visitation for non-hunting activities.

	Visited	Did Not Visit
Winter (December 1 st – February 28 th)	19.5%	80.5%
Spring (March 1 st – May 31 st)	25.5%	74.5%
Summer (June 1 st – August 31 st)	24.2%	75.8%
Fall (September 1 st – November 30 th)	34.0%	66.0%

Section 4: Wildlife Management Area User Beliefs about WMAs

Findings:

Beliefs about using WMAs in Minnesota

Hunters were asked whether or not they agreed with 26 statements about using WMAs (Table 4- 1 and Table 4- 2) using a 7-point scale with a range of “Extremely Disagree” and “Extremely Agree”. In regards to statements about using WMAs in Minnesota, most statements had an average response below neutral (neither agree nor disagree). However, respondents were agreeable with “I identify strongly with WMAs” ($\bar{x}=4.70$), “I am very attached to WMAs” ($\bar{x}=4.53$), and “I feel like WMAs are a part of me” ($\bar{x}=4.32$). The statements with the highest level of disagreement were “I would not continue hunting if I could not access WMAs” ($\bar{x}=3.33$), “No other place can compare to WMAs” ($\bar{x}=3.36$), and “I get more satisfaction out of visiting WMAs than from visiting any other place” with a ($\bar{x}=3.36$). There were significant differences in the mean scores for each statement, as well as a significant difference in the responses to each question.

When asked about the state of WMAs throughout the state, most hunters felt positively about almost all of the statements. Respondents agreed most strongly that “The number of WMAs should be increased” ($\bar{x}=6.15$), “WMAs provide me with an important place to hunt pheasant” ($\bar{x}=5.94$), and “WMAs provide an easy place to go hunting” ($\bar{x}=5.88$). Respondents most strongly disagreed with “Hunting on WMAs is better than hunting on private lands that I have access to” ($\bar{x}=2.81$). WMAs provide an essential place for hunters seeking specific experiences. More than 3 out of 4 respondents feel that WMAs provide an important place to hunt pheasant (86%), while more than half believe that WMAs are important for their waterfowl hunting experiences (58%). Deer hunters do not find WMAs as important as other hunters, as only 44% of respondents believe that WMAs provide an important place for them to hunt deer. There was a significant difference in the mean scores for each statement, as well as a significant difference in the responses to each question (Table 4- 2).

Perceived constraints to using WMAs

WMA users were asked which limitations they found to be most constraining in regards to using WMAs during the last 12 months (Table 4- 3). The statements with the highest indication of moderate to extreme constraint were found in the following categories: “Not enough game” ($\bar{x}=5.28$), “Lack of time” ($\bar{x}=5.09$), and “Family/relationship responsibilities” ($\bar{x}=3.61$). The following were not considered to be as much as a constraint: “Poor health” ($\bar{x}=1.70$), “Difficulties due to age” ($\bar{x}=1.91$), and “Lack of interest” ($\bar{x}=1.95$). While our chi-square results demonstrate that our observed results are different than expected ($p < 0.005$), there is no significant difference in the mean response of each statement ($p > 0.05$).

Section 4: Wildlife Management Area User Beliefs about WMAs

Maintenance beliefs about WMAs

Hunters were asked about whether or not they agreed with various components for WMA upkeep (Table 4- 4). Using a 7-point scale with “Extremely Disagree” and “Extremely Agree”, the majority of responses had an overwhelmingly positive reaction. The components with the highest mean response were: “Maintaining habitat for game species” (\bar{x} =6.73), and “Providing habitat for wildlife” (\bar{x} =6.73). While all mean responses were above 5.0, the statements with the lowest agreement were “Providing diverse recreational opportunities” (\bar{x} = 5.18), “Providing educational learning opportunities” (\bar{x} = 5.36), “Maintain scenic beauty” (\bar{x} = 5.54), and “Supporting local economies and business” (\bar{x} = 5.55).

Important conditions for satisfactory conditions for hunting on WMAs

When asked about important components needed for satisfactory experiences while hunting WMAs, most respondents feel that all listed statements are necessary. Using a 7-point scale with “Extremely Unimportant” and “Extremely Important”, nearly every response had a mean score above 4.0. The only statement that had a mean score below “Neutral” was “Getting food for my family” (\bar{x} =3.87). The highest mean scores belong to the following categories: “Enjoying nature and the outdoors” (\bar{x} =6.60), “I feel better mentally, after I have spent time hunting” (\bar{x} =6.25), “Getting away from crowds of people” (\bar{x} =6.23), “The excitement of hunting” (\bar{x} =6.16), “Hunting provides an enjoyable way to get exercise” (\bar{x} =6.15), “I feel better physically, after I have spent time hunting” (\bar{x} =6.11), and “Access to a lot of different hunting areas” (\bar{x} =6.01) (Table 4- 5).

Section 4: Wildlife Management Area User Beliefs about WMAs

Table 4- 1. Hunter beliefs about using WMAs in Minnesota.

	n	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree	Mean ¹
I identify strongly with WMAs.	839	5.4%	6.1%	6.1%	24.9%	23.5%	21.1%	13.0%	4.70
I am very attached to WMAs.	834	7.9%	6.4%	7.3%	26.4%	20.9%	18.0%	13.2%	4.53
I feel like WMAs are a part of me.	838	9.5%	7.2%	6.6%	32.2%	18.5%	15.4%	10.6%	4.32
WMAs are the best places for what I like to do.	834	10.2%	14.4%	14.7%	22.9%	19.2%	13.8%	4.8%	3.87
I wouldn't substitute any other area for doing the types of things I do at WMAs.	836	10.6%	16.6%	15.3%	25.5%	11.5%	14.8%	5.6%	3.78
WMAs provide my only opportunity to hunt on MN.	835	21.1%	15.1%	12.1%	12.1%	13.2%	14.9%	11.6%	3.72
Doing what I do at WMAs is more important to me than doing it in any other place.	837	11.9%	16.2%	12.7%	29.4%	13.7%	11.2%	4.8%	3.70
No other place can compare to WMAs.	836	16.6%	18.9%	15.4%	24.6%	12.6%	9.0%	2.9%	3.36
I get more satisfaction out of visiting WMAs than from visiting any other place.	837	14.7%	20.5%	14.7%	26.5%	13.6%	7.4%	2.5%	3.36
I would not continue hunting if I could not access WMAs.	839	32.8%	13.2%	10.0%	9.5%	12.0	11.1	11.3	3.33
		$X^2 = 1101.6^{***}$							$F = 65.5^{***}$

¹ Mean based on scale: 1 = Extremely Disagree, 7 = Extremely Agree.

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

Section 4: Wildlife Management Area User Beliefs about WMAs

Table 4- 2. Hunter beliefs about the state of WMAs in Minnesota.

	n	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree	Mean ¹
The number of WMA sites should be increased.	845	1.1%	0.8%	1.4%	8.9%	11.0%	20.4%	56.4%	6.15
I understand the rules for using WMAs.	837	0.7%	1.3%	1.9%	7.4%	13.6%	28.7%	46.4%	6.03
WMAs provide me with an important place to hunt pheasant.	843	2.1%	1.3%	2.4%	8.1%	13.0%	27.0%	46.0%	5.94
WMAs provide an easy place to go hunting.	836	1.3%	1.2%	2.3%	6.7%	17.8%	33.4%	37.3%	5.88
WMAs provide a place to take kids hunting.	839	1.0%	1.1%	2.5%	11.8%	21.1%	31.2%	31.3%	5.70
There are NOT enough WMAs near me.	837	4.1%	7.9%	9.7%	17.4%	16%	20.7%	24.3%	4.92
WMAs provide high quality hunting experiences.	845	4.3%	6.6%	11.5%	14.7%	27.1%	23.3%	12.5%	4.74
WMAs are too crowded.	842	2.6%	8.2%	10.5%	16.5%	30.4%	23.5%	8.3%	4.68
WMAs provide me with an important place to hunt small game other than waterfowl and pheasants.	811	9.5%	5.9%	4.4%	37.0%	14.3%	14.1%	14.8%	4.42
The quality of hunting on WMAs is not as good as other locations.	841	3.6%	12.5%	15.2%	18.5%	23.2%	17.8%	9.2%	4.35
Hunting on WMAs is better than hunting on Walk-In Access lands.	837	2.5%	4.8%	7.2%	56.8%	11.1%	9.7%	8.0%	4.30
WMAs provide me with an important place to hunt deer.	803	17.7%	6.8%	3.7%	27.9%	14.1%	13.7%	16.1%	4.19
Most of the WMAs I know about are too small.	835	6.8%	11.9%	23.4%	26.6%	18.0%	9.7%	3.7%	3.81
Most of the WMAs I know about are too far away.	840	10.6%	13.6%	19.5%	24.8%	17.5%	9.3%	4.8%	3.72
Hunting on WMAs is better than hunting on private lands that I have access to.	844	25.4	25.5	14.7	21.9	5.1	4.5	3	2.81
$X^2 = 5919.9^{***}$								$F = 328.7^{***}$	

¹ Mean based on scale: 1 = Extremely Disagree, 7 = Extremely Agree.

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

Section 4: Wildlife Management Area User Beliefs about WMAs

Table 4- 3. Beliefs about limitations/constraints to using WMAs.

	n										Mean ¹
		Not a constraint		Slight constraint		Moderate constraint		Extreme constraint			
Not enough game.	815	15.7%	4.5%	6.4%	12.3%	7.4%	16.3%	13.0%	10.1%	14.4%	5.28
Lack of time.	787	18.2%	4.7%	4.3%	13.1%	6.9%	19.4%	12.2%	11.4%	9.8%	5.09
Family/relationship responsibilities.	782	33.6%	10.0%	7.4%	13.9%	7.7%	11.6%	7.7%	5.1%	2.9%	3.61
Too many regulations.	797	45.5%	12.9%	9.4%	9.5%	6.5%	6.3%	3.0%	3.6%	3.1%	2.86
Seasons too short.	787	51.0%	12.7%	7.2%	8.8%	7.1%	6.0%	3.0%	2.5%	1.7%	2.61
No hunting partners.	782	52.7%	12.1%	8.2%	11.4%	4.6%	6.5%	2.3%	1.3%	0.9%	2.44
Lack of finances.	777	53.7%	13.4%	7.5%	10.2%	4.5%	6.6%	2.6%	0.8%	0.9%	2.38
Price of licenses and stamps.	790	59.4%	13.5%	7.5%	6.7%	4.1%	3.9%	2.5%	1.3%	1.1%	2.18
Lack of interest.	768	63.9%	13.8%	5.9%	6.6%	3.8%	3.5%	1.2%	0.7%	0.7%	1.95
Difficulties due to age.	776	67.4%	12.8%	3.7%	5.5%	3.2%	4.4%	2.1%	0.6%	0.3%	1.91
Poor health.	759	75.6%	9.4%	2.6%	4.3%	2.6%	3%	0.7%	1.1%	0.7%	1.70
Too much equipment needed.	765	74.4%	12.3%	4.6%	3.0%	3.1%	1.2%	0.8%	0.4%	0.3%	1.58
$X^2=2662.4***$									$F=0.739$ n.s.		

¹ Mean based on scale: 1 = Not a constraint, 9 = Extreme constraint.

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

Section 4: Wildlife Management Area User Beliefs about WMAs

Table 4- 4. Important components for WMA maintenance.

	n	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree	Mean ¹
Maintaining habitat for game species.	845	0.5%	0.0%	0.1%	1.4%	3.0%	13.4%	81.7%	6.73
Providing habitat for wildlife.	846	0.6%	0.0%	0.0%	1.2%	2.5%	14.9%	80.9%	6.73
Ensuring natural and undeveloped lands will exist for future generations.	845	0.6%	0.5%	0.8%	2.2%	5.3%	14.9%	75.6%	6.58
Providing access to public lands at no charge.	846	0.9%	1.4%	1.4%	7.4%	8.7%	19.0%	61.0%	6.23
Improving water quality.	842	1.0%	0.4%	1.3%	8.1%	12.2%	18.4%	58.7%	6.2
Maintaining a diversity of native plants and animals.	840	1.1%	1.2%	1.5%	6.5%	11.5%	21.0%	57.1%	6.18
Improving ecosystem health.	842	1.1%	0.5%	1.1%	7.7%	13.8%	18.6%	57.2%	6.18
Restoring native wetland landscapes.	843	1.2%	1.1%	1.7%	9.7%	11.2%	17.6%	57.7%	6.12
Providing a place where all people are welcome.	846	1.1%	1.7%	1.7%	10.0%	10.6%	19.6%	55.3%	6.08
Restoring native prairies.	843	2.5%	0.7%	3.0%	9.4%	13.2%	17.6%	53.7%	5.98
Preserving a part of our history.	844	0.9%	1.4%	2.3%	12.6%	14.6%	19.7%	48.6%	5.92
Supporting local economies and businesses.	845	2.2%	2%	3.0%	14.4%	22.8%	20.6%	34.9%	5.55
Maintaining scenic beauty.	841	2.7%	2.9%	5.0%	14.9%	16.2%	18.8%	39.6%	5.54
Providing educational and learning opportunities.	843	2.8%	4.5%	4.3%	17.3%	17.9%	19.9%	33.2%	5.36
Providing diverse recreational opportunities.	841	3.4%	5.4%	7.4%	17.7%	16.9%	18.5%	30.7%	5.18
$X^2=5552.2^{***}$									$F=110.9^{***}$

¹ Mean based on scale: 1 = Extremely disagree, 7 = Extremely agree.

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

Section 4: Wildlife Management Area User Beliefs about WMAs

Table 4- 5. Important components for satisfactory experiences while hunting on WMAs.

	n	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important	Mean ¹
Enjoying nature and the outdoors.	847	0.2%	0.5%	0.2%	1.5%	5.7%	19.8%	72.0%	6.6
Good behavior among other hunters.	844	0.6%	0.2%	0.9%	6.4%	7.1%	24.9%	59.8%	6.33
I feel better mentally, after I have spent time hunting.	841	0.4%	0.5%	0.8%	4.3%	12.5%	29.4%	52.2%	6.25
Getting away from crowds of people.	843	0.5%	0.7%	1.3%	4.7%	11.7%	27.8%	53.3%	6.23
The excitement of hunting.	840	0.4%	0.2%	0.7%	4.3%	15.1%	34.5%	44.8%	6.16
Hunting provides an enjoyable way to get exercise.	841	0.2%	0.6%	1.2%	4.2%	14.9%	33.5%	45.4%	6.15
I feel better physically, after I have spent time hunting.	842	0.4%	0.7%	0.8%	6.4%	14.4%	31.9%	45.4%	6.11
Access to a lot of different hunting areas.	844	0.7%	0.9%	1.8%	6.6%	15.9%	31.5%	42.5%	6.01
Reducing tension and stress.	846	1.1%	1.4%	1.9%	8.7%	15.1%	29.2%	42.6%	5.93
The prospect of hunting motivates me to stay physically healthy.	840	0.4%	0.8%	2.4%	8.0%	17.9%	31.2%	39.4%	5.93
The challenge of making a successful shot.	839	1.3%	1%	2.1%	7.5%	21.5%	32.5%	34.1%	5.81
Hunting on WMAs reduces stress in my normal work and home life.	839	0.6%	2.1%	2.5%	11.8%	19.8%	25.1%	38.0%	5.76
Being with friends.	847	1.2%	2.1%	1.7%	10.0%	19.2%	34.6%	31.2%	5.72
Seeing a lot of wild game.	847	0.6%	1.7%	3.5%	8.7%	23.3%	32.3%	29.9%	5.69
Being with family.	842	1.9%	2.5%	1.4%	14.8%	15.0%	27.1%	37.3%	5.69
Being on my own.	841	3.2%	4.3%	4.6%	18.0%	19.5%	27.0%	23.4%	5.21
Developing my skills and abilities.	844	3.1%	3.0%	4.5%	19.5%	22.4%	25.8%	21.7%	5.19
Sharing my hunting skills and knowledge.	845	1.8%	4%	3.8%	18.8%	26.6%	25.6%	19.4%	5.19
Thinking about personal values.	837	2.3%	3.6%	2.9%	21.9%	24.3%	24.7%	20.4%	5.18
Using my hunting equipment (calls, blinds, guns, etc.).	839	2.7%	3.6%	4.5%	18.1%	30.0%	24.6%	16.4%	5.09
Harvesting an animal.	837	5.9%	8.4%	7.9%	15.5%	30.1%	21.3%	11.0%	4.63
Shooting a gun.	842	10.2%	8.6%	7.4%	20.7%	23.2%	15.0%	15.1%	4.43
Getting my own food.	836	12.3%	11.1%	9.2%	21.2%	23.7%	11.6%	10.9%	4.11
Getting food for my family.	840	15.4%	15.1%	9.3%	19.8%	19.5%	9.9%	11.1%	3.87
$\chi^2=5515.3^{***}$									$F=245.4^{***}$

¹ Mean based on scale: 1 = Extremely Unimportant, 7 = Extremely Important.

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

Section 5: Wildlife Management Area Information Sources and Management Actions

Findings:

Sources for locating information on WMAs

Wildlife Management Area users were asked which sources are important for locating and hunting WMAs. Using a 7-point scale with “Extremely Unimportant” and “Extremely Important”, most of the sources of information listed were found to be important to hunters for utilizing WMAs. The two sources of information that scored highest for moderately to extremely important were “Just spot the WMA boundary signs in the field” (\bar{x} =5.5) and “WMA detail maps” (\bar{x} =5.3). The lowest scoring source of information comes from “Commercial cell phone apps” (\bar{x} =3.6) (Table 5- 1).

Opinions on WMA management actions

Respondents were asked how much they supported or opposed 12 different management actions on WMAs using a 7-point scale with “Extremely Oppose” and “Extremely Support”. The response rate was very high for this set of questions (97%), indicating a high degree of interest in the future of WMAs. While responses for all 12 items scaled positively, the items related to WMA acquisition and habitat enhancement scaled the highest. Specifically, “Create more WMAs” (\bar{x} =6.38), “Wetland restoration” (\bar{x} =6.11), “Food plot development” (\bar{x} =6.09), and “Prairie restoration” (\bar{x} =6.03) were most often “moderately” or “extremely” supported. Conversely, respondents tended to be neutral for “Conservation grazing” (\bar{x} =4.32), “tree removal” and “fall prescribed burns” (\bar{x} =4.16) and “provide educational exhibits” (\bar{x} =4.11). Interestingly, spring burning (\bar{x} =5.41) was supported at higher rates than fall burning (\bar{x} =4.16) (Table 5- 2).

Section 5: Wildlife Management Area Information Sources and Management Actions

Table 5- 1. Sources of information for locating WMAs.

	n	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important	Mean ¹
Just spot the WMA boundary signs in the field.	766	4.2%	3.4%	2.6%	9.5%	20.5%	30.7%	29.1%	5.47
WMA detail maps.	664	5.9%	2.4%	2.7%	15.8%	16.0%	28.5%	28.8%	5.34
The DNR website on WMAs in general.	692	6.4%	2.7%	3.2%	14.0%	24.7%	25.7%	23.3%	5.18
Hardcopy of the Walk-In Access hunting atlas.	651	8.9%	4.5%	4.1%	14.0%	17.4%	22.6%	28.6%	5.08
The printable WMA hunting atlas from the DNR website.	656	7.5%	4.7%	4.1%	16.3%	19.4%	22.9%	25.2%	5.05
Google maps for WMAs.	633	9.0%	3.9%	3.2%	17.9%	18.6%	25.0%	22.4%	4.98
Plat books.	703	8.3%	5.4%	4.1%	17.8%	17.8%	24.8%	21.9%	4.93
Google Earth data for WMAs.	613	10.9%	4.6%	4.1%	21.0%	16.3%	23.5%	19.6%	4.76
DNR Recreation Compass – Desktop Version.	522	14.4%	6.5%	6.3%	21.3%	16.9%	17.6%	17.0%	4.41
DNR Recreation Compass – Mobile Version.	501	17.0%	8.2%	5.8%	23.6%	14.8%	13.6%	17.2%	4.20
PRIM Atlas.	535	13.6%	7.5%	5.4%	32.9%	13.5%	13.1%	14%	4.20
GPS data downloaded for WMAs.	556	15.3%	8.3%	7.6%	26.4%	15.5%	12.2%	14.7%	4.14
Commercial cell phone app.	517	23.6%	8.5%	7.7%	30.6%	9.9%	10.4%	9.3%	3.63
$X^2=806.57***$								$F=123.5***$	

¹ Mean based on scale: 1 = Extremely Unimportant, 7 = Extremely Important.

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

Section 5: Wildlife Management Area Information Sources and Management Actions

Table 5- 2. Hunter preferences for management actions on WMAs.

	n	Extremely Oppose	Moderately Oppose	Slightly Oppose	Neutral	Slightly Support	Moderately Support	Extremely Support	Mean ¹
Create more WMAs.	835	1.0%	0.5%	0.7%	5.3%	7.4%	20.2%	64.9%	6.38
Wetland restoration/recovery effort.	842	0.7%	1.2%	1.1%	7.8%	12.0%	26.8%	50.4%	6.11
Create more wildlife food plots.	844	0.6%	1.1%	1.5%	5.6%	14.9%	29.3%	47.0%	6.09
Prairie (grassland) maintenance/enhancement.	843	0.8%	1.3%	1.1%	6.9%	15.3%	29.8%	44.8%	6.03
Provide WMA maps.	844	1.3%	0.9%	1.4%	16.7%	17.3%	30.2%	32.1%	5.67
Use of prescribed burns in the SPRING to promote prairie (grassland)	844	3.4%	3.9%	3.8%	15.0%	16.1%	26.2%	31.5%	5.41
Build trails for disabled access.	839	5.1%	6.8%	7.7%	26.7%	16.6%	21.6%	15.5%	4.69
Remove trees to reduce predation on pheasants/small game.	842	10.9%	9.6%	10.6%	16.5%	15.3%	16.2%	20.9%	4.48
Conservation grazing as a management tool for prairie (grassland).	843	13.9%	6.4%	7.5%	22.4%	18.6%	18.0%	13.2%	4.32
Remove trees to promote native prairie (grassland) maintenance/enhancement.	843	13.0%	10.3%	11.0%	21.9%	15.5%	12.9%	15.2%	4.16
Use of prescribed burns in the FALL to promote prairie maintenance/enhancement.	842	17.2%	9.1%	10.1%	17.8%	13.7%	13.8%	18.3%	4.16
Provide exhibits to help visitors learn about WMAs.	837	7.2%	11.4%	9.4%	32.4%	21.9%	10.3%	7.5%	4.11
$X^2=259.89***$								$F=267.1***$	

¹ Mean based on scale: 1 = Extremely Oppose, 7 = Extremely Support.

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

Section 6: Use of Lead Shot

Findings:

Beliefs about lead shot and levels of use

Respondents were asked about their use and beliefs regarding using lead shot for small game hunting on WMAs. Overall, 69% indicated they either never (48%) or occasionally (21%) use lead shot while hunting on WMAs and only 15% indicated they exclusively use lead shot (except while waterfowl hunting) (Figure 6- 1).

Respondents were also asked about their beliefs in regards to using or not using lead shot at the current time using a 7-point scale from “Extremely Oppose” to “Extremely Support”. It is interesting to note that while the response rate for these sets of questions was 88%, there was a significant drop off in responses to “It is not my responsibility to stop using lead shot” (\bar{x} =3.2). Two statements stand out as important to the respondents include “I am concerned about the effects of lead on wildlife” (\bar{x} =4.8).and “I think lead is more effective than alternatives” (\bar{x} =4.7). Interestingly, respondents were slightly more concerned about effects of lead on wildlife (\bar{x} =4.8) than the effects of lead on human health (\bar{x} =4.5). The statements with the lowest mean scores include “Alternatives to lead shot are very difficult to find” (\bar{x} =2.6) and “I think alternatives to lead shot might damage my shotgun” (\bar{x} =3.0) (Table 6- 1).

Likelihood of supporting a lead shot ban

Respondents were also asked how likely they would be support a ban on lead shot to hunt small game ‘in the next few years’. On a 7-point scale ranging from “Extremely Unlikely” to “Extremely Likely”, the response was exactly neutral (\bar{x} =4.0) with a near even percentage of respondents falling on the extreme sides of the spectrum (36% moderately/extremely unlikely vs. 38% moderately/extremely likely) (Figure 6- 2).

Section 6: Use of Lead Shot

Table 6- 1. Beliefs about lead shot.

	n	Extremely Oppose	Moderately Oppose	Slightly Oppose	Neutral	Slightly Support	Moderately Support	Extremely Support	Mean ¹
I am concerned about the effects of lead on wildlife.	840	8.5%	6.3%	7.5%	15.4%	18.8%	22.1%	21.4%	4.82
I think lead is more effective than alternatives.	838	10.5%	6.6%	5.8%	16.9%	19.0%	18.7%	22.4%	4.73
I am concerned about the effects of lead on human health.	839	11.8%	9.8%	7.0%	18.4%	14.2%	20.6%	18.2%	4.48
Alternatives to lead shot are too expensive.	840	15.8%	9.6%	7.3%	10.8%	18.9%	19.4%	18.1%	4.38
I think I have a personal responsibility to NOT USE lead shot.	843	15.3%	10.0%	6.6%	20.8%	11.6%	15.2%	20.5%	4.31
A ban on lead shot is an unnecessary government regulations.	838	15.5%	11.1%	7.9%	18.4%	11.8%	12.6%	22.7%	4.29
I think hunters have a responsibility to NOT USE lead shot.	843	15.7%	10.6%	7.2%	21.9%	13.2%	14.1%	17.3%	4.18
I do not think the lead from hunting is an environmental problem.	838	17.5%	15.9%	13.4%	16.6%	14.1%	11.2%	11.3%	3.73
It is not my responsibility to stop using lead shot.	769	25.6%	14.0%	13.4%	25.0%	5.6%	7.0%	9.4%	3.29
I do not think lead shot causes any problems for wildlife.	838	29.6%	17.3%	14.8%	15.0%	7.0%	8.5%	7.8%	3.09
I think alternatives to lead shot might damage my shotgun.	840	30.4%	16.7%	10.8%	21.0%	11.0%	5.4%	4.9%	3.01
Alternatives to lead shot are very difficult to find.	841	38.2%	22.1%	9.2%	11.9%	9.8%	5.2%	3.7%	2.63
$X^2=1435.7***$									$F=117.3***$

¹ Mean based on scale: 1 = Extremely Oppose, 7 = Extremely Support.

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

Section 6: Use of Lead Shot

Figure 6- 1. Hunter preferences for lead shot use.

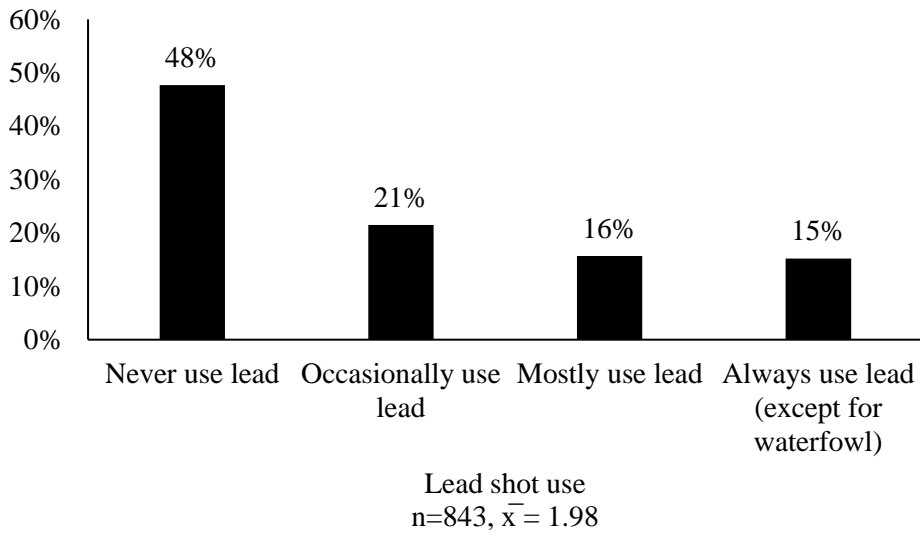
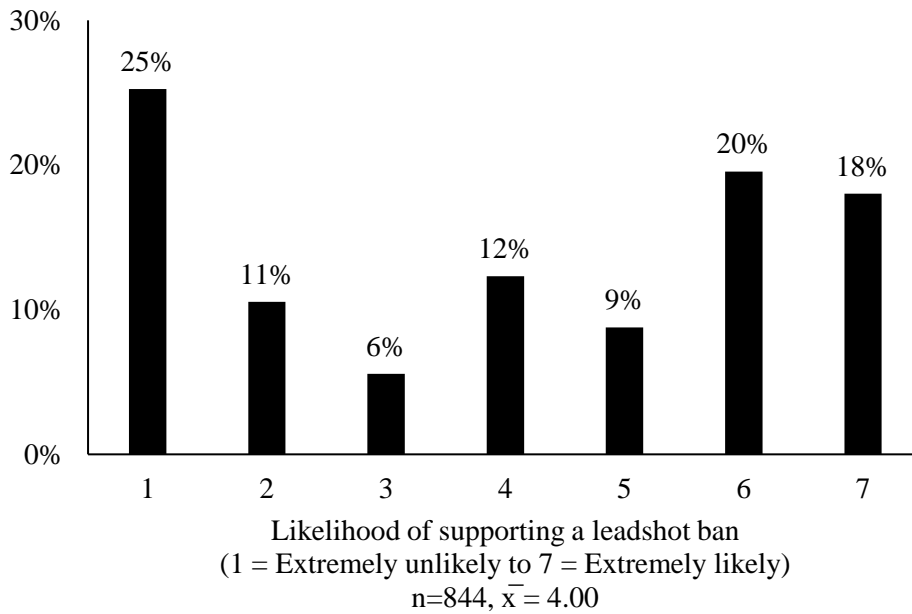


Figure 6- 2. Likelihood to support a lead shot ban in a few years.



Section 7: Wildlife Management Area User Demographic Characteristics Findings:

Hunt participation and lands hunted

Hunters were invited to participate in this survey in several ways. The first group of respondents were contacted in the field, either through an invitation left on their windshield while they were hunting on a WMA, or a student-technician handed them the survey and explain the project. We were interested to see if hunters who talked to students were more likely to respond than hunters who found the invitation on their car. The second group of respondents were randomly selected from all Minnesota hunters who held a pheasant and a small game hunting license. They were sent an invitation in the mail, and responded by saying they would be willing to participate. When we asked the respondents who they received their invitation, 677 responded they received an invitation postcard in the mail. Because we tracked the surveys with individual IDs, we know that only 661 of the returned surveys came from the postcard invitations. This shows the recollection may not have been as complete as originally hoped (Table 7- 1).

The majority of the respondents to the original survey were male (96%), and only 28 females responded (Table 7- 2). The range of ages of respondents fell between 12 and 85 years of age, with a mean age of 50.77. The average respondent has been hunting since they were 14.17 years old, and have been hunting for a mean total of 35.78 years (Table 7- 3). Almost half (45%) of respondents brought a dependent hunting with them during the 2015-2016 hunting season, while only 18% of respondents brought their spouse or partner hunting with them (Table 7- 4). The average income from respondents was \$79,361, with a maximum reported income of \$750,000 and a minimum reported income of \$0.00 (Table 7- 5). Respondents with a four-year college degree made up the largest group (29%), followed closely by respondents who went to vocational or technical school (20%) (Table 7- 6). Respondents almost all identified as “White, not Hispanic” (96%) (Table 7- 7). Most respondents are from smaller towns of less than 5,000 people, both where they lived as children and where they live currently. The second highest category was communities between 10,000 and 50,000 people, both as children and where they live currently (Table 7- 8).

Section 7: Wildlife Management Area User Demographic Characteristics

Table 7- 1. Manner in which survey invitation was received.

	Respondents
An invitation was left on my vehicle	19.4%
A student handed me the invitation	5.7%
I received an invitation postcard in the mail	70.3%
Did Not Respond	3.6 %

Table 7- 2. Manner in which survey invitation was received.

	Respondents
Male	95.5%
Female	3.0%
Did Not Respond	1.6%

Table 7- 3. Age of hunters now and at time of first hunt.

	n	Min Age	Max Age	Mean Age	Median Age
Current age of respondents	933	12	85	50.77	53
Age of first hunt	930	1	42	14.17	5
Total years spent hunting	927	1	73	35.78	37

Table 7- 4. Participation of dependents and spouses/partners on hunting trips.

	n	Yes	No	Did Not Respond
Did a dependent hunt with you?	949	45.3%	52.9%	1.8%
Did a spouse or partner hunt with you?	949	18.3%	80.0%	1.7%

Table 7- 5. Income ranges of respondents.

	n	Min \$	Max \$	Mean \$	Median \$
Income of respondents	814	\$0.00	\$750,000.00	\$79,361.84	\$70,000.00

Section 7: Wildlife Management Area User Demographic Characteristics

Table 7- 6. Educational backgrounds of respondents.

	Respondents
Grade school	0.4%
Some high school	0.5%
High school diploma or G.E.D	12.4%
Some vocational or technical school	6.6%
Vocational or technical school (associate's) degree	20%
Some college	15.6%
Four-year college (bachelor's) degree	28.5%
Some graduate school	3.2%
Graduate (master's or doctoral) degree	8.3%
Professional doctoral degree (like MD, DVM, DO)	2.8%
Did Not Respond	1.6%

Table 7- 7. Ethnic backgrounds of respondents.

	% total responses
African American	0.1%
Asian	0.1%
American Indian or Alaskan Native	0.1%
Hispanic or Latino	0.3%
Native Hawaiian or Pacific Islander	0%
White (not Hispanic)	96.2%
Did Not Respond	3.2%

Table 7- 8. Size of community where respondents lived in their childhoods and where they currently live.

	Town <5K	Town 5K-10K	Town 10K-50K	Metro >50K	Suburb >50K
Childhood Community	47.1%	13.9%	20.8%	9.7%	8.5%
Current Community	40.1%	11.6%	27.8%	9.8%	10.8%

References

- Dillman, D.A. (2008). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. New York: John Wiley & Sons, Inc.
- Cross, M. (2014). *Surveys of Minnesota Walk-In Access Users Participating in the 2013-2014 Seasons*. Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. University of Minnesota, St. Paul, MN 55108
- Fulton, D., and D.H. Anderson (2003). *Estimating Visitor Use Levels at Waterfowl Production Areas in Minnesota*. Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. University of Minnesota, St. Paul, MN 55108
- Gregoire, T.G. and Buhyoff, G.J. 1999. *Sampling and estimating recreational use*. USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-456.
- Knoche, S., and Lupi, F. 2007. *Valuing deer hunting ecosystem services from farm landscapes*. *Ecological Economics*. 64: 313-320
- Knoche, S., and Lupi, F. 2012. *The economic value of publicly accessible deer hunting land*. *Journal of Wildlife Management*. 76(3) 462-470.
- Knoche, S., and Lupi, F. 2013. *Economic benefits of publicly accessible land for ruffed grouse hunters*. *Journal of Wildlife Management*. 77(7): 1294-1300.
- Miller, C., & Vaske, J. (2011). *Individual and Situational Influences on Declining Hunter Effort in Illinois*. *Human Dimensions of Wildlife*. 8(4): 263-276.
- Schroeder, S. A., Penning, W., and Don Carlos, K. (2008). *Small Game Hunter Lead Shot Study*. Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. University of Minnesota, St. Paul, MN 55108
- Shelby, N, Vaske, J.J., and T.A. Heberlein (1989). *Comparative analysis of crowding in multiple locations: Results from fifteen years of research*.
- Vaske, J.J., and L.B. Shelby. (2008). *Crowding as a descriptive indicator and an evaluative standard: results from 30 years of research*. *Leisure Sciences*, 30 (2): 111-126.
- Vlaming, J., Anderson, D.H., Fulton, D., Rosendahl, J. and S. Hayes (2003). *Minnesota Waterfowl Production Areas, 2001 Visitor Use Study*. Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology. University of Minnesota, St. Paul, MN 55108
- Watson, A.E., Cole, D.N., Turner, D.L., and Reynolds, P.S. 2000. *Wilderness recreation use estimation: A handbook of methods and systems*. USDA Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-56.

2016 DNR Wildlife Management Area Visitor Survey



A joint-venture between University of Minnesota and Minnesota Department of Natural Resources

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

Your participation in this study is greatly appreciated!

Minnesota Cooperative Fish and Wildlife Unit
1980 Folwell Ave., 200 Hodson Hall
Department of Fisheries, Wildlife, and Conservation Biology
University of Minnesota
St. Paul, MN 55108

First we would like to know about your hunting participation on Wildlife Management Areas (WMA) in Minnesota

1. During the past fall and winter 2015-16, did you hunt on a DNR Wildlife Management Area? *(Check one box below)*
- YES
- NO → **Skip to Question 29**

1. Take some time to think carefully about your visits to WMAs during this past fall and winter 2015-16. As accurately as you can, please report how many trips you took to visit WMAs in each county listed in the table below. Please refer to the map on the back of your cover letter.

Please answer these questions in reference to your personal hunting activities.

Land Type

Species (Check box if you hunted during the past fall hunting season)	County (List counties hunted on separate lines)	Number of different WMAs visited per trip	Number of days hunted (include all days hunted, even if you did not harvest anything)	Number of Animals Taken	Private land	Public Land (WMAs)	Public Land (non-WMAs)	Combination of land types
<input checked="" type="checkbox"/> Example	Ottertail	3	5	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Pheasant (Do not count birds taken on a licensed shooting preserve)	1				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Waterfowl	1				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Deer (Rifle, Archery, and/or Muzzleloader)	1				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Think carefully about the trip to a WMA for which you best remember your trip details including the amount of money you spent.

2. In what county and WMA did you visit on this trip?

County name: _____ WMA name (if known): _____

3. When did you take this trip? Month _____ Approximate date(s): _____

4. What PRIMARY activity did you do on the WMA during this trip?

- Deer Hunting → IF Deer, was it ? → Firearm | Muzzleloader | Archery
- Pheasant Hunting
- Waterfowl Hunting
- Turkey Hunting
- Other Small Game

5. On this trip, how much money did you personally spend? Please complete the table below for spending at home getting ready for the trip, while traveling to/from the area, and in the destination area where you visited a WMA. If you spent nothing on an item, please enter "0".

	At home spending (getting ready for the trip)	Travel and destination area (to/from and in the area)
Lodging, including camping at a privately-owned campground		
Grocery or convenience store food and drink		
Restaurant/bar meals and drinks	NA	
Gasoline or other fuels		
Other transportation costs		
Hunting Equipment (shells, decoys, blinds)		
Licenses, stamps, Walk-In-Access Validation		
Entertainment (including casinos)		
Shopping (gifts, clothes, etc.)		
Other (please specify): _____		

6. How many people were covered by these expenditures you personally made? _____ People

7. How many were under 18 years of age? _____ People

8. How many days was this trip (count part of a day as 1 full day)? _____ Days

9. How many miles did you travel one-way from home on this trip? _____ Miles




10. During the past hunting season, how satisfied were you with your **GENERAL HUNTING EXPERIENCES** specifically at **WMAs in Minnesota**? Indicate how many days you spent hunting each species, use a 0 for species you did not hunt.

Activity	Extremely Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Moderately Satisfied	Extremely Satisfied	Did not hunt this species	Number of days spent hunting each species	Number of animals bagged
Firearm Deer	1	2	3	4	5	6	7	9		
Muzzleloader Deer	1	2	3	4	5	6	7	9		
Archery Deer	1	2	3	4	5	6	7	9		
Spring Turkey	1	2	3	4	5	6	7	9		
Fall Turkey	1	2	3	4	5	6	7	9		
Duck	1	2	3	4	5	6	7	9		
Geese	1	2	3	4	5	6	7	9		
Grouse	1	2	3	4	5	6	7	9		
Pheasant	1	2	3	4	5	6	7	9		
Dove	1	2	3	4	5	6	7	9		
Rabbits	1	2	3	4	5	6	7	9		
Squirrels	1	2	3	4	5	6	7	9		

11. Overall, how satisfied are you with your experiences at WMAs in Minnesota? (*Circle one*).

Extremely Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Moderately Satisfied	Extremely Satisfied
1	2	3	4	5	6	7

12. How often did you hunt on each of the following land types in Minnesota during the 2015 hunting season? (*Check one box per line*).

Sign and Land Type	None	Some	Most	All
 Wildlife Management Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Walk-in Access Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Waterfowl Production Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Public Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13.

14. During the past hunting season, how **CROWDED DID YOU FEEL** at the different kinds of places you hunted in this area of Minnesota? (*Circle one number per line*).

Land Type	Not at all crowded		Slightly crowded			Moderately crowded		Extremely crowded		Did not hunt
	1	2	3	4	5	6	7	8	9	
Wildlife Management Area	1	2	3	4	5	6	7	8	9	NA
Walk-in Access Area	1	2	3	4	5	6	7	8	9	NA
Waterfowl Production Area	1	2	3	4	5	6	7	8	9	NA
Other Public Land	1	2	3	4	5	6	7	8	9	NA
Private Land	1	2	3	4	5	6	7	8	9	NA

Wildlife Management Area Specific Questions

15. How likely, if at all, would you return to use a WMA in the future? (*Circle one*).

Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neutral	Slightly Likely	Moderately Likely	Extremely Likely
1	2	3	4	5	6	7

16. During your WMA visits within the past 12 months, indicate how often, if at all, you participated in each activity. (*Check one box per line*).

	None	Some	All	Most	I did not participate in this activity
During the hunting season					
Hunted a WMA with one or more people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hunted a WMA with one or more dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hunted by myself on a WMA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hunted on more than one WMA per day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moved to another WMA if the first one had cars present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Used the same WMA on consecutive trips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scouted a WMA prior to opening day of hunting season	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outside the hunting season					
Visited a WMA with one or more people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visited a WMA with one or more dogs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visited a WMA by myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visited more than one WMA per day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moved to another WMA if the first one had cars present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visited the same WMA between trips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For the next two questions, we would like to know about your non-hunting activities on WMAs in Minnesota

17. How many days, if any, did you participate in each activity while visiting WMAs within the past 12 months? (Check one box per line).

Activity	1-5 days last year	6-10 days last year	11-30 days last year	>31 days last year	I did not participate in this activity
Viewing wildlife/bird watching (<i>not while hunting/fishing</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berry/nut/mushroom/plant collecting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sightseeing/observing on WMA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Picnicking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hiking/walking/running	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training my dog	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Photographing nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Looking for antler sheds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Do you visit WMAs for non-hunting activities during each of the following seasons?? (Check one box per line).

	Yes	No
Winter (December 1 st – February 28 th)	<input type="checkbox"/>	<input type="checkbox"/>
Spring (March 1 st – May 31 st)	<input type="checkbox"/>	<input type="checkbox"/>
Summer (June 1 st – August 31 st)	<input type="checkbox"/>	<input type="checkbox"/>
Fall (September 1 st – November 30 th)	<input type="checkbox"/>	<input type="checkbox"/>

19. To what extent do you agree or disagree with each statement in regards to using WMAs. (Circle one number per line).

	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree
I wouldn't substitute any other area for doing the types of things I do at WMAs.	1	2	3	4	5	6	7
Doing what I do at WMAs is more important to me than doing it in any other place.	1	2	3	4	5	6	7
No other place can compare to WMAs.	1	2	3	4	5	6	7
I get more satisfaction out of visiting WMAs than from visiting any other place.	1	2	3	4	5	6	7
WMAs are the best places for what I like to do.	1	2	3	4	5	6	7
I identify strongly with WMAs.	1	2	3	4	5	6	7
I feel like WMAs are a part of me.	1	2	3	4	5	6	7
I am very attached to WMAs.	1	2	3	4	5	6	7
WMAs provide my only opportunity to hunt on Minnesota.	1	2	3	4	5	6	7
I would not continue hunting if I could not access WMAs.	1	2	3	4	5	6	7

20. We would like to find out some of your beliefs about WMAs in Minnesota. Please indicate the level to which to disagree or agree? (Circle one number per line).

	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree
WMAs provide me with an important place to hunt deer.	1	2	3	4	5	6	7
WMAs provide me with an important place to hunt pheasant.	1	2	3	4	5	6	7
WMAs provide me with an important place to hunt waterfowl.	1	2	3	4	5	6	7
WMAs provide me with an important place to hunt small game other than waterfowl and pheasants.	1	2	3	4	5	6	7
The quality of hunting on WMAs is not as good as other locations.	1	2	3	4	5	6	7
There are NOT enough WMAs near me.	1	2	3	4	5	6	7
WMAs are too crowded.	1	2	3	4	5	6	7
WMAs provide a place to take kids hunting.	1	2	3	4	5	6	7
Most of the WMAs I know about are too small.	1	2	3	4	5	6	7
Most of the WMAs I know about are too far away.	1	2	3	4	5	6	7
I understand the rules for using WMAs.	1	2	3	4	5	6	7
WMAs provide an easy place to go hunting.	1	2	3	4	5	6	7
WMAs provide high quality hunting experiences.	1	2	3	4	5	6	7
The number of WMA sites should be increased.	1	2	3	4	5	6	7
Hunting on WMAs is better than hunting on Walk-In Access lands.	1	2	3	4	5	6	7
Hunting on WMAs is better than hunting on private lands that I have access to.	1	2	3	4	5	6	7

21. To what extent has each of the following limited/constrained your ability, if at all, to use WMAs within the past 12 months? (Circle one number per line).

	Not a constraint		Slight constraint		Moderate constraint			Extreme constraint		Does not apply
	1	2	3	4	5	6	7	8	9	
Lack of time	1	2	3	4	5	6	7	8	9	NA
Lack of interest	1	2	3	4	5	6	7	8	9	NA
Lack of finances	1	2	3	4	5	6	7	8	9	NA
No hunting partners	1	2	3	4	5	6	7	8	9	NA
Poor health	1	2	3	4	5	6	7	8	9	NA
Too much equipment needed	1	2	3	4	5	6	7	8	9	NA
Family and relationship responsibilities	1	2	3	4	5	6	7	8	9	NA
Difficulties due to age	1	2	3	4	5	6	7	8	9	NA
Price of licenses and stamps	1	2	3	4	5	6	7	8	9	NA
Seasons too short	1	2	3	4	5	6	7	8	9	NA
Not enough game	1	2	3	4	5	6	7	8	9	NA
Too many regulations	1	2	3	4	5	6	7	8	9	NA

22. To what extent is each of the statements below an important component, if at all, for WMA maintenance? (Circle one number per line).

	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important
Maintaining habitat for game species	1	2	3	4	5	6	7
Maintaining a diversity of native plants and animals	1	2	3	4	5	6	7
Providing habitat for wildlife	1	2	3	4	5	6	7
Improving ecosystem health	1	2	3	4	5	6	7
Improving water quality	1	2	3	4	5	6	7
Restoring native wetland landscapes	1	2	3	4	5	6	7
Restoring native prairies	1	2	3	4	5	6	7
Maintaining scenic beauty	1	2	3	4	5	6	7
Providing diverse recreational opportunities	1	2	3	4	5	6	7
Providing access to public lands at no charge	1	2	3	4	5	6	7
Providing educational and learning opportunities	1	2	3	4	5	6	7
Ensuring natural and undeveloped lands will exist for future generations	1	2	3	4	5	6	7
Supporting local economies and businesses	1	2	3	4	5	6	7
Preserving a part of our history	1	2	3	4	5	6	7
Providing a place where all people are welcome	1	2	3	4	5	6	7

23. To what extent is each of the statements below an important component, if at all, for your experiences while hunting on WMAs. (Circle one number per line).

	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important
Enjoying nature and the outdoors	1	2	3	4	5	6	7
Getting away from crowds of people	1	2	3	4	5	6	7
Getting food for my family	1	2	3	4	5	6	7
Shooting a gun	1	2	3	4	5	6	7
Access to a lot of different hunting areas	1	2	3	4	5	6	7
Harvesting an animal	1	2	3	4	5	6	7
Being on my own	1	2	3	4	5	6	7
Being with friends	1	2	3	4	5	6	7
Developing my skills and abilities	1	2	3	4	5	6	7
Being with family	1	2	3	4	5	6	7
Good behavior among other hunters	1	2	3	4	5	6	7
Reducing tension and stress	1	2	3	4	5	6	7
Seeing a lot of wild game	1	2	3	4	5	6	7

<i>Question 23 (Cont.)</i>	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important
Sharing my hunting skills and knowledge	1	2	3	4	5	6	7
Thinking about personal values	1	2	3	4	5	6	7
Using my hunting equipment (calls, blinds, guns, etc.)	1	2	3	4	5	6	7
Getting my own food	1	2	3	4	5	6	7
The excitement of hunting	1	2	3	4	5	6	7
The challenge of making a successful shot	1	2	3	4	5	6	7
Hunting provides an enjoyable way to get exercise.	1	2	3	4	5	6	7
The prospect of hunting motivates me to stay physically healthy.	1	2	3	4	5	6	7
Hunting on WMAs reduces stress in my normal work and home life.	1	2	3	4	5	6	7
I feel better physically, after I have spent time hunting.	1	2	3	4	5	6	7
I feel better mentally, after I have spent time hunting.	1	2	3	4	5	6	7

24. We are interested in how you locate and hunt WMAs. Below we list possible ways to find WMAs. For each, please tell us how important that source of information is to you for LOCATE WMAs. (Circle one number per line).

	Extremely Unimportant	Moderately Unimportant	Slightly Unimportant	Neutral	Slightly Important	Moderately Important	Extremely Important	Did not know about
DNR Recreation Compass – Desktop Version	1	2	3	4	5	6	7	NA
DNR Recreation Compass – Mobile Version	1	2	3	4	5	6	7	NA
The DNR website on WMAs in general	1	2	3	4	5	6	7	NA
The printable WMA hunting atlas from the DNR website	1	2	3	4	5	6	7	NA
Hardcopy of the Walk-In Access hunting atlas	1	2	3	4	5	6	7	NA
GPS data downloaded for WMAs	1	2	3	4	5	6	7	NA
PRIM Atlas	1	2	3	4	5	6	7	NA
Google maps for WMAs	1	2	3	4	5	6	7	NA
Google Earth data for WMAs	1	2	3	4	5	6	7	NA
WMA detail maps	1	2	3	4	5	6	7	NA
Commercial cell phone app	1	2	3	4	5	6	7	NA
Just spot the WMA boundary signs in the field	1	2	3	4	5	6	7	NA
Plat books	1	2	3	4	5	6	7	NA
Other: _____	1	2	3	4	5	6	7	NA

25. Given the present conditions at WMAs, to what extent do you oppose or support each management action? (*Circle one number per line*).

	Extremely Oppose	Moderately Oppose	Slightly Oppose	Neutral	Slightly Support	Moderately Support	Extremely Support
Build trails for disabled access	1	2	3	4	5	6	7
Provide exhibits to help visitors learn about WMAs	1	2	3	4	5	6	7
Create more wildlife food plots	1	2	3	4	5	6	7
Prairie (grassland) maintenance/enhancement	1	2	3	4	5	6	7
Wetland restoration/recover effort	1	2	3	4	5	6	7
Conservation grazing as a management tool for prairie(grassland) maintenance/enhancement	1	2	3	4	5	6	7
Provide WMA maps	1	2	3	4	5	6	7
Create more WMAs	1	2	3	4	5	6	7
Remove trees to promote native prairie (grassland) maintenance/enhancement	1	2	3	4	5	6	7
Remove trees to reduce predation on pheasants/small game	1	2	3	4	5	6	7
Use of prescribed burns in the SPRING to promote prairie (grassland) maintenance/enhancement	1	2	3	4	5	6	7
Use of prescribed burns in the FALL to promote prairie maintenance/enhancement	1	2	3	4	5	6	7

26. Do you typically use lead shot or non-lead shot (steel, bismuth) when you hunt small game on WMAs? (*Check one*)

- Never use lead
- Occasionally use lead
- Mostly use lead
- Always use lead (except for waterfowl)

27. We would like to find out some of your beliefs about using or not using lead shot at the current time. Please indicate the level to which you disagree or agree. (*Circle one number per line*).

	Extremely Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Extremely Agree
Alternatives to lead shot are very difficult to find.	1	2	3	4	5	6	7
Alternatives to lead shot are too expensive.	1	2	3	4	5	6	7
I think lead is more effective than alternatives	1	2	3	4	5	6	7
I think alternatives to lead shot might damage my shotgun	1	2	3	4	5	6	7
I do not think lead shot causes any problems for wildlife.	1	2	3	4	5	6	7
I am concerned about the effects of lead on wildlife.	1	2	3	4	5	6	7
I am concerned about the effects of lead on human health.	1	2	3	4	5	6	7
I do not think the lead from hunting is an environmental problem.	1	2	3	4	5	6	7
I think hunters have a responsibility to NOT USE lead shot.	1	2	3	4	5	6	7
I think I have a personal responsibility to NOT USE lead shot.	1	2	3	4	5	6	7
It is not my responsibility to stop using lead shot.	1	2	3	4	5	6	7
A ban on lead shot is an unnecessary government regulations	1	2	3	4	5	6	7

28. Would you be likely or unlikely to support a ban on using lead shot to hunt small game on WMAs in the next few years? (*Circle one*).

Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neutral	Slightly Likely	Moderately Likely	Extremely Likely
1	2	3	4	5	6	7

29. How did you receive this survey invitation? (*Check one box*).

- An invitation was left on my vehicle
- A student handed me the invitation
- I received an invitation postcard in the mail

Now, please tell us a little bit about yourself

30. What is your gender?

- Female Male

31. What is your age? _____ Years

32. How old were you when you went hunting for the first time? _____ Years

33. How many years total have you been hunting? _____ Years

34. Did any dependents hunt with you during the past hunting season?

- Yes No

35. Did your spouse or partner hunt with you during the past hunting season?

- Yes No

36. What is the highest level of education you have completed?

- | | |
|--|--|
| <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 G.E.D | <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 | <input type="checkbox"/> Professional doctoral degree (like MD, DVM, DO) |

37. What was your annual individual income from all sources, before taxes, in 2015? Please round to the nearest \$5,000.

\$ _____

38. What is your ethnicity or race?

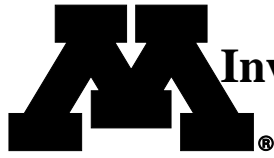
- | | |
|--|--|
| <input type="checkbox"/> African American | <input type="checkbox"/> Hispanic or Latino |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Native Hawaiian or Pacific Islander |
| <input type="checkbox"/> American Indian or Alaskan Native | <input type="checkbox"/> White (Not Hispanic) |

39. What is the size of the community of your current residence? What is the size of your hometown (from childhood to 17 years of age?) Please check the size of your current and childhood communities.

	Current Community <i>(check one)</i>	Childhood Community <i>(check one)</i>
Less than 5,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Between 5,000 and 10,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Between 10,000 and 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Metro area of a city with a population over 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Suburb of a city with a population over 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>

Please use the space below for any comments you may have:

Thank you for your continued support of Wildlife Management Areas. Your inputs to this survey will help shape future management decisions.



Invitation to help DNR learn more about Wildlife Management Area Users



Dear Visitor,

Thank you for visiting a DNR Wildlife Management Area (WMA)! These public access lands are found across Minnesota, covering prairies, forests and wetlands. They provide essential wildlife habitat as well as serve as important recreation areas for hunters and other users. The Minnesota DNR manages WMAs on behalf of the Minnesota public. As a WMA user, you have real-life experiences, knowledge, and information that can assist in the management of these areas and the wildlife that depends on them.

Knowing what people think about WMAs and how they are used is an important component of their management. By participating in this study, *you* will be providing valuable information that can help guide management for you and other WMA visitors in Minnesota.

This fall, we are contacting people who use WMAs and asking them to complete a mail-back questionnaire about their visit and experiences. Participation is voluntary and responses are completely confidential. If you are willing to help us in this effort, **please complete the back of this letter and mail it back to the University of Minnesota in the enclosed postage-paid envelope.** A survey will be mailed to you (and other interested members in your party) in early January, after the small game season closes.

PLEASE COMPLETE THE INFORMATION ON THE BACK →


Thank you!

For more information please contact:
Kelsie LaSharr, Graduate Research Assistant

*Minnesota Cooperative Fish and Wildlife Unit
1980 Folwell Ave.,
200 Hodson Hall
University of Minnesota
St. Paul, MN 55108*

*(612) 625-3718
lasha003@umn.edu*

UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

 The University of Minnesota is an equal opportunity educator and employer.
Printed on recycled and recyclable paper with at least 10 percent postconsumer material.

Date of Visit: _____, 2015

Time of Visit: FROM: _____AM/PM TO: _____AM/PM

How many people are visiting the WMA with you today (in the same vehicle)?

Total Number: _____ male _____ female Age 18 and older _____

Please provide the names, addresses, and phone numbers of all adults (18 years of age or older) in your party. If you would like to receive the survey via email, please provide your email address and check the corresponding box. Thanks!

Name: _____ Phone Number: (____) _____

Mailing Address: _____ Email: _____
 I would like to participate in this survey

For a quicker online response, follow the QR code with your smartphone to input this information online, rather than returning the letter by mail.

ID Code: _____

_____ via email.



Number: (____) _____

_____ like to participate in this survey

Name: _____

Mailing Address: _____

Name: _____

Mailing Address: _____

Phone Number: (____) _____

Email: _____
 I would like to participate in this survey

via email.

Name: _____

Mailing Address:

Phone Number: (____)_____

Email: _____

I would like to participate in this survey
via email

APPENDIX C: LETTERS FOR CONTACTING PARTICIPANTS VIA MAIL

December 8, 2015

<MAIL ID>

<FIRSTNAME> <LASTNAME>

<STREET>

<CITY> <STATE> <ZIP>

Dear <FIRSTNAME>,

We are contacting you because you purchased a stamp to hunt pheasant in Minnesota in 2015. Many Minnesota hunters choose to hunt on Minnesota Department of Natural Resources' Wildlife Management Areas (WMAs) for pheasant, deer, waterfowl, and other game. These public access lands are found across Minnesota, covering prairies, forests and wetlands. They provide essential wildlife habitat as well as serve as important recreation areas for hunters and other users. The Minnesota DNR manages WMAs on behalf of the Minnesota public. As a WMA user, you have real-life experiences, knowledge, and information that can assist in the management of these areas and the wildlife that depends on them.

Knowing what people think about WMAs and how they are used is an important component of their management. By participating in this study, *you* will be providing valuable information that can help guide management for you and other WMA visitors in Minnesota.

This fall, we are contacting people who use WMAs and asking them to complete a mail-back questionnaire about their visit and experiences. Participation is voluntary and responses are completely confidential. If you hunted on WMAs and are willing to help us in this effort, **please complete the enclosed post card.** A survey will be mailed to you (and other interested members in your party) in January, after the small game season closes.

For more information please contact: Kelsie LaSharr, Graduate Research Assistant (612) 625-3718
e-mail: lasha003@umn.edu

Thank you for visiting a DNR Wildlife Management Area (WMA)!

Regards,



David C. Fulton
Adj. Professor

- Yes, I hunted on a Minnesota DNR Wildlife Management Area (WMA) in Minnesota in 2015, and I would be willing to complete a survey about WMA management.

<Mail ID Merge Field>

This is a postage-paid postcard, so no stamps are needed.
Thank you for your response!

Minnesota Cooperative Fish & Wildlife Research Unit;
Dept. of Fisheries, Wildlife, & Conservation Biology;
University of Minnesota;
St. Paul, MN 55108

APPENDIX D: FOLLOW-UP “NON-RESPONSE” SURVEY FOR PARTICIPANTS WHO DID NOT RESPOND TO THE ORIGINAL SURVEY

FOLLOW-UP SURVEY FOR WILDLIFE MANAGEMENT AREA (WMA) VISITORS

Q1. Which of the following, if any, prevented you from responding to our earlier survey mailings? (Check all that apply).

- | | |
|---|---|
| <input type="checkbox"/> I am not that interested in WMAs
<input type="checkbox"/> I do not use WMAs enough to provide useful input
<input type="checkbox"/> I did not have time
<input type="checkbox"/> The original survey was too long
<input type="checkbox"/> I never received the earlier mailings
<input type="checkbox"/> I misplaced the earlier mailings
<input type="checkbox"/> I intended to complete it, but did not get to it | <input type="checkbox"/> Challenge of returning “snail mail” postal survey
<input type="checkbox"/> I returned it
<input type="checkbox"/> The information and questions were too complicated
<input type="checkbox"/> Concerns about how the information would be used
<input type="checkbox"/> Other: _____ |
|---|---|

Q2. During the past fall and winter 2015-16, did you hunt on a DNR Wildlife Management Area (WMA)? (Check one box)

- YES → If yes, about how many total trips did you take to WMAs? _____
- NO

Q3. During the past hunting season, how satisfied were you with your GENERAL HUNTING EXPERIENCES specifically at WMAs in Minnesota? Indicate how many days you spent hunting each species, use a 0 for species you did not hunt. (Circle one response for each activity and write in the numbers).

Activity	Extremely Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Moderately Satisfied	Extremely Satisfied	Did not hunt this species	Number of days spent hunting each species	Number of animals bagged
Firearm Deer	1	2	3	4	5	6	7	9	_____	_____
Muzzleloader Deer	1	2	3	4	5	6	7	9	_____	_____
Archery Deer	1	2	3	4	5	6	7	9	_____	_____
Spring Turkey	1	2	3	4	5	6	7	9	_____	_____
Fall Turkey	1	2	3	4	5	6	7	9	_____	_____
Duck	1	2	3	4	5	6	7	9	_____	_____
Geese	1	2	3	4	5	6	7	9	_____	_____
Grouse	1	2	3	4	5	6	7	9	_____	_____
Pheasant	1	2	3	4	5	6	7	9	_____	_____
Dove	1	2	3	4	5	6	7	9	_____	_____
Rabbits	1	2	3	4	5	6	7	9	_____	_____
Squirrels	1	2	3	4	5	6	7	9	_____	_____

Q4. How often did you hunt on each of the following land types in Minnesota during the 2015 hunting season? (Check one box per line).

Land Type	None	Some	Most	All
Wildlife Management Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walk-in Access Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waterfowl Production Area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Public Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5. Overall, how satisfied are you with your experiences at WMAs in Minnesota? (*Circle one*).

Extremely Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Moderately Satisfied	Extremely Satisfied
1	2	3	4	5	6	7

Q6. How likely, if at all, would you return to use a WMA in the future? (*Circle one*).

Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neutral	Slightly Likely	Moderately Likely	Extremely Likely
1	2	3	4	5	6	7

Q7. Do you typically use lead shot or non-lead shot (e.g., steel, bismuth) when you hunt small game on WMAs? (*Check one*)

- Never use lead
- Occasionally use lead
- Mostly use lead
- Always use lead (except for waterfowl)

Q8. Would you be likely or unlikely to support a ban on using lead shot to hunt small game on WMAs in the next few years? (*Circle one*).

Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neutral	Slightly Likely	Moderately Likely	Extremely Likely
1	2	3	4	5	6	7

Q9. What is your gender?

- Female
- Male

Q10. What is your age? _____ Years

Q11. How old were you when you went hunting for the first time? _____ Years

Q12. How many years total have you been hunting? _____ Years

Q13. What is the size of the community of your current residence? What is the size of your hometown (from childhood to 17 years of age?) Please check the size of your current and childhood communities.

	Current Community (<i>check one</i>)	Childhood Community (<i>check one</i>)
Less than 5,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Between 5,000 and 10,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Between 10,000 and 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Metro area of a city with a population over 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>
Suburb of a city with a population over 50,000 people	<input type="checkbox"/>	<input type="checkbox"/>

<ID>

APPENDIX E: COMMENTS FROM RESPONDENTS

Original Survey Questionnaire:

Verbatim responses by respondents to the open-ended questionnaire “COMMENTS” item:

“Please use the space below for any comments you may have:”

These comments are not sorted in any manner.

I am a pheasant hunting nut! I hunt 2 evenings and every weekend during the season, I also take 3 weeks vacation during pheasant season. I hunt with a lot of different people (familiar people, friends, relatives, and co workers). I tend to target WMAs with crops on them or bordering them! I would like to learn more about crop planting on WMAs.

Used WMA a lot every year before kids and hope to use more as they grow and learn to hunt!

Same questions asked over and over but worded differently. Frustrating!!

Iowa does a better job of managing their WMA than Minnesota. In fact so does South and North Dakota!

I wish someone would start a program to plant more evergreen between farms and fence lines.

It was a pleasure seeing the return of birds of prey! I am not convinced that there is a problem with lead poisoning. I do think that the moose population has suffered terribly by allowing the wolf population to grow as it has!

Mr. Fulton,

Please don't take my paper as offensive, but as constructive criticism. I quit hunting WMAs about 5-6 years ago after I found them to be a waste of our time (spouse and grandkids) and myself. The problem is that WMAs are not managed for the benefit of wildlife. My spouse and I have hunted every WMA in our county plus 2 neighboring counties. They all have 1 thing in common and that is that they all have plain blade grasses with no seeds meaning no food value. It may have worked or seemed to back in the 50s-60s and even 70s, but then Farmer's have corncribs—cornpiles—less efficient equipment that didn't get every cob or grain in the wagon when they turned in the field etc etc.

Now days and the past decade plus equipment is so efficient nothing is left and whatever is harvested is in sealed bins. It's all so different now. There's not enough natural prairie grasses with seeds and taller prairie grasses for better habitat. The same holds true for the waterfowl. The bait people in our area ruined many a good slough by raising minnows. I once had one of the best hunting sloughs in the state to hunt till the farmer let the minnow guy in. Went from the best to nothing doing in just a 2-3 year time. Lack of fresh water shrimp, wild rice, etc. has led to record low numbers. Yet we have large bag limits for low numbers. I keep reading and hearing to buy more land for habitat is what we need. Well I personally think the DNR needs to manage what we got. Give the wildlife something to eat and they will come—stay and reproduce. I know cause I made my own little piece of paradise from nothing and so has my farmer friend. DNR needs to manage what they've got for food source first. Deer habitat is pretty much same problems and putting heated deer stands next to a food plot when all farm fields are black or harvested is not

right. Your first sentence in your cover letter is that the DNR wants to ensure that its WMAs are well managed yet you leave hardly no space for comments on what we think and most of your questions are geared to our enjoyment of being able to use them. I would love to discuss ideas of large scale management. Call if you like ###-###-####.

Need more game/pheasants in WMA. It's sparse each time I've tried it, perhaps due to over hunting. Private land is much better. Or Montana's BMA program is good. Ranchers put private land up for hunting through the state.

My opinion on lead shot is that it should be phased out as to not provide a burden to businesses. This requires education with a timetable to make it happen. An outright ban with no cushion would be harmful to a lot of people.

Thank you for your efforts!

Keep up the good work!

Thanks for taking the time to conduct surveys like these—WMAs are an important part of Minnesota's landscapes and hopefully a continuing number are added in the next several years!

Thanks for asking these questions and taking my feedback. The WMA system is a great part of this state, and some of the only habitat that we have left in the south and western portions of our state.

I would like to see more DNR Officers in the field. And stronger/stricter punishments for poachers.

Heavily use state lands/forest for ATV and hunting in Cass county MN. Love freedom dislike rules.

I'd like to see severe penalties for deer stands left on WMA. I see many on public property and they should be removed. They are chained and locked to trees. It would be nice to be able to report them so they can be removed by a proper authority.

I'm upset with DNR in respect for the public hunters on Hwy 4 from St. James to Ormsly. The area on the west side of the hwy is hunted heavily during bird season—now they're cutting trees and placing a hiking trail right down the middle. Oh, sure they claim hunters will always be allowed—but where—you've taken the heart of the cover out of this area. This move was all done basically behind the backs of sportsmen.

If no water—lead; If water present—no tox; I'm more concerned about farm chemicals (fewer bugs now)

WMAs, WPAs and WIAs are the only game in town, without them hunting has no future except game farms.

The most limiting factor to me using WMAs is low water levels. Some of this is due to light precipitation but some is also due to mis-managed wetlands. Thanks!

I worked for the DNR as a teenager. The DNR people now are deadbeat bureaucrats. Collect their checks every two weeks and hang around the office and do virtually nothing.

Thanks for allowing me to give input. I'm a big advocate of public spaces like WPAs and WMAs. Quality around Jackson county is good and less populated. Nicollet county is not as well maintained and in short supply for the population.

Just really starting hunting WMAs in the last 5 years or so and really enjoy them. Last year bought my 15 year old daughter out and we had a blast. Friends and Family.

WMA needs more winter cover. Hunted pheasants with two good dogs and saw only a few hens. Very few.

We need to keep adding more public hunting lands in an effort to sustain a healthy wildlife population, clean water and safe hunting.

I feel WMAs are mis-managed, poorly maintained, and poorly marked. I'm very disappointed in the Minnesota DNR.

It is a shame how poor the hunting became on Bashaw after they allowed grazing on it. The habitat was destroyed.

I have been very disappointed by crops being taken down on WMAs during pheasant hunting season.

Carver co. has very little WMAs. It would be nice to have more to make afternoon hunts easier.

It's disappointing to go to all the local WMAs and find people (NOT sportsmen) screwing around! Especially target shooting! Also finding no food to hold wildlife.

If a ban for lead use was to go in place it would be nice to have a 5 year heads up so that people wouldn't buy more and could use up what they had.

Keep up the good work!

Need to convert more farms to WMA. Continue CRP for farmers.

Dear Dr. Fulton,

First, let me say that I am grateful for having been selected to participate in the WMA survey. In addition to the survey, I feel compelled, because of my age and number of years hunted on WMA's, to suggest more info for your study is needed.

Here are a few suggestions I would like to make that could paint a clearer picture of the current WMA's situation. Questions such as:

How many years have you hunted a particular WMA?

Over those years, what changes, if any have taken place? Good or bad

What improvements could be done to improve a particular WMA? i.e. better parking area, better water control, marsh improvements such as deepening or removal of excess cattail vegetation (many WMA's overrun with cattails with little or no water) Prescribed burn?

I bring these questions up because I am a frustrated Minnesota hunter. I am one of the 1000's of supporters for the Legacy Amendment. I marched on the state capital. We are going in the right direction with the amendment but I see the good hampered by the bureaucrats on the state level. Most of them have agendas for their own areas of the state and all of them seem to want to rob the fund for special interests. It is sad and frustrating. We need to fix our WMA's by science, not by political agendas.

Having taught my daughter to waterfowl hunt 20 years ago and now am on the verge of taking my grandchildren hunting also, what sits in my craw is the fact that the very WMAs I have hunted since my high school years in the western part of MN are in such bad shape, in need of repair and lack huntable populations of pheasant and waterfowl, my grandkids may never experience what I had back in the late 60's and 70's. They may go with "grandpa" just once or twice before they become bored.

I have hunted Saskatchewan for 40 years, I may have to save up and take the grandkids there for a truly memorable hunting experience. Minnesota is just not up to it at this point in time.

Thank you for taking time to read my letter. I know I am not alone in my thinking; my hunting buddies are on my

same page. We have many good WMA's, too many need much repair and have needed it for years.

Sincerely yours,

I use WMAs because it is hard to get permission on private land. Private land is too high priced and I can't afford to buy my own. I like to deer hunt too much to quit all together because I don't own my own land. This is why I started hunting on WMA's. An alternative to private land.

Garbage cans in parking area would be nice. Not uncommon to find trash in the parking areas.

Glad there is Area's Lake WMA for public hunting, but they get too much traffic in the fall. At least they are good habitat areas the rest of the year.

I'm sorry, but this survey is way over the top. I think WMA's are great, but 10 questions could provide all pertinent information.

This questionnaire is too long.

Hard to hang deer stand with no trees... Just saying :)

I feel that most of the WMA's in "my area" are just land that a farmer could not farm so he sold it to the DNR. Need more land on rivers and lakes with some oak trees and stuff.

WMA get hit pretty hard in St. Michael Monticello maple lake area

I prob spend around \$500 a year to replace old or buy new equipment (clothing, decoys, calls. Etc.) but did not buy anything specific for question 6. Not sure if you

wanted that prioritized per hunt or not. Once my lead bullets I bought in bulk years ago run out I will be moving to non-toxic.

This survey was way too long and confusing

Happy to participate in this survey.

Need better shot alternatives

Overall experience with WMA's in my area (LaP and Big Stone counties) is that there are too few waterfowl in the fall and too many hunters- especially the 1st and 2nd weekends. Overall, waterfowl hunting has diminished considerably in MN over the past 20 years.

Access to public Hunting areas are very important.

I noted I was 5 years old when I started hunting. This was when I began bird dogging which is a wonderful way to learn to hunt- bring this back! Gun safety and able to carry a gun at 13 years old.

Strong supporter of acquisition efforts of local pheasants forever chapters

WMA's are essential to hunting and ensuring a place to hunt in the future. I am lucky to have places to hunt. I hope this survey helps the DNR determine that maintenance to habitat for small game is needed. Because its rare to see pheasant and grouse in the areas I hunt. thank you for including me. I would be happy to do it again.

Didn't know I could go to WMA's for non-hunting reasons. Isn't it illegal to ask my ethnicity?

Special use for seniors. Motors on boats, power units to bring in equipment and retrieve big game, not ATV's but units that can be developed in the future.

Do not buy more land. Improve existing WMA's. Plant birds, stimulate to stocking ?

I have enjoyed hunting WMA's in my area all my life. The new regulations about stands not being left overnight leave me out. I have hip and knee problems that prohibit me from carrying too much gear on rough terrain. I have in past years enjoyed WMA's from a stand whether I kill anything or not

I believe that in my area we could call our areas "the Wildlife no Management Areas". They are just left with minimal support.

Although I did not hunt a WMA this year, I have in the past. And I would like to say that the habitat is not as good as what Iowa does with their public ground.

1.)Lead shot: I get the concern and long term it doesn't make sense to keep piling it on the landscape. So a grudging acceptance of a ban is my current feeling. More accessible and affordable alternatives such as alloys other than steel would help greatly. 2.) I would hunt WMA's for ducks much more if the water bodies were more accessible. They are often a long distance from parking areas and getting any type of craft to them nearly impossible. 3.) Experiment with fix platforms/blinds available first come first serve. Constructed of durable materials they could last 25 years. OR allow limited 4 wheel drop and pick up on designated routes.

I think pheasants forever has done a terrible 2013 as a whole and all the land they have is pretty worthless.

I'm normally a pheasant hunter but broke my ankle last year. -No hunting will continue next year- mainly around pipestone.

I would enjoy seeing results of this survey if possible.

The non lead shot I have used doesn't seem to have the same killing power. More cripples.

Stop banning things damn it. The desire to fix only makes things worse.

I would like to see access to ponds for duck hunting with some motorized access for boats and four wheelers. Getting older it is getting very hard to carry boats or canoes to ponds.

90% of all the wetlands have been drained all across the Midwest causing clean water problems. I also believe it is causing weather problems in the Gulf. And changing weather in the Midwest.

Very impressed with the amount and quality of wetlands in this area. I do notice a lot of empty feeders on some places.

Hunting pressure on WMA's is very high. Especially on beginning of seasons, that is when the counties hold larger populations (ex. Pheasants in southern counties) see an in flux of hunters. These public lands become flooded, and over hunted.

Again other than waterfowl hunting. I am extremely opposed to a ban on lead shot or bullets. Leads to wounded and wasted game.

Not a hunter so I see no point in mailing it back.

I don't hunt small game on WMA's. This survey is too long.

We had a nice time on the public land. It was enjoyable. Keep up the good work.

No game makes it hard to get youth excited about hunting. Bans on lead will make it too expensive to hunt in the future.

This is a long wordy survey

I would like to see more WMA's and maintained (burned with food plots). And also we need more CRP with walk ins available.

I am a huge duck hunter and strongly believe in clean water in our WMA's. Lake Maria and Hurricane are very good projects that have been done in my area, good job on them.

Get to the point. This was all about the hunters willingness to use or not be willing to use lead shot in WMA's.

Impressed with the food plots and the shelter belts. And that the farmers left a few rows at almost every corner and next to the WMA and other areas. Nice Work! No wonder why we see so many birds--- We'll hit 'em next year.

Education and Field time create respect and understanding.

To make deer hunting better get rid of the wolves.

WMA's are primarily grasslands, I see no need to ban lead shot for upland game. I do see need in WPA's and Wetlands.

Prescribed burns destroy pheasant nests, generally speaking (Don't do that)

There needs to be a strong effort to stop the loss of wetlands in the private farm area. Too much after hours draining, tiling being done. 2nd stop the loss of wetlands via cattails taking over.

WMA's are an important resource since it is getting harder to find private land to hunt. But WMA's have gotten very crowded in the last couple years.

I've lived in several areas of the United States.

These are for more WPA in my part of the state= more important

The state wild managers could do a lot better job at actively managing the WMA's under their control. It seems the only "in thing" to do is burn. Need more food plots and woody cover.

We need to keep adding public hunting lands in an effort to sustain a healthy wildlife pop., clean water and to save hunting

WMA is a great program. But the birds have seem hard to fins over the last 5 years. Tough to walk already and not see ... gone.

WMA's should mimic state forest land management. Forest management provides multiple recreational opportunities while providing habitat and deer stand flexibility.

Hunted twice on WMA= no birds, no shots. Hunted once on private land= no birds, one shot. Hunted with a group of 6 guys on a game farm preserve= 30 birds released, 23 birds shot, harvested.

The use of lead shot on pheasants and grouse does not effect other wildlife!!

I have just started hunting WMA's a little bit. It just seems that most of the places get hunted so much. Next year I will give them more of a chance. We own a family farm in western Minnesota. We were told at the time not to put in evergreen. We strategically added them to our plot of native grasses and food plot. Our pheasants seem to stay alive in the evergreen. Everything else blows in with snow. We cut our scraggly trees that grow in our prairie. I hate wounding birds with steel.

Keep protecting our wildlife. The wolves in our cabin area have destroyed our deer population and run the moose to much!- We need to study this problem more!

I love the outdoor opportunities in Minnesota. In Houston county I see many more food plots than central MN. Food Plots on WMA's are a great investment! Thanks!

I'd like to see the WMA's more actively managed for game species. Better cover and food plot.

I hunted WMA dozens of times but for crows only, hunted private land for deer and pheasants. Hunted in Waseca, Steele, Freeborn, Nicollet, LeSueur, and Rice counties; crows only.

Most of the money spent on hunting areas should be on purchasing marginal land, which will help maintain good water quality and hunting opportunities.

The foresight in establishing WMA's was a huge plus for Minnesota. With WMA status, land would have been tiled and polluted with herbicides, nitrates, and pesticides. Maintenance restoration and additions are necessary for preservation of the remaining landscape. Charge an additional fee for the above- use of WMA's requires an obligation to support.

Removing trees in WMA's in my area destroys critical cover for deer and winter cover for pheasants. WMA's should be managed for deer and pheasants- NOT ducks. Most hunters in this area DO NOT HUNT DUCKS. Screw the ducks unlimited lobby!!!

Get the lead out of hunting- several hunt clubs already ban lead shot on their sites.

Cats kill more birds than lead shot. Bear season should open on Saturdays to accommodate kids.

I strongly oppose banning lead shot. If a ban is created I will not buy a Minnesota license because I will be doing all my hunting out of state.

Reservations should be available for deer hunting+ would avoid contact.

Not to close duck hunting on weekends in Oct. close it during the week if have to.

I hunt Private land, but appreciate the opportunity of public land.

I live in Pope county and my passion is hunting waterfowl. There are plenty WMA's but you cant access them to get a boat in to hunt because there is no access to the water that is available on the larger WMA if you

provided a single road to the water it would open up more opportunities and you would sell more licenses. The other problem is having to row on these areas. If the wind blows strong I now have to avoid WMA's. If you limited it to trolling motors it would make them more popular.

Add more WIA areas please

Hunting has gotten poorer on WMA's which trees have been removed from. Less pheasants, ducks, and deer. More fox and coyote.

The largest problem of hunting in the WMA's where I hunt is the wolf population. It is getting to the point that after 40 years of hunting I am considering not hunting deer any longer. Most people that I know who hunted the WMA where I hunt, gave up deer hunting due to the low deer population. We see more wolves than deer and more wolf tracks than deer tracks.

We need more food for dove hunting-small grain.

A couple of the Todd County WMA's need more access/parking areas. Especially the one just South of Osakis on Todd/Douglas Line. Nothing of South end. If you walk in along the lake you have to walk back same way.

Usually bow hunt and pheasant hunt. Purchased both licenses but only was able to hunt on private land for archery. No time for pheasant this year.

Please Continue to buy more land for WMA's and maintain them.

I basically only hunt pheasants on WMA's and am surprised at the lack of pheasants (roosters or hens) that I see there. One Particular WMA's grass is so short and thin birds cannot nest in it. That same piece of ground has been that way for many years. It must be some type of broom grass (not very good cover). I hunt with a good dog and am not afraid to cover ground.

Birds live in trees late fall and winter fools. Don't cut them down leave some around.

We need to enhance our WMA's by having more land, food plots and overall quality. I feel guilty taking game on Minnesota WMA areas as I know there is only a finite amount of game on each parcel. Please purchase more land and maintain.

There are a lot of people that have no access to the outdoors, other than WMA's. The better their experiences, the license sales will go up creating more money for conservation.

Habitat is key – private land with native prairie offers fantastic pheasant hunting. Replicate it with public land. Limited non-toxic loads for smaller gouges. Good offerings are very expensive.

More food plots are needed on WMA's. Plenty of us farmers are willing to help out.

Did not know lead shot was permitted on any public land.

WMA's are "gems" in the midst of habitat destroying human development and row crop farming. They need to be protected and expanded.

Keep up the good work!

Keep up the good work. The best hunting land in the counties I hunt is WMA land. No excuse not to hunt.

Please provide results of this survey

While I don't support banning lead shot in WMA's, I do in wetlands and waterfowl areas to a much larger extent. I don't believe steel shot is as effective but if waterfowl are ingesting it I'd prefer it to not be lead.

DNR- You do a great job with W.M.A. I support you.

Lots of the questions were too arbitrary or unclear to answer in a meaningful way. Why did you not include more questions related to WIA's? Not clear if the term WMA is also supposed to include WPA: I answered the questions assuming that they did!

Current WMA regulations are about right... Thank you.

I hunt in MN but not in any WMA's. I hunt in S.D. and use WAA's sometimes.

Please do not allow grazing on WMA. The cattle do not leave anything for wildlife & destroy cattails which if a person did that to cattails they would be fined by the government.

A lot of public spots get hammered and the birds get real spooky.

We need management programs to increase numbers of game birds, especially pheasants.

This was a great opportunity for me to represent the most important need for WMA please improve the quality of the habitat as listed in question #22 "restore the habitat"

I would like to see more WMA's, WPA's, etc. in the south metro/southern, MN. Vermillion Highlands was a great addition.

Stop bulldozing trees down on WMAs. Need better signage in some areas.

Decisions about lead should be made by a consensus of wildlife professionals – not a popularity contest.

Thank you for doing this survey WMA's are important to me. Also I am not racist but I've seen a large influx of Asian hunters on WMA's and they don't obey the rules and are not considerate of others.

It would be nice to not only continue adding as many WMA's as we can but also maintain them.

Due to my MS I have difficulty to walk any distance. So if I shoot a deer from the shoulder of the road, I would be unable to retrieve the deer. But if I could drive a 4-wheeler out in the hunting area it would work for me.

Snowshoe haves are gone. Little information is available.

This is the 3rd survey that I have received this year?

We loved our experience with the WMA!! Keep up the good work!

I feel very fortunate to have much public hunting land in our area. I also feel this land could be greatly enhanced with little cost to make contracts with local farmers to put food plots on most of these lands. Plots of 10 to 20 acres with the farmers harvesting ½ the crop for their time.

Please ban use of lead shot. I have used steel for pheasants for 30 years.

The mountains are getting tough. Need more pheasant in MN. Thanks, Don

I do use WMA's and WPA's several times each year. I also hunt private land including my own as well as family land. Management areas offer additional opportunities.

Fall waterfowl dates are not right. 2 day openers then closed and then another opener is all about the \$ money not what's best for hunting.

I hunt to eat what I hunt-not for trophies or large numbers.

I hate grazed or mowed off wildlife areas in South Dakota. There is normally nothing left for wildlife!!

Stop cutting down all the trees, stop putting barbwire around public land

Like to see more food sources on mgmt. areas. Some areas have none after crops are harvested.

There should be no reason to fence some WMAs with 4 strands of barb wire. There should be no cattle grazing on any public land.

I have pheasant hunted off + on since 1980 I started archery hunting deer + turkey 5 years ago + am now hooked.

I love WMA & have turkey hunted them in other states. This is too long of a survey - my adult son's & husband would not take time to fill it out. I had many opportunities to shoot a deer with my bow this year but did not because I so enjoy sitting in woods and enjoy being out & did not want it to end.

This WMA is being run by the farmers around it. Destroying bridges and culverts as they see it.

Primary concerns - lack of access to quality habitat and ban(?) of inte...(?) new hunters and outdoor people

The use of lead shot (and its impact) should be separated into two categories. Plated and non-plated.

Too many people don't respect or get it when you are there go someplace else - stop buying and over paying for land - let farmers have the land. Need to make heavy shot cheaper. Steel cripples too many birds.

I was with my dad when I signed up for the survey and he filled on out.

DNR needs to allow overnight portable stands to hunt deer, or it becomes too hard to hunt *ATV's should be allowed under certain circumstances (i.e. retrieve game)

I enjoy hunting on WMA's. The ones in my area are well taken care of.

Duck and goose hunting has gone down in Big Stone County the last 7-8 years. To the point I may quit. I hunted Big Stone for 45 years.

Keep up the good work. Please print more hard copy books with more plot information for better access.
Thanks

Last year was the least I have used WMAs. I normally go to Southern MN and use many WMAs for pheasant hunting. The last few years have been difficult to get there due to career development

Q12: Neutral – Kicked up a lot of hens, not many roosters. Little duck action seen, Q40: Long Lake by Luke Freeborn in Kensington should be lowered, fish killed, and fresh water shrimp replaced to what it used to be. Used to be an incredible duck lake for all types of ducks including divers. Not so much anymore. Fill WPA & WMAs with fresh water shrimp too! Best duck food ever! & restore more prairie land!

WMA are great for the future of hunting!

I have sent this survey back twice. No more

Too much broam grass on too many WMAs and WPAs. Needs more prescribed burning! Without WMAs and WPAs I'd probably quit hunting! Thank you WMAs are Awesome!

More accesses to WMA would be nice, they are too limited

I tend to hunt more WPAs than WMAs, simply because there are more of them in the area I hunt.

Q25: My mom has health problems. I wish there were trail that we could drive four wheeler up there and drop her off. So she could hunt.

Q28: Neutral – I don't know enough about it.

Too long

-We need more land to ensure future generations get to enjoy this beautiful world. -Education is powerful - get hunter safety and fishing back in K-12 and your participation #s will rise, without awareness we will have support.

The DNR needs to stay focused on their mission which is conservation and outdoor recreation. They are becoming political. The attempt to ban lead shot is the work of political hacks and not based in science as proven by California's findings.

Q28: Extremely unlikely – I use to shoot a box of shells per trip to WMA's before steel shot and there was more game and more hunters. Now I shoot less then 2 boxes of shells a season, no game and no hunters. ; Q40: Trees are habitat, stop killing the trees, they do aid!! Forms of wildlife. STOP using WMA's for farming profit, STOP using chemicals on DNR land. Provide an off road parking area every 1/8 mile along WMA roads. STOP mowing road ditches along WMA lands. Leave the beaver dams alone they are wildlife and provide habitat. For the amount of shells shot on WMA's lead restrictions are no longer needed. Do away with large group hunting. 5 to 6 hunters per group is plenty.

WPA's are great to hunt on but most of them need some sort of food plots on them to make them really good.

Q25_10: Extremely oppose – This is the most stupid thing I have ever seen DNR do! More damage than good

This is a long, wordy survey.

This survey is WAY too detailed and long. One would have had to have taken notes to complete it accurately!!

This was a really long survey. Didn't have time to complete it all.

I'm a huge duck hunter and strongly believe in clean water in our WMA's, Lake Maria and Hurricane are very good projects that have been done in my area, good job on them.

I am excited to be a part of this wildlife management survey. It is nice to see people are continuously studying and trying to improve WMA's. I have hunted WMA's on and off almost my entire life, but more so in the last six years. I primarily hunt deer and pheasant. With that said I feel as though we need to take a better look at making these hunting experiences safer and easier for people to recover big game. As most any big game hunter knows it can be very challenging setting up portable tree stands. With the self-climbing tree stand you need a straight tree with no limbs. If there are limbs you are not supposed to cut or trim trees in WMA's. If you would like to use a ladder stand they are heavy and often times takes more than one trip to get them to your hunting location. Once you have selected your spot it takes two people to set it up. Now imagine doing this at 4:30 in the morning, in the dark just before prime hunting time. At the end of the day you are required to remove your stand and repeat this every day you hunt. Oh and don't forget your three kids that need your help and are relying on you to be successful. The recovery of big game can be hard. Every year my dad is limited on where he hunts in WMA's. Often times not hunting the entire area because he would not be able to recover big game from the opposite side of the hunting area from where you park. In some state forests and lands you are able to use four wheelers to recover big game during certain times of the day. I know of teenagers in my family that are not able to hunt at times

because of this. I think for all other types of hunting activities WMA's are wonderful. I would have nowhere to hunt pheasant if I there were none. Everyone I have visited have been great, the parking has always been good, the boundaries are well marked, and any special regulations are clearly marked in the parking area.

Q23_19: Reword question/phrase – Practice first ~~The challenge~~ making a clean, well placed ~~successful~~ shot.
Q40: Education and field time create respect and understanding

I believe that in my area we could call our areas, the "wildlife no management areas." They are just left with minimal support.

WMA's are primarily grasslands, I see no need to ban lead shot for upland game. I do see the need in WPA's and wetlands.

Although I did not hunt a WMA this year, I have in the past. And I would like to say that the habitat is not as good as what Iowa does with their public grove!

Q25: Pheasants are an invasive species!

1) Lead shot - I get the concern + long term it doesn't make sense to keep piling it on the landscape so a grudging acceptance of a ban is my current feeling. More accessible + affordable alternative such as alloys other than steel would help greatly. 2) I would hunt WMA's for ducks much more if the water bodies were more accessible. They are often a long distance from parking areas and getting any type of ... 3) ... craft to them nearly impossible. Experiment with fix platforms/blinds available first come first served. Constructed of durable materials they could last 25 years. Or allow limited 4 wheel drop + pick up on designated routes.

I would enjoy seeing the results of this survey if possible.

I'm usually a pheasant hunter but broke my ankle last year. - No hunting will continue next year - mainly around Pipestone.

Q25_1,_11,_12: Moderately oppose – Not if it destroys habitats, Kills young pheasants, Destroys winter cover; Q27_6: Neutral, Only for waterfowl; Q28: Non-lead shot creates many more wounded animals that get away and die later. Wasteful. Very Wasteful; Q40: Again other than waterfowl hunting. I am extremely opposed to a ban on lead shot or bullets. Leads to wounded and wasted game

Hunting pressure on WMA's is very high. Especially on beginning of seasons. That is when the counties that hold larger populations (ex. Pheasants in southern counties) see an influx of hunters. These public lands become flooded, and over hunted.

We had a nice time on the public land. It was enjoyable. Keep up the great work.

Q26: I don't hunt small game on WMA's; Q40: This survey is too long.

I'm not a hunter so I see no point in mailing it back

I would like to see more WMA's and maintained (burned? With food plots.) And also we need more CRP with walk in's available.

I have enjoyed hunting WMA's (for deer) in my area all my life. The new regulations about stands not being left overnight leave me out. I have hip and knee problems that prohibit me from carrying too much gear on rough

terrain. I have in past years enjoyed watching WMA's from a stand whether I kill anything or not.

Do not buy more land. Improve existing WMA's. Plant birds, similar to stocking fish.

It would be nice to not only continue adding as many WMA's as we can but also maintain them.

Due to my MS I have difficulty to walk any distance. So if I shoot a deer from the shoulder of the road, I would be unable to retrieve the deer. But if I could drive a 4-wheeler out in the hunting area it would work for me.

Q26: Never use lead – except when turkey hunting

I hunt in Western Minnesota where there are lots of WMA's. I hunt both private and public. I hunt some very nice private land, but am very grateful to have some great WMA's to hunt. I think that if there wasn't the quality WMA's to hunt, hunting would not be nearly as enjoyable as it is today.

Keep it up, get more land!

While I don't support banning lead shot in WMA's, I do in wetlands and waterfowl areas to a much larger extent. I don't believe steel shot is as effective but if waterfowl are ingesting it I'd prefer it to not be lead.

The conservation grazing plan- I have seen it work and increase the native grass stand, but last four years the local WMA's around my house have been overgrazed and look more like pasture ground than prairie land.

Cattle grazing? I see evidence of the practice for many years after the fact/cutting groves of trees to reduce

predation -trees provided cover for winter. Just an excuse to reintroduce prairie chickens

Support seurt/sewrt larger WMA to help escape the crowds

More food plots are needed on WMA's. Plenty of us farmers are willing to help out.

Q28: Extremely unlikely – use small gauge shotgun (16 gauge); Habitat is key - private land with native prairie offers fantastic pheasant hunting. Replicate it with public land.; Limited non-toxic loads for smaller gauges. ; Good offerings are very expensive.

There are A LOT of people that have no access to the outdoors, other than WMA's. The better their experiences, the license sales will go up; creating more \$ for conservation.

We need to enhance our WMA's by having more land, food plots and overall quality. I feel guilty taking game on Minnesota WMA. Areas as I know there is only a finite amount of game on each parcel. Please purchase more land & maintain.

Q2.1: Hunted- North Dakota, South Dakota, Kansas, Arizona; Q2.2: Bought stamp did not hunt; Q3: We had 30 people there Apr 2 2016 and probably 30 more Apr 16-17 2016. Dog train and test thru NAVHDA + MFFTC ;Q14: Need more not for the people for the wildlife; Q16: MN NAVDA has brought 150 people + dogs to four brooks WMA for training + test in 2015; Q19: I hunt grouse + woodcock in Northern MN still plenty of places to hunt. In the Dakotas I hunt all public area and find it good but getting worse cause of tile + loss of grounds; Q21: Lack of game!! Quit tiling both public + private land. Need buffer around all waterways; Q24: Quit wasting money give free plat book like Dakotas + Kansas; Q40: Quit draining swamps & marginal lands. Quit killing songbird with mosquito

control The ducks are gone there is no nesting habitat. I quit hunting pheasants in MN 20 yrs. ago because you have drained all the lands to let the soil blow away DNR should focus on wildlife not building an empire.

We need management programs to increase numbers of game birds, especially pheasants.

I enjoy the public hunting areas.

Also need to promote more nature conservation and respect in schools

I would most like to see more WMA's, WPA's, ect in the south metro/southern, MN. Vermillion Highlands was a great addition.

Stop bulldozing trees down on WMAs. Need better signage in some areas.

Q26: Until recently - thought lead was not allowed on WMA's

Special use for seniors. Motors on boats, powered units to bring in equipment & retrieve big game, not ATVs but units that can be developed in future.

Q18: Did not know I could do these things; Q38: Isn't this illegal to ask?

WMA's are essential to hunting and ensuring a place to hunt in the future I'm lucky to have places to hunt. I hope this survey helps the DNR determine that maintenance to habitat for small game is needed, because it's rare to see pheasant & grouse in the area I hunt. Thank you for including me. I'd be happy to do it again.

Strong supporter of acquisition efforts of local pheasants forever chapters!

I noted I was 5 yrs old when I started hunting. This was when I began "bird-dogging"; which is a wonderful way to learn to hunt - bring this back!! Gun safety & able to carry a gun at 13 years old.

I enjoy hunting on WMA's. The ones in my area are well taken care of.

Access to public hunting areas are very important.

Thank you!

Q12: Moderately dissatisfied – I love that these exist but pressure is too strong. It makes me realize the importance of finding private land.; Q14: There is such a variance depending on location Lac Qui Parle was PACKED but all others were pretty secluded; Q19: WMA are AMAZING for people getting into hunting or no access to private land. However the hunting pressure is so high that productivity is very low. So after a season or 2 it is disheartening especially when you see how productive private land is.; Q40: I would not have been able to get into hunting w/ out the WMA, WIA, & AMA access that MN has. As the hunting population grows while duck & pheasant populations go down the productivity of WMAs & other public land has dropped drastically. !!The more public land the better!!

I have been pheasant hunting for 42 yrs. On state & private land. In my opinion, I see far more crippled birds that I have shot at from steel, than lead shots. Please DO NOT ban lead shots on our wildlife management areas.

I love the outdoor opportunities in MN. In Houston County I see many more food plots than Central MN. Food plots on WMA's are a great investment. Thanks!

Please maintain our WMA's. They are a precious resource for the public. Thank you.

The best way to stretch conservation dollars is to buy expired CREP/RIM lands. The state owns farming rights but with established habitat and low cost (less than \$1,000) it makes ACCESS/Hunting Acres cheap!!

Great places to hunt, but competition with other hunters induces stress and this not what the outdoors is about to me !! :)

Q5: Running my Bangles on rabbits; Q40: I think they could do a lot better job on habitat for small game (rabbits) more brush, pine, cedar etc. which would also help pheasants over winter.

Q28: If smaller than #4 lead; Q40: I feel that most of the WMA's in "my area" are just land that a farmer could not farm so he sold it to the DNR. Need more land on rivers & lake's with some oak trees & stuff.

WMA get hit pretty hard in St. Michael Monticello Maple Lake Area.

Q28: Need better shot alternatives to lead

Happy to participate in the survey.

This survey was way too long & confusing.

Thank you!

Wonder about the removal policy in WPA lands in counties like Grant County. Pheasants and deer depend on cover in the winter and its removed at a large cost - why?

I don't mind paying taxes to ensure we can have public land to hunt in the future. For my children!!

Stop cutting down the trees

The WMAs and WIAs are all most perfect for holding wildlife I don't understand why there are not more pheasants??? I hunt an average of 2-3 days a week and a lot of days I won't see a bird - and I have a good dog also. I'm from So. Dak. Originally, my brother has our family farm his cap is the same there and there are ton of birds there.

Q39: I live in the rural area; Q40: I think it is more important to maintain these units than to buy more of them.

Q28: Trade in lead for steel one way to get rid of lead.
Q40: The public land is great, if they want to band lead do a exchange box for box to get rid of lead. That's why I have both, WMA's and Private

Thank you for allowing me to participate in your survey. I have hunted in state WMA's for almost 50 years and because of the changing demographics of hunters over the years, I decided to purchase my own hunting property 180 miles north of where I live. We live on rural farmland 4 miles outside of a small town in central MN. Our property line borders state land on one side and I have seen over the years how behavior has changed regarding public property. What used to be regarded as a privilege is now looked upon as an entitlement. It is my guess that this can only be coming from our public education system or from the DNR itself. Because of a number of different incidents that have happened over the last number of years, I now keep a database of every vehicle that enters that property. Make, model, license no. and number of people hunting. Some people are very understanding of what I am doing and some get very upset. I simply tell them that when they choose to hunt public property, public is what they get. I explain to

them that I personally know of tens of thousands of acres of private property that never gets hunted simply because no one asks. Judging by vehicle license plates and dealer stickers I can tell that these are mostly metro area hunters. These are the same hunters that can't simply empty a shot gun at the end of a hunt, they need to shoot it empty, despite being within 150 feet of an occupied residence. Apparently the need to "shoot something" overrides the law or common sense. I do not believe that spending any taxpayer dollars or license based dollars will ever make any difference when it comes to the mentality of the metro area hunters. I also believe that the MN DNR worships the metro dollars to the extent that those dollars dictate DNR policy over common sense or wildlife based decisions. When we purchased our property, (residence) we needed to file for a variance because of proximity to the state land. When I inquired with the district DNR manager whether they (DNR) would file a protest, his reply was, why would anyone want to build a house next to land that has been taken over by drug dealers? My answer to him was that drug dealers would not be a problem but jackass hunters would be. He agreed not to file a protest but stated that I should not complain about drug dealing activity when I had been warned about it ahead of time. We went ahead and built our house and the first few years were relatively quiet. There was drug dealing activity, but they never bothered anybody. A car would drive by very slowly and I would hear one approach from the opposite direction, then you could hear voices quietly speaking, and soon both vehicles would leave going the opposite direction they had come from. Soon the drug dealers simply left, apparently finding a better place somewhere else. Then came the hunters. Four wheel drive pickups flying past our house with a shotgun blast blowing our mailbox off of it's post, then sliding to a stop past the approach to the state land, spinning wheels in reverse, and finally pulling in to the state land only to hear 3 more shotgun blasts as the "Public Hunting Allowed" sign was blown off of its post. (you know how many times that sign was replaced before you finally gave up). This finally was the customer the DNR was looking for. It only got worse from there and now you know why I chose to buy my own private hunting land 250 miles north of the metro area. Like I said before, when you choose to hunt "public" land, "Public" is what you get! I do appreciate the survey that you are doing, and I really hope that you don't discard mine simply because it goes

against popular DNR policy. I could fill pages with similar experiences, but I think you get the picture. Thank you very much for your time.

*Rules should be more clear regarding motorized boats on state land.

Lead shot has its place on wildlife management areas!
Thanks

We use WMA's – We need more! I will pay more

Add food plots for pheasant/deer

Stop bulldozing trees down on ALL WMAs signage of WMAs needs to be checked, most areas are great but some not.

I think putting cattle on WMAs is not good for hunting it makes it hard to walk around swamps!

Need more WMA around our area more disability areas we have none available.

This questionnaire is too long (written below number 19)

In order to have some you must plant what they eat and plant what provides cover, this gives them time to raise their young (only allow so many a year (people) for hunting only).

I would like to see accesses to ponds for duck hunting with some motorized access for boats and 4 wheelers. Getting older it is getting very hard to carry boats or canoes to ponds.

Keep up the good work!

Keep up the good work. The best hunting land in the counties I hunt is WMA land. No excuse not to hunt.

Please provide results on this survey.

Good survey - Keep protecting our wildlife the wolfs in our area have destroyed our deer population and run the moose to much - we need to study this problem more. I have just started hunting WMAs a little bit. It just seems that most of the places get hunted so hard. Next year I will give them more of a chance . Hunted a same WMA a couple of times I never saw a bird.

The use of lead shot on pheasants and grouse does not effect other wildlife.

The survey was way too long.

Deer hunting has been very very discouraging the last few years. Definitely been seeing more people than deer.

WMA get hunted out by Nov 1 or so. Too much activity, birds are wild stop hunting.

I believe some areas are growing too much with red brush. Would be nice if there was a way to control it.

I did hunt a WMA in 2014-2015

I'm on disability that makes it very difficult to use our management areas we don't have very many areas around here we need more!

As I think more about it, I'm not opposed to banning lead on WMA for most upland game. Would still like to use it for wild turkey, however. I did another survey for you some time back, can't remember the topic. The questions were clearer, easier to answer on that survey. It was the one on changes to the wild turkey season. I thought the questions on this one were a little confusing as far as hunting generally and hunting on WMA. Maybe I was reading it wrong. Thanks.

Mainly going walking with partner while hunts WMAs

I hunt in MN but not any WMAs, I hunt SD and use WAAs sometimes, GRY

Like to see pen raised birds sprinkled in on heavy use WMAs. Each counties should have as many WMAs as Lyon county.

Please stop grazing on WMAs its hard on dogs and man in field stop the farmers from draw tiling all the pot holes during dry seasons.

I love the WMAs and walk in land has been a nice addition. Walk ins need more cover and we need more birds thank you for sending me this survey! If you need anything else please ask.

I like WMAs they provide good opportunity, but actual harvest results are below average. I hunt WMA, WPA, Private, county/state. The further away they are, less people. I try to hunt weekdays when I can. I am concerned about future hunting generations. Good survey!

I don't believe WMAs are managed very well after they have been established. What was once a thriving waterfowl production land is now a very area of reeds with no potholes. Water levels need to be regulated.

Would like to see more food plots in WMAs

Do not cut down trees

I feel the WMA system is a very positive thing and hope to see more created. However I am becoming increasingly disappointed in how much land around these units are in row crops. The WMAs are just small little islands surrounded by wasteland, and they get hunted hard - the wildlife doesn't have a chance! We need to be able to set aside more and larger tracts of land.

I worked for a number of years in the mid south. Public hunting exists nowhere like it does in Minnesota! That's why I moved back home. Thank you!

WMAs and WPAs that have waterfowl habitat need to be regularly monitored for rough fish. I witnessed a WPA go from clear water with abundant vegetation to turbid cloudy water with no vegetation in the course of 1 year. The specific WPA was Big Slough WPA in NE Swift County.

WMAs are a wonderful way to enjoy the great outdoors!

WMAs are crucial access points for hunting. I believe we could manage them better for wildlife. I have a science degree and background and find it difficult to accept our practices of public lands being privately grazed and hayed. I have personally witnessed sharp declines in wood duck populations in western MN as a direct result of tree removal on public lands. This all so resulted in cover being far more readily snow covered with wind after loss of tree cover. Pheasant populations in the same area have declined in a direct correlation to loss of these wind blocks, even when considering the tough winters recently.

In Iowa they do a much better job of preparing and maintaining their management areas. It would be better to fix some of the existing ones than to spend money on new ones.

WMAs are very important to me and my 11 yr old son who is just starting to hunt. I think it is one of the great things/activities about living in this great state!

Lived in same place all my life. I didn't do much hunting in 2015, hope to do more in the future. I enjoy WMA that I hunt deer on because of other wildlife I get to see. Thanks.

I live in Vermont, was raised in MN. Go back to hunt MN, SD and ND each Fall. In MN would be lost without WMA because of loss of CRP. I'm proud to be a former Minnesotan. I am a life member of pheasants forever.

Good to see this type of research being done!

WMAs need to pay farmers to leave some crops around the WMAs so wildlife had food in winter use money from hunting licenses.

We need to bring the ducks back. Duck hunting in MN is horrible nowadays.

Hard to use survey - first part. My trips are all day trips - love home in AM and hunt and return home. Hunt with my son who is an adult and a couple of friends one owns a farm that we hunt.

Buffer strips on waterways are very important! I hunt these in Iowa and they really hold pheasants and clean the water, make sure barbed wire removed and no trapping! (Worried about my dogs)

I do hunt mostly private lands, but that is getting increasingly difficult, so I do use public lands. Pheasant hunting is my main purpose on public land and I was pleased with the increase in birds this year, but still not even close to the early 90s. Better habitat and food plots will keep the numbers climbing. Thank you for doing this.

Thanks guys! Keep up the good work!

Keep up the great work, it's great that young people have places to go hunting for the rest of their lives' plus there kids kids, Thank you!

WMAs are fantastic but limited numbers crowd hunters to these areas which make it a not fun experience, need more WMAs

I worry that farmers aren't being fairly compensated when water fowl production is affecting their land. When water is onto land in spring for water fowl production.

I have traveled to MN from MI for the last 5 years to pheasant hunt. I make 4 week long trips a year. I let people know why I am there and how much appreciate them allowing me to hunt in their state. Love it!

Splitting the southern waterfowl zone each year has dramatically cost us days because of freeze-up. Don't split the season/zone!!

During some seasons WMAs can be very crowded

Do not harvest crops on WMA - leave for wildlife until spring for food and cover.

WMAs give citizens more opportunities to enjoy and preserve wildlife and habitat!

I responded to the original invitation because my main concern is that these WMAs need to be burned every few years. With no burning they grow up and the grass gets packed down like asphalt. That's the reason why WMAs don't support pheasants anymore. Call me if more information is desired.

Conservation grazing is a disaster ruining water quality, shorelines eroded, land mined as nutrients leave area in the meat of cattle, money wasted on fencing that could be used to create shallow water, grasses stunted, thistle and goldenrod replace grasses, land hummocked and ruined for a person's lifetime. Once again, conservation grazing that ruins WMAs. An unproven technique.

Hunted South Dakota the 2015-2016 season. Waterfowl only, spring light goose, early Canada goose and 10 day waterfowl

Why too much tree removal!! Money being spent on it could be put to better use.

I own 120 acres. Family 340 ac. We use WMAs to hunt additional species mainly, pheasant and ducks, archery deer. Rifle hunt on private only and turkey hunt private

WMAs are great for opportunities to hunt pheasant in MN. Crowded early. Thicker grass area would be good. Late season and early all hang in cattails.

Why does the DNR do controlled burns in the fall on WMA after hunting season has started? Some people only have access to those lands and when they take days off from work to go upland bird hunting at a WMA (Caribou) only to discover the entire area is on fire! Makes it impossible to hunt!

Please do not send any more of these surveys to me.
Thank you.

I didn't get to go deer hunting last year for health reasons.

I tend to favor WPAs over WMAs primarily because I enjoy waterfowl hunting the most. Minnesota needs to improve water quality. The duck hunting is not nearly as good as it was 20 or more years ago.
Too many people on small WMA/WPA. Not enough WMA/WPA lower stamp prices, easier access to some bigger WMA/WPA, more WIA in Central MN and North. Thank you for asking for my input.

On WMAs that I used to hunt on while in college around that time use to have firewood sales, clear cuts which provides new growth and habitat. I've been back to these areas and this is no longer a practice especially in NW MN where there are more moose and grouse in these areas after practices done.

The WMAs are useful but for waterfowl hunting the WPAs tend to be way better

Don Nelson and the staff at White Water WMA are always extremely helpful. Great people and a valuable resource.

Not much wildlife in Olmsted county WMAs.
Nonetheless, they are great spaces to get out and relax.

I hunt only on private land. WMAs are overrun with unethical redneck and hmong "sportsmen".

I would like to see more public hunting areas.

If they ban lead I would not be able to use most of my shotguns, as they are older, full choke guns. I have some very nice model 50 Winchesters that would become useless because of steel shot. I have a couple of guns that can use steel for when I hunt pheasant on waterfowl land. I am going to contact my congressman about my views of steel shot.

Although injuries are not common, the safety of hunting dogs remains a concern as it relates to trapping. Would like to see greater restrictions on trapping locations in WMAs and outside notice of trapping taking place (entrance notice).

Please stop taking machines and cutting thickets and red willow, leave alone.

Without WMAs hunting opportunities would suffer we will typically hunt the same 6-8 WMAs and 203 WPAs every year

Shorter Survey

Thank you for doing this work

The DNR is one of the few bodies of government that I wholeheartedly support. The fall is my favorite time of year because I get to take my dog hunting and spend more time outdoors.

There needs to be a statewide antler point restriction. It is also an issues how many people dump garbage at the WMAs. I never leave without filling my backpack full of someone else's trash. If garbage cans are there maybe people will use them?

I think grazing on WMAS should be confined to on-pheasant hunting lands/refuges or WMAs larger than 2500 acres.

There is an extreme lack of water on the Mustinka river! It barely floats alande.

Biggest problem with WMAs is boundary markers. Adjacent land owners remove them to claim the as their own and deter anyone from hunting it. I've seen this over and over again all over the state.

I am a former high school trap shooting coach. This sport has grown immensely. The DNR needs to step it

up and get creative in getting kids into the woods and hunt.

Too many questions

We need more food plots for dove hunting - small grain

Hunting has gotten poorer on WMAs which trees have been removed from. Less pheasants, ducks and deer. More fox and coyote.

Add more WIA areas please

I hunt private land, but I appreciate the opportunity of public land.

Not to close duck hunting on weekends in October, close it during the week if have to.

I am mainly a deer hunter. I would like to see most trees left on wildlife areas. Several acres in western MN are nearly void of trees!

Florida Creek has never had a prescribed burn in 34 years. I have hunter this area every year from 1981.

More boundary signs would be helpful, please stop using barbed wire for grazing (dog safety), please remove trees when taken down, there will never be enough WMAs, need more habitat for all animals

In regards to no elevated stands being left over night during deer season, I find it almost discriminatory that I

am no longer able to hunt the WMA in my area due to physical implications of not being able to place my stand without assistance and being able to leave it up for a short period of time

I would answer some questions differently if: 1. I had access to private hunting land, 2. I lived closer to or in the pheasant range

I will be a FWCB major next year. You should do a survey on scientific and natural areas.

This should be done online, reducing the cost of producing this pamphlet, using the saving for further studies

Trapping season limits my ability to use WMAs because of my dogs

I support non lead shot for small game

Although I now Live in IA, I look forward to MN pheasant hunting. I have stopped hunting deer in Northern MN (Big Fork Area) after 35 consecutive hunts to the dramatic decrease in the deer population and increase in timber wolves. I am sad that my home state has allowed this to happen. MN has certainly lost millions of \$ from lack of hunters @ deer season.

Pheasants are an invasive species dependent species dependent on agriculture, blue stem and red dog wood, while native are of little use to pheasants. Stop planting them on WMAs. Plant food plots instead. Small grains. Leave them up over winter.

Shortened, Non-Response Survey Questionnaire:

Verbatim responses by survey respondents to Question 1, "OTHER" item

(or otherwise written on the survey)

These comments are not sorted in any manner.

I did respond

I did respond and filled out the first one you sent

I was given several of these surveys during to 2015 season, and responded a long time ago

Make it more plain English

Thought I sent it in

I just walk with my friends and dogs while they hunt. I do not hunt, I just walk along.

I believe I returned my survey. I, ##### completed and returned mine, I believe. How about my son: #####? I think I did?

I thought I completed the survey and mailed it in

The survey focused only on hunting. While I occasionally use WMAs for hunting, 90% of my usage nowadays is for wildlife observation (bird watching etc) and photography. This question tries our examples, I didn't go hunting, but I spent time on WMAs at least a dozen times in the last year for other purposes. I thought I did anyways :)

I could not recall most answers needed on survey

I did complete and return the previous survey. I do not know why it was not received. Biggest issue I see is the lack of fish barrier on Mulligan Slough. Springs with low runoff result in clean water and an abundance of waterfowl. There even used to be wild rice that grew here but no more since carp got in.

I am 77 years old, hunted since I was 14 years old - too damn old to answer surveys - thank you

Completed it

I filled out and sent other survey back

I did do the previous survey

I have sent in my survey

I really believe I sent it! I will send this one also.

We moved and lost survey. New address is #####

Someone would need to keep a diary to give the info that was requested in the first survey

I completed other surveys for other states. Theirs are all on-line and very quick and easy to complete

To many personal questions. Take into account that most waterfowl hunters shoot 2-3 boxes EACH outing. Pheasant hunters go entire seasons on 1 box of shells.

I started on the other one, but too detailed for my situation

Had to list to many WMA hunted and cost of each hunt one dollar amount for the year would have been nice

I didn't hunt in 2015

Wrong questions being asked

I couldn't remember which WMAs I visited or which county it was in