

Acceptance capacity for white-tailed deer (*Odocoileus virginianus*) in Michigan: a comparison of hunters and non-hunters from the Upper Peninsula, Northern Lower and Southern Lower Peninsula of Michigan, 2009¹.



Research conducted and reported by:

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¹ This report to the Michigan Department of Natural Resources' Wildlife Division is intended to provide knowledge about values and attitudes of Michigan residents, including deer hunters and non-hunters, about deer and deer management. Communication with Wildlife Division personnel occurred throughout the project. Nonetheless, this study was conducted independently by researchers in the Department of Fisheries and Wildlife at Michigan State University in collaboration with the Institute for Public Policy and Social Research. Data and inferences presented herein reflect those of the authors of this report who were the principal investigators, and not necessarily those of Wildlife Division personnel.

EXECUTIVE SUMMARY

A quantitative survey of 8,990 randomly selected Michigan residents (2,490 purchasers of 2008 deer licenses and 6,500 residents) was conducted in spring 2009 to gain insights about stakeholders in deer management.

Key findings include:

1. Deer create important positive impacts for Michigan residents. Deer are a species that connects people to nature and provides many forms of valued recreation. Michigan residents enjoy interacting with deer, and many stakeholders wish to have the same number or more interactions with deer in the future than they do currently.
2. How stakeholders perceive deer and deer management in Upper Peninsula (UP), Northern Lower (NLP), and Southern Lower (SLP), however, is as different as the unique landscapes of these regions. These differences suggest greater satisfaction with deer and improved trust in the Department of Natural Resources could be achieved if deer management is geographically tailored to meet the needs of stakeholders within regions.
3. Greater satisfaction with deer management and greater trust in the DNR occurs in the SLP; the least satisfaction with deer management and the lowest levels of trust occur in the UP. NLP stakeholders are intermediate between the UP and SLP in almost every category.
4. Stakeholders concerned about deer in the UP are willing to tolerate more deer now and express a desire for more deer in the future than do stakeholders in the SLP.
5. Hunters throughout Michigan are more tolerant of interactions with deer and want more deer in the future than do non-hunters. They are also less satisfied with deer management than non-hunters.
6. Hunters were more than twice as likely to disagree as non-hunters that the DNR provides the types of hunting experiences desired by hunters, and nearly three times as likely to disagree with the statement that the DNR cares about hunters concerns. These data suggest non-hunters believe the DNR is attending to hunters while nearly one-third of hunters believe the opposite.
7. Hunters are most concerned about the size and condition of deer herds and their relation to anticipated quality of hunting, whereas regardless of region, non-hunters report the most important impact from deer is providing connections to nature.
8. Hunters are more apt to allow hunter access than are non-hunters. If access is needed for gaining hunting experiences, any additional loss of hunters in the population may reduce the amount of hunter access available to recruit new hunters.
9. Michigan residents hold fairly homogenous throughout values toward wildlife and uses of wildlife. Michiganders place high levels of importance on the social and communication benefits of wildlife, as well as concerns about traditional uses of wildlife. These values reflect general attitudes towards nature and wildlife, and are not specific to deer.
10. Attention to factors affecting impacts from deer, rather than merely altering deer populations, may yield alternatives for management, especially in places such as the SLP where access and tolerance for hunting is less than in northern regions.

Acceptance capacity for white-tailed deer (*Odocoileus virginianus*) in Michigan: a comparison of hunters and non-hunters from the Upper Peninsula, Northern Lower and Southern Lower Peninsula of Michigan, 2009.²

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Stakeholder engagement is a critical component of Michigan Department of Natural Resources (DNR) Wildlife Division's planning processes. Insights into public perceptions about white-tailed deer (*Odocoileus virginianus*) and desired levels of impacts created by deer, are achieved through varied mechanisms such as one-on-one meetings, telephone calls, letters, group or club meetings, as well as more systematic means (e.g., annual deer hunter surveys, focus groups, deer advisory teams). As part of ongoing public involvement in deer management, we developed a quantitative questionnaire to gain insights about demographics of Michigan stakeholders in deer management, stakeholder experiences with deer, the type and frequency of interactions stakeholders have with deer, stakeholder tolerance for these interactions and desired levels of future interactions. In addition, we sought out opinions about satisfaction with deer management in Michigan and levels of trust in the DNR.

Development of the questionnaire was organized around an evolving concept of acceptance capacity (Lischka et al. 2008). Acceptance capacity represents the upper limits of tolerance of the negative and the lower limit of desirable effects of wildlife on human values – these limits are most frequently expressed as desires for increased or reduced populations of animals relative to what is perceived to be the current situation (Decker and Purdy 1988, Minnis and Peyton 1995, Riley and Decker 2001). Characteristics such as age (Manfredo and Zinn 1996), tenure in area of residence, gender, education (Vaske et al. 2001), experience with wildlife (Mankin et al. 1999), occupation (Millbrath 1984), and setting of current and childhood residence

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(Clendenning et al. 2005, Heberlein and Ericsson 2005) all influence values related to wildlife, therefore affecting the potential suite of impacts perceived.

Although acceptance capacity may have a single upper and/or lower bounds, factors affecting these limits may be defined by the cumulative effect of perceived positive and negative effects of a wildlife population. Zinn et al. (2000) predicted that values influence an individual's acceptance capacity for a wildlife species. Riley et al. (2002) proposed impacts, the effect on human values through interactions with wildlife, as the primary determinant of acceptance capacity for a species (Figure 1). Thus, a complete explanatory model of factors affecting acceptance capacity likely includes a combination of stakeholder characteristics and perception of impacts.

Lischka et al. (2008) conducted a pilot study in southern Michigan to determine the relationship of impacts created by deer on acceptance capacity of various stakeholders. Among rural stakeholders in deer management in that study, acceptance capacity was most influenced by impacts. That is, although stakeholder demographics such as participation in hunting and farming affected perception of impacts, the total effect of impacts perceived explained a majority of variation in acceptance capacity for deer. Therefore, one cannot assume that that just because someone is a farmer they would have a lower acceptance capacity for deer, or that because people are aware that deer cause damage to crops they would desire fewer deer. Rather, if an individual experienced an economic loss due to deer browsing on cash crops and were bothered by that loss, they would likely desire a reduction in deer numbers and, therefore, the impacts they perceive.

There were reported differences between hunters and non-hunters in southern Michigan for desired future populations: hunters were the only group (compared with farmers and non-hunting, non-farming residents) who desired more deer in the future than existed at the time of the survey. Knowledge gained from this pilot project led to inquiry herein about impacts perceived as a result of interactions with deer across Michigan's varied landscape and between stakeholder groups. The current study also is designed to illuminate differences in trust in the DNR and activities that may influence effectiveness of deer management.

To help support decisions about state-wide deer management in Michigan, the following working objectives were established for this study: 1) determine deer-related impacts perceived by hunter and non-hunter populations within the 3 major regions of deer management of Michigan, 2) measure acceptance capacity among these stakeholders and 3) determine satisfaction among these stakeholders related to deer management and the DNR. The scale of sampling and analyses occurred at the level of the 3 deer management zones: the Upper Peninsula (UP), the Northern Lower Peninsula (NLP), and the Southern Lower Peninsula (SLP).

Methods

Self-administered survey

Based on insights gained through previous interactions between stakeholders and deer managers in Michigan, as well as communications with the Michigan Deer Advisory Team and a

review of literature on Midwestern deer management, we designed a self-administered, mail-back questionnaire. The purpose was to quantify the type and severity of deer-related impacts perceived by respondents, interactions with deer that caused those impacts, and overall acceptance capacity for deer. In addition, we gathered information about respondents' characteristics, such as participation in hunting, farming and other wildlife-related activities, land ownership, setting of childhood and current residence and tenure in the study area to characterize stakeholders (see full questionnaires in Appendix II). All deployment of mail and telephone non-response bias questionnaires, as well as data entry and quality checking were conducted by the Michigan State University Institute for Public Policy and Social Research (IPPSR) in collaboration with the principle investigators.

Two populations of stakeholders ≥ 18 years old were surveyed in each of Michigan's three deer management regions: 1) a stratified random sample of Michigan residents (herein labeled "general population"); and 2) a random selection of 2008 purchasers of a general deer hunting license (herein labeled "hunters"). A total of 8,890 surveys were sent to residents of Michigan (2,490 to the hunter sample and 6,500 to the public sample). The general population sample of addresses and telephone numbers, selected to under-represent the urban-metropolitan areas of Michigan, was purchased from Survey Sampling, Inc. of Fairfield, Connecticut. For the SLP 750 addresses were selected from urban census tracts and 1,750 from suburban/rural US census tracts. Because we used census tracts that were defined as urban, they were selected from various urban centers throughout the SLP (e.g., Detroit, Lansing, Livonia, Muskegon, Pontiac and Saginaw). No urban-metropolitan areas exist elsewhere in Michigan. A "next birthday" approach was attempted with the general population, where the person with the next birthday in the household was asked to fill out the questionnaire. Addresses of hunters were obtained from DNR databases.

Questionnaires was mailed between 29 April – 01 July, 2009, according to a modified version of the Total Design Method (Dillman 2000: 149-193) with four total mailings: two copies of the questionnaire with cover letters, a reminder post card between mailings one and two of the questionnaire, and a final request, with questionnaire, to people in the general public sample who had not replied as of 01 July 2009. A copy of mailings can be found in the Appendices of this report. All questionnaires and correspondence were mailed from and returned to IPPSR on the MSU campus in East Lansing, Michigan. A telephone non-response questionnaire, comprising eight key questions from the original mail questionnaire, was initiated 15 July 2009 and terminated when a sample of 100 was reached in each region. The non-response bias survey was conducted only for the general population sample, as phone numbers were not available to conduct non-response telephone surveys of hunters. Methods used in this study were reviewed and approved by the University Committee on Research Involving Human Subjects at Michigan State University under Internal Review Board #i032298.

Stakeholder groups for white-tailed deer management

To fulfill Wildlife Division requests for comparisons of variables, we classified respondents in two ways: by their participation in deer hunting and by the region in which their interactions with deer were most important to them. We classified respondents as deer hunters if they belonged to the MDNR-provided deer hunter sample (see above for description of this

sample). We classified respondents as non-hunters if they belonged to the general public sample and reported that they did not hunt deer in Michigan (Appendix II, question #8). Many respondents from the general public sample ($n=852$) reported hunting deer in Michigan, yet we were unable to determine if they had hunted deer in Michigan during 2008. As such, we excluded them from comparisons of hunters to non-hunters, as we did not believe we could discern whether they were active deer hunters or had only hunted deer in the past.

Michiganders interact with deer in many ways and in many areas of the state. As such, the area where they reside may not always be the region in which their interactions with deer have the greatest influence on their opinions about deer and deer management. For example, an individual who owns a cabin in the NLP, but resides in the SLP, may hunt and recreate in the NLP, which will affect how often and under what circumstances he or she interacts with deer. As a result the individual may consider the deer population in the NLP more important to them than the population in the SLP. To account for this difference, we classified individuals for regional comparisons by the region in which respondents indicated their interactions with deer were most important to them (Appendix II, question #3). For all regional comparisons, region of greatest importance was used to assign respondents.

Demographic characteristics and wildlife-related activities

We asked respondents to indicate the highest level of education they had obtained. We also asked them to indicate a category that best described the type of area where they live currently and the area in which they grew up. Respondents reported the number of years they resided at their current address. We also asked respondents to indicate their gender, and the year in which they were born, which we subtracted from 2009 to estimate their age. In addition to demographic information, respondents reported their participation in specific wildlife-related activities previously determined to affect attitudes about deer and deer management. All activity variables were dichotomous, with 0= no participation and 1=participation.

Wildlife Attitudes and Values Scale

A Wildlife Attitudes and Values (WAV) scale (Purdy and Decker 1989) was used to assess the attitudinal alignment of respondents relative to their wildlife-specific attitudes. To reduce the number of variables in the WAV scale to a meaningful set of variables for use in analysis, we conducted a principle components factor analysis with varimax rotation on responses WAV questions (Butler et al. 2003). Data were suitable for factor analysis, as shown by a KMO measure of sampling adequacy >0.8 . Factor analysis produced three factors, which explained 59% of the total variation in the data. For all respondents, we calculated a mean score on each factor (social and communication benefits of wildlife, traditional concerns about wildlife, and tolerance of wildlife-related problems). Mean scores were compared by region and hunting participation to identify groups where differences in wildlife-related values existed.

The social benefits factor contained items related to appreciation and existence of wildlife broadly, as well as the importance wildlife plays in communication with family, friends, and others. Questionnaire items measured the importance people place on knowing wildlife exist in nature, and on the role of wildlife in education and understanding about the environment. This

factor also measured the importance people place on observing, photographing, and talking about wildlife. The traditional concerns factor attempted to measure the importance people place on of wildlife as a source of food, fur, and other utilitarian-oriented attributes. This factor also included the importance individuals place on expressing their own opinions about wildlife and its management to public officials. The problem tolerance factor included questionnaire items related to wildlife as a nuisance or as a source of risk from disease or physical injury.

Impacts: Identification and change

To identify the subset of effects resulting from interactions with deer that were recognized and important to stakeholders, we created a weighted variable (IMPACT, $n=36$) by the following formula:

$$\text{IMPACT} = \text{RECOGNIZE} \times \text{IMPORTANCE}$$

where RECOGNIZE was assigned a 2-point scale ($-1 = \text{no}$, $1 = \text{yes}$) and IMPORTANCE was assigned a 3-point scale ($2 = \text{very important}$, $1.5 = \text{somewhat important}$, $1.0 = \text{not at all important}$). Recognition of effects (RECOGNIZE) was measured by asking respondents to indicate whether they perceived given effects as a result of specific interactions with deer. In a second question, respondents were asked to assign a level of importance (IMPORTANCE) to the effects from the previous question. Based on our definition of impacts as recognized, important effects of interactions with wildlife, we limited impacts to those with an IMPACT value of 2 (i.e. RECOGNIZE = 1 and IMPORTANCE = 2) and created dummy-coded variables to reflect impact identification ($1 = \text{impact identified}$, $0 = \text{impact not identified}$). Dummy coded variables for each impact were used in all further analysis.

Acceptance capacity

We measured respondents' perceptions of the current deer herd size (CURRENTPOP) and desire for change in the herd size (FUTUREPOP) over the period from 2009-2014 on a 5-point scale that ranged from "decrease(d) greatly" to "increase(d) greatly," with a midpoint of "stay the same." We assumed that FUTUREPOP was an accurate surrogate value for acceptance capacity, relative to CURRENTPOP. Respondents who desired a great change in FUTUREPOP were assumed to have their acceptance capacity exceeded by interactions with the deer herd.

Satisfaction with deer management and trust in the DNR

When stakeholders perceive a mismatch between the impacts they desire from deer, and therefore their acceptance capacity, and their actual interactions with deer, their satisfaction with deer management and trust in agency capacity are likely to suffer. To test this hypothesis and provide a measure of satisfaction with DNR deer management and trust in the agency, respondents were asked to indicate their level of agreement with a series of 10 items. The items measured satisfaction with DNR actions to limit negative effects from deer and provide for positive ones, responsiveness to concerns of various stakeholder groups, capacity to communicate about deer management and make proper decisions about deer management and overall satisfaction with deer management in Michigan.

Results

Response rate

Of 8,990 surveys sent, 623 were undeliverable (61 from the hunter sample and 562 from the public sample). We received 3,882 useable questionnaires, for an overall response rate of 47%. The response rate for the hunter sample was 52% (1,268 useable responses) and the response rate for the public sample was 43% (2,565 useable responses).

Non-response bias

Non-response bias was measured for the public sample only, as telephone numbers were unavailable as part of the DNR hunter sample. Respondents to the full survey and to the telephone non-response survey were similar in their perception of how the deer population had changed in the past five years and desired change in the next five years. There were, however, a larger proportion of males among the respondents to the full survey than the non-response survey. In addition, many more respondents to the full survey reported hunting deer in Michigan (56% full survey, 25% non-response survey). Changes in the deer population were less important to respondents to the non-response survey than respondents to the full survey (27% not important in non-response survey and 9% not important in full survey).

Stakeholders

Respondents were classified in two ways for comparison: a) by region where interactions with deer are most important and b) by participation in deer hunting. There were 1,332 respondents (37%) from the UP, 1,436 respondents (40%) from the NLP and 832 respondents (23%) from the SLP. Within in the DNR hunter sample, 17 respondents had not hunted deer in Michigan, and were excluded from hunter vs. non-hunter comparisons. There were a total of 1,268 hunter respondents. Within the public sample, 852 respondents reported hunting deer, and were excluded from hunter vs. non-hunter comparisons. There were a total of 1,636 non-hunting respondents in the public sample.

For a majority of respondents (89%), the region of residence was the same as the region where interactions with deer were most important to them. In the 11% of cases where there was a mismatch between region of residence and region of importance, 64% resided in the SLP, but reported their interactions with deer were most important in the NLP (Table 2). An additional 17% of "mismatched" respondents resided in the SLP but indicated their interactions with deer were most important in the UP. Only 5% of UP residents reported that their interactions with deer were more important to them in either the NLP or SLP of Michigan than in the UP.

Demographic characteristics

Among all three regions of the state, approximately 75% respondents were male and 25% were female (Table 3a). In contrast, nearly all (90%) hunter respondents were male (Table 3b). Among non-hunters, 45% were male and 55% were female. Respondents for whom interactions with deer were most important in the SLP of Michigan had attained a higher level of

education than respondents from other regions (Table 4a). Respondents who did not hunt deer also had higher educational attainment than hunters (Table 4b).

Respondents, for whom interactions with deer are most important in the UP, are most likely to reside in a rural area, but not on a farm (40%) or within a small town (23%, Table 5a). Nearly half (42%) of respondents who reported interactions with deer were most important in the NLP resided in a rural area, but not on a farm. Respondents for whom deer are most important in the SLP resided at a higher rate in urban and metropolitan areas than respondents from other regions. Among hunters and non-hunters, the most common area to live in was a rural area, not on a farm (Table 5b); however, 14% of hunters reported that they live on a rural farm. Only 5% of non-hunters reported they lived on a rural farm.

Respondents, for whom deer are important in the UP, were most likely to have grown up in a small town, whereas NLP respondents were most likely to have grown up in a rural farming or non-farming area (Table 6a). Respondents from the SLP were much more likely than respondents from other regions to have grown up in urban or metropolitan areas. Hunters were more likely to have grown up in rural areas of all types than non-hunters, who were more likely to have grown up in towns, urban and metropolitan areas (Table 6b).

Respondents, who reported interactions were most important in the SLP, had a younger average age than their counterparts in the NLP and UP (Table 7a). They had also lived in Michigan for the fewest number of years, and the fewest years at their current address. Non-hunters were, on average, older and had lived in Michigan for more years than hunters (Table 7b). Hunters had, in contrast, lived at their current address for slightly longer than non-hunters.

Most respondents participated in activities in which interaction with deer was likely. The most common wildlife-related activities were reading about wildlife (82%) and gardening (82%). Many individuals participated in activities likely to involve intentional interactions with deer, such as observing (75%), photographing (63%), or feeding (69%) wildlife. Just over half (57%) of respondents had hunted deer in the past 3 years and 45% of respondents had hunted other wildlife in the same time period. Approximately 30% of respondents had been involved in a deer-vehicle collision over the previous three years.

Wildlife Attitudes and Values Scale (WAVS)

Respondents from all three regions of Michigan reported statistically similar orientations in their values about wildlife (Table 8). The social and communication benefits of wildlife were important to respondents throughout Michigan. Respondents throughout Michigan also agreed that traditional concerns about wildlife (i.e. those relating to consumptive uses) were important. In addition, respondents from all three regions reported potential problems associated with wildlife were tolerable to them. Hunters, in contrast to non-hunters, reported higher average values on all three aspects of values related to wildlife; the largest difference in mean values was on traditional concerns about wildlife.

Involvement with hunting

In the Upper Peninsula of Michigan, approximately half (54%) of respondents reported allowing other hunters to access their land to hunt deer (Table 9a). In the NLP and SLP, fewer respondents allowed hunters to access their land (43% and 34% respectively). Among hunting respondents, 63% allowed other people to hunt on their land, whereas only 20% of non-hunters allowed anyone to hunt on their land (Table 9b). In all 3 regions of Michigan, a majority of respondents allowed family and friends who asked permission to access their lands to hunt deer (Table 10a). Similarly, a majority of both hunters and non-hunters allow their friends and family who ask permission to access their land for deer hunting (Table 10b).

Impacts perceived by stakeholders

Respondents to the questionnaire could have identified up to a maximum of 36 impacts resulting from their interactions with deer (Table 1). Among all respondents, statewide, the most commonly identified impacts from interactions with deer were: feeling connected to nature when deer are seen near their home (61%), in a forest or wooded area (60%) and in farmer's fields (56%). The same impacts were most commonly identified among respondents in the UP, NLP and SLP (Table 11a). A list of impacts ranked by the percentage of respondents who experienced them suggests respondents from the three regions had similar views on nearly all impacts presented (Table 12a), with concerns about feeling connected to nature, deer health and hunt quality as most important. The exception was concerns about the likelihood of deer starving over winter and the effects of predators on deer populations. Respondents from the UP identified these impacts more frequently than respondents who were concerned about deer in the NLP or SLP. In all three regions, concerns about wildlife-borne diseases, over-browsing by deer on native plants and crop damage were the least commonly identified impacts.

Several differences were apparent in the impacts perceived by hunters and non-hunters. The three most commonly identified impacts among non-hunters were the same as the entire population of respondents (Table 11b), with feeling connected to nature when deer are seen around home (53%), in a forested area (51%) or in farm fields (49%) the three most commonly identified impacts. Among hunters, however, the most commonly identified impacts were feeling that deer hunting would be good when deer are seen in farm fields (68%) and around home (66%), feeling deer are healthy and well fed when they are seen in farm fields (67%) and feeling connected to nature when deer are seen around home (66%) and in forested areas (66%). Differences between hunters and non-hunters are particularly evident when the rank of concerns about deer-vehicle collisions is compared. Hunters ranked their risk of injury from and the hassle and cost of dealing with a deer-vehicle collision when deer are seen in multiple settings as items 16-25 out of 36. To non-hunters, in contrast, these concerns were ranked 4 to 12. Whereas hunters and non-hunters indicated that different suites of impacts were most important to them, the same impacts made up those least likely to be identified: concerns about crop damage, overbrowsing and diseases (Table 12b).

Acceptance Capacity

Whereas respondents from the three regions of Michigan identified similar suites of impacts resulting from their interactions with deer, their perception of changes in deer populations over the past five years and desires for change in the coming five years exhibit clear differences. Nearly 60% of respondents for whom interactions with deer are most important in the UP felt that the deer population in the UP had decreased over the past five years (Table 13a). In contrast, only 26% of respondents from the SLP felt the deer population had decreased over the same time period. In the SLP, many more respondents felt that the population had stayed the same (38%) or increased (36%). Responses of individuals from the NLP of Michigan were intermediate between those of respondents from the UP and SLP.

Likely as a result of perceptions of a decreasing deer population, a majority (63%) of respondents from the UP expressed a desire to see the deer population in the UP increase in the coming five years (Table 14a). Only 8% of respondents from the UP desired a decrease in the deer population. Similarly, most (55%) respondents from the NLP preferred an increase in the deer population between 2009 and 2014. Respondents who felt their interactions with deer were most important in the SLP were more likely to desire the deer population to stay the same (39%) or even decrease (25%) than respondents from other regions of the state.

A majority of hunters (59%) felt that the deer population had decreased in the region of most importance to them, whereas only 27% of non-hunting respondents felt the population had decreased (Table 13b). A plurality (44%) of non-hunters felt that the deer population had stayed the same over the time period. Nearly $\frac{3}{4}$ of hunting respondents (74%) desired an increase in the deer population over the next five years, whereas only 27% of non-hunting respondents desired an increase.

Satisfaction with deer management and trust in the Department of Natural Resources

The frequency and intensity with which Michiganders interact with deer, and the mismatches between desired and actual interactions, are likely to influence stakeholder judgment of the responsiveness and trustworthiness of the Department of Natural Resources. Only 1/3 of respondents in all 3 regions of the state agreed that actions taken by the DNR reduced the negative impacts they felt from deer (Table 15a). Similar percents of respondents felt that actions taken by the DNR increased the positive impacts they perceived from deer. Nearly half of respondents in all 3 regions (48% UP, 44% NLP, 41% SLP) reported that the DNR could do more to manage the negative effects of deer in their life. Hunter respondents reported similar feeling about the DNR's actions to manage the effects of deer (Table 15b); however, non-hunters were much less likely to feel that the DNR could do more to manage the negative effects from deer.

Approximately 1/3 of respondents in the UP, NLP and SLP (32%, 34%, and 38%, respectively) agreed that the DNR does a good job communicating about deer management (Table 15a). A majority of respondents from all regions agreed that the DNR cared about the concerns of hunters, farmers and other residents who do not hunt or farm in regard to deer management. A majority of hunters and non-hunters (>60%) also agreed that the DNR cares about the

concerns of farmers and residents who do not hunt or farm (Table 15b); however, only 49% of hunters agreed that the DNR cares about the concerns of hunters in Michigan. Hunters further expressed dissatisfaction with DNR actions connected to hunt management when asked if the DNR provides the type of hunt most hunters desire. A plurality (42%) of hunters disagreed with this statement.

A gradient of satisfaction with deer management and trust in the DNR to make the proper decisions about deer management exists from north to south. Respondents from the UP were less likely to agree that they trusted the DNR to make proper decisions and that they were satisfied with DNR deer management than respondents from the NLP and SLP (Table 15a). Residents from the SLP were most likely to agree with those statements. Nearly half of hunter respondents (47%) reported that they did not trust the DNR to make proper decisions and that they were dissatisfied with DNR deer management (Table 15b). Non-hunters reported trust in the DNR and satisfaction with deer management at much higher rates than hunters.

Discussion

The types of impacts created by deer in Michigan are perceived similarly by stakeholders throughout the state. Deer are almost uniformly reported to create important positive impacts to residents of Michigan in that they are a species – for many people deer are the species – that connects people to nature regardless of where stakeholders live. Lischka et al. (2008) reported that stakeholders in Livingston, Washtenaw and Jackson Counties of the SLP viewed the presence of deer as perceptual cues to the well-being and balance of nature. Our current findings indicate that this is probably true throughout the state, where deer are the most common large mammal with which people are likely to interact. As expressed by attitudes toward deer and preferences for future deer populations, residents throughout Michigan enjoy deer, hold them in high regard as a natural resource, and many stakeholders wish to have interactions with the same number of deer or more than they currently perceive to exist.

With respect to deer and deer management, however, a distinct gradient of stakeholder perceptions exists along geographical lines, which supports delineation of deer management zones that treat the UP, NLP, and SLP differently. Key differences indicate that people in the UP are more willing than people in the SLP to tolerate deer and express a desire for more deer than what currently is perceived to exist. The greatest level of satisfaction with deer management and greatest level of trust in the DNR is observed in the SLP, where deer populations are densest and public tolerance is lowest. The lowest level of satisfaction with deer management and the lowest levels of trust occur in the UP, where deer are most thinly populated and desire for more deer is greatest. This observation may indicate that the mismatch between real and desired interactions with deer is larger in UP than SLP. Or, that the specific impacts that are mismatched are most important (and more important than to residents of SLP). Attitudes expressed about NLP deer and deer management are intermediate between the UP and SLP in nearly every respect, which probably reflects its intermediate relationship in geography and subsequent characteristics of deer and stakeholders between northern and southern Michigan.

Greater discrepancy exists between hunters' and non-hunters' attitudes toward deer, deer management, and acceptance capacity for deer than exists between stakeholders in different regions of Michigan. Hunters are more tolerant of interactions with deer and want more deer in the future than do non-hunters. Hunters are most concerned about the health of the deer herd and its relation to the anticipated quality of hunting, whereas the connections to nature created by deer were the most important impact reported by non-hunters. It should be noted that respondents were not given a definition of health. The term was left up to them to define. Based on responses (or lack thereof) to other questions related to disease, we believe health mostly is evaluated in relation to perceptions of the physical condition of deer – their ability to survive through winter and reproduce – rather than freedom from disease.

Strong differences between regions with respect to satisfaction with deer management were not observed, yet non-hunters and hunters have different views. A general satisfaction with DNR deer management exists among non-hunters while a general dissatisfaction by hunters is evident. Hunters more often also expressed a lack of trust in the DNR to make the proper decision about deer. These two variables – satisfaction and trust – likely are intertwined, yet when considered together point to a priority of building trust and opening communication between hunters and the DNR.

Hunters were more than twice as likely to disagree as non-hunters that the DNR provides the types of hunting experiences desired by hunters, and nearly three times as likely to disagree with the statement that the DNR cares about hunters concerns. These data suggest non-hunters believe the DNR is attending to hunters while nearly one-third of hunters believe the opposite. Communication about deer and deer management was identified by hunters as a need. Communication received the lowest satisfaction among all the various management actions. The data do not, however, necessarily point to a need for more communication; it might be that a change in the nature or the quality of the communication would achieve a higher degree of satisfaction (Jacobson 2009).

Neither hunters nor non-hunters exhibited much sympathy for farmers about damage created by deer, nor did very many stakeholders report concern over disease that could be transmitted to either humans or livestock. We expected to detect concern for disease among Michigan residents, especially in NLP, because of the prominence of bovine tuberculosis as an issue, but that was not the case. This conclusion is also supported by similar questions asked on the Michigan State of the State survey in 2008, which revealed little awareness or concern among Michigan residents about bovine tuberculosis in deer and little concern for the hunters and farmers dealing with the disease (IPPSR 2008 unpublished data). Residents of a Chronic Wasting Disease positive area in Illinois were similarly unconcerned about their own risk or the risk to livestock of contracting disease carried by wildlife (Lischka and Campbell 2009).

The negative impacts arising from the effects of deer-vehicle collisions appear to be the single greatest concern related to deer populations, irrespective of region of the state. Tolerance of problems with deer was statistically similar throughout Michigan. Although DVCs often appear to be more of an issue in the SLP, stakeholders accurately recognize DVCs as a risk throughout the state. Previous research indicates the probability of any individual driver being in a DVC is

as great in many areas of the UP as in most areas of the SLP (Sudharsan et al. 2005). These latest questionnaire data indicate one in three Michigan residents have been involved in a DVC during the time period 2006-2009. Lischka et al. (2007) revealed DVCs to be an important interaction with deer in terms of influencing tolerance for deer by non-hunters in southern Michigan. Additional research in southeast Michigan indicated that although most drivers hold themselves responsible for avoiding DVCs, they identify the DNR as the agency most responsible for managing the DVC issue (Marcoux and Riley 2010). A connection is thus likely to exist between the rate of DVCs and satisfaction with deer management.

The WAVS data indicates there is considerable homogeneity among Michigan residents with respect to values toward wildlife and various uses of wildlife. These measurements are not specific to deer, but reflect general attitudes towards nature and wildlife. Not surprisingly, hunters were more utilitarian than non-hunters, and wildlife plays a more important role for people in the UP in terms of social benefits and communication than in other parts of the state. The rural nature of the UP and a greater proportion of the total population being hunters can be expected to result in wildlife affecting UP residents more than it would in other parts of the state. As a whole, Michigan residents appear to hold slightly more positive values related to the importance of wildlife as a center of communication and more utilitarian values about uses of wildlife than a cross-section of New York residents (Butler et al. 2003).

The questionnaire data from this research suggest several potentially serious situations related to the general decline of hunters that may underpin future declines in Michigan. The first is that hunters are more apt to allow hunter access than are non-hunters. If access is needed for gaining hunting experiences, any loss of hunters in the population can be expected reduce the amount of access available to promote recruitment of new hunters.

Hunters typically express more utilitarian-oriented values toward wildlife and various human uses of wildlife than do non-hunters (Butler et al. 2003, Heberlein and Ericsson 2005). This is reflected in the Michigan data throughout the state, and in addition there is a greater proportion of the human population in the UP – hunters and non-hunters alike – that express utilitarian values than anywhere else in the state. There is a strong correlation between living in a hunting and shooting culture and continued participation in those activities (Responsive Management/National Shooting Sports Foundation 2008). Research is needed to better understand the extent to which there are thresholds in numbers of hunters needed in any given land area to influence social norms in a positive way toward hunting. Although a lasting positive influence toward wildlife and hunting exists with people who grew up in rural environments (Heberlein and Ericsson 2005), areas experiencing urban sprawl are losing hunter participation (Poudyal et al. 2008). It appears that if an erosion of the hunter population occurs in the SLP, it may hasten a continual difference in the way wildlife policies toward hunting and other uses of wildlife are viewed between areas of Michigan.

Another subtle, but important implication is that in areas such as the SLP, hunter capacity is already insufficient to control deer populations in most years (Brown et al. 2000, Riley et al. 2003). Yet, it is in places such as the SLP that deer populations are most in need of being kept within sizes that create tolerable interactions with deer among all stakeholders. Residents of

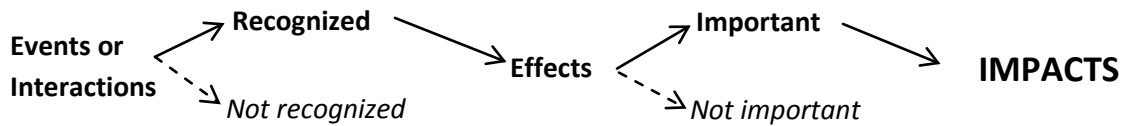
the SLP already exhibit lower tolerance for deer, and yet the SLP is the area is where most of the Michigan stakeholders in deer management reside. If hunting is to continue as a recreational activity and mechanism for control of deer populations, this dilemma creates a need to focus deer management activities: 1) at the local level to address the impacts of deer with an eye on the state-wide implications, and 2) on impacts perceived from deer, not just deer populations (Enck et al. 2006, Riley et al. 2002), especially in places such as the SLP. If stakeholders' desire for deer populations deer are mostly affected by the impacts they perceive from deer (e.g., those impacts arising from the effects of DVCs), then effectiveness of deer management may benefit by focusing on those impacts rather than only the deer population, especially if hunters are unable to limit the size of the deer population through recreational harvest.

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Figure 1. Interactions to impacts pathway.



Impacts are a subset of effects, arising from recognized events or interactions pertaining to wildlife, and evaluated by stakeholders as sufficiently important to warrant management attention (Riley et al. 2002).

Table 1. Potential impacts identified by respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) and identifying abbreviation.

Impact abbreviation	Interaction	Effect
H_connected	When I see deer around my home...	I feel connected to nature.
H_costplants	When I see deer around my home...	I worry about the cost of replacing plants eaten by deer.
H_huntquality	When I see deer around my home...	I am confident deer hunting in the area will be good.
H_dvccost	When I see deer around my home...	worry about the cost of DVC.
H_dvchassle	When I see deer around my home...	worry about the hassle of dealing with DVC.
H_dvcinjury	When I see deer around my home...	worry about my risk of injury from DVC.
H_disease	When I see deer around my home...	worry about my own risk of catching a disease carried by deer.
F_connected	When I see deer in a farm field...	I feel connected to nature.
F_cropdamage	When I see deer in a farm field...	worry about a farmer's lost income from crop damage.
F_diseaselivestock	When I see deer in a farm field...	worry about the risk to livestock of catching a disease carried by deer.
F_deerhealth	When I see deer in a farm field...	feel deer are healthy and well fed.
F_huntquality	When I see deer in a farm field...	I am confident deer hunting in the area will be good.
F_dvccost	When I see deer in a farm field...	worry about the cost of DVC.
F_dvchassle	When I see deer in a farm field...	worry about the hassle of dealing with DVC.
F_dvcinjury	When I see deer in a farm field...	worry about my risk of injury from DVC.
F_farmerkill	When I see deer in a farm field...	worry that farmers may kill too many deer to protect crops.
R_connected	When I see live deer along a roadway...	I feel connected to nature.
R_dvccost	When I see live deer along a roadway...	worry about the cost of DVC.

R_dvchassle	When I see live deer along a roadway...	worry about the hassle of dealing with DVC.
R_dvcinjury	When I see live deer along a roadway...	worry about my risk of injury from DVC.
R_deerddie	When I see live deer along a roadway...	worry that a deer may be killed.
FO_connected	When I see deer in a forest or natural area...	I feel connected to nature.
FO_overbrowse	When I see deer in a forest or natural area...	worry that deer may damage or destroy natural plant communities by eating too much vegetation.
FO_disease	When I see deer in a forest or natural area...	worry about my own risk of catching a disease carried by deer.
FO_deerhealth	When I see deer in a forest or natural area...	feel deer are healthy and well fed.
FO_starve	When I see deer in a forest or natural area...	worry that deer will starve to death over winter.
FO_predators	When I see deer in a forest or natural area...	worry that predators will kill too many deer in the area.
FO_huntquality	When I see deer in a forest or natural area...	I am confident deer hunting in the area will be good.
FO_dvccost	When I see deer in a forest or natural area...	worry about the cost of DVC.
FO_dvchassle	When I see deer in a forest or natural area...	worry about the hassle of dealing with DVC.
FO_dvcinjury	When I see deer in a forest or natural area...	worry about my risk of injury from DVC.
HU_strayshot	When I see hunters during deer hunting season...	worry about being hurt by stray gunshots.
HU_largepop	When I see hunters during deer hunting season...	confident the deer population is large enough to hunt.
HU_deerddie	When I see hunters during deer hunting season...	worry that a deer may be killed.
HU_trespass	When I see hunters during deer hunting season...	worry that someone may trespass on my land.
HU_otherhunter	When I see hunters during deer hunting season...	think that other hunters may affect the quality of deer hunting in the area.

Table 2. Region of residence and most important deer-related interactions, for respondents who reported a difference in the "Living with White-tailed deer in Michigan" survey, April – July 2009 ($n=393$).

Region of Residence	Region of Importance	n	%
UP	SLP	3	1%
UP	NLP	14	4%
NLP	SLP	25	6%
NLP	UP	35	9%
SLP	UP	65	17%
SLP	NLP	251	64%

Table 3. Gender of respondents to the “Living with White-tailed Deer in Michigan” survey (April –July 2009) by a) region of Michigan and b) participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Male	949	72%	2%	1011	71%	2%	533	65%	3%
Female	369	28%	2%	408	29%	2%	286	35%	3%

b) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Male	1152	90%	2%	758	45%	2%
Female	135	10%	2%	919	55%	2%

Table 4. Educational attainment of respondents to the “Living with White-tailed Deer in Michigan” survey (April –July 2009) by a) region of Michigan and b) participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Less than high school	45	3%	10%	71	5%	10%	22	3%	12%
High school or GED	358	27%	10%	376	27%	10%	170	21%	12%
Vocational or technical school	124	9%	10%	89	6%	10%	64	8%	12%
Some college	264	20%	10%	339	24%	10%	196	24%	12%
Associate’s Degree	139	11%	10%	138	10%	10%	90	11%	12%
Bachelor’s Degree	238	18%	10%	212	15%	10%	168	20%	12%
Graduate or Professional Degree	148	11%	10%	188	13%	10%	113	14%	12%

By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Less than high school	59	5%	10%	68	4%	9%
High school or GED	369	29%	10%	364	22%	9%
Vocational or technical school	131	10%	10%	87	5%	9%
Some college	306	24%	10%	339	20%	9%
Associate's Degree	128	10%	10%	167	10%	9%
Bachelor's Degree	182	14%	10%	344	21%	9%
Graduate or Professional Degree	106	8%	10%	309	18%	9%

Table 5. Current residence of respondents to the "Living with White-tailed Deer in Michigan" survey (April –July 2009) by a) region of Michigan and b) participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Rural area, on a farm	101	8%	10%	160	12%	10%	86	11%	16%
Rural area, not on a farm	487	38%	10%	534	42%	10%	226	28%	16%
Rural subdivision	105	8%	10%	181	14%	10%	93	11%	16%
In a village (<5,000 people)	179	14%	10%	128	10%	10%	40	5%	16%
In a suburban area	82	6%	10%	122	10%	10%	101	12%	16%
In a small town (between 5,000 and 25,000 people)	297	23%	10%	151	12%	10%	89	11%	16%
In an urban area (between 25,000 and 100,000 people)	32	2%	10%	69	5%	10%	96	12%	16%
In a metropolitan area (>100,000 people)	13	1%	10%	36	3%	10%	79	10%	16%

By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Rural area, on a farm	170	14%	11%	88	5%	10%
Rural area, not on a farm	502	40%	11%	477	29%	10%
Rural subdivision	128	10%	11%	194	12%	10%
In a village (<5,000 people)	126	10%	11%	146	9%	10%
In a suburban area	88	7%	11%	190	12%	10%
In a small town (between 5,000 and 25,000 people)	144	11%	11%	296	18%	10%
In an urban area (between 25,000 and 100,000 people)	64	5%	11%	139	8%	10%
In a metropolitan area (>100,000 people)	33	3%	11%	109	7%	10%

Table 6. Childhood residence of respondents to the “Living with White-tailed Deer in Michigan” survey (April –July 2009) by a) region of Michigan and b) participation in hunting.

b) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Rural area, on a farm	211	16%	12%	285	21%	13%	152	19%	18%
Rural area, not on a farm	280	21%	12%	295	21%	13%	146	18%	18%
Rural subdivision	47	4%	12%	63	5%	13%	37	5%	18%
In a village (<5,000 people)	182	14%	12%	95	7%	13%	47	6%	18%
In a suburban area	81	6%	12%	125	9%	13%	67	8%	18%
In a small town (between 5,000 and 25,000 people)	326	25%	12%	203	15%	13%	119	15%	18%
In an urban area (between 25,000 and 100,000 people)	87	7%	12%	140	10%	13%	110	14%	18%
In a metropolitan area (>100,000 people)	93	7%	12%	182	13%	13%	133	16%	18%

c) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Rural area, on a farm	276	22%	13%	241	15%	12%
Rural area, not on a farm	324	26%	13%	246	15%	12%
Rural subdivision	56	4%	13%	62	4%	12%
In a village (<5,000 people)	130	10%	13%	126	8%	12%
In a suburban area	74	6%	13%	153	9%	12%
In a small town (between 5,000 and 25,000 people)	200	16%	13%	325	20%	12%
In an urban area (between 25,000 and 100,000 people)	101	8%	13%	226	14%	12%
In a metropolitan area (>100,000 people)	104	8%	13%	281	17%	12%

Table 7. Mean age, years of residence in Michigan and years of residence at current address for respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) a) by region of Michigan and b) by participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI
Age	1316	55.9	0.82	1406	56.0	.80	809	52.8	1.01
Years in MI	1316	47.7	1.05	1416	50.5	0.92	819	46.6	1.22
Years at current residence	1315	18.8	0.84	1417	17.2	0.74	824	15.9	1.00

b) By participation in hunting

	Hunters			Non-hunters		
	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI
Age	1285	51.9	0.81	1656	57.9	0.74
Years in MI	1286	47.6	0.90	1673	48.0	0.98
Years at current residence	1284	17.4	0.77	1676	16.8	0.71

Table 8. Mean score on factor analysis of WAV scale from “Living with White-tailed deer in Michigan” survey (April – July 2009) a) by region of Michigan and b) by participation in hunting. Scores are the mean value of the response items that contributed to individual factors. Values were measured on a scale from 1 to 5, where 1 = strongly disagree and 5 = strongly agree, with a midpoint of 3= neither agree, nor disagree.

a) By region of Michigan

	UP			NLP			SLP		
	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI
Social and Communication Benefits	1325	4.28	0.029	1426	4.30	0.027	828	4.22	0.039
Traditional Concerns	1324	3.91	0.039	1424	3.86	0.039	827	3.61	0.059
Problem Tolerance	1315	3.74	0.043	1412	3.78	0.039	820	3.72	0.053

b) By participation in hunting

	Hunters			Non-hunters		
	n	\bar{x}	± 95% CI	n	\bar{x}	± 95% CI
Social and Communication Benefits	1287	4.39	0.027	1682	4.11	0.029
Traditional Concerns	1287	4.26	0.027	1676	3.26	0.036
Problem Tolerance	1276	3.79	0.041	1661	3.67	0.037

Table 9. Percent of respondents who allow others to hunt on the land they own or manage a) by region of Michigan and b) by participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Allow hunters	483	54%	4%	401	43%	4%	153	34%	5%
Do not allow hunters	406	46%	4%	522	57%	4%	293	66%	5%

b) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Allow hunters	540	63%	5%	181	20%	4%
Do not allow hunters	320	37%	5%	740	80%	4%

Table 10. Relationship of hunters allowed to respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) a) by region of Michigan and b) by participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Myself and my family	158	31%	9%	142	31%	8%	57	34%	11%
Friends and family who ask permission	288	56%	9%	278	62%	8%	103	61%	11%
Lessees	5	1%	9%	3	1%	8%	5	3%	11%
Anyone who asks permission	35	7%	9%	20	4%	8%	4	2%	11%
Open public access	27	5%	9%	9	2%	8%	1	1%	11%

b) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Myself and my family	202	34%	7%	67	31%	13%
Friends and family who ask permission	339	57%	7%	125	57%	13%
Lessees	7	1%	7%	2	1%	13%
Anyone who asks permission	28	5%	7%	14	6%	13%
Open public access	16	3%	7%	10	5%	13%

Table 11. Percent of respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) who identified impacts by a) region of Michigan and b) participation in hunting.

By region of Michigan	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
H_connected	1198	61%	3%	1297	62%	3%	695	61%	2%
H_costplants	1138	8%	2%	1225	9%	2%	650	10%	2%
H_huntquality	965	52%	3%	1022	55%	3%	497	56%	4%
H_dvccost	1192	25%	3%	1313	27%	2%	737	34%	3%
H_dvchassle	1190	22%	2%	1309	25%	2%	734	33%	3%
H_dvcinjury	1198	27%	3%	1321	31%	3%	740	39%	4%
H_disease	1181	4%	1%	1268	3%	1%	703	7%	2%
F_connected	1213	55%	3%	1297	57%	3%	752	57%	4%
F_cropdamage	1164	12%	2%	1250	14%	2%	709	13%	3%
F_diseaselivestock	1172	7%	1%	1294	9%	2%	722	9%	2%
F_deerhealth	1222	55%	3%	1320	54%	3%	737	51%	4%
F_huntquality	1016	53%	3%	1084	54%	3%	536	56%	4%
F_dvccost	1233	27%	3%	1353	27%	2%	782	34%	3%
F_dvchassle	1230	24%	2%	1348	25%	2%	783	34%	3%
F_dvcinjury	1240	29%	3%	1360	31%	3%	787	38%	3%
F_farmerkill	1190	18%	2%	1308	22%	2%	743	13%	2%
R_connected	1242	47%	3%	1299	48%	3%	769	44%	4%
R_dvccost	1280	28%	3%	1372	29%	2%	806	36%	3%
R_dvchassle	1278	25%	2%	1366	27%	2%	803	35%	3%
R_dvcinjury	1288	31%	3%	1380	34%	3%	810	42%	3%
R_deerdie	1218	16%	2%	1324	12%	2%	775	16%	3%
FO_connected	1274	59%	3%	1358	61%	3%	799	59%	3%
FO_overbrowse	1241	3%	1%	1338	4%	1%	766	4%	1%
FO_disease	1236	4%	1%	1324	2%	1%	751	6%	2%
FO_deerhealth	1233	52%	3%	1312	51%	3%	739	50%	4%
FO_starve	1239	35%	3%	1339	28%	2%	753	16%	3%
FO_predator	1256	33%	3%	1342	13%	2%	759	8%	2%
FO_huntquality	1038	48%	3%	1089	52%	3%	541	54%	4%
FO_dvccost	1249	24%	2%	1353	24%	2%	789	29%	3%
FO_dvchassle	1248	21%	2%	1346	23%	2%	785	28%	3%
FO_dvcinjury	1257	26%	2%	1359	28%	2%	792	32%	3%
HU_strayshot	1219	14%	2%	1310	17%	2%	751	22%	3%
HU_largepop	1206	22%	2%	1306	23%	2%	731	23%	3%
HU_deerdie	1213	6%	1%	1324	5%	1%	762	9%	2%
HU_trespass	1040	25%	3%	1102	25%	3%	536	26%	4%
HU_otherhunter	1006	24%	3%	1075	23%	3%	513	23%	4%

a) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
H_connected	1187	66%	3%	1417	53%	3%
H_costplants	1109	4%	1%	1330	13%	2%
H_huntquality	1161	66%	3%	667	21%	3%
H_dvccost	1183	16%	2%	1472	41%	3%
H_dvchassle	1185	15%	2%	1465	39%	3%
H_dvcinjury	1189	20%	2%	1481	44%	3%
H_disease	1172	3%	1%	1398	7%	1%
F_connected	1181	61%	3%	1518	49%	3%
F_cropdamage	1173	11%	2%	1373	16%	2%
F_diseaselivestock	1171	6%	1%	1441	11%	2%
F_deerhealth	1223	67%	3%	1443	36%	3%
F_huntquality	1207	68%	3%	764	20%	3%
F_dvccost	1221	17%	2%	1558	41%	2%
F_dvchassle	1222	16%	2%	1554	39%	2%
F_dvcinjury	1227	21%	2%	1569	45%	3%
F_farmerkill	1207	25%	2%	1441	11%	2%
R_connected	1182	53%	3%	1547	39%	2%
R_dvccost	1242	19%	2%	1615	42%	2%
R_dvchassle	1244	18%	2%	1605	40%	2%
R_dvcinjury	1248	25%	2%	1626	47%	2%
R_deerdie	1194	9%	2%	1549	20%	2%
FO_connected	1232	66%	3%	1608	51%	3%
FO_overbrowse	1213	2%	1%	1543	5%	1%
FO_disease	1216	2%	1%	1504	6%	1%
FO_deerhealth	1210	63%	3%	1484	35%	2%
FO_starve	1209	33%	3%	1533	21%	2%
FO_predator	1225	25%	2%	1523	9%	1%
FO_huntquality	1222	65%	3%	786	19%	3%
FO_dvccost	1221	14%	2%	1579	36%	2%
FO_dvchassle	1223	14%	2%	1569	35%	2%
FO_dvcinjury	1228	18%	2%	1588	40%	2%
HU_strayshot	1209	11%	2%	1471	26%	2%
HU_largepop	1221	28%	3%	1418	14%	2%
HU_deerdie	1203	1%	1%	1502	12%	2%
HU_trespass	1069	30%	3%	1036	19%	2%
HU_otherhunter	1236	32%	3%	691	5%	2%

Table 12. Rank of impacts perceived by a) region of Michigan and b) participation in hunting. Data from the "Living with White-tailed deer in Michigan" survey (April – July 2009).

a) By region of Michigan

	Rank		
	UP	NLP	SLP
H_connected	1	1	1
FO_connected	2	2	2
F_connected	3	3	3
F_deerhealth	4	5	7
F_huntquality	5	6	4
FO_deerhealth	6	8	8
H_huntquality	7	4	5
FO_huntquality	8	7	6
R_connected	9	9	9
FO_starve	10	14	26
FO_predator	11	29	33
R_dvcinjury	12	10	10
F_dvcinjury	13	11	12
R_dvccost	14	13	13
F_dvccost	15	17	15
H_dvcinjury	16	12	11
FO_dvcinjury	17	15	19
R_dvchassle	18	16	14
H_dvccost	19	18	16
HU_trespass	20	20	22
HU_otherhunt	21	24	23
FO_dvccost	22	22	20
F_dvchassle	23	19	17
HU_largepop	24	23	24
H_dvchassle	25	21	18
FO_dvchassle	26	25	21
F_farmerkill	27	26	29
R_deerdie	28	30	27
HU_strayshot	29	27	25
F_cropldamage	30	28	28
H_costplants	31	32	30
F_diseaselivestock	32	31	31
HU_deerdie	33	33	32
H_disease	34	35	34
FO_disease	35	36	35
FO_overbrowse	36	34	36

b) By participation in hunting

	Rank	
	Hunters	Non-hunters
F_huntquality	1	23
F_deerhealth	2	16
H_connected	3	1
FO_connected	4	2
H_huntquality	5	21
FO_huntquality	6	24
FO_deerhealth	7	17
F_connected	8	3
R_connected	9	14
FO_starve	10	20
HU_otherhunter	11	36
HU_trespass	12	25
HU_largepop	13	27
FO_predator	14	32
F_farmerkill	15	31
R_dvcinjury	16	4
F_dvcinjury	17	5
H_dvcinjury	18	6
R_dvccost	19	7
R_dvchassle	20	10
FO_dvcinjury	21	11
F_dvccost	22	9
F_dvchassle	23	12
H_dvccost	24	8
H_dvchassle	25	13
FO_dvccost	26	15
FO_dvchassle	27	18
HU_strayshot	28	19
F_cropdamage	29	26
R_deerdie	30	22
F_diseaselivestock	31	30
H_costplants	32	28
H_disease	33	33
FO_disease	34	34
FO_overbrowse	35	35
HU_deerdie	36	29

Table 13. Perception of change in the deer population over the past 5 years, as reported by respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) by a) region of Michigan and b) participation in hunting.

b) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Increased greatly	35	3%	6%	64	5%	6%	83	13%	9%
Increased somewhat	97	9%	6%	145	12%	6%	150	23%	9%
Stayed the same	326	29%	6%	412	34%	6%	249	38%	9%
Decreased somewhat	326	29%	6%	264	22%	6%	110	17%	9%
Decreased greatly	335	30%	6%	313	26%	6%	60	9%	9%

c) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Increased greatly	37	3%	6%	118	10%	6%
Increased somewhat	135	11%	6%	224	19%	6%
Stayed the same	318	27%	6%	512	44%	6%
Decreased somewhat	338	29%	6%	180	15%	6%
Decreased greatly	356	30%	6%	143	12%	6%

Table 14. Desired change in the deer population in the next 5 years, as reported by respondents to the “Living with White-tailed deer in Michigan” survey (April – July 2009) by a) region of Michigan and b) participation in hunting.

a) By region of Michigan

	UP			NLP			SLP		
	n	%	± 95% CI	n	%	± 95% CI	n	%	± 95% CI
Increase greatly	329	26%	7%	331	25%	7%	86	11%	10%
Increase somewhat	465	37%	7%	398	30%	7%	202	27%	10%
Stay the same	352	28%	7%	439	33%	7%	294	39%	10%
Decrease somewhat	77	6%	7%	101	8%	7%	106	14%	10%
Decrease greatly	30	2%	7%	72	5%	7%	65	9%	10%

b) By participation in hunting

	Hunters			Non-hunters		
	n	%	± 95% CI	n	%	± 95% CI
Increase greatly	428	34%	6%	111	8%	7%
Increase somewhat	509	40%	6%	277	19%	7%
Stay the same	256	20%	6%	709	50%	7%
Decrease somewhat	51	4%	6%	196	14%	7%
Decrease greatly	27	2%	6%	137	10%	7%

Table 15. Perceptions of MDNR actions reported by respondents to the “Living with White-tailed Deer in Michigan” survey (April –July 2009) by a) region of Michigan and b) participation in hunting.

c) By region of Michigan

UP					
	n	% agree	% neither	% disagree	± 95% CI
DNR actions reduce the negative impacts from deer	1229	31%	41%	28%	4%
DNR could do more to manage the negative impacts from deer	1234	48%	40%	12%	4%
DNR actions increase positive impacts I feel from deer	1256	32%	36%	32%	5%
DNR cares about hunters concerns about deer	1269	49%	19%	32%	5%
DNR cares about farmers concerns about deer	1249	56%	26%	18%	4%
DNR cares about non-hunter, non-farmer concerns about deer	1284	56%	27%	17%	4%
DNR does good job communicating about deer issues	1293	32%	29%	39%	5%
DNR provides the kind of hunt experience most hunters desire	1235	32%	30%	38%	5%
I trust the DNR to make proper decisions	1296	31%	25%	43%	5%
Overall, I am very satisfied with DNR deer management	1291	31%	27%	42%	5%
NLP					
	n	% agree	% neither	% disagree	± 95% CI
DNR actions reduce the negative impacts from deer	1341	34%	39%	27%	4%
DNR could do more to manage the negative impacts from deer	1337	44%	42%	13%	4%
DNR actions increase positive impacts I feel from deer	1350	35%	37%	28%	4%
DNR cares about hunters concerns about deer	1374	51%	21%	28%	5%
DNR cares about farmers concerns about deer	1367	60%	24%	16%	4%
DNR cares about non-hunter, non-farmer concerns about deer	1384	55%	29%	16%	4%
DNR does good job communicating about deer issues	1398	34%	28%	38%	5%
DNR provides the kind of hunt experience most hunters desire	1344	33%	32%	35%	5%
I trust the DNR to make proper decisions	1395	36%	25%	40%	5%
Overall, I am very satisfied with DNR deer management	1391	32%	29%	39%	5%

SLP					
	n	% agree	% neither	% disagree	± 95% CI
DNR actions reduce the negative impacts from deer	783	42%	43%	14%	5%
DNR could do more to manage the negative impacts from deer	776	41%	50%	9%	5%
DNR actions increase positive impacts I feel from deer	790	43%	44%	14%	5%
DNR cares about hunters concerns about deer	791	63%	24%	14%	5%
DNR cares about farmers concerns about deer	794	63%	25%	12%	5%
DNR cares about non-hunter, non-farmer concerns about deer	807	63%	25%	12%	5%
DNR does good job communicating about deer issues	812	38%	34%	28%	5%
DNR provides the kind of hunt experience most hunters desire	732	43%	39%	18%	5%
I trust the DNR to make proper decisions	812	48%	30%	23%	5%
Overall, I am very satisfied with DNR deer management	803	41%	37%	21%	5%

b) By participation in hunting

Hunters					
	n	% agree	% neither	% disagree	± 95% CI
DNR actions reduce the negative impacts from deer	1236	33%	37%	30%	5%
DNR could do more to manage the negative impacts from deer	1237	53%	36%	11%	4%
DNR actions increase positive impacts I feel from deer	1245	33%	32%	34%	5%
DNR cares about hunters concerns about deer	1263	49%	17%	34%	5%
DNR cares about farmers concerns about deer	1242	60%	23%	17%	4%
DNR cares about non-hunter, non-farmer concerns about deer	1261	60%	26%	14%	4%
DNR does good job communicating about deer issues	1274	32%	25%	43%	5%
DNR provides the kind of hunt experience most hunters desire	1274	32%	25%	42%	5%
I trust the DNR to make proper decisions	1270	29%	23%	47%	5%
Overall, I am very satisfied with DNR deer management	1275	29%	24%	47%	5%

Non-hunters					
	n	% agree	% neither	% disagree	± 95% CI
DNR actions reduce the negative impacts from deer	1521	39%	47%	14%	3%
DNR could do more to manage the negative impacts from deer	1506	35%	54%	12%	3%
DNR actions increase positive impacts I feel from deer	1535	40%	47%	12%	3%
DNR cares about hunters concerns about deer	1551	63%	25%	13%	4%
DNR cares about farmers concerns about deer	1571	62%	26%	12%	4%
DNR cares about non-hunter, non-farmer concerns about deer	1604	57%	29%	14%	4%
DNR does good job communicating about deer issues	1612	40%	36%	24%	4%
DNR provides the kind of hunt experience most hunters desire	1407	42%	43%	15%	4%
I trust the DNR to make proper decisions	1614	50%	30%	20%	4%
Overall, I am very satisfied with DNR deer management	1596	42%	39%	19%	4%

Appendix I

Letters and post card reminders sent with questionnaire

517-353-9456 Office
rileysh2@msu.edu E-mail

DATE

RECIPIENT NAME
RECIPIENT ADDRESS
RECIPIENT ADDRESS

I am writing to ask for your help in a study of about white-tailed deer in Michigan. This study, conducted in cooperation with the Michigan Department of Natural Resources, is an effort to learn more about people's views regarding the white-tailed deer in Michigan. Results from the survey will be used along with data about deer populations and other public input to help guide future decisions about management of the white-tailed deer resources.

We are contacting a random sample of residents to ask their opinions of and experiences with white-tailed deer. **Your answers are completely confidential.** The survey has identifying information so that we may check your name off our mailing list when your survey is returned. **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.** Although your response to this survey and any of the questions is completely voluntary, you can help us by taking a few minutes to share your views about white-tailed deer. By completing and returning this survey, you indicate your voluntary agreement to participate in this study. We look forward to hearing from you soon.

If you have any questions or comments about this study, we would be happy to talk with you. Feel free to call Debra Ruz, Project Manager, at **1-517-353-1766**, e-mail her at ruszdebr@msu.edu, or write to her at the address on the back of the survey. If you have questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact – anonymously, if you wish – Judy McMillan, Director of the University Human Research Protection Program by phone: (517) 432-4502, fax: (517) 353-2976, email: irb@msu.edu, or regular mail: 202 Old Hall, East Lansing, MI 48824.

Thank you very much for helping with this important study. The information you provide will make a difference.

Sincerely yours,

Shawn J. Riley, Associate Professor
Wildlife Ecology and Management

Postcard Reminder

Recently you were mailed a questionnaire seeking your views on deer and deer management in Michigan.

Please accept our sincere thanks if you already have returned the questionnaire. If you have not returned the questionnaire, please do so as soon as possible. It is vital we receive your views, which will help wildlife managers better serve the public's interests and needs associated with Michigan's deer populations.

If by chance you did not receive the questionnaire or it got misplaced, please call Debra Ruzs, Project Manager, at **1-517-353-1766**, e-mail her at ruszdebr@msu.edu, or write to her at the address on the front of this card, and another questionnaire will be mailed to you.

Thank you!

Dr. Shawn J. Riley, Associate Professor
Michigan State University

Appendix II

“Living with White-tailed Deer in Michigan” questionnaire with summary response.

Living with White-tailed Deer in Michigan:

A survey of your opinions *Results Summary – Public sample*



This questionnaire is part of a study to help wildlife professionals make better decisions about the management of white-tailed deer in Michigan. You have been selected to participate as a part of a random sample of Michigan residents. Your views are important and give a better understanding of how people feel about white-tailed deer. Please keep in mind that we are interested in everyone's responses, not just deer hunters!

To make sure that your opinions are included in this study, please complete this questionnaire as soon as you can and return it in the postage-paid envelope provided. It should take about 20 minutes to complete.

We realize that many Michiganders visit other parts of the state regularly. However, when answering questions in this survey, **please refer to your experiences in the region of Michigan where your interactions with deer are most important to you**. You might interact with deer where you live or farm, where you travel most often, where you hunt or where you vacation in Michigan. Your interactions with deer might include: viewing deer, seeing deer on the roadways, feeding deer, hunting deer, dealing with deer damage to crops or ornamental plants, and others. The final question provides you with an opportunity to share any additional comments you may have about white-tailed deer and their management in Michigan.

**Your responses will remain confidential
and will never be associated with your name.**

If you have any questions regarding this survey, please contact Debra Ruzs, Project Manager. You may write to her at the address on the return envelope, e-mail her at ruszdebr@msu.edu, or call her at (517) 353-1766.

THANK YOU FOR YOUR ASSISTANCE!

If you choose not to complete the questionnaire, please return it in the postage paid envelope provided, with a note on Question 27 at the end.

Wildlife and You. In its efforts to improve management of deer in Michigan, the Michigan Department of Natural Resources (DNR) wants to learn about the ways deer are important in the lives of Michiganders. In this section, please tell us a little about ways you interact with wildlife, deer and land in Michigan.

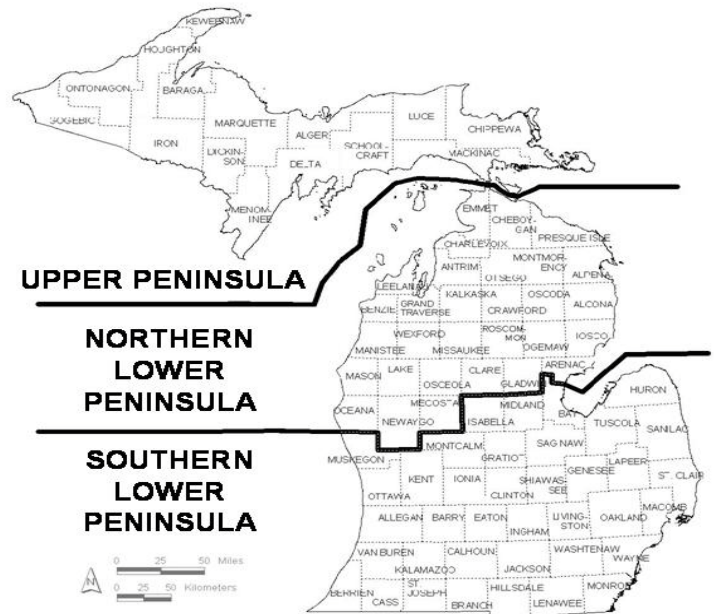
1. The following are some ways that Michiganders interact with deer and other wildlife. Have you participated in these activities in the past 3 years? (Please check one for each item.)

	<i>n</i>	Yes	No		<i>n</i>	Yes	No
a. Read about deer or other wildlife	2459	77.1%	22.9%	f. Fed deer specifically	2400	29.8%	70.2%
b. Photographed deer or other wildlife	2419	59.2%	40.8%	g. Fed other wildlife	2411	66.9%	33.1%
c. Closely observed or tried to identify birds or other wildlife	2433	74.3%	25.7%	h. Hunted deer	2413	34.3%	65.7%
d. Grew food or flowers in a garden	2466	80.9%	19.1%	i. Hunted other wildlife	2395	28.6%	71.4%
e. Worked on a farm	2383	16.8%	83.2%	j. Had an auto accident as a result of deer	2409	29.1%	70.9%

2. In which region of Michigan are interactions with deer **most important to you**? Interactions with deer might include: viewing deer, seeing deer on the road, feeding deer, hunting deer, dealing with deer damage to crops. Refer to Figure 1 at the right to determine the region of Michigan. (Please check only one.)

n=2446

- 34.4% Upper Peninsula
- 36.7% Northern Lower Peninsula
- 23.2% Southern Lower Peninsula
- 4.2% I am not sure.



3. Do you own or make decisions about how to use land in Michigan? (Please check one.)

n=2421

60.3% Yes 36.6% No

(If no, please skip to question 8.)

4. How many acres of land do you own or decide how to use in each region of Michigan? Refer to Figure 1 to determine the region. If less than 1 acre, enter acreage as a fraction. (Please indicate.)

Ave. 22.3 (Range: 0-2,700) acres in UP *n*=1531

Ave 31.2 (Range: 0-11,000) acres in NLP *n*=1536

Ave. 7.2 (Range: 0-4,000) acres in the SLP *n*=1536

Figure 1. Regions of Michigan

5. In which of the following ways do you use land you own or make decisions about in Michigan? If you own or make decisions about more than one parcel of land, respond in reference to the land on which your interactions with deer are **most important to you**. (*Please check all that apply.*) **n=3424**

38.8% As a place for me/my family to live/vacation	16.5% As an area to hunt or participate in other wildlife-related recreation
3.2% Farming or ranching to provide income	15.7% To provide habitat for wildlife generally
3.8% Farming or ranching primarily for recreation	6.9% To provide habitat for deer specifically
4.5% Timber production	2.1% Other (<i>Please indicate.</i> _____)
8.4% As an investment	

6. Do you allow people, other than yourself, to access the land you own or make decisions about in Michigan to hunt deer? (*Please check one.*) **n=1542**

34.4% Yes **62.1%** No (*If no, please skip to question 8.*)

7. If you do allow others access for deer hunting, which of the following best describes those people? (*Please check one.*) **n=617**

29.3% Only myself and my immediate family
57.9% Only friends and family who ask permission to access my land
1.1% Lessees who pay me for access to my land
6.0% Anyone who asks permission to access my land
3.6% Anyone; I allow open access to my land, regardless of permission.

8. Do you hunt deer in Michigan? (*Please check one.*) **n=2513**

33.9% Yes **65.1%** No (*If no, please skip to question 11.*)

9. If you do hunt deer in Michigan, in which regions of Michigan do you hunt? Refer to Figure 1 to determine the region of Michigan. (*Please check all that apply.*) **n=1043**

42.3% Upper Peninsula
40.1% Northern Lower Peninsula
16.4% Southern Lower Peninsula
0.01% I am not sure.

10. If you do hunt deer in Michigan, on which of the following types of land do you **most often** hunt? (*Please check one.*) **n=862**

33.2% Private land, which I own
28.5% Private land, which I do not own, but on which I hunt for free
2.4% Private land, which I pay to access (leased, membership, outfitter controlled, etc.)
2.7% Private lands owned by a coporation or land trust
19.4% Public land owned by the state or federal government
2.0% I am not sure.

11. People relate to wildlife in many ways; some of these relationships are listed below. Please indicate how strongly you agree or disagree with the following statements by checking one box for each item.

	<i>n</i>	Strongly agree	Agree	Neither agree, nor disagree	Disagree	Strongly disagree	Does not apply
a. I tolerate most wildlife nuisance problems.	2501	18.4%	55.1%	13.6%	7.7%	3.0%	2.2%
b. It is important to me to hunt game animals for recreation.	2497	19.6%	14.9%	14.3%	11.5%	20.4%	19.3%
c. It is important to me to observe or photograph wildlife.	2457	28.8%	40.7%	18.1%	4.6%	2.0%	5.8%
d. I appreciate the role wildlife plays in the environment.	2486	51.8%	41.6%	4.4%	0.6%	0.6%	0.9%
e. I express opinions about wildlife and their management to wildlife managers or public officials.	2487	7.6%	18.7%	34.4%	16.6%	5.7%	17.0%
f. It is important to me to know wildlife exist in Michigan.	2510	56.7%	36.1%	5.3%	0.7%	0.4%	0.8%
g. It is important to me that wildlife are included in educational materials to learn about nature.	2526	52.6%	41.0%	5.0%	0.5%	0.4%	0.6%
h. It is important to me to understand the behavior of wildlife.	2510	36.1%	45.0%	15.1%	1.8%	0.6%	1.4%
i. It is important to me to hunt game animals for food.	2510	17.8%	18.1%	17.8%	12.0%	17.0%	17.3%
j. I tolerate personal safety hazards associated with some wildlife.	2499	13.8%	50.2%	19.0%	9.3%	3.6%	4.1%
k. It is important to me to talk about wildlife with family and friends.	2522	25.5%	41.4%	24.1%	3.6%	1.9%	3.5%
l. Local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation.	2514	34.6%	48.2%	13.5%	0.8%	0.4%	2.4%
m. It is important to me to see wildlife in books and movies.	2482	30.2%	47.3%	18.4%	2.1%	0.9%	1.2%
n. It is important to me that game animals are managed for legal harvest without risking the future of populations.	2522	24.0%	36.0%	28.0%	4.0%	4.0%	4.0%

Experiences with Deer. Michiganders interact with deer intentionally and unintentionally. Please answer the following questions to help us learn how often and in what ways you prefer to interact with deer in Michigan.

12. In the tables below, please think of your experiences **in the region of Michigan where your interactions with deer are most important to you**, and check one answer per line to indicate whether you personally experience each of the listed impacts.

<i>Seeing deer on my property makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
a. feel connected to nature.	2520	80.5%	7.5%	12.0%
b. worry about the cost of replacing plants and trees eaten by deer.	2497	23.5%	62.8%	13.7%
c. confident that deer hunting in the area will be good.	2439	46.9%	27.1%	26.0%
d. worry about hitting a deer with a vehicle.	2485	57.6%	34.9%	7.5%
e. worry about my own risk of catching diseases carried by deer.	2482	12.1%	79.3%	8.6%
<i>Seeing deer in a farmer's field makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
f. feel connected to nature.	2497	76.7%	16.2%	7.1%
g. worry about the farmer's lost income from deer eating crops.	2501	35.3%	57.3%	7.4%
h. worry about the risk to livestock of catching diseases carried by deer.	2478	24.1%	70.0%	5.9%
i. feel deer in the area are healthy and well fed.	2500	73.2%	18.8%	8.0%
j. confident that deer hunting in the area will be good.	2486	57.0%	24.9%	18.1%
k. worry about hitting a deer with a vehicle.	2504	60.9%	35.0%	4.0%
l. worry that farmers may kill too many deer to protect crops.	2492	28.9%	63.5%	7.5%
<i>Seeing live deer near the road makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
m. feel connected to nature.	2493	58.9%	36.1%	5.0%
n. worry about hitting a deer with a vehicle.	2529	82.0%	17.0%	1.0%
o. worry that a deer may be killed.	2490	58.6%	39.0%	2.4%
<i>Seeing deer in a forest or natural area makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
p. feel connected to nature.	2512	90.2%	7.2%	2.6%
q. worry that deer may damage or destroy natural plant communities by eating too much vegetation	2512	10.1%	87.1%	2.9%
r. worry about my own risk of catching diseases carried by deer.	2509	8.4%	88.9%	2.7%
s. feel deer in the area are healthy and well fed.	2495	73.9%	20.0%	6.2%
t. worry that deer will starve to death during the winter.	2498	36.9%	60.0%	3.1%
u. worry that predators will kill too many deer in the area.	2500	24.9%	71.2%	3.9%
v. confident that deer hunting in the area will be good.	2488	55.4%	28.1%	16.5%
w. worry about hitting a deer with a vehicle.	2493	52.0%	45.2%	2.7%
<i>Seeing hunters during deer hunting season makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
x. worry about being hurt by stray gun shots.	2509	34.2%	61.1%	4.7%
y. confident that the deer population is large enough to hunt.	2513	63.5%	29.0%	7.5%
z. worry that a deer may be killed.	2490	14.5%	80.6%	4.9%
aa. worry that someone may trespass on my land.	2500	24.4%	59.6%	16.0%
bb. think that other hunters may affect the quality of deer hunting in the area.	2498	30.3%	56.1%	13.6%

13. How important to you personally are each of the following kinds of impacts you might feel because of your deer-related experiences in the region of Michigan where your interactions with deer are most important to you? (Please check one for each item.)

<i>How important to you is...</i>	<i>n</i>	Very important	Somewhat important	Not at all important	Does not apply
a. feeling connected to nature?	2529	55.0%	37.3%	6.2%	1.4%
b. worrying about the cost of replacing plants and trees eaten by deer?	2505	9.9%	33.4%	50.6%	6.1%
c. feeling frustrated that your time and efforts have been wasted when deer eat your plants?	2528	12.5%	29.0%	42.4%	16.1%
d. the ability to hunt deer in the region you prefer?	2532	35.0%	14.4%	19.4%	31.2%
e. farmer's lost income from crops eaten by deer?	2512	13.8%	52.3%	24.5%	9.4%
f. feeling that deer in the area are healthy and well fed?	2524	47.9%	38.3%	10.2%	3.6%
g. worrying that deer will starve to death in winter?	2520	31.0%	41.2%	23.9%	3.9%
h. worrying that the deer population is large enough to hunt?	2521	28.1%	34.6%	25.8%	11.5%
i. worrying about your own risk of catching diseases carried by deer?	2519	7.2%	24.5%	61.9%	6.4%
j. worrying about the risk to livestock of catching diseases carried by deer?	2529	11.3%	34.8%	46.5%	7.5%
k. worrying about the cost of vehicle repair caused by a deer-vehicle collision?	2532	35.4%	37.6%	24.6%	2.5%
l. worrying about personal injury from a deer- vehicle collision?	2535	39.9%	38.3%	19.6%	2.2%
m. worrying about the hassle of dealing with a deer-vehicle collision?	2523	32.9%	38.8%	25.5%	2.8%
n. worrying that deer may be killed?	2521	17.0%	34.8%	44.3%	3.8%
o. worrying about being hurt by stray gun shots during deer hunting season?	2527	21.4%	29.8%	41.2%	7.6%
p. feeling that the land can support a large deer population?	2522	26.9%	48.1%	19.0%	5.9%
q. worrying that deer will disturb or destroy natural plant communities by eating vegetation?	2531	7.2%	35.8%	52.2%	4.9%
r. worrying that predators will kill too many deer?	2531	17.7%	25.7%	52.5%	4.1%
s. worrying that farmers will kill too many deer to protect crops?	2527	15.6%	30.1%	49.0%	5.4%
t. interference with your deer hunt by other hunters?	2526	15.0%	21.1%	27.0%	36.9%
u. worrying about someone trespassing on your property?	2530	19.7%	22.8%	30.2%	27.4%

14. Think about how often you interact with deer in the region of Michigan where your interactions with deer are most important to you. Please indicate how much of a change you want in your experiences with deer, for each item listed below.

<i>How much of a change would you like in...</i>	n	Increase greatly	Increase somewhat	Stay the same	Decrease somewhat	Decrease greatly	Does not apply
a. the number of deer you see around your home?	2526	9.2%	20.9%	45.9%	10.1%	5.9%	8.1%
b. the number of deer you see in farmers' fields?	2513	5.1%	15.8%	52.2%	15.2%	4.9%	6.9%
c. the number of live deer you see near roadways?	2490	2.4%	7.1%	35.8%	33.0%	19.2%	2.5%
d. the number of deer you see in forests and natural areas?	2515	17.7%	31.7%	41.3%	4.3%	1.9%	3.0%
e. the number of hunters you see during deer hunting season?	2515	2.8%	9.1%	50.5%	16.7%	8.8%	12.1%
f. the number of plants and trees eaten by deer?	2507	1.3%	4.5%	53.6%	21.9%	8.0%	10.6%
g. the amount of farmer's crops eaten by deer?	2485	0.6%	2.0%	36.1%	35.6%	13.0%	12.8%
h. your risk of catching diseases carried by deer?	2502	1.7%	2.0%	30.6%	24.2%	20.0%	21.5%
i. the risk to livestock of catching diseases carried by deer?	2501	1.7%	2.5%	27.5%	25.7%	24.0%	18.6%
j. the extent of deer eating native plants?	2505	1.3%	3.8%	51.7%	21.3%	8.9%	13.0%
k. the deer hunting opportunities in the area where you prefer to hunt?	2502	8.9%	15.8%	30.0%	3.5%	3.3%	38.5%
l. the number of deer-vehicle collisions?	2494	1.8%	2.1%	12.9%	30.1%	48.4%	4.7%
m. the number of deer killed by deer-vehicle collisions?	2497	1.5%	2.0%	21.3%	38.9%	31.9%	4.6%
n. the number of deer killed by hunters?	2506	5.6%	18.8%	51.5%	10.0%	6.5%	7.6%
o. the number of deer killed by farmers to protect crops?	2494	4.0%	9.4%	46.3%	18.6%	10.8%	10.9%
p. the number of healthy, well fed deer you see?	2500	17.7%	29.7%	41.3%	4.8%	2.4%	4.2%
q. the number of deer that starve in winter?	2400	2.0%	2.5%	23.4%	28.8%	35.2%	8.1%
r. the number of deer killed by predators?	2492	2.7%	4.7%	47.1%	17.7%	18.0%	9.8%
s. your risk of being injured by stray gun shots during deer hunting season?	2509	2.5%	1.9%	24.6%	18.8%	30.1%	22.1%
t. the interference from other hunters you feel while deer hunting in your area?	2509	1.6%	2.0%	21.8%	14.9%	11.0%	48.7%
u. the amount of hunting-related trespassing that occurs in your area?	2514	1.8%	1.8%	19.8%	19.4%	22.6%	34.7%

15. Thinking about the region of Michigan where your interactions with deer are most important to you, how has the number of deer changed over the last 5 years? (Please circle only one.)

n=2419

Increased greatly	Stayed the same	Decreased greatly	Not sure	No opinion
6.4%	11.8%	30.3%	15.9%	15.8%
16.9%	2.9%			

16. Once again, thinking about the region of Michigan where your interactions with deer are most important to you, how would you like to see the number of deer change in the next 5 years? (Please circle only one.) n=2526

Increase greatly		Stay the same		Decrease greatly		Not sure	No opinion
13.8%	23.7%	35.9%	9.9%	6.1%		6.0%	4.7%

17. How important is it to you that the change in deer populations you indicated in Question 16 happens in the region of Michigan where your interactions with deer are most important to you over the next 5 years? (Please circle only one.) n=2518

Very important		Slightly important		Not at all important		Not sure	No opinion
24.0%	23.6%	27.8%	6.6%	4.2%		6.9%	6.8%

18. Your opinions about deer management in Michigan are important to the Michigan Department of Natural Resources. Please indicate how strongly you agree or disagree with the following statements by checking the box which best reflects your beliefs for each item.

	n	Strongly agree	Agree	Neither agree, nor disagree	Disagree	Strongly disagree	Does not apply
a. I believe actions taken by the DNR reduce the negative effects I experience from deer.	2495	6.1%	27.7%	40.6%	13.4%	5.5%	6.7%
b. I believe the DNR could do more to manage the negative effects I experience from deer.	2490	10.4%	26.9%	44.1%	9.2%	2.5%	6.9%
c. I believe actions taken by the DNR increase the positive effects I desire from deer.	2485	5.1%	30.5%	39.8%	13.3%	6.3%	5.0%
d. I believe the DNR cares about hunters' concerns about deer.	2502	9.0%	44.2%	21.9%	14.0%	6.4%	4.6%
e. I believe the DNR cares about farmer's concerns about deer.	2493	9.1%	47.4%	25.4%	9.7%	4.1%	4.3%
f. I believe the DNR cares about the concerns people other than hunters or farmers have about deer.	2502	9.4%	45.6%	27.2%	10.9%	4.2%	2.7%
g. I believe the DNR does a good job of communicating with the public about deer issues.	2503	6.1%	29.2%	31.9%	21.1%	9.4%	2.2%
h. I believe the DNR does a good job of providing the type of deer hunting experience most hunters desire.	2508	5.0%	28.1%	33.5%	15.1%	7.6%	10.6%
i. I trust the DNR to make the proper decisions about deer management.	2508	7.4%	33.5%	27.0%	17.5%	12.4%	2.3%
j. Overall, I am very satisfied with current DNR deer management.	2506	5.8%	29.9%	33.0%	16.8%	11.5%	2.9%

Information about you. Please tell us about yourself. All responses will be kept confidential.

19. Are you 58.8% male or 41.2% female? (Please check one.) n=2517

20. In what year were you born? Ave. age 56.9 years (Range: 18-97) n=2492

21. How many years have you lived in Michigan? Ave. 48.9 (Range: 1-97) years n=2516

22. How many years have you lived at your current address? Ave. 17.3 (Range: 0-89) years n=2520

23. How would you describe the area where you currently live? (Please check one.) n=2509

- | | |
|--|---|
| 7.6% Rural setting, on a farm | 16.8% Within a small town
(Population between 5,000 and 25,000) |
| 32.3% Rural setting, <u>not</u> on a farm | 6.5% Within an urban area
(Population between 25,000 and 100,000) |
| 10.9% Rural subdivision | 5.1% Within a metropolitan area
(Population more than 100,000) |
| 9.0% Within a village (Population < 5,000) | |
| 10.1% Suburban area on edge of town or city | |

24. How would you describe the area where you lived during most or all of your childhood? (Please check one.) n=2519

- | | |
|---|--|
| 16.4% Rural setting, on a farm | 19.4% Within a small town
(Population between 5,000 and 25,000) |
| 17.4% Rural setting, <u>not</u> on a farm | 11.2% Within an urban area
(Population between 25,000 and 100,000) |
| 3.9% Rural subdivision | 13.5% Within a metropolitan area
(Population more than 100,000) |
| 8.0% Within a village (Population < 5,000) | |
| 9.1% Suburban area on edge of town or city | |

25. What is your highest level of education? (Please check one.) n=2519

- | | |
|---|---|
| 3.8% Less than high school diploma | 10.7% Associate's Degree (2 year) |
| 23.9% High school graduate or GED | 18.7% Bachelor's Degree (4 year) |
| 6.5% Vocational or trade school | 15.0% Graduate/Professional Degree |
| 21.4% Some college | |

27. Please use the space below to write any additional comments or observations about deer management in Michigan you would like to share.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Please return this survey in the postage-paid envelope provided.

Living with White-tailed Deer in Michigan:

A survey of your opinions Results Summary – Hunter sample



This questionnaire is part of a study to help wildlife professionals make better decisions about the management of white-tailed deer in Michigan. You have been selected to participate as a part of a random sample of Michigan residents. Your views are important and give a better understanding of how people feel about white-tailed deer. Please keep in mind that we are interested in everyone's responses, not just deer hunters!

To make sure that your opinions are included in this study, please complete this questionnaire as soon as you can and return it in the postage-paid envelope provided. It should take about 20 minutes to complete.

We realize that many Michiganders visit other parts of the state regularly. However, when answering questions in this survey, **please refer to your experiences in the region of Michigan where your interactions with deer are most important to you**. You might interact with deer where you live or farm, where you travel most often, where you hunt or where you vacation in Michigan. Your interactions with deer might include: viewing deer, seeing deer on the roadways, feeding deer, hunting deer, dealing with deer damage to crops or ornamental plants, and others. The final question provides you with an opportunity to share any additional comments you may have about white-tailed deer and their management in Michigan.

**Your responses will remain confidential
and will never be associated with your name.**

If you have any questions regarding this survey, please contact Debra Ruzs, Project Manager. You may write to her at the address on the return envelope, e-mail her at ruszdebr@msu.edu, or call her at (517) 353-1766.

THANK YOU FOR YOUR ASSISTANCE!

If you choose not to complete the questionnaire, please return it in the postage paid envelope provided, with a note on Question 27 at the end.

Wildlife and You. In its efforts to improve management of deer in Michigan, the Michigan Department of Natural Resources (DNR) wants to learn about the ways deer are important in the lives of Michiganders. In this section, please tell us a little about ways you interact with wildlife, deer and land in Michigan.

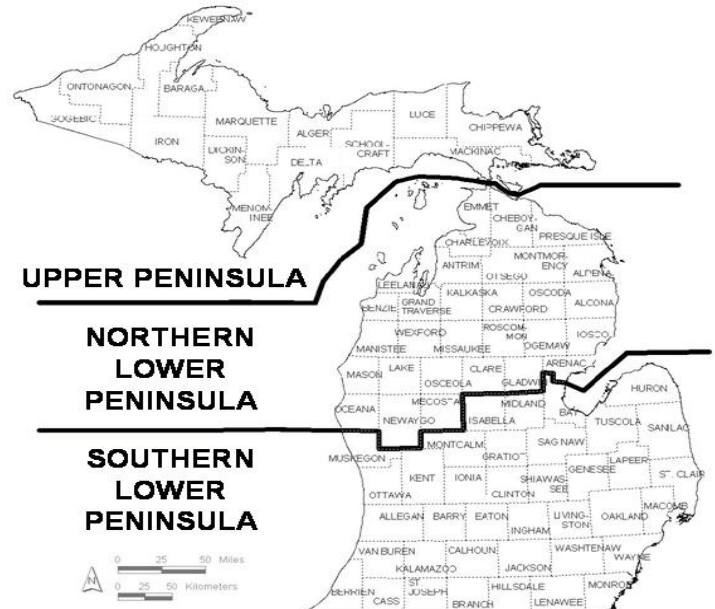
1. The following are some ways that Michiganders interact with deer and other wildlife. Have you participated in these activities in the past 3 years? (*Please check one for each item.*)

	<i>n</i>	Yes	No		<i>n</i>	Yes	No
a. Read about deer or other wildlife	1265	94.3%	5.7%	f. Fed deer specifically	1227	60.5%	39.5%
b. Photographed deer or other wildlife	1237	70.2%	29.8%	g. Fed other wildlife	1207	74.4%	25.6%
c. Closely observed or tried to identify birds or other wildlife	1229	76.7%	23.3%	h. Hunted deer	1262	98.9%	1.1%
d. Grew food or flowers in a garden	1235	83.6%	16.4%	i. Hunted other wildlife	1240	77.6%	22.4%
e. Worked on a farm	1201	29.4%	70.6%	j. Had an auto accident as a result of deer	1215	32.2%	67.8%

2. In which region of Michigan are interactions with deer **most important to you**? Interactions with deer might include: viewing deer, seeing deer on the road, feeding deer, hunting deer, dealing with deer damage to crops. Refer to Figure 1 at the right to determine the region of Michigan. (*Please check only one.*)

n=1275

36.8% Upper Peninsula
 40.4% Northern Lower Peninsula
 19.7% Southern Lower Peninsula
 0.4% I am not sure.



3. Do you own or make decisions about how to use land in Michigan? (*Please check one.*)
n=1250

71.4% Yes 26.5% No

(*If no, please skip to question 8.*)

4. How many acres of land do you own or decide how to use in each region of Michigan? Refer to Figure 1 to determine the region. If less than 1 acre, enter acreage as a fraction. (*Please indicate.*)

Ave. 99.9 (Range: 0-30,000) acres in UP *n*=920

Ave 43.2 (Range: 0-5,000) acres in NLP *n*=924

Ave. 37.6 (Range: 0-13,150) acres in the SLP *n*=924

Figure 1. Regions of Michigan

5. In which of the following ways do you use land you own or make decisions about in Michigan? If you own or make decisions about more than one parcel of land, respond in reference to the land on which your interactions with deer are **most important to you**. (Please check all that apply.) *n=2699*

24.4% As a place for me and my family to live or vacation

2.9% Farming or ranching to provide income

5.0% Farming or ranching primarily for recreation

6.1% Timber production

7.2% As an investment

25.4% As an area to hunt or participate in other wildlife-related recreation

17.3% To provide habitat for wildlife generally

10.4% To provide habitat for deer specifically

1.4% Other (Please indicate. _____)

6. Do you allow people, other than yourself, to access the land you own or make decisions about in Michigan to hunt deer? (Please check one.) *n=903*

59.8% Yes

35.4% No (If no, please skip to question 8.)

7. If you do allow others access for deer hunting, which of the following best describes those people? (Please check one.) *n=603*

33.5% Only myself and my immediate family

56.2% Only friends and family who ask permission to access my land

1.2% Lessees who pay me for access to my land

4.6% Anyone who asks permission to access my land

2.7% Anyone; I allow open access to my land, regardless of permission.

8. Do you hunt deer in Michigan? (Please check one.) *n=1285*

98.7% Yes

1.3% No (If no, please skip to question 11.)

9. If you do hunt deer in Michigan, in which regions of Michigan do you hunt? Refer to Figure 1 to determine the region of Michigan. (Please check all that apply.) *n=1575*

35.9% Upper Peninsula

39.9% Northern Lower Peninsula

24.1% Southern Lower Peninsula

0.0% I am not sure.

10. If you do hunt deer in Michigan, on which of the following types of land do you **most often** hunt? (Please check one.) *n=1264*

33.1% Private land, which I own

29.7% Private land, which I do not own, but on which I hunt for free

2.8% Private land, which I pay to access (leased, membership, outfitter controlled, etc.)

2.5% Private lands owned by a corporation or land trust

19.7% Public land owned by the state or federal government

0.3% I am not sure.

11. People relate to wildlife in many ways; some of these relationships are listed below. Please indicate how strongly you agree or disagree with the following statements by checking one box for each item.

	<i>n</i>	Strongly agree	Agree	Neither agree, nor disagree	Disagree	Strongly disagree	Does not apply
a. I tolerate most wildlife nuisance problems.	1277	16.7%	55.8%	14.5%	8.5%	2.5%	2.0%
b. It is important to me to hunt game animals for recreation.	1275	59.3%	28.4%	6.7%	2.7%	1.7%	1.1%
c. It is important to me to observe or photograph wildlife.	1265	33.8%	38.9%	19.1%	3.3%	0.9%	4.0%
d. I appreciate the role wildlife plays in the environment.	1266	60.3%	35.0%	3.6%	0.3%	0.2%	0.6%
e. I express opinions about wildlife and their management to wildlife managers or public officials.	1271	15.3%	29.6%	35.7%	9.9%	1.4%	8.0%
f. It is important to me to know wildlife exist in Michigan.	1276	68.5%	28.4%	2.4%	0.1%	0.0%	0.6%
g. It is important to me that wildlife are included in educational materials to learn about nature.	1283	59.9%	34.6%	4.4%	0.3%	0.2%	0.6%
h. It is important to me to understand the behavior of wildlife.	1284	49.3%	43.7%	6.2%	0.4%	0.1%	0.4%
i. It is important to me to hunt game animals for food.	1282	50.2%	32.9%	12.2%	3.1%	0.5%	1.2%
j. I tolerate personal safety hazards associated with some wildlife.	1272	20.8%	49.9%	18.2%	6.6%	2.5%	2.0%
k. It is important to me to talk about wildlife with family and friends.	1283	43.3%	46.1%	9.0%	0.9%	0.0%	0.6%
l. Local economies benefit from the sale of equipment, supplies, or services related to wildlife recreation.	1279	58.3%	34.2%	6.3%	0.7%	0.2%	0.3%
m. It is important to me to see wildlife in books and movies.	1269	35.1%	45.3%	17.4%	1.3%	0.2%	0.7%
n. It is important to me that game animals are managed for legal harvest without risking the future of populations.	1285	59.1%	34.4%	4.0%	1.6%	0.6%	0.3%

Experiences with Deer. Michiganders interact with deer intentionally and unintentionally. Please answer the following questions to help us learn how often and in what ways you prefer to interact with deer in Michigan.

12. In the tables below, please think of your experiences **in the region of Michigan where your interactions with deer are most important to you**, and check one answer per line to indicate whether you personally experience each of the listed impacts.

<i>Seeing deer on my property makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
a. feel connected to nature.	1273	88.8%	5.6%	5.7%
b. worry about the cost of replacing plants and trees eaten by deer.	1264	14.4%	77.2%	8.4%
c. confident that deer hunting in the area will be good.	1248	68.1%	26.0%	5.9%
d. worry about hitting a deer with a vehicle.	1258	36.2%	59.8%	4.0%
e. worry about my own risk of catching diseases carried by deer.	1254	6.6%	89.8%	3.6%

<i>Seeing deer in a farmer's field makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
f. feel connected to nature.	1263	78.1%	16.7%	5.1%
g. worry about the farmer's lost income from deer eating crops.	1263	31.4%	64.3%	4.2%
h. worry about the risk to livestock of catching diseases carried by deer.	1262	16.1%	81.0%	2.9%
i. feel deer in the area are healthy and well fed.	1275	84.5%	12.1%	3.5%
j. confident that deer hunting in the area will be good.	1267	72.7%	23.8%	3.6%
k. worry about hitting a deer with a vehicle.	1264	39.9%	58.8%	1.3%
l. worry that farmers may kill too many deer to protect crops.	1268	42.0%	55.0%	2.9%

<i>Seeing live deer near the road makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
m. feel connected to nature.	1258	64.5%	30.8%	4.8%
n. worry about hitting a deer with a vehicle.	1277	68.1%	31.2%	0.8%
o. worry that a deer may be killed.	1265	47.1%	50.9%	2.0%

<i>Seeing deer in a forest or natural area makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
p. feel connected to nature.	1271	92.3%	5.8%	1.9%
q. worry that deer may damage or destroy natural plant communities by eating too much vegetation	1268	7.2%	91.4%	1.4%
r. worry about my own risk of catching diseases carried by deer.	1267	4.6%	94.5%	0.9%
s. feel deer in the area are healthy and well fed.	1266	77.6%	18.6%	3.8%
t. worry that deer will starve to death during the winter.	1261	42.4%	56.1%	1.4%
u. worry that predators will kill too many deer in the area.	1267	36.3%	62.1%	1.6%
v. confident that deer hunting in the area will be good.	1272	70.0%	27.4%	2.7%
w. worry about hitting a deer with a vehicle.	1263	31.3%	67.3%	1.4%

<i>Seeing hunters during deer hunting season makes me...</i>	<i>n</i>	<i>Yes</i>	<i>No</i>	<i>Does not apply</i>
x. worry about being hurt by stray gun shots.	1268	19.6%	78.6%	1.8%
y. confident that the deer population is large enough to hunt.	1280	58.7%	38.4%	3.0%
z. worry that a deer may be killed.	1267	2.9%	95.3%	1.8%
aa. worry that someone may trespass on my land.	1268	33.9%	55.8%	10.3%
bb. think that other hunters may affect the quality of deer hunting in the area.	1273	55.0%	43.6%	1.4%

13. How important to you personally are each of the following kinds of impacts you might feel because of your deer-related experiences **in the region of Michigan where your interactions with deer are most important to you? (Please check one for each item.)**

<i>How important to you is...</i>	<i>n</i>	Very important	Somewhat important	Not at all important	Does not apply
a. feeling connected to nature?	1285	64.5%	31.1%	3.0%	1.4%
b. worrying about the cost of replacing plants and trees eaten by deer?	1277	4.2%	28.6%	61.9%	5.2%
c. feeling frustrated that your time and efforts have been wasted when deer eat your plants?	1286	6.4%	24.4%	56.3%	12.9%
d. the ability to hunt deer in the region you prefer?	1283	88.2%	9.9%	0.9%	1.0%
e. farmer's lost income from crops eaten by deer?	1286	12.0%	59.3%	24.7%	4.0%
f. feeling that deer in the area are healthy and well fed?	1286	73.6%	23.6%	2.4%	0.4%
g. worrying that deer will starve to death in winter?	1285	41.6%	39.8%	16.0%	2.5%
h. worrying that the deer population is large enough to hunt?	1286	61.4%	30.7%	6.4%	1.1%
i. worrying about your own risk of catching diseases carried by deer?	1283	4.4%	30.4%	61.9%	3.4%
j. worrying about the risk to livestock of catching diseases carried by deer?	1287	8.2%	38.3%	48.1%	5.4%
k. worrying about the cost of vehicle repair caused by a deer-vehicle collision?	1287	19.3%	40.8%	37.8%	2.1%
l. worrying about personal injury from a deer- vehicle collision?	1287	26.4%	39.1%	32.9%	1.6%
m. worrying about the hassle of dealing with a deer-vehicle collision?	1286	18.5%	39.4%	40.2%	1.9%
n. worrying that deer may be killed?	1276	9.3%	34.6%	53.0%	3.1%
o. worrying about being hurt by stray gun shots during deer hunting season?	1286	15.3%	33.0%	48.5%	3.2%
p. feeling that the land can support a large deer population?	1283	46.3%	44.7%	7.6%	1.4%
q. worrying that deer will disturb or destroy natural plant communities by eating vegetation?	1287	4.3%	32.6%	59.8%	3.3%
r. worrying that predators will kill too many deer?	1285	28.3%	29.6%	40.5%	1.6%
s. worrying that farmers will kill too many deer to protect crops?	1288	25.8%	35.1%	36.6%	2.5%
t. interference with your deer hunt by other hunters?	1287	41.3%	40.2%	16.7%	1.8%
u. worrying about someone trespassing on your property?	1288	31.9%	32.3%	22.1%	13.7%

14. Think about how often you interact with deer in the region of Michigan where your interactions with deer are most important to you. Please indicate how much of a change you want in your experiences with deer, for each item listed below.

<i>How much of a change would you like in...</i>	n	Increase greatly	Increase somewhat	Stay the same	Decrease somewhat	Decrease greatly	Does not apply
a. the number of deer you see around your home?	1287	22.0%	31.9%	33.8%	6.4%	3.2%	2.7%
b. the number of deer you see in farmers' fields?	1278	12.9%	27.3%	44.7%	10.4%	2.3%	2.3%
c. the number of live deer you see near roadways?	1268	6.3%	13.5%	48.3%	23.7%	7.3%	1.0%
d. the number of deer you see in forests and natural areas?	1283	35.8%	37.0%	21.8%	3.2%	1.9%	0.3%
e. the number of hunters you see during deer hunting season?	1287	4.4%	9.1%	57.3%	20.1%	6.9%	2.3%
f. the number of plants and trees eaten by deer?	1281	2.3%	6.3%	67.2%	12.6%	3.5%	8.0%
g. the amount of farmer's crops eaten by deer?	1276	0.9%	3.6%	52.0%	28.5%	7.1%	7.9%
h. your risk of catching diseases carried by deer?	1278	08.0%	1.3%	40.0%	22.5%	17.1%	18.4%
i. the risk to livestock of catching diseases carried by deer?	1282	1.1%	2.0%	36.0%	24.3%	20.0%	16.6%
j. the extent of deer eating native plants?	1280	1.2%	4.7%	62.9%	15.7%	4.8%	10.7%
k. the deer hunting opportunities in the area where you prefer to hunt?	1280	25.5%	31.3%	37.0%	2.9%	2.1%	1.3%
l. the number of deer-vehicle collisions?	1278	0.9%	2.0%	24.1%	36.9%	31.6%	4.5%
m. the number of deer killed by deer-vehicle collisions?	1275	1.3%	2.0%	21.3%	38.9%	31.9%	4.6%
n. the number of deer killed by hunters?	1277	6.1%	26.1%	53.6%	8.7%	4.2%	1.3%
o. the number of deer killed by farmers to protect crops?	1277	3.1%	6.1%	46.7%	24.7%	14.9%	4.5%
p. the number of healthy, well fed deer you see?	1280	32.0%	38.3%	24.7%	2.8%	1.4%	0.8%
q. the number of deer that starve in winter?	1233	1.3%	2.8%	25.4%	28.8%	37.6%	4.1%
r. the number of deer killed by predators?	1276	2.6%	3.3%	40.3%	22.6%	27.1%	4.2%
s. your risk of being injured by stray gun shots during deer hunting season?	1280	1.3%	1.3%	35.6%	21.1%	26.5%	14.1%
t. the interference from other hunters you feel while deer hunting in your area?	1284	2.4%	2.6%	35.2%	28.3%	22.3%	9.1%
u. the amount of hunting-related trespassing that occurs in your area?	1283	2.2%	2.3%	26.6%	28.1%	26.1	14.7%

15. Thinking about the region of Michigan where your interactions with deer are most important to you, how has the number of deer changed over the last 5 years? (Please circle only one.)

n=1237

Increased greatly	Stayed the same	Decreased greatly	Not sure	No opinion
3.0%	10.9%	25.7%	27.3%	28.8%
3.8%	0.5%			

16. Once again, thinking about the region of Michigan where your interactions with deer are most important to you, how would you like to see the number of deer change in the next 5 years? (Please circle only one.) n=1287

Increase greatly	Stay the same	Decrease greatly	Not sure	No opinion
33.3%	39.5%	19.9%	4.0%	2.1%
			0.7%	0.5%

17. How important is it to you that the change in deer populations you indicated in Question 16 happens in the region of Michigan where your interactions with deer are most important to you over the next 5 years? (Please circle only one.) n=1288

Very important	Slightly important	Not at all important	Not sure	No opinion
42.6%	31.8%	18.7%	2.6%	1.6%
			1.5%	1.2%

18. Your opinions about deer management in Michigan are important to the Michigan Department of Natural Resources. Please indicate how strongly you agree or disagree with the following statements by checking the box which best reflects your beliefs for each item.

	n	Strongly agree	Agree	Neither agree, nor disagree	Disagree	Strongly disagree	Does not apply
a. I believe actions taken by the DNR reduce the negative effects I experience from deer.	1272	7.5%	24.4%	36.1%	20.4%	8.7%	2.8%
b. I believe the DNR could do more to manage the negative effects I experience from deer.	1275	18.8%	32.4%	35.2%	8.1%	2.5%	3.0%
c. I believe actions taken by the DNR increase the positive effects I desire from deer.	1261	5.1%	27.9%	31.8%	22.4%	11.5%	1.3%
d. I believe the DNR cares about hunters' concerns about deer.	1275	7.8%	40.6%	17.3%	19.7%	13.6%	0.9%
e. I believe the DNR cares about farmer's concerns about deer.	1274	9.7%	48.3%	22.7%	11.1%	5.7%	2.5%
f. I believe the DNR cares about the concerns people other than hunters or farmers have about deer.	1279	12.2%	46.8%	25.5%	9.1%	5.0%	1.4%
g. I believe the DNR does a good job of communicating with the public about deer issues.	1279	5.0%	26.8%	24.9%	27.2%	15.7%	0.4%
h. I believe the DNR does a good job of providing the type of deer hunting experience most hunters desire.	1281	4.0%	28.2%	25.1%	25.8%	16.3%	0.5%
i. I trust the DNR to make the proper decisions about deer management.	1278	5.3%	23.6%	23.2%	25.2%	22.0%	0.6%
j. Overall, I am very satisfied with current DNR deer management.	1280	3.9%	24.6%	24.2%	25.5%	21.4%	0.4%

Information about you. Please tell us about yourself. All responses will be kept confidential.

19. Are you 89.5% male or 10.5% female? (Please check one.) n=1287

20. In what year were you born? Ave. age 51.9 years (Range: 19-90) n=1285

21. How many years have you lived in Michigan?

Ave. 47.6 (Range: 1-90) years n=1286

22. How many years have you lived at your current address?

Ave. 17.4 (Range: 0-89) years n=1284

23. How would you describe the area where you currently live? (Please check one.) n=1280

- | | | | |
|-------|---|-------|---|
| 13.3% | Rural setting, on a farm | 11.3% | Within a small town
(Population between 5,000 and 25,000) |
| 39.2% | Rural setting, <u>not</u> on a farm | 5.0% | Within an urban area
(Population between 25,000 and 100,000) |
| 10.0% | Rural subdivision | 2.6% | Within a metropolitan area
(Population more than 100,000) |
| 9.8% | Within a village (Population < 5,000) | | |
| 6.9% | Suburban area on the edge of town or city | | |

24. How would you describe the area where you lived during most or all of your childhood? (Please check one.) n=1280

- | | | | |
|-------|---|-------|---|
| 21.6% | Rural setting, on a farm | 15.6% | Within a small town
(Population between 5,000 and 25,000) |
| 25.3% | Rural setting, <u>not</u> on a farm | 7.9% | Within an urban area
(Population between 25,000 and 100,000) |
| 4.4% | Rural subdivision | 8.1% | Within a metropolitan area
(Population more than 100,000) |
| 10.2% | Within a village (Population < 5,000) | | |
| 5.8% | Suburban area on the edge of town or city | | |

25. What is your highest level of education? (Please check one.) n=1281

- | | | | |
|-------|-------------------------------|-------|------------------------------|
| 4.6% | Less than high school diploma | 10.0% | Associate's Degree (2 year) |
| 28.8% | High school graduate or GED | 14.2% | Bachelor's Degree (4 year) |
| 10.2% | Vocational or trade school | 8.3% | Graduate/Professional Degree |
| 23.9% | Some college | | |

27. Please use the space below to write any additional comments or observations about deer management in Michigan you would like to share.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!

Please return this survey in the postage-paid envelope provided.