



MINNESOTANS' ATTITUDES TOWARD WOLVES AND WOLF MANAGEMENT

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SUMMARY OF FINDINGS

The Minnesota Department of Natural Resources, in partnership with the Minnesota Cooperative Fish and Wildlife Research Unit, conducted a survey of Minnesota residents', deer hunters', and livestock producers' values, beliefs, attitudes, and behaviors toward wolves and wolf management. Findings demonstrate a diversity of perspectives regarding stakeholders' attitudes toward wolves, priorities for wolf management, preferences for future wolf populations and distribution, and support for the establishment of regulated wolf hunting and trapping seasons, among other variables measured. Residents, on average, expressed positive attitudes toward wolves, preferred to maintain current (2019) wolf populations and distribution, and opposed lethal solutions to human-wolf conflict. Residents were split in their support or opposition for establishing wolf hunting and trapping seasons. Deer hunters and livestock producers held similar positions on most variables. A majority of deer hunters and livestock producers expressed a negative attitude toward wolves, preferred to reduce current (2019) wolf populations, and supported killing wolves as a solution to conflict. Deer hunters differed from livestock producers regarding preferences for wolf distribution, with roughly 42% preferring to maintain the status quo. Majorities of both deer hunters and livestock producers supported establishing wolf hunting and trapping seasons in Minnesota.

INTRODUCTION

Gray wolf (*Canis lupus*) management is a topic of concern for diverse stakeholders given the cultural, ecological, and economic significance of the species (Kellert et al 1996; Landon et al 2019; Carlson et al 2019). In 2019, the U.S. Fish and Wildlife Service introduced a rule proposing to remove the gray wolf from the U.S. endangered species list. If adopted, individual U.S. states will assume management authority for wolves. Minnesota is the only state in the lower 48 that has maintained a continuous breeding population of wolves within its borders since European colonization, and has a history of wolf management (Mech 1995). In 2001, Minnesota adopted a wolf management plan, and this document has since served to guide state wolf policy during periods of state control. In the face of substantial uncertainty regarding federal endangered species status, and owing to the dated nature of the extant management plan, the Minnesota Department of Natural Resources (MNDNR) initiated a process to update its wolf management plan in 2019. Part of this process involved the collection of information about stakeholders' values, beliefs, attitudes, and behaviors toward wolves and wolf management. Generalizable information about controversial issues like wolf management is critical for developing fair and equitable policies that reflect the needs of diverse stakeholders (Nie 2010). Scientific survey methods are one tool used to obtain information of this nature. To that end, we

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conducted a survey of Minnesota residents, deer hunters, and livestock producers to assess attitudes toward wolves and wolf management, during the fall and winter of 2019.

OBJECTIVES

To survey Minnesota residents, deer hunters, and livestock producers to assess values, beliefs, attitudes, and behaviors toward wolves and wolf management. Specific topics assessed included individuals:

1. Experiences with wolves.
2. General attitudes and emotions associated with wolves.
3. Values for wolves.
4. Wildlife value orientations.
5. Tradeoffs between wolf, deer, and moose.
6. Preferences for wolf populations and distributions.
7. Preferences for wolf management .
8. Support for establishing regulated wolf hunting and trapping seasons, and
9. Demographics.

METHODS

Data Collection

We randomly selected livestock producers, deer hunters, and residents from independent sample frames for inclusion in the study. The Minnesota Board of Animal Health provided a list of known livestock producers, and we selected 2,000 cattle producers and 500 sheep producers for participation. We purchased a sample of Minnesota household residential addresses from the survey firm Marketing Systems Group. Households were selected using address based sampling from the U.S. Postal Service Master Delivery Sequence File (n=5,250). Stratification for the resident sample was by DNR administrative region, plus an additional strata corresponding to Hennepin and Ramsey counties, to ensure representation. For the resident sample, the individual in the household aged 18+ with the birthdate nearest receipt of the solicitation was directed to complete the questionnaire. Adult (18 and older) firearm deer hunters comprised the hunter sample frame, and we randomly selected 2,000 individuals from the DNR electronic licensing system to receive a questionnaire, from those with a valid 2018 license.

Data collection occurred through postal-mail, following the recommendations of Dillman et al. (2014). Personally addressed cover letters inviting participation, survey questionnaires, and postage-paid return envelopes were furnished to subjects at 3-week intervals. Responding parties were removed from mailing lists and a maximum of 3 solicitations were sent. After accounting for non-deliverable mail, and invalid cases (e.g., deceased), response rates were 33%, 47%, and 53% for the resident (n=1,466), deer hunter (n=895), and livestock producer (n=1,139) samples respectively.

We constructed post-stratification weights for statewide estimates for the resident sample. Weights adjusted estimates to account for study strata population, gender, age, and hunting participation, given the sampling design and response propensity. Hunting participation was calculated using Minnesota DNR electronic license records.

Selected Measures

We measured respondents' general attitude toward wolves with 4 items on a semantic differential scale. Item pairs included bad/good, negative/positive, harmful/beneficial, dangerous/harmless,

and responses were recorded in reference to each polar anchor; very (1), moderately (2), slightly (3), neither (4), slightly (5), moderately (6), and very (7). Items were averaged to create an attitude scale variable and interpreted relative to the original response scale.

We assessed respondents' perception of the importance of wolves in Minnesota with a single item; "it is important to maintain a wolf population in Minnesota." Responses were recorded on a 7pt likert-type scale where 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = neither, 5 = slightly agree, 6 = moderately agree, and 7 = strongly agree.

Respondents' preferences for future wolf populations and range were also assessed. Preference for future wolf population was measured using the question: "there were an estimated 2,655 wolves in MN in winter 2017/18. In the future, I would like to have _____ wolves in Minnesota." Response options included 1 = zero, 2 = many fewer, 3 = fewer, 4 = about the same number, 5 = more, and 6 = many more. A similar question assessed preference for geographic range; "compared to today, I would like to see wolves occupy _____ territory in MN." Response options included 1 = no, 2 = much less, 3 = about the same amount of, 4 = more, and 5 = much more.

Respondents' preferences for wolf management actions were assessed with 11 items. Actions were presented following the stem "how important do you personally think it is that the Minnesota DNR do each of the following concerning wolves in Minnesota?" Items included "protect individual wolves," "compensate livestock producers for animals lost to wolves," and "study wolf populations," among others. Responses were recorded on a scale where 1 = not at all important, 2 = slightly important, 3 = somewhat important, 4 = moderately important, and 5 = very important.

We assessed respondents values for wolves using 10 items adapted from Kellert's (1996) typology. Items were presented following the stem "people value having wolves in MN for a number of reasons, how much do you agree or disagree with the following statements? I value having wolves in Minnesota..." Individual items included "...because they have a right to exist," "...because they are an important part of the ecosystem," and "...because they are a symbol of wilderness" among others.

Finally, respondents' support for establishing regulated hunting and trapping seasons was assessed with two items following the stem "some Minnesotans want the opportunity to hunt and trap wolves, while others feel the hunting and trapping of wolves is wrong. If wolves were removed from the endangered species list and management authority moves to the state of Minnesota, how much do you support or oppose the following? a) establishing a regulated wolf hunting season, b) establishing a regulated wolf trapping season? Responses were recorded on a scale where 1 = strongly oppose, 2 = moderately oppose, 3 = slightly oppose, 4 = neither, 5 = slightly support, 6 = moderately support, 7 = strongly support.

RESULTS

Attitudes toward Wolves

Residents, on average, expressed positive attitudes toward wolves, with 69% reporting average attitudinal scale scores greater than neutral. A minority (20%) evaluated wolves negatively (scale score less than 4), or possessed a neutral attitude toward wolves (scaled score of 4). This pattern was reversed for deer hunters (52%) and livestock producers (62%), among whom a majority expressed a negative attitude toward wolves. Nearly 32% of livestock producers held a positive attitude toward wolves, while a small minority (8%) were neutral. Similarly, 39% of

deer hunters held a positive attitude toward wolves, and roughly 10% were neutral. Results are presented in Figure 1.

Importance of Wolves

When asked about the importance of maintaining a wolf population in Minnesota, both residents and deer hunters responded in the affirmative. The vast majority (87%) of residents and a clear majority of deer hunters (67%) either slightly agreed, moderately agreed, or strongly agreed with the statement “it is important to maintain a wolf population in Minnesota.” Agreement with this statement was less strong among livestock producers. Individuals in this group were split between agreement (47%) and disagreement (43%) about the importance of maintaining a wolf population in the state. A further 10% were neutral toward the position. Results are presented in Figure 2.

Wolf Population and Distribution

On average, residents preferred maintaining wolf populations (44%) and geographic distribution (56%) “about the same” compared to conditions in 2019. Around 33% and 28% of residents expressed a preference for increasing wolf populations and geographic distribution in the state respectively. Deer hunters, on average, preferred a reduction in wolf populations, with 59% expressing a desire for fewer wolves. A further 30% indicated a preference for maintaining wolf populations “about the same,” and the remainder preferring increase. A similar pattern emerged for preferences for the geographic distribution of wolves in Minnesota, with around 42% of deer hunters preferring “about the same” and 48% preferring a reduction. Nearly 73% of livestock producers expressed a preference for having fewer wolves in Minnesota in the future. Similarly, 67% preferred that wolves occupy less range than the current distribution. Results summarizing respondents’ preferences for wolf populations and distribution are presented in Figures 3 and 4 respectively.

Values for Wolves

Respondents were asked their agreement with a number of statements about the values they may assign to wolves. Livestock producers, on average, did not agree with any of the statements they were asked to evaluate. Among value items evaluated, livestock producers were roughly neutral toward the belief that wolves “have a right to exist”, “for the opportunity to hunt and trap them,” and “because they are an important part of the ecosystem.” Among the items evaluated, livestock producers expressed the strongest disagreement with the belief that they have an emotional connection to wolves. Deer hunters assigned a greater diversity of values to wolves than did livestock producers. On average, deer hunters agreed that wolves “have a right to exist,” and “are an important part of the ecosystem,” among other values. Like livestock producers, deer hunters also disagreed most strongly with a belief that they have an emotional connection to wolves. Residents, unlike deer hunters and livestock producers, agreed with the majority of the value items they evaluated, on average. The two items with the strongest agreement among these individuals were “because they have a right to exist,” and “because they are an important part of the ecosystem.” Residents expressed the strongest disagreement that wolves are valuable in Minnesota because they provide an opportunity for hunting or trapping. Results summarizing respondents’ values for wolves are presented in Figure 5.

Preferences for Wolf Management

We assessed respondents’ priorities for potential management actions for wolves with 11 items. Livestock producers placed the greatest priority on “kill wolves in areas where they are attacking domestic livestock,” “kill wolves that show aggression or threatening behavior toward people,” and “compensate livestock producers for animals lost to wolves” as actions DNR should take

with respect to wolf management. These same individuals felt that “protect individual wolves” should be the lowest priority for the agency. Deer hunters placed the highest importance on lethal management of problem wolves, rating “kill wolves that show aggression or threatening behavior toward people,” and “kill wolves in areas where they are attacking domestic livestock” as the 2 highest items. Deer hunters also placed the least importance on “protect individual wolves.” Residents’ priorities for wolf management were different from both livestock producers and deer hunters. These individuals, on average, placed the greatest importance on “educate livestock producers about best management practices to prevent conflict,” “educate people about wolves,” and “study wolf populations as actions DNR should take. Residents placed the least importance on “reduce wolf populations to address concerns about deer and moose populations.” Results summarizing respondents’ wolf management preferences are presented in Figure 6.

Wolf Hunting and Trapping

Respondents were asked to evaluate the prospects of establishing regulated wolf hunting and trapping seasons in Minnesota, in the instance that management authority is returned to the state and the species is removed from federal endangered species protection. The vast majority of both livestock producers supported establishing both regulated wolf hunting (88%) and trapping (84%) seasons. A very similar result was found among deer hunters with 88% supporting establishing a wolf hunting season, and 80% supporting establishing a wolf trapping season. Among residents, attitudes toward wolf hunting and trapping were mixed. Roughly, 41% of residents supported establishing a wolf hunting season, whereas 30% held a favorable view of establishing a wolf trapping season. A majority of residents (58%) opposed the prospect of wolf trapping, while a near majority (49%) indicated the same with respect to hunting. Results are presented in figures 7 and 8.

DISCUSSION

Results of this study inform recommendations formulated by technical and citizen advisory committees convened to support the wolf management plan revision. Salient results include residents’, deer hunters’, and livestock producers’ attitudes toward wolves, priorities for management, preferences for future wolf populations and distribution, and attitudes toward the establishment of wolf hunting and trapping seasons. A plurality of individuals in each group agree that maintaining a wolf population in Minnesota is important. However, residents diverge from deer hunters and livestock producers about how to manage that population, especially in their support for the establishment of hunting and trapping seasons. These data serve to demonstrate the diversity of perspectives held by stakeholder groups that experience wolves in very different ways. Policy makers, and citizen and technical advisory committees, should heed these results in seeking solutions to conflict that protect individuals’ interests when faced with conflict, while respecting the values of society at-large whenever possible.

ACKNOWLEDGMENTS

We thank David C. Fulton for technical assistance. This study was supported with funding from a Federal Aid in Wildlife Restoration Grant W-73-3.

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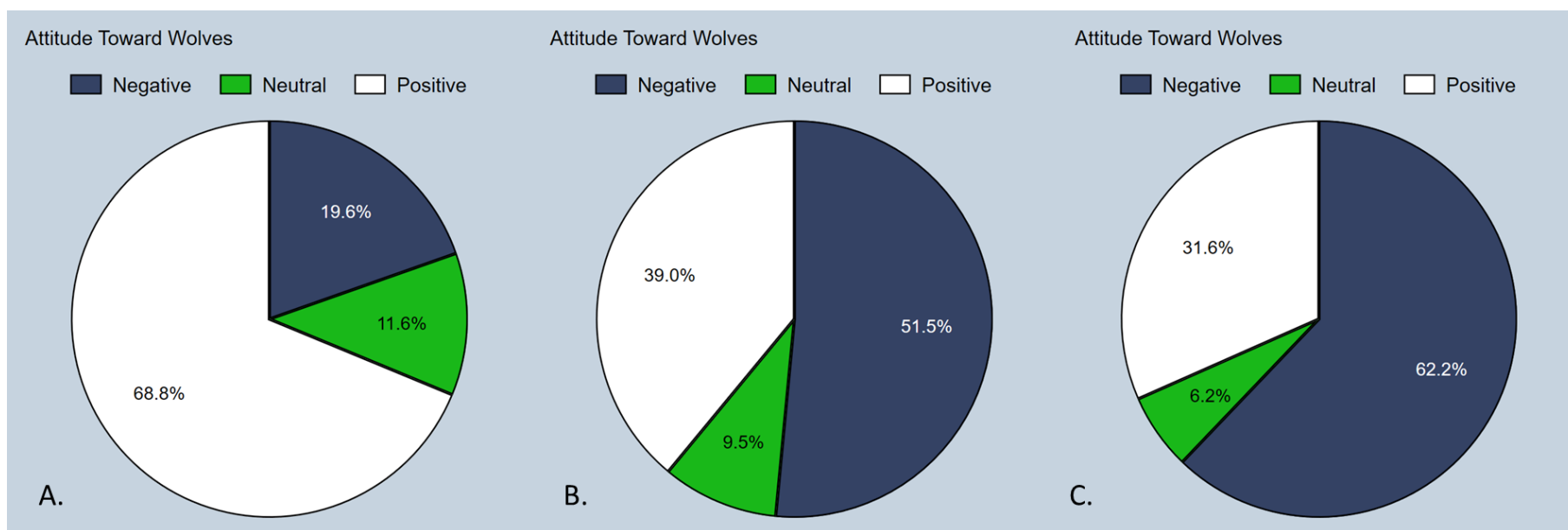


Figure 1. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' general attitude toward wolves. Percent of respondents scoring greater than 4 (positive), 4 (neutral), or less than 4 (negative), on attitude scale variable where 1 = negative anchor, 7 = positive anchor, and 4 = neutral.

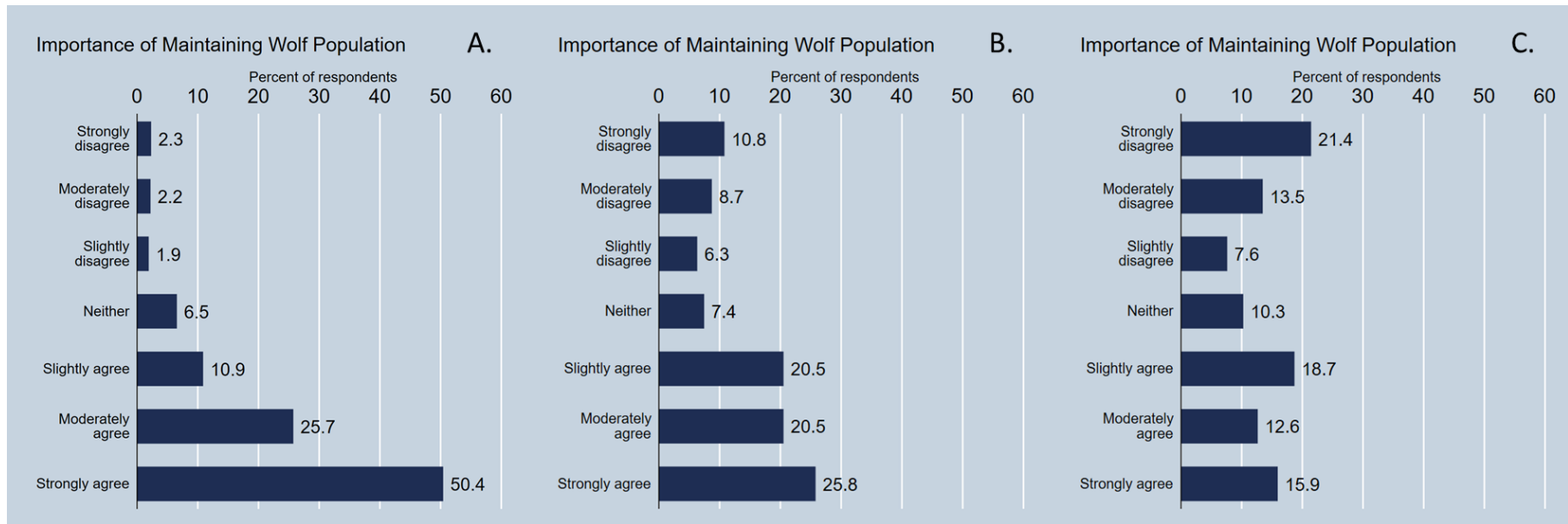


Figure 2. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' agreement with the statement "it is important to maintain a wolf population in Minnesota.

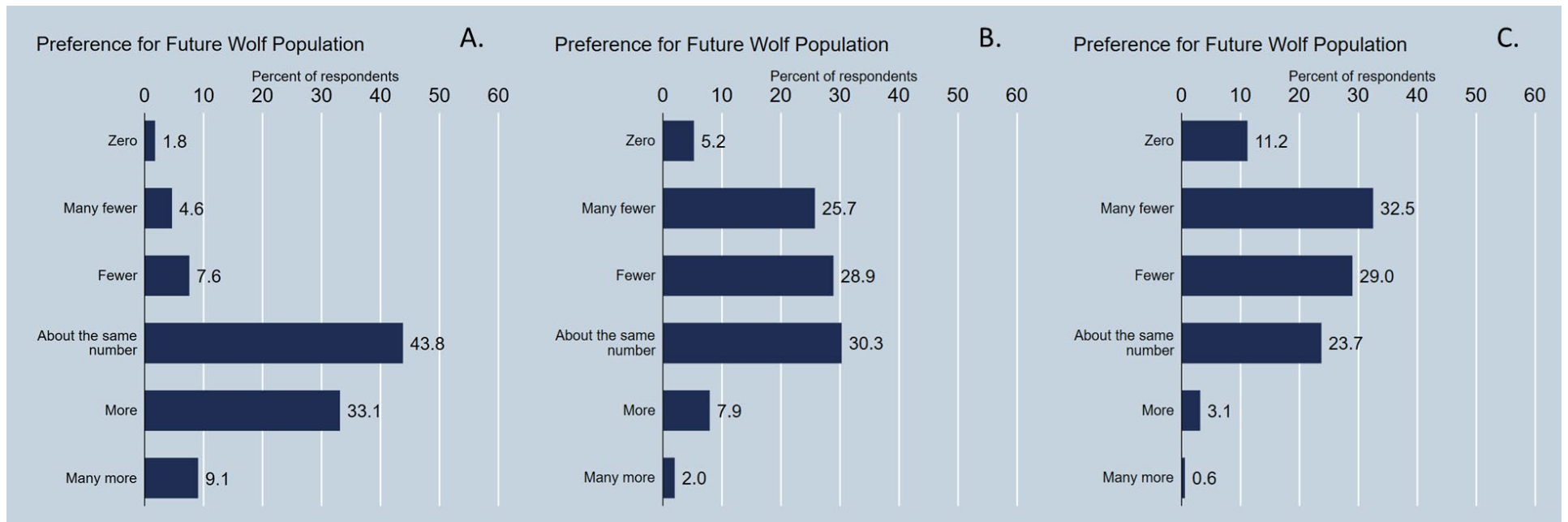


Figure 3. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' preference for future deer populations in Minnesota.

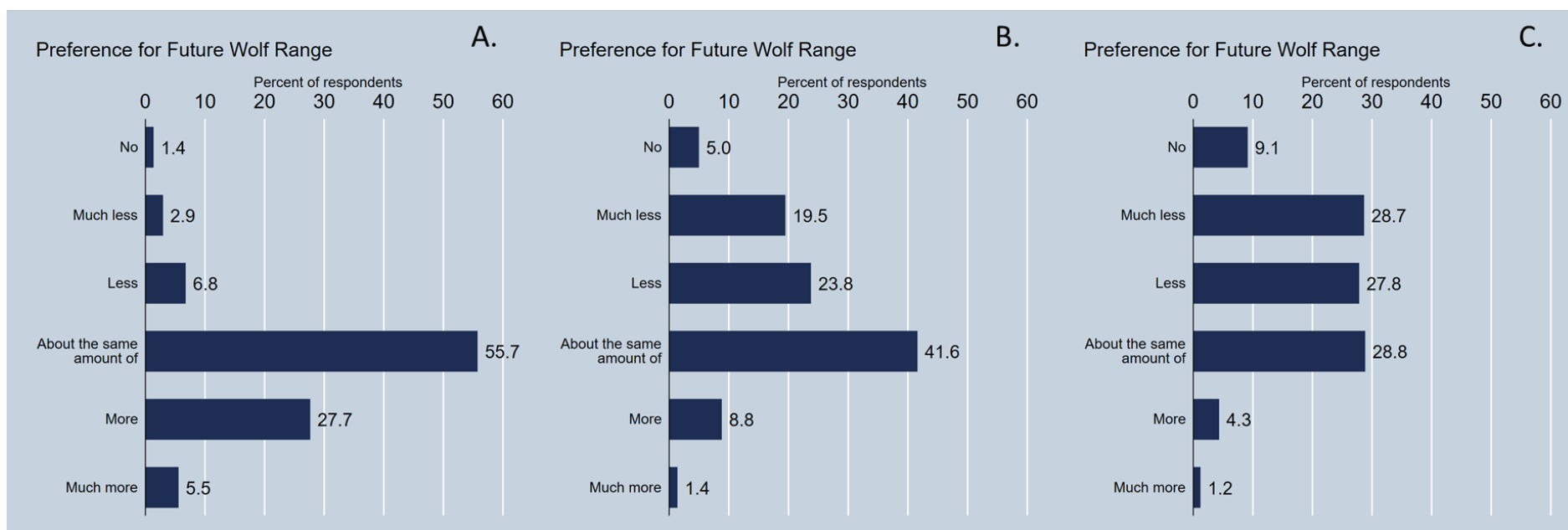


Figure 4. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' preference for future deer distribution in Minnesota.

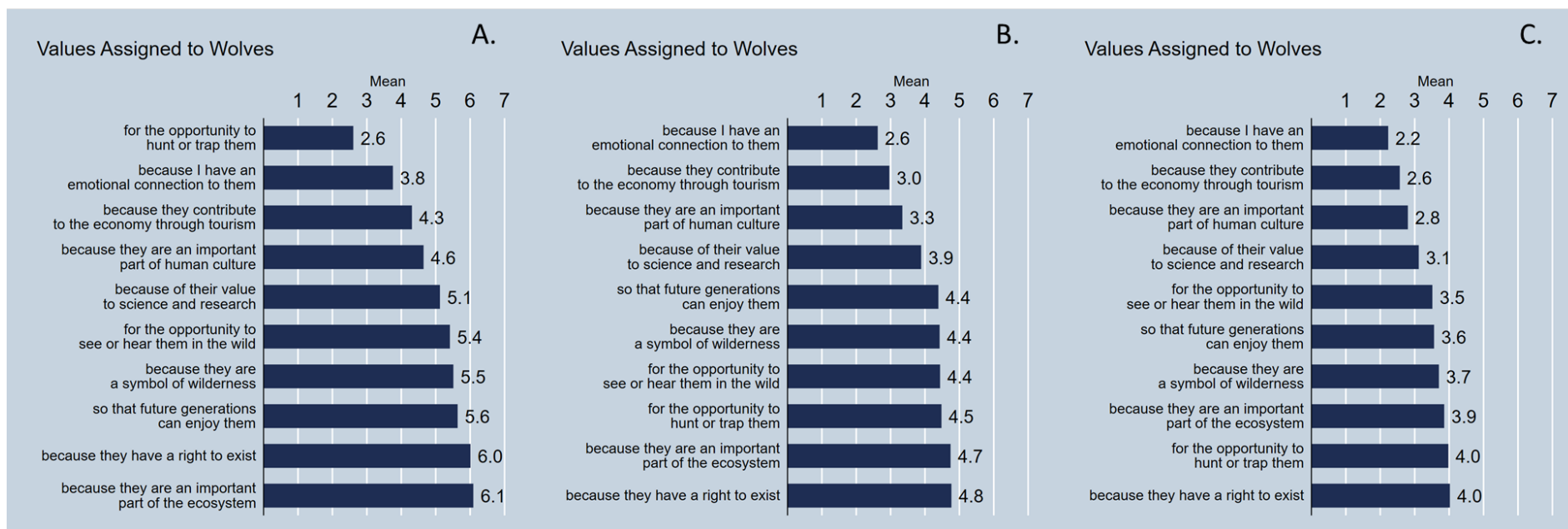


Figure 5. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' values for wolves in Minnesota.



Figure 6. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' preferences for DNR wolf management.

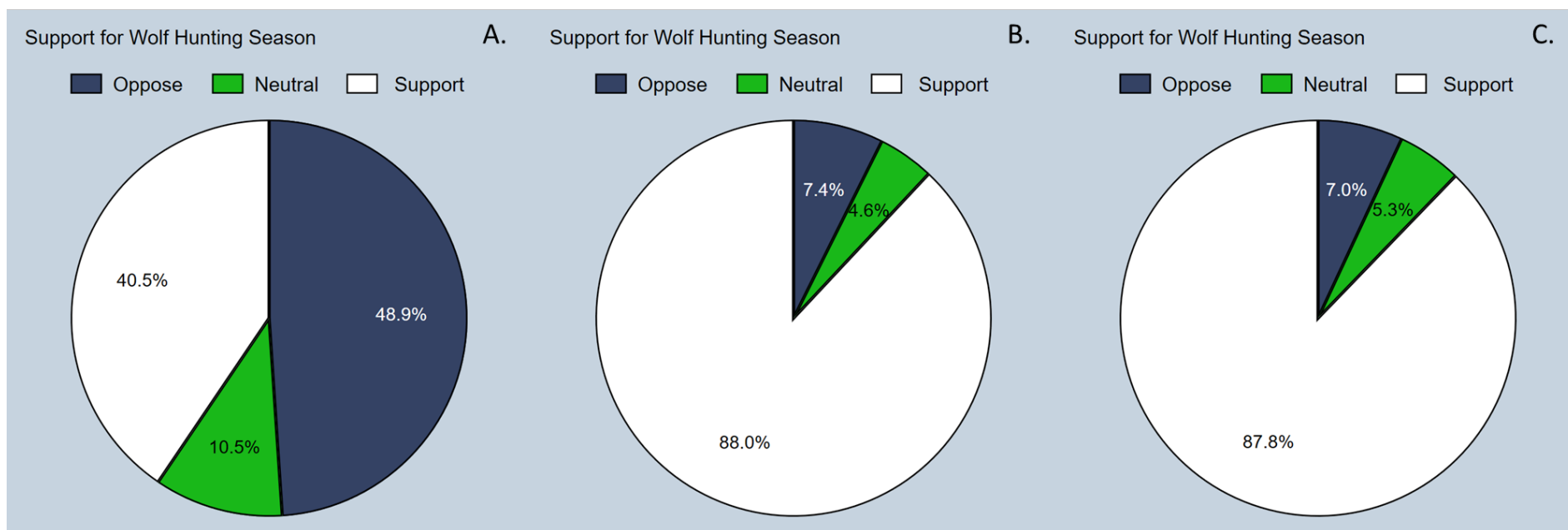


Figure 7. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' support or opposition to establishing a regulated wolf hunting season in Minnesota.

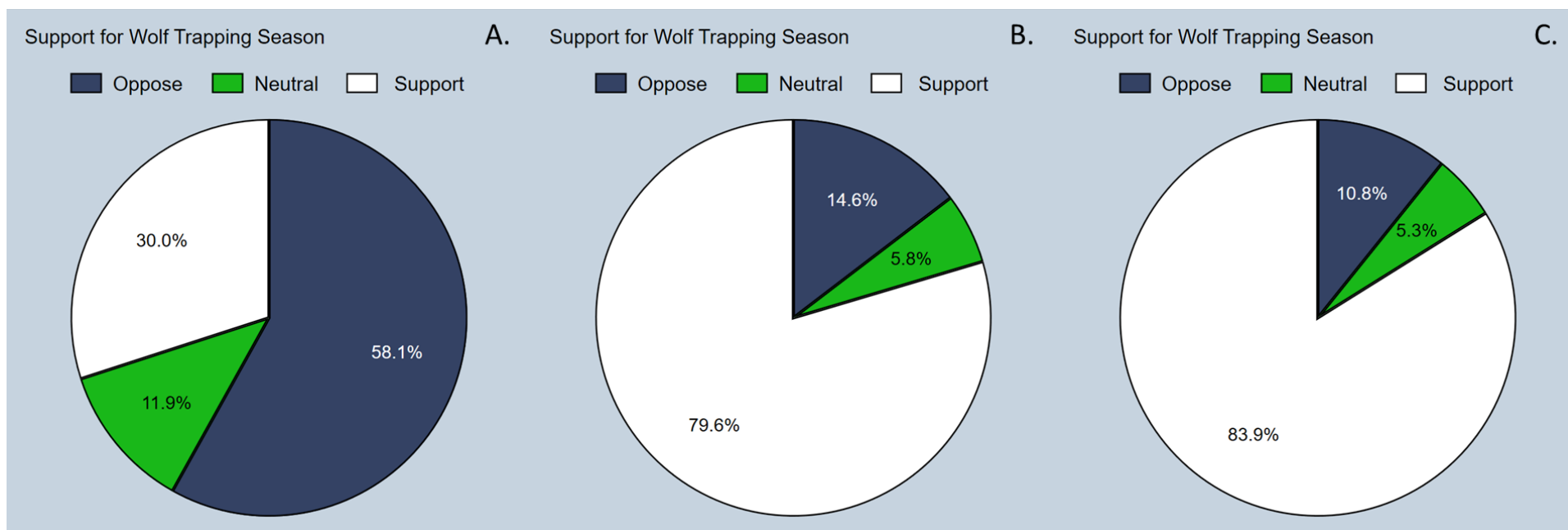


Figure 8. Summary of 2019 Minnesota A) Residents', B) Deer hunters', and C) Livestock producers' support or opposition to establishing a regulated wolf trapping season in Minnesota.