ATTITUDES ABOUT WOLF HUNTING AS A TOOL TO MANAGE WOLVES IN MICHIGAN:
INSIGHTS FROM 4 PUBLIC MEETINGS AND AN ONLINE SURVEY

Photo courtesy of USFWS

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EXECUTIVE SUMMARY

In March 2013, the Michigan Department of Natural Resources (MDNR) hosted 4 public meetings about wolf hunting as a management tool. Meeting participants were invited to fill out a survey of their opinions about concerns associated with hunting as a management tool. An electronic version of the survey was made available for individuals that wanted to complete the survey electronically (i.e., Internet-based). Meeting participants were invited to share the online link with other people potentially interested in participating in the survey. The survey was not intended to capture the entire state of Michigan or be representative of the general Michigan population. It was designed to assess sources of information for wolf management and wolf hunting in Michigan; attitudes about wolves; attitudes about wolf hunting as a tool to manage wolves; and concerns associated with using hunting as a tool to manage wolves. This report represents a summary of findings from the survey.

Results are presented in terms of three different groups of respondents: the total sample including online respondents and meeting participants, Michigan-only residents from both online and meeting sources, and Upper Peninsula (UP) residents versus Lower Peninsula (LP) residents from both online and meeting sources. Six hundred and sixty six total respondents completed the survey from 22 United States. Among these responses, 94% were Michigan residents (n = 625), 78% were male (n = 520), 48% (n = 319) were from the UP, 37% (n = 249) were from the LP, and 15% (n = 98) were unknown. The most commonly mentioned sources of information for wolf management and wolf hunting were MNDR, newspapers, and the Internet. The majority of respondents supported hunting as a management tool for wolves and greatly cared about wolves. Perceptions of danger from wolves in the woods were varied; some participants reported high perceptions of danger and others low perceptions of danger. Wolf conflicts, use of science in policy decisions, and sustainable wolf populations were the highest ranked concerns among total respondents.

Key conclusions from this research include:
(1) The Michigan Wolf Management Advisory Council's original list of 12 concerns generally captured the overarching concerns of all survey respondents, indicating that the group was able to effectively identify the suite of different concerns associated with wolf hunting in Michigan.
(2) Different groups consistently ranked a small number of concerns as being of high concern including wolf conflict, use of science in policy decisions, and sustainable populations. Poaching and differences among stakeholder attitudes consistently were ranked as being of lower concern.
(3) Some trends in attitudes emerged among survey participants. However, results cannot be generalized beyond the sample frame, which was comprised of over 75% males and 50% hunters. There was general agreement in support of wolf hunting and the majority of respondents care greatly about wolves. Perceptions of danger from wolves in the woods were highly variable, indicating different opinions on risks associated with wolves. When coupled with insights from biological science, the social science information herein can contribute to effective science-based decision-making about wolf hunting in Michigan.

BACKGROUND

In December 2012, Senate Bill 1350 passed into Michigan law becoming Public Act (PA) 520. PA 520 designated wolves as a game species, authorized a wolf hunting season, and codified the Wolf Management Advisory Council (WMAC). The WMAC was designed to, among other things, provide diverse perspectives and feedback to the MDNR on issues surrounding wolves and wolf management in Michigan. Before PA 520 passed, the WMAC, at the time called the Wolf Forum, constructed a list of 12 categories of concerns associated with hunting as a management tool for wolves as a public engagement activity (see Gore and Lute, 2013 for the list of concerns and the process by which they were generated). MDNR wolf managers requested Michigan State University's Department of Fisheries and Wildlife assist with soliciting feedback about these concerns from a broader segment of the Michigan public so that concerns could be incorporated in the design, implementation, and evaluation of wolf management activities, including public engagement.

One form of wolf-related public engagement initiated by the MDNR was a series of 4 public meetings in March 2013. These meetings were designed to present information about potential regulations and concerns associated with hunting as a tool for wolf management. A survey was administered in March 2013 as a way for meeting participants to provide additional feedback about their opinions to MDNR. The 12 concerns were the focus of the survey.

This report represents a summary of findings from the survey.

STUDY GOAL & OBJECTIVES

This research had 4 objectives:

1) Assess sources of information for wolf management and wolf hunting in Michigan;
2) Assess attitudes about wolves;
3) Assess attitudes about wolf hunting as a tool to manage wolves; and
4) Assess concerns associated with using hunting as a tool to manage wolves.

METHODS

This research was designed to compliment the 4 public meetings about using hunting as a tool to manage wolves in Michigan held on March 12, 13, 19 and 21, 2013 (in Ironwood, Marquette, Gaylord, Lansing respectively). The public meetings were announced by MDNR via press release, mentioned in a number of print and electronic versions of newspapers (e.g., Lansing State Journal, Ironwood Daily Globe), and WMAC members were asked to communicate information about the meetings and survey to their respective organizations' members.

Data collection. We used purposive sampling to achieve objectives. In this case, we were interested in measuring the responses of individuals participating in the public meetings and wolf management in Michigan. This method has the advantage of being easily understood by nontechnical audience(s) and the disadvantage of limiting results to the study population and not the broader population (Trochim 2001). The survey was not designed to cover the entire state of Michigan or be representative of Michigan residents as a whole. Survey results should not be extrapolated beyond the study population.

All individuals attending the 4 public meetings were invited to participate in the survey, providing they were at least 18 years of age. Paper surveys were made available to all public meeting attendants along with a URL address for individuals that wanted to complete the survey electronically (i.e., Internet-based). Meeting participants were invited to share the URL with other people potentially interested in participating in the survey. WMAC members were sent an email by MDNR with a link to the survey URL and asked to share the link with their respective organization's members. The online survey was open March 12-29th. The second author administered the paper survey at the public meetings and sent all email communications to the WMAC regarding this survey.

Data Focus. WMAC members had previously identified 12 overarching concerns associated with hunting as a tool to manage wolf populations in Michigan (in alphabetical order): data and uncertainty, human-human conflict, human-wolf conflict, negative attitudes, poaching, public engagement, regulations, resource allocation, sustainability of wolf populations, use of non-hunting management tools, wolf pack dynamics, and wolf-deer relationship (Gore and Lute, 2013). A report on the process by which this list was constructed and the evolution of the Wolf Forum into the Wolf Management Advisory Council (WMAC) is available on the Michigan Department of Natural Resource's (MDNR) and Dr. Gore's MSU website (Gore and Lute, 2013). The survey questions were based on the 12 WMAC concerns and pretested at the February 2013 WMAC meeting; respondents were asked to rank the 12 concerns against each other and indicate their level of agreement that the concern was relevant to wolf management. Additional questions asked respondents about their support for hunting, caring about wolves in Michigan, danger from wolves and sources of wolf-related information. Graduate students and faculty in the Department of Fisheries and Wildlife at MSU reviewed and pretested the entire survey instrument for grammar, formatting, and completability. The online survey was hosted by www.riddlemethis.com, a payment-based online survey service and linked off Dr. Gore's MSU website (www.fw.msu.edu/~gorem) and MNDR (www.michigan.gov/dnr) for the duration of the survey. See the Survey Instrument section of this document for the complete survey instrument.

Data analysis. Paper and electronic surveys were pooled into a single database for processing with the assistance of two Michigan State University Department of Fisheries and Wildlife undergraduate student research assistants. Reverse Internet Protocol (IP) address searches were conducted on all electronic surveys to determine the State of origin (http://ipaddress.com/) for all electronic surveys. Responses from duplicate IP addresses were kept in the sample provided distinct email addresses were provided by participants. We chose this inclusion criterion given the tendency for some computers to produce

dynamic IP addresses (Fielding et al. 2008). In instances where duplicate IP addresses provided duplicate email addresses, the response with the earlier timestamp was kept in the sample (e.g., if two responses from example@msu.edu were submitted, the response submitted at 1:30 pm was kept and the response submitted at 1:45 pm was removed). If no email address was provided, the duplicate response was dropped from the sample. SPSS Version 20 (SPSS 2013) was used to produce descriptive statistics, cross tabulations and regression analyses. The lead author conducted all statistical analyses presented herein and reviewed intended statistical procedures with a consultant from MSU Center for Statistical Training and Consulting. The University Committee on Research Involving Human Subjects at Michigan State University (IRB# 11-1144e) reviewed and approved as exempt the methods used in this research.

RESULTS

Description of the Study Population. The total response from the paper and Internet survey was 676. Ten duplicate electronic surveys were deleted because they did not meet the aforementioned inclusion criteria; the usable sample for this survey was 666 responses. Among these responses, 94% were Michigan residents (n = 625), 78% were male (n = 520), 48% (n = 319) were from the UP, 37% (n = 249) were from the Lower Peninsula, and 15% (n = 98) were unknown. The Ironwood meeting generated the largest number of paper surveys (n = 212, 32%), followed by Marquette (n = 66, 10%), Lansing (n = 37, 6%), and Gaylord (n = 29, 4%). The Internet survey generated slightly fewer responses than the in person survey (n = 322, 48%). Internet survey respondents were from 22 US States including Michigan: Illinois, Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Kentucky, Massachusetts, Minnesota, Montana, New York, Ohio, Oklahoma, Oregon, Texas, Washington DC, and Wisconsin. Approximately half of respondents (n = 349, 52%) were self-identified hunters and 14% (n = 95) were self-identified trappers.

Many questions were measured on 5-point Likert-type scales ranging from strongly disagree to strongly agree (1= strongly disagree and 5 = strongly agree). Below, when mean scores are reported, they are based on these scales. Thus, the higher the mean score, the more respondents agreed wit the statement.

Sources of Information about Wolf Management. Respondents (n= 666) identified 52 distinct sources of information about wolf management in Michigan. The most commonly mentioned sources of information for wolf management were MNDR (n = 176, 38.7%), newspapers (n = 109, 16.4%), and the Internet (n = 69, 10.4%). The same pattern was observed with Michigan-only, Internet-only, and public meeting-only respondents Specific nongovernmental organizations were mentioned, as were types of media and government agencies.

Sources of Information about Wolf Hunting. Respondents (n = 666) identified 41 sources of information about wolf hunting. The most commonly mentioned sources of information for wolf hunting were MDNR, (n = 111, 16.7%), newspapers (n = 92, 13.8%), and the Internet

(n = 43, 6.5%). The same pattern was observed with Michigan-only, Internet-only, and public meeting-only respondents. Tribes, state and federal agencies, family and friends, and nongovernmental organizations were mentioned.

Support for Hunting. Respondents were asked how much they supported managing wolf populations in Michigan by hunting. Across all groups, the extreme responses (i.e., strongly disagree, strongly agree) dominated responses (Figure 1). UP residents had the highest mean response to this question (Xbar UP = 4.19; Xbar Michigan residents = 3.56; Xbar total sample = 3.59; Xbar Internet = 3.20; Xbar public meetings = 4.06).

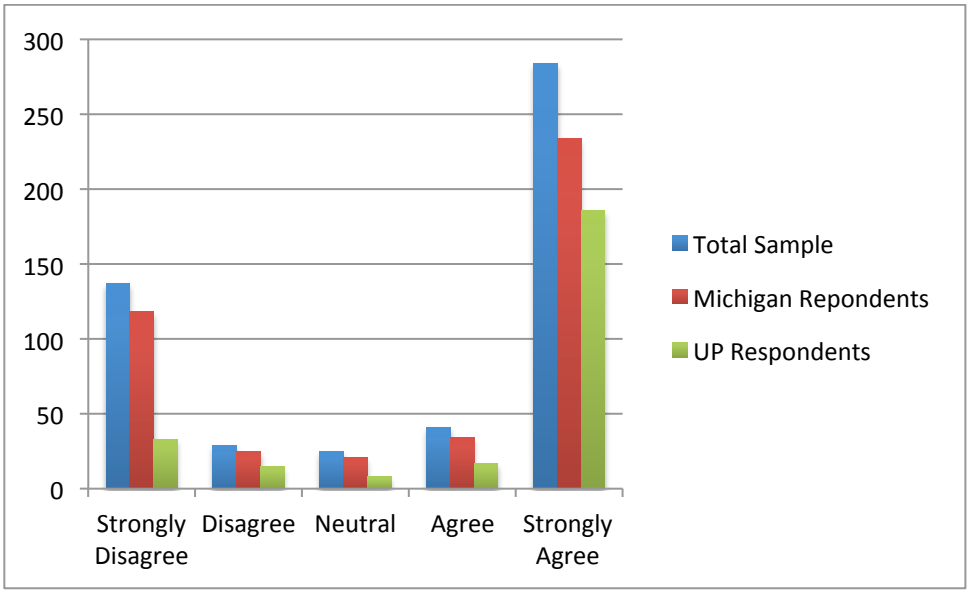

Figure 1. Support for hunting wolves in Michigan among three respondent groups, March 2013 measured on 5-point Likert-type scales (strongly disagree= 1 and strongly agree = 5).

Care about Wolves: Respondents were asked how much they care about wolves in Michigan. This question has been asked of Michigan residents multiple times by human dimensions researchers (Lute 2013). We asked this question so as to be able to compare results to previous findings. Similar to other studies, all respondent group responses were skewed toward caring a great deal about wolves (Figure 2). Mean responses to this question were very similar among three respondent groups with the exception of public meeting respondents (Xbar Total sample = 4.22; Xbar Michigan residents = 4.23; Xbar UP = 4.01; Xbar Internet = 4.51; Xbar public meetings = 3.87).

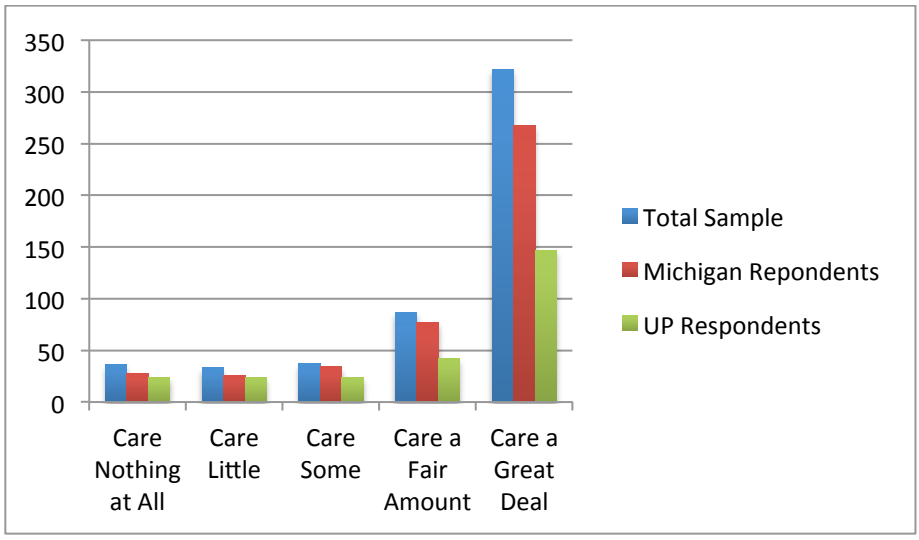

Figure 2. Care about wolves in Michigan among three respondent groups, March 2013 measured on 5-point Likert-type scales (care nothing at all= 1 and care a great deal = 5).

Danger from Wolves: Respondents were asked how much they believed wolves in the woods can be dangerous to people. This question has also been asked of Michigan residents multiple times by human dimensions researchers. We asked this question so as to be able to compare results to previous findings. UP respondent were slightly more likely than other groups to agree with the idea that wolves can be dangerous to people. Perceptions of risk were slightly skewed among UP respondents and relatively level among other groups (Figure 3). Mean responses to this question were relatively similar among respondent groups with Internet respondents less likely to agree (Xbar Total sample = 3.13; Xbar Michigan residents = 3.13; Xbar UP = 3.64; Xbar Internet only = 2.81; Xbar public meetings = 3.50).

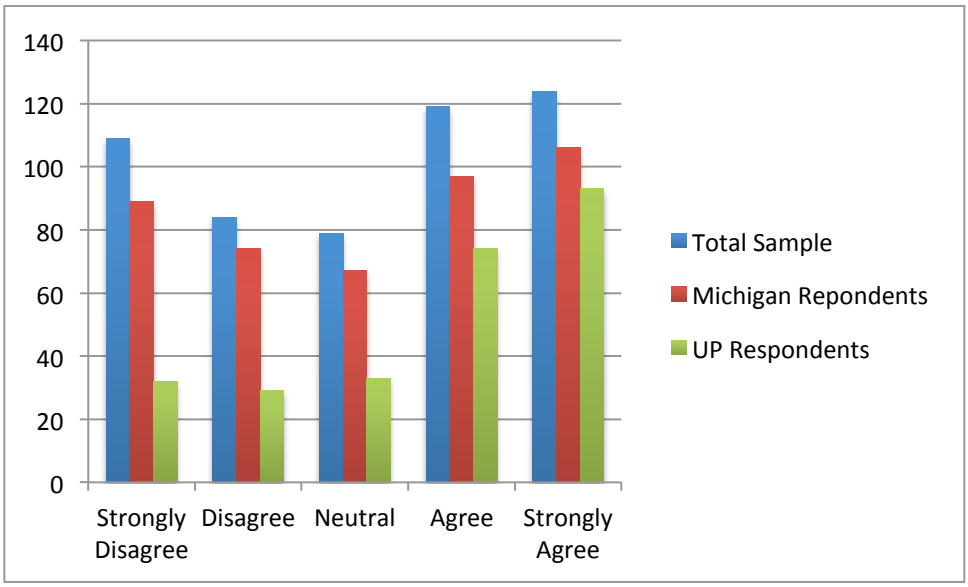

Figure 3. Perceptions of risk from wolves in Michigan among three respondent groups, March 2013 measured on 5-point Likert-type scales (strongly disagree= 1 and strongly agree = 5).

Ranking and Agreement with WMAC Concerns. Respondents were informed that by law, the MDNR works with a group of people interested in wolf management called the WMAC. The WMAC identified 12 concerns about hunting as a tool to manage wolves. Respondents were asked to rank the concerns from high (1 = most concerned) to low (12 = least concerned). They were then asked how much they agreed the concern is important in Michigan. The total sample ranked wolf conflicts, use of science in policy decisions, and sustainable populations as the top three concerns associated with hunting as a management tool (Table 1). Average agreement with each concern was similar (Xbar wolf conflicts = 3.85; Xbar science = 3.79; Xbar sustainable population = 3.74).

WMAC CONCERN	NUMERICAL RANK	AVERAGE RANK	AGREEMENT WITH CONCERN
Wolf Conflicts	1	4.18	3.85
Science	2	4.58	3.79
Sustainable population	3	4.68	3.74
Deer	4	5.01	3.43
Law	5	5.36	3.78
Nonlethal	6	5.38	3.73
Public input	7	5.59	3.31
Money	8	5.71	3.87
Behavior	9	5.98	3.5
Negative attitudes	10	6.18	3.27
Different attitudes	11	6.48	3.59
Poaching	12	6.92	2.82

Table 1. Ranking and agreement with 12 concerns associated with hunting as a management tool among total respondents (n = 666), March 2013.

UP respondents ranked wolf conflicts, wolf-deer relationships and sustainable populations as the top three concerns associated with hunting as a management tool (Table 2). Overall, most respondents agreed that these concerns were important (Xbar wolf conflicts = 3.9; Xbar wolf-deer relationships = 3.49; Xbar sustainable population = 3.48).

WMAC CONCERN	NUMERICAL RANK	AVERAGE RANK	AGREEMENT WITH CONCERN
Wolf Conflicts	1	3.72	3.9
Deer	2	4.2	3.49
Sustainable population	3	5.2	3.48
Science	4	5.28	3.64
Law	5	5.57	3.66
Nonlethal	6	5.78	3.65
Public input	7	5.79	3.14
Money	8	6.22	3.77
Negative attitudes	9	6.26	3.24
Behavior	10	6.63	3.48
Different attitudes	11	6.74	3.46
Poaching	12	7.45	2.45

Table 2. Ranking and agreement with 12 concerns associated with hunting as a management tool among UP respondents (n = 319), March 2013.

LP respondents ranked sustainable populations, science, and wolf conflicts as the top three concerns associated with hunting as a management tool (Table 3). Average agreement with these concerns was similar but higher than average agreement in the UP (Xbar sustainable populations = 4.12; Xbar science = 4.01; Xbar wolf conflicts = 3.84).

WMAC CONCERN	NUMERICAL RANK	AVERAGE RANK	AGREEMENT WITH CONCERN
Sustainable population	1	3.98	4.12
Science	2	4.15	4.01
Wolf Conflicts	3	4.86	3.84
Nonlethal	4	4.95	3.82
Behavior	5	5.27	3.54
Law	6	5.3	3.89
Money	7	5.41	3.97
Public input	8	5.74	3.45
Poaching	9	6.23	3.45
Deer	10	6.23	3.32
Negative attitudes	11	6.29	3.31
Different attitudes	12	6.53	3.73

Table 3. Ranking and agreement with 12 concerns associated with hunting as a management tool among LP respondents (n = 249), March 2013.

Respondents identified a number of concerns associated with hunting as a tool for wolf management that were not identified by WMAC members. In alphabetical order, these concerns were: (1) the effect of artificial food sources on wolf behavior, (2) the ethics of hunting (e.g., pain, suffering), (3) human-nature relationships (do not interfere with the natural balance), (4) differences in attitudes between people who live among wolves and

people who do not, (5) safety (e.g., for children, of methods of take, animals, livestock and pets/hunting dogs), and (6) wolf-dog and wolf-coyote hybrids.

STUDY LIMITATIONS & CONSIDERATIONS

As with all scientific studies, there are a number of study considerations that influence the extent and degree to which data can be interpreted. First, the sampling frame was not random or representative. This means that the results should not be generalized to the general population of Michigan or beyond Michigan to other states with wolves. This also means that it is impossible to draw conclusions about what sociodemographic variables (e.g., education level, income, age) predict responses. Second, survey questions were focused on the 12 concerns identified by WMAC members; other concerns potentially exist beyond study participants. Survey questions were also focused on wolf hunting; there are other issues associated with wolf management in Michigan beyond hunting and this survey does not address those issues.

The survey instrument was developed by a social scientist with experience conducting wildlife surveys, based on well known survey design (e.g., Dillman 1996, Salant 1994), and data analysis was conducted using common procedures and widely available statistical software (SPSS 2012). Methods were reviewed and approved as exempt by the MSU Institutional Review Board. Although limited in generalizability, results are valid for the study participants and provide valuable social science insight regarding public opinions about wolf hunting that may complement biological knowledge when considering management options.

CONCLUSION & NEXT STEPS

There are a number of noteworthy findings from this research. First, the WMAC's original list of 12 concerns generally captured the overarching concerns of all survey respondents, indicating that the group was able to effectively identify a suite of different concerns associated with wolf hunting in Michigan. Second, different groups consistently ranked a small number of concerns as being of high concern including wolf conflict, use of science in policy decisions, and sustainable populations. Poaching and different stakeholder attitudes consistently were ranked as a lower concern. Third, a few trends in attitudes emerged among survey participants. However, results cannot be generalized beyond the sample frame, which was comprised of over 75% males and 50% hunters. There was general agreement in support of wolf hunting and the majority of respondents care greatly about wolves. Perceptions of danger from wolves in the woods were highly variable, indicating different opinions on risks associated with wolves. When coupled with insights from biological science, social science information herein can contribute to effective and science-based decision-making about wolf hunting in Michigan.

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SURVEY INSTRUMENT

This survey is part of a study conducted by Michigan State University to learn about Michigan residents' attitudes about wolf management. Information from this study will help the Michigan Department of Natural Resources and its partners improve wolf management as well as communication with stakeholders.

If you would like to participate in this study, please complete the following questionnaire as soon as possible. Your participation in this survey is completely voluntary and you may skip a question or withdraw at any time without penalty. This survey should take about 15 minutes or less. You must be at least 18 years of age to participate.

Your answers will be kept confidential. Your name and address will never be associated with your responses in any way and your privacy will be protected to the maximum extent allowable by law. Your completion of the questionnaire means that you voluntarily agree with consent to participate in this research. If you have any questions about this study, please contact Dr. Meredith Gore at 517-432-8203 or gorem@msu.edu.

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1. What county within Michigan do you live in? _____

2. How did you find out about the survey? _____

3. Are you a MI resident? (Please circle one). YES NO
   → If yes, what is your county of residence? _____

4. Where do you get your information about *wolf management* in Michigan? (Please list up to 3 sources).
   1. _____
   2. _____
   3. _____

5. Where do you get your information about *wolf hunting* in Michigan? (Please list up to 3 sources).
   1. _____
   2. _____
   3. _____

6. Are you… (Please circle one). MALE FEMALE

7. Do you currently do any of the following outdoor recreation activities? (Please check all that apply)

☐ Backpack camping	☐ Fishing
☐ Berry/Mushroom picking	☐ Hiking/Walking
☐ Bicycling	☐ Hunting
☐ Bird watching	☐ Riding horses
☐ Campground camping	☐ Snowmobiling
☐ Canoeing/Kayaking	☐ Trapping
☐ Cross-country skiing	☐ Viewing wildlife
☐ Driving off-road vehicles	☐ Wildlife photography
☐ Dog sledding	☐ Other outdoor recreation (Please specify): _____

8. If you are willing to participate in future online surveys related to wolves and wildlife in Michigan, please *print* your email address here: _____

9. How much do you care about wolves in Michigan? (Please circle one).

Care Nothing At All	Care Little	Care Some	Care a Fair Amount	Care a Great Deal

10. How much do you believe wolves in the woods can be dangerous to people? (Please circle one).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Please continue to other side →

11. How much do you support managing wolf populations in Michigan by hunting? (Please circle one).

Strongly Oppose	Oppose	Neutral	Support	Strongly Support

12. Please list concerns you may have associated with managing wolf populations in Michigan by hunting.

_____

_____

_____

13. By law, the MDNR works with a group of people interested in wolf management called the Wolf Management Advisory Council (WMAC). The WMAC offers their opinion about wolf management. The WMAC has identified some concerns about hunting as a tool to manage wolves. Some of these concerns are listed below. Please provide your opinion on concerns identified by the WMAC by (**A**) ranking your level of concern and (**B**) selecting your level of agreement with each concern. Use a number only once in the (**A**) ranking column.

A		**B**				
Your Rank (1 = most concerned, 12 = least concerned)	**The WMAC is concerned that…**	**How much do you agree this concern is important in Michigan?** (Please circle one).				
	…wolf management is based on scientific research.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…wolf managers consider differing attitudes about wolf management.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…wolf management reduces negative attitudes.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…hunting could cause more illegal killing of wolves.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…the public have enough chances to share their opinions about wolf management.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…wolf management is implemented according to the law.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…financial resources for wolf management be used responsibly.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…a wolf population in Michigan be maintained.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…MDNR continue to use non-lethal and lethal tools for reducing wolf-related conflicts.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…wolf management reduces conflicts with people, livestock, game species, and pets.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…wolf management does not cause harmful changes in wolf pack behavior.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	…harmful effects of wolves on deer populations are avoided.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Thank you for completing this survey.