Wolf Management Plan Update

Executive Summary

To be developed

Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolf Management Plan Update</td>
<td>1</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>1</td>
</tr>
<tr>
<td>Contents</td>
<td>1</td>
</tr>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Vision for wolves</td>
<td>1</td>
</tr>
<tr>
<td>Plan purpose and structure</td>
<td>1</td>
</tr>
<tr>
<td>Plan context</td>
<td>2</td>
</tr>
<tr>
<td>Planning process</td>
<td>2</td>
</tr>
<tr>
<td>II. Background and Current Conditions</td>
<td>4</td>
</tr>
<tr>
<td>Minnesota’s wolf population</td>
<td>4</td>
</tr>
<tr>
<td>Historical protection status and future outlook</td>
<td>5</td>
</tr>
<tr>
<td>Wolf governance</td>
<td>10</td>
</tr>
<tr>
<td>Regulated wolf hunting and trapping</td>
<td>12</td>
</tr>
<tr>
<td>Wolf depredation management</td>
<td>13</td>
</tr>
<tr>
<td>Wolf research and monitoring</td>
<td>14</td>
</tr>
<tr>
<td>III. Strategic issues</td>
<td>15</td>
</tr>
<tr>
<td>Diverse and changing wildlife values</td>
<td>15</td>
</tr>
<tr>
<td>Tribal wolf interests</td>
<td>16</td>
</tr>
<tr>
<td>Resources to support Minnesota wolf management</td>
<td>17</td>
</tr>
<tr>
<td>Wolf depredation and predation</td>
<td>18</td>
</tr>
<tr>
<td>Wolf population objectives</td>
<td>19</td>
</tr>
<tr>
<td>Wolf research and monitoring needs</td>
<td>21</td>
</tr>
<tr>
<td>IV. Goals, objectives, and strategies</td>
<td>21</td>
</tr>
<tr>
<td>Goal 1. Maintain a well-connected and resilient wolf population</td>
<td>22</td>
</tr>
<tr>
<td>Goal 2. Collaborate with diverse partners to collectively support wolf plan implementation</td>
<td>24</td>
</tr>
<tr>
<td>Goal 3. Minimize and address human-wolf conflicts while recognizing diverse wolf values</td>
<td>25</td>
</tr>
<tr>
<td>Goal 4. Inform and engage the public about wolves in Minnesota and their conservation</td>
<td>25</td>
</tr>
<tr>
<td>Goal 5. Conduct research to inform wolf management</td>
<td>26</td>
</tr>
</tbody>
</table>
I. Introduction

Vision for wolves

Minnesota’s wolf population will continue to be healthy, widespread across suitable range, and stable after decades of recovery from historical lows. The Minnesota Department of Natural Resources (DNR) supports the presence of a healthy wolf population in the state, where many Minnesotans appreciate wolves for their intrinsic value and for their ecosystem and social benefits. Wolves on the landscape also bring challenges and require collaborative solutions to address human-wolf conflicts. The best available ecological, social, and cultural knowledge will inform wolf conservation.

Plan purpose and structure

To support the vision above, this plan describes goals, objectives and strategies for Minnesota’s approach to wolf stewardship. Wolves connect with all parts of the Minnesota DNR’s mission. Minnesotans differ greatly in how they value wolves and want them conserved and managed. This is perhaps truer for wolves than any other wildlife species in the state. This plan’s goals seek to incorporate the diverse views of Minnesotans, while adhering to the statutes guiding Minnesota wolf management and supporting the Minnesota DNR’s mission. Importantly, the plan emphasizes cooperation and collaboration with tribal, federal, and state governments; non-governmental organizations; and other partners. This plan will guide wolf management for 10 years, and will be evaluated and revised if necessary five years after adoption. In support of the plan’s goals, management actions are continually adapted to current conditions, trends, and the best scientific information.

Following this introduction (section I), section II provides a summary of Minnesota wolf population information and describes current conditions helpful to understanding wolves in Minnesota. A summary of basic wolf information, including the 2001 Minnesota Wolf Management Plan and additional resources that informed this plan, are listed in Appendix 3. Section III lays out significant and more recent strategic issues surrounding wolves. Section IV contains goals, objectives, and strategies for addressing issues described in Section III. This plan update describes current knowledge of Minnesota’s wolf population; Minnesotans’ attitudes toward wolves; the history and legal status of wolves in the state; and management to support coexistence with a healthy and resilient wolf population integral to Minnesota’s overall biodiversity, while minimizing conflicts between humans and wolves.
Plan context

The Minnesota DNR is responsible for conservation and management of the state’s wildlife, including wolves. Although the state had been actively supporting wolf conservation for decades, the Minnesota DNR, in consultation with the Minnesota Department of Agriculture (MDA), adopted its first wolf management plan in 2001. The 2001 plan was initiated in response to the U.S. Fish and Wildlife Service’s (USFWS) recommendation to remove federal Endangered Species Act (ESA) protections for the gray wolf. In 1992, the USFWS set a population recovery goal for Minnesota at 1,251 to 1,400 wolves; by 2001 the population was roughly double the upper end of that goal. The 2001 plan provided a framework to accomplish a goal the Minnesota DNR articulated in 1998 of “ensuring the long-term survival of the wolf in Minnesota, and also to resolving conflicts between wolves and humans.” Although it was developed in response to federal action, the 2001 plan has guided wolf management through multiple ESA listing and delisting decisions.

The USFWS published a rule removing wolves from the endangered species list in 2021, and this decision was subsequently overturned by a federal court ruling in 2022. This plan update began in 2019 before recent federal wolf policy decisions. Regardless of the wolf’s status under the federal Endangered Species Act, it is critical that Minnesota approach the state’s contributions to wolf management with knowledge of contemporary challenges, and the social, economic, and ecological contexts of wolf management today. These contexts have evolved since the 2001 plan was adopted, and it is against this backdrop the DNR updated this plan.

Planning process

Throughout the planning process, Minnesotans had several opportunities to share their perspectives, including through a scientific survey of their attitudes toward wolves and wolf management; an advisory group comprised of wolf stakeholders; and public comment and meetings open to all. A wolf technical committee (WTC) of university, tribal, state, and federal wildlife managers and scientists also provided support to the planning process, including through the identification of research and management needs and challenges, and potential solutions. Consultation and coordination with tribal governments occurred throughout the process before final adoption of the plan.

Table 1. Plan update development process

<table>
<thead>
<tr>
<th>Date</th>
<th>Process component</th>
<th>Description</th>
<th>More details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Internal project scoping and planning</td>
<td>Minnesota DNR leadership and staff developed project framework</td>
<td>n/a</td>
</tr>
<tr>
<td>2019</td>
<td>Public attitude survey</td>
<td>Statistically representative survey of values, beliefs, attitudes, and behaviors of three stakeholder groups on wolves and wolf management – livestock producers, deer hunters, and residents statewide</td>
<td>Appendix 5: Minnesotans’ Attitudes Toward Wolves and Wolf Management (2020)</td>
</tr>
<tr>
<td>Date</td>
<td>Process component</td>
<td>Description</td>
<td>More details</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>2019-2022</td>
<td>Tribal coordination and consultation</td>
<td>Tribal governments were consulted early and throughout the plan update process; tribal natural resource staff served on the WTC, were engaged by Minnesota DNR staff at multiple points during plan development, and provided revisions to the draft plan</td>
<td>Appendix 1: Input summary</td>
</tr>
<tr>
<td>2020</td>
<td>Public input process</td>
<td>Online questionnaire, discussion forum, and three online open houses (due to Covid-19 restrictions) allowed members of the public to provide input on wolf management preferences</td>
<td>Appendix 1: Input summary</td>
</tr>
<tr>
<td>2020-2022</td>
<td>Wolf plan advisory committee (WPAC)</td>
<td>A committee of Minnesotans representing diverse perspectives about wolves (including hunting and trapping; wolf advocacy and animal rights; livestock and agriculture; natural resource conservation and environmental protection; and local government) was convened, provided input through the process, and reviewed the draft plan</td>
<td>Appendix 1: Input summary</td>
</tr>
<tr>
<td>2020-2022</td>
<td>Wolf technical committee (WTC)</td>
<td>State, federal, tribal, and NGO experts convened to review the previous wolf plan and recommend plan update strategies</td>
<td>Appendix 1: Input summary</td>
</tr>
<tr>
<td>2022</td>
<td>Public comment and review process</td>
<td>Draft plan posted for public review and comment</td>
<td>Appendix 1: Input summary</td>
</tr>
<tr>
<td>2022</td>
<td>Final adoption of plan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
II. Background and Current Conditions

Minnesota’s wolf population

Wolf population size and distribution

Based on what we know of the relationship between wolves and ungulate populations, it is reasonable to conclude that Minnesota may have had more than 4,000 wolves prior to European colonization. Historically wolves ranged the entire state but by 1900 were rare in the south and west. By 1930, wolf range was restricted to northern counties, and primarily forested areas bordering Canada.

Early estimates indicate that the wolf population likely never dropped below 300-400, and may have been closer to 400-800 during a period of limited protection from the 1930s to 1960s. By 1970, the population was rebounding, estimated at 700-1,000. However, these earlier population point estimates prior to the late 1970s derive from different methods than those used currently and the margin of error is not known.

From the late 1970s until the late 1990s, the wolf population expanded in number and distribution. The highest population estimate of 3,020 wolves occurred in the winter of 2003-2004, which coincided with high deer populations as indicated by hunter harvest and modeled deer density estimates. With ESA protections and a growing deer population, wolves in Minnesota increased from the 1970s to late 1990s. Since the late 1990s, the population of wolves in Minnesota has stabilized with relatively little change in number and distribution.

Since the late 1970s, Minnesota has conducted standardized monitoring to delineate wolf distribution and estimate average territory and winter pack size. To define wolf range, delineation surveys were conducted at approximately 10-year intervals (1978, 1988, 1997) before transitioning to approximately 5-year intervals (2003, 2007, 2012, 2017). Results indicate range and population expansion through the 1997-1998 survey, no range expansion from 1998-2007, and then some range expansion in both 2012 and 2017 (Erb et al. 2018; Figure 1). Current occupied wolf range (the area within total range occupied by wolf packs) is estimated to be 28,561 mi², approximately one third of the state. From 1978-2008, winter population size increased from around 1,200 to 3,000, an average rate of 3% per year. Although not statistically different, population point estimates have been lower in the last decade, with the winter population remaining stable the last five years at around 2,700 wolves (Figure 2).
Historical protection status and future outlook

Soon after the establishment of the Minnesota territory in 1849, the legislature authorized counties to pay individuals for any wolf they killed. This wolf bounty system remained in place until 1965. From 1946 to 1964, residents could also obtain permits to shoot wolves from airplanes. In addition to the bounty program, state personnel were involved in wolf removal from the late 1940s through the mid-1950s, including via aerial shooting. Aerial shooting over the Boundary Waters Canoe Area was eliminated in 1950, but continued elsewhere until 1954, and other forms of wolf control (shooting and trapping) by state employees ended in 1956. In 1969, the legislature authorized a predator control program that permitted private, state-certified trappers to locally remove wolves based on evidence of livestock depredation. After wolves received federal ESA protection in 1974, management of wolf depredation on livestock and other domestic animals shifted to the USFWS.

Prior to ESA listing, the wolf population in the lower forty-eight states declined from historical levels because of habitat loss; low wild ungulate populations; and widespread, federal and state sponsored killing (e.g., through unlimited or subsidized trapping, shooting, aerial gunning, and poisoning). The first federal protection for gray wolves occurred with the passage of the Endangered Species Preservation Act of 1966, a precursor to the Endangered Species Act of 1973. In 1970, some federal protections began for the eastern timber wolf, and taking of wolves was prohibited on most of the Superior National Forest. Wolves in all of Minnesota received complete ESA protection in 1974 under a subspecies designation for the eastern timber wolf. In 1978, USFWS issued a final rule reclassifying “the gray wolf in the United States and Mexico” to threatened in Minnesota and endangered in the remainder of the lower 48 states.

Despite historical eradication efforts, wolves that persisted in northern Minnesota facilitated wolf recovery following passage of the ESA. Given the simultaneous increase in deer numbers, the Minnesota wolf population responded quickly with an increase in wolf numbers through range expansion, approaching its current distribution by 1998.
Wolf recovery in Minnesota has been regarded as a success that contributed significantly to wolf recovery in other parts of the upper Great Lakes. In 1978, the USFWS Eastern Timber Wolf Recovery Plan called for implementing wolf management zones, reestablishing wolves in other states, and reclassifying wolves in Minnesota from endangered to threatened under the ESA. The recovery team recognized the viability of the Minnesota wolf population at that time, but the Eastern Timber Wolf Recovery Plan recommended establishing at least one other viable population. Emigrating wolves from Minnesota subsequently recolonized portions of Wisconsin and Michigan, resulting in a self-sustaining regional population now numbering more than 4,000 wolves and connected to the larger wolf population in Canada. Today, of the estimated 6,000 gray wolves in the lower 48 states, nearly one-half are in Minnesota.

The regional population appears to be resilient and robust, with no immediate or serious population threats in Minnesota. However, as with any wildlife population, future threats may emerge. Wolves require large amounts of space, and despite their ability to disperse long distances to suitable habitat, they can be impacted by habitat loss, degradation or fragmentation caused by pressures like urbanization and agricultural landscapes or other human activities. These pressures can affect wolves directly (e.g., loss of habitat, increase in diseases or parasites) or indirectly (e.g., loss of moose, changes in deer distribution or density), and they remain difficult to predict. Some potential changes (e.g., more deer due to milder winters) may also have positive effects on wolves.

**Influences on wolf population and range**

Multiple factors interact to influence wolf distribution in Minnesota.

**Human density:** Modeling conducted in the 1980s suggested higher densities of humans and roads correlated with fewer wolves. However, as wolves recolonized former range, they demonstrated more tolerance of humans/roads than was previously assumed. From 1988 to 2018, the percentage of townships that exceeded the presumed “suitable” human-road density thresholds, but nonetheless had confirmed wolf pack use, increased from about 10% to 30% (Erb et al. 2018). Animals changing their behavior in response to changing conditions is called “behavioral plasticity.” Although suitable human-road density thresholds may be higher than originally thought, they remain a useful predictor of wolf distribution.

**Landscape context:** Recent analyses specific to Minnesota and the broader Great Lakes (Minnesota, Wisconsin, Michigan) wolf population demonstrate that wolf habitat suitability is higher in landscapes with more natural cover and farther from agricultural crops. In addition, the connectivity of Minnesota’s wolf population to wolves in Manitoba and Ontario supports an extensive area for long-term wolf persistence.

**Prey availability:** Wolves are habitat generalists and can live anywhere with sufficient prey. Although wolves may supplement their diet with smaller animals such as beavers and snowshoe hares during periods of the year, viable wolf populations require large ungulates (hoofed mammals) for prey. With the loss of elk, bison and caribou in most of Minnesota associated with European colonization, wolves in Minnesota today primarily rely on white-tailed deer, and moose where they occur. Although wolf-prey
dynamics can be complicated, particularly in areas with multiple prey or multiple large carnivore species, recent data suggest that wolf population size is closely associated with deer density (Figure 4).

*Figure 4. Comparison of estimated spring (pre-fawn) deer density and winter wolf abundance in Minnesota, 2012-2021.*

Research in Minnesota strongly suggests that wolves have not caused large-scale or long-term declines in deer. In recent decades, deer population estimates in wolf range have substantially declined following severe winters and intensive hunter harvest. However, deer can and have rebounded quickly, despite relatively high wolf numbers, in response to milder winters and deer harvest strategies that reduce hunting pressure. In some cases, wolf predation may prolong declines in local deer populations caused by poor habitat and winter severity that cumulatively may have reduced deer hunting opportunities or success at local levels. However, these effects are not evident in deer population trends throughout the entirety of wolf range.

Where they occur, moose can be important prey for wolves. Although range contraction of Minnesota’s moose has been observed since the late 1800s, with periodic expansion in the northwest, population declines have been exceptionally steep in the recent past, particularly from 2009-2014. In 2005, for example, Minnesota’s northeastern moose population was estimated to exceed 8,000 animals, while today it is about 3,000-4,000 animals. Northeastern Minnesota moose appear to have declined primarily due to high mortality, fewer breeding age females, and reduced calf recruitment. Recent DNR research indicates health-related causes account for about two-thirds of non-hunting adult moose mortality, with brain worm, a parasite normally carried by white-tailed deer, the leading cause. Wolf predation is the second leading direct cause of adult moose mortality in the northeast, but with predisposing health conditions identified in nearly half of the predation events. Wolf predation is the leading cause of death for calf moose during their first 30 to 50 days of life. Wolf predation, however, did not play a role in the decline of moose population in northwestern Minnesota.

**Minnesotans’ attitudes toward wolves and wolf management, and experiences living with wolves**

Wolves are important to Minnesota’s natural and cultural heritage. They are highly valued and sometimes maligned, but capture the attention of Minnesotans from all backgrounds. This section describes the Minnesota DNR’s understanding of the values different people and groups assign to
wolves, as well as their perspectives on wolf management and key benefits and challenges of living with wolves.

**2019-2020 study: Minnesotans’ values, beliefs, and attitudes**

To prepare for this wolf plan update, the Minnesota DNR in collaboration with the Minnesota Cooperative Fish and Wildlife Research Unit at the University of Minnesota conducted a study in 2019-2020 to assess Minnesotans’ values, beliefs, attitudes, and behaviors toward wolves and wolf management (Appendix 5 contains a summary report of key findings). Given the logistics of conducting scientific surveys, three groups were identified as study populations to represent a range of interests in wolf management: Minnesota residents, deer hunters, and livestock producers in wolf range. Results are statistically representative estimates of variables of interest for each study population. Although the study did not specifically survey tribal members and other indigenous Minnesotans, it is necessary to appreciate the importance of wolves for tribal nations within – and with connections to – Minnesota. Some context on the cultural significance of wolves as well as tribal perspectives on their relationship with wolves is provided in section III.

**Social benefits and costs associated with wolves in Minnesota**

Individuals and groups hold a wide range of perspectives about wolves and seek different outcomes in wolf policy. However, there are values common to most. For instance, Minnesotans support the long-term persistence of a healthy wolf population. Most state residents (87%) – in a survey sample including all potential stakeholders – agreed with the statement “it is important to maintain a wolf population in Minnesota,” and over 50% strongly agreed. Minnesota residents similarly value having wolves in the state because they are “an important part of the ecosystem” (87% agree), “because they have a right to exist” (83% agree), and “so that future generations can enjoy them” (78% agree), among other reasons.

There are myriad social, ecological, and economic benefits that stem from wolves. For example, many Minnesotans spend time in nature viewing wildlife, an activity gaining in popularity nationally. Survey results showed that 75% of residents felt it was important to have wolves in the state for the opportunity to see and hear them. While most wolf sightings or detections are opportunistic, meaning people are pursuing another activity in wolf range when they hear howling or observe wolves or wolf sign (e.g., tracks, scats, kill sites), Minnesotans still believed the viewing opportunity was a reason to value wolves. Wolves also affect ecological processes by influencing prey species abundance, distribution, and movements with implications for forest regeneration and health, and by influencing the dynamics of other co-existing carnivore species. Minnesotans, on average, value wolves for their contributions to the functioning of healthy ecosystems.

While many Minnesotans recognize the benefits of a healthy wolf population, individuals experience costs or concerns unequally. Livestock producers in wolf range deal with the risk or reality of wolves killing their livestock. Wolves also prey on culturally and economically significant species like white-tailed deer and moose, and sometimes injure and kill pets, primarily dogs. Survey results show marked differences in attitudes toward wolves and wolf policies, stemming in part from these costs, in addition to personal values, ideologies, experiences, and places of residence. For instance, residents, deer
hunters, and livestock producers have different opinions regarding the importance of killing wolves that are attacking domestic livestock and reducing wolf populations to address concerns about deer and moose populations. Responses were recorded on a scale from 1 to 5 (1=not at all important and 5=very important). Hunters and livestock producers think it is more important to reduce wolf populations to address concerns about deer and moose impacts, on average, than Minnesota residents surveyed. A similar pattern held concerning the killing of wolves to reduce livestock depredations (Figure 5).

Figure 5. Minnesota residents, deer hunters, and livestock producers perceived importance of wolf management priorities

Minnesotans were also asked about the risks they perceive from wolves, including to their personal safety. Results were recorded on a scale from 1 to 5 (1=no risk at all and 5=a large amount of risk). Residents (mean=1.88), deer hunters (mean=2.27), and livestock producers (mean=2.52) did not perceive wolves to be a significant public safety risk. In fact, over 78% of residents believed wolves to either pose “no risk at all” or “very little risk” to their personal safety, although these values were lower for livestock producers and deer hunters.

There are very few documented incidents of a wolf attacking a human in North America. These incidents usually occur in association with wolves exhibiting other abnormal behaviors, sometimes associated with wolf injury/illness or human “conditioning” of wolves. Although these incidents are rare, such interactions with wild wolves warrant serious attention. People should not intentionally attract or approach wolves, and wolves should be discouraged from areas of high human activity through non-lethal means and respected from a distance. A wolf exhibiting abnormal behavior that is not deterred by human presence may be killed to protect public safety.
**Wolf governance**

Government agencies hold wildlife and other natural resources “in the public trust,” meaning wildlife is managed for the benefit of the resource and the public, now and into the future. Authority for wolf conservation and management rests in several state, federal, and tribal agencies.

**Tribal authority**

Seven Ojibwe bands and four Dakota communities exist as sovereign tribal nations within the boundaries of present-day Minnesota. The Minnesota DNR recognizes and respects these federally recognized tribes’ sovereignty. Tribal nations’ inherent right to self-governance of their members and territory pre-dates establishment of the United States. Tribal staff participating on the Wolf Technical Committee (WTC) explained to the Minnesota DNR that tribes similarly respect one another as sovereign nations who have management authority within their respective boundaries. On tribal land within reservation boundaries, tribes generally have authority to manage wildlife. Tribes’ unique legal status requires that federal and state agencies participate in government-to-government relations. Minnesota Statutes, Chapter 10.65 confirms this relationship and directs consultation, coordination and cooperation: the state and tribal nations “significantly benefit from working together, learning from one another, and partnering when possible.” In wolf range, Ojibwe bands conserve wolf habitats and prey species, monitor wolf populations, and conduct wildlife research. Wolf research and monitoring, and depredation management, is often coordinated among tribal, state and other partners.

Outside of reservation boundaries, a number of tribes in and beyond Minnesota retain interests in territory ceded through treaties to the U.S. in the mid-1800s in exchange for payments, services and confirmation of rights. In wolf range, this includes some Ojibwe bands with treaty-protected rights to off-reservation hunting, fishing, and gathering, and with recognized agreements made between the band and state regarding natural resource management in ceded territory.

**Federal authority**

The USFWS administers the ESA to conserve species with vulnerable populations and ensure their long-term survival and recovery. Species can be listed as threatened or endangered, and the USFWS then develops a recovery plan for the species. When a species or sub-population receives ESA protections, the federal government has additional regulatory oversight, working collaboratively with states and tribes to achieve recovery goals. Protections for threatened or endangered species include designation and protection of critical habitat and prohibition on their take (e.g., harming or killing).

Although the 2001 plan was developed with the recognition that wolves in Minnesota had exceeded federal recovery goals and could be removed from federal ESA listing, a comprehensive plan for wolf stewardship in Minnesota is important regardless of federal or state status. In 2007, the USFWS removed ESA protections for wolves. Litigation resulted in the decision being overturned, and there have been several listing and delisting decisions since. ESA protections for wolves were removed in January 2021, triggering transition of certain responsibilities from the USFWS to the Minnesota DNR. In February 2022, however, a federal court ruling reinstated ESA protections, placing wolves again under...
the protection of the USFWS as a threatened species in Minnesota. Minnesota DNR was already engaged in an update to the 2001 wolf management plan prior to either of these actions and will continue to manage wolves in Minnesota regardless of their federal listing status.

**State authority**

The Minnesota DNR is an executive branch agency that manages natural resources through wildlife habitat management, population monitoring and management, research, education, and more. The Minnesota Department of Agriculture is another executive agency, which oversees Minnesota’s wolf depredation compensation program. Through this program, livestock owners may be reimbursed for domestic livestock losses resulting from verified wolf depredation. The MDA receives an annual legislative appropriation, from general funds that all Minnesotans contribute to, for response to depredation claims.

**Public involvement**

Reflecting Minnesotans’ longstanding and substantial interest in wolves, public involvement has occurred regularly in recent decades. For example, an extensive public process supported the 2001 plan. Funded largely by what is now the Legislative-Citizen Commission on Minnesota Resources, the Minnesota DNR held 12 public information meetings throughout the state in 1998, drawing over 3,000 attendees. Also in 1998, the Minnesota DNR convened environmental, agricultural, hunting, trapping, and wolf advocate organizations; government agencies; and members of the public to generate consensus-based guidance for development of the wolf plan. This “roundtable” group’s recommendations greatly informed Minnesota DNR’s initial 1999 wolf management bill, which was revised and passed by the legislature in 2000.

Minnesota statute (MS 97B.645, subd. 9) requires the Minnesota DNR to provide an opportunity for public comment before opening a wolf season. In 2012, Minnesota DNR collected public input regarding the establishment of a potential wolf season using an online questionnaire anyone could complete. There was significant out-of-state and even international participation, with metro residents comprising the majority of Minnesota respondents. Although not a representative survey, almost 80% of respondents to the online input opportunity said they did not support hunting and trapping of wolves in Minnesota.

USFWS held public meetings in Minnesota in 2004 and 2006, and the agency proposed and finalized several rules to discontinue ESA protections for the species. In 2019, USFWS again held a public comment period and a public hearing, informing its 2020 decision to remove the gray wolf from the endangered species list.

Wolf management is a popular topic even in the context of other Minnesota DNR issues, commonly arising during public involvement efforts regarding deer and moose management. Nongovernmental organizations (e.g., environmental, agricultural) also play a role in involving the public across the spectrum of wolf interests through dissemination of information, coordination of membership actions, and advocacy to represent organizational interests.
Public education and information

Minnesotans have a strong interest in engaging on and learning about wolves, wolf conservation and management. The Minnesota DNR strives to ensure that timely and accurate information about wolf conservation and management is available to the public through its programs and in communication and educational materials.

Many other organizations provide educational resources and programs about wolves. Notably, the International Wolf Center (IWC) in Ely is a destination for people to learn about and experience wolves through programs on wolf biology, population status, and the complex interactions with people and the environment. IWC and other partner organizations in the state reach broad audiences and play an important role in wolf conservation. The Minnesota DNR supports these organizations by providing accurate information on population status, research findings, and management information.

Regulated wolf hunting and trapping

Historically, hunters and trappers pursued wolves for their fur, for bounty payments (1849-1965) or at other times when wolves interfered with livestock. With limited state protections and no regulated season for wolves in the 1960s, about 200 wolves were taken annually through these activities.

The wolf plan adopted in 2001 included a five-year waiting period prior to implementing a wolf season in Minnesota, consistent with a 2000 Minnesota law. In 2011, the legislature classified wolves as small game in statute and authorized the Minnesota DNR to implement a wolf season following removal from the ESA. The 2012 legislature established wolf hunting and trapping licenses and further clarified authority to implement a season starting no later than firearms deer season.

Prior to the 2012 season, there had never been a regulated wolf hunting and trapping season in Minnesota. From 2012-2014, the state held limited and highly regulated hunting and trapping seasons. Unlike seasons for other species, the Minnesota DNR implemented a program for daily harvest monitoring to enable closing the season when the number of wolves killed reached a set limit. In addition, as a requirement at wolf registration, hunters and trappers had to present wolves for the collection of biological information useful in assessing population status and trends and harvest impacts.

<table>
<thead>
<tr>
<th>Year</th>
<th>Season</th>
<th>Licenses issued</th>
<th>Season length (days)</th>
<th>Target Harvest</th>
<th>Harvest</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>early hunting</td>
<td>3,670</td>
<td>16</td>
<td>200</td>
<td>147</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>late hunting</td>
<td>1,656</td>
<td>41</td>
<td>253&lt;sup&gt;a&lt;/sup&gt;</td>
<td>67</td>
<td>5.1&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>late trapping</td>
<td>797</td>
<td>199</td>
<td>29.4&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012 totals</td>
<td>6,123</td>
<td>57</td>
<td>400</td>
<td>413</td>
<td>6.7</td>
</tr>
<tr>
<td>2013</td>
<td>early hunting</td>
<td>2,084</td>
<td>16</td>
<td>110</td>
<td>88</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>late hunting</td>
<td>744</td>
<td>29</td>
<td>132&lt;sup&gt;b&lt;/sup&gt;</td>
<td>31</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>late trapping</td>
<td>606</td>
<td>119</td>
<td>19.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013 totals</td>
<td>3,434</td>
<td>45</td>
<td>220</td>
<td>238</td>
<td>6.9</td>
</tr>
<tr>
<td>2014</td>
<td>early hunting</td>
<td>2,394</td>
<td>15</td>
<td>125</td>
<td>124</td>
<td>5.2</td>
</tr>
<tr>
<td></td>
<td>late hunting</td>
<td>790</td>
<td>13</td>
<td>126&lt;sup&gt;b&lt;/sup&gt;</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>late trapping</td>
<td>736</td>
<td>124</td>
<td>16.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2014 totals</td>
<td>3,920</td>
<td>28</td>
<td>250</td>
<td>272</td>
<td>6.9</td>
</tr>
</tbody>
</table>
Wolf hunting and trapping remains a contentious issue. A season decision framework describing how the Minnesota DNR will decide whether to establish a season upon implementation of this plan if federal ESA protections are again removed and, if so, how a possible season would be structured. This includes the legal requirement for the Minnesota DNR to provide opportunity for public comment if there is a proposed wolf season in Minnesota.

Some states and Canadian provinces with wolves have held regulated hunting and trapping seasons, in some cases for many decades. When seasons are in place, agencies evaluate the impacts of harvest on wolf populations and the connection between harvest and wolf conservation and management objectives. Agencies also typically collect biological samples that are incorporated into population monitoring programs that track metrics on reproduction, age, and disease prevalence, among others. Any potential wolf season in Minnesota would incorporate robust evaluation and monitoring methods.

If a season is proposed in Minnesota, the objectives used as a rationale would be communicated transparently. For example, possible objectives could include managing wolf-livestock conflicts, aiding ungulate population recovery, reducing wolf disease outbreaks, or providing regulated hunting and trapping opportunities. With proper harvest and population monitoring, the effects of hunting and trapping on a wolf population can be evaluated, informing adjustments to seasons to ensure wolf conservation goals are supported.

**Wolf depredation management**

Minnesota’s depredation management program has been in place since the late 1970s, involving coordination of multiple state and federal agencies that work closely to address impacts of wolf predation on livestock and pets. In the 2001 plan, the Minnesota DNR adopted many of the practices in place while wolves were listed under the ESA, and in 2007 initiated a cooperative agreement with the United States Department of Agriculture Wildlife Services (USDA WS), in consultation with the MDA. Wolf depredation management involves multiple entities, including the Minnesota DNR divisions of Fish and Wildlife and Enforcement, the MDA, University of Minnesota Extension, and private certified wolf control trappers. Roles of each agency may be adjusted as a result of the ESA listing status of wolves in Minnesota.

Many livestock producers use prevention and mitigation techniques to reduce the risk of wolf depredation, including husbandry practices, guard animals, fencing, and removal of dead livestock carcasses. Cooperating agencies across wolf range provide technical guidance on these practices to help reduce wolf damage.

Wolf conflicts and predation on livestock and domestic animals generally increased from 1978-1998, concurrent with increases in the wolf population. Since that time, verified wolf complaints have occurred at about 100 locations annually, and in response approximately 180 wolves are killed annually. Over the last 10 years, the MDA has paid between 80-140 claims each year at a cost of $100,000-$250,000 per year.
Wolf research and monitoring

Thanks to state, federal, tribal, university, and other agencies and individuals, Minnesota has a long history of wolf research and monitoring. Minnesota wolves are the subject of hundreds of peer-reviewed articles in the scientific literature. Recent monitoring of wolves in Minnesota has included the following:

- Annual estimation of the statewide wolf population size
- Two (fall and winter) annual track surveys for use in population trend assessment
- Annual documentation of various metrics associated with verified wolf depredations
- Localized research projects by Minnesota DNR, collaborators, and other agencies or organizations.

Minnesota DNR’s research and monitoring program conducts population estimation, including documentation of changes in wolf distribution and pack dynamics (e.g., average territory and pack size). Since the writing of the 2001 plan, Minnesota DNR has focused on collaring more wolves, and especially on expanding the spatial distribution of wolf-collaring areas to ensure results are more representative and robust; this effort has also included increased collaboration with tribal partners to expand monitoring in reservations and treaty areas. Minnesota DNR has also explored other approaches to wolf monitoring, including an aerial-survey approach used in Ontario, Canada. However, this method was not practical at the statewide level in Minnesota due to time and cost constraints of large-scale aircraft operations and the unpredictable nature of the required snow conditions. In addition, Minnesota DNR research with university collaborators explored the use of remote trail cameras to monitor carnivore trends, potentially expanding this technique to monitoring of other wildlife species. Finally, Minnesota DNR uses a newer monitoring technique on bears, fishers, and martens referred to as statistical population reconstruction (SPR), which could be a low-cost and reliable approach to estimating wolf abundance if a harvest season were re-established. For wolves, data collected from hunters and trappers (e.g., from mandatory tooth submissions and harvest effort surveys) can inform population estimates using this reliable yet low-cost SPR method.

Beginning in 2016, Minnesota DNR also began exploring options for monitoring wolf pup survival, including use of implantable microchips (i.e., PIT tags) and expandable radio-collars. Pup survival and its variability remains under-studied and has potential value as a monitoring index or in development of population models that require data on age-specific survival. These data also provide information on wolf den selection and variation in pup survival.

Collaborations with tribal, federal, and academic partners enable Minnesota DNR to explore best practices for acquiring these data and improving annual monitoring protocols. These collaborations also support wolf research. Since the publication of the 2001 plan, peer-reviewed research has addressed wolf genetics and taxonomy; reproduction; survival and causes of mortality; disease prevalence; depredation dynamics and control methods; wolf-beaver, -deer and -moose dynamics; and wolf capture and other research (e.g., acoustic, camera trapping) methods.
III. Strategic issues

With the background and current conditions described above, this section summarizes the fundamental policy questions and critical opportunities and challenges the Minnesota DNR seeks to address through this plan’s goals.

Diverse and changing wildlife values

Humans assign diverse values to wolves, and some believe wolves possess intrinsic value outside their utility to people. The Minnesota DNR’s management responds to these diverse values (Table 3), appreciates that wolves’ existence in Minnesota is meaningful and a reason for their conservation, and acknowledges both the positive and negative experiences Minnesotans have related to wolves and wolf management.

Table 3. Positive and negative wolf values

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/cultural</td>
<td>Intrinsic value of wolves</td>
</tr>
<tr>
<td></td>
<td>Wildlife viewing</td>
</tr>
<tr>
<td></td>
<td>Hunting and trapping opportunity</td>
</tr>
<tr>
<td></td>
<td>Ojibwe cultural significance</td>
</tr>
<tr>
<td>Ecological</td>
<td>Ecological function</td>
</tr>
<tr>
<td></td>
<td>Predation (e.g., reduce degradation of vegetation by over browsing)</td>
</tr>
<tr>
<td>Economic</td>
<td>Economic gains (e.g., ecotourism)</td>
</tr>
</tbody>
</table>

There are numerous factors shaping individuals’ attitudes toward wolves and wolf management, and the factors that shape those attitudes have and will continue to evolve. Among these factors are personal values or beliefs about how humans relate to wildlife. Researchers have termed these beliefs a “wildlife value orientation” (Fulton et al., 1996). Beliefs about humans’ relationship with wildlife can be described along a spectrum of “mutualism” (wildlife are deserving of rights similar to humans, and humans and wildlife are part of a single community) to “domination” (wildlife are resources that can be used to achieve specific human-oriented goals). How strongly a person agrees with each of these dimensions often correlates with their preferences for wildlife management. For instance, individuals with strong mutualism beliefs often oppose killing wolves as a solution to depredation conflicts, while those with strong domination beliefs often support lethal control.

Wildlife value orientations link to larger social trends like urbanization and demographic change (Manfredo et al., 2020a). For example, the United States is urbanizing, and beliefs about wildlife, on average, are moving closer to mutualism than domination (Manfredo et al., 2020b). The Twin Cities metro population is likely to increase by nearly 1 million by 2053, while greater Minnesota may see a reduction over the same time (Minnesota State Demographic Center, 2020). While individual differences will persist, it is likely that mutualism beliefs will increase in Minnesota over time, with implications for...
how the majority of residents view state wolf policy and the attitudes and interests of those in the minority.

Tribal wolf interests

This plan directly affects tribal nations in Minnesota and has a connection to tribes outside Minnesota with interests in and rights to ceded territory within the state. Tribal staff involved in developing this plan explained that elders, cultural and religious leaders, and other knowledge holders must guide how tribal knowledge and perspectives are shared with others; the Minnesota DNR is working to be attentive to that guidance and offers the discussion below in cooperation with the tribes.

Tribal members and other indigenous people of Minnesota, like all Minnesotans, have diverse views on wolves and the wolf/human relationship. Similarly, individual tribal members may hold perspectives that differ from those of tribal governments. As this plan was developed, Dakota communities, who refer to wolves as Buąktokça, were kept informed but did not actively participate in planning. The Upper Sioux Community shared a preference to defer to Ojibwe tribes’ involvement. As a result, this discussion focuses on the perspectives expressed by the governments of Ojibwe tribes located in Minnesota, with involvement from Great Lakes Indian Fish and Wildlife Commission (GLIFWC), which also represents Ojibwe tribes in Wisconsin with legal rights on ceded lands in the state of Minnesota. Ojibwe tribes in Canada and other parts of the U.S. were not consulted in development of this plan. Tribal representatives participated in the Wolf Technical Committee (WTC), observed Wolf Plan Advisory Committee (WPAC) meetings, and held separate meetings with Minnesota DNR staff. Minnesota DNR leadership also conducted consultations with tribal leaders. Finally, tribal wolf plans also contain a wealth of information that informed this section (Appendix 6).

Cultural and ecological significance of ma’iinganag (wolves) to the Ojibwe

GLIFWC collaborated with other Ojibwe bands in sharing the following information with the Minnesota DNR on the significance of ma’iinganag (wolves, or singular ma’iingan) to the Ojibwe. Ma’iingan has a critical role in the Ojibwe Creation Story, and a primary teaching is that ma’iingan and the Ojibwe are brothers, with intertwined fates. While the state references wolf “management,” the term is inappropriate from an Ojibwe perspective, for one does not typically manage one’s brother. Terms such as “stewardship” or “protection” may come closer. However, Ojibwe often speak about their “relationship” with ma’iingan, reflecting reciprocity, the inherent right of ma’iingan to exist, and a sense of responsibility to their brother and to repay ma’iinganag for the benefits they provide.

In addition to the cultural relationship with ma’iingan, the Ojibwe have spent centuries sharing the North American landscape with wolves, imparting substantial traditional ecological knowledge to inform ma’iingan stewardship. Wolves are generally seen as presenting little threat to human health and safety, and they are appreciated for their ecological role in maintaining the long-term health of prey populations and the health and diversity of forest ecosystems. This in turn yields overall strong support for maintaining wolf presence on the land.
This relationship with ma’iingan informs tribal policy positions, reflecting that a tied fate means health is sought for the wolf community just as for the human community. It is generally felt that wolves should determine their own numbers and distribution on the landscape, rather than humans making these determinations. Taking a wolf’s life requires serious consideration and substantial justification. Recreational harvest does not meet this threshold, and policies regarding livestock depredation favor preventative actions and non-lethal approaches before consideration of lethal techniques.

Ojibwe tribes have treaty rights related to resource stewardship in many parts of wolf range in Minnesota, so it is important for the state and the tribes to share their knowledge, understandings, and perspectives for the benefit of the wolf community. As sovereign nations, each tribe has unique views, and consulting independently regarding wolf stewardship in and around their own tribal lands and in ceded territories, while difficult at times, best supports cooperative stewardship of ma’iingan.

Additional tribal perspectives on wolves

In addition to the information above provided by GLIFWC, perspectives were provided by other tribal staff involved in plan development, and by documents consulted by the Minnesota DNR. Ma’iingan were important historically in tribal customs – for some tribes this could involve occasional take as part of cultural or religious practices. As cited above, the Ojibwe generally do not view ma’iingan as a threat to their personal safety, and population management and recreational harvest are incongruent with the relationship with ma’iingan.

WTC tribal representatives said these views remain dominant among members, although some are increasingly concerned about localized impacts to prey. There is generally strong support among tribal governments or staff for nonlethal methods to prevent livestock depredation; however, some Ojibwe bands believe that lethal control is necessary in limited circumstances, especially in the context of competing wildlife management objectives like moose population recovery. While coexistence involves challenges, at least one tribal leader shared “we do not see ourselves in conflict with wolves.” These challenges can include domestic animal depredation, as mentioned above, as well as views around ma’iingan being in competition with deer and moose.

Some Minnesota Ojibwe bands have formalized their positions against harvesting ma’iingan on tribal lands or have designated their reservations as ma’iingan sanctuaries. Although these interests did not arise during Minnesota DNR’s planning process, the USFWS in its 2019 ESA proposed rule cited that there may be some limited interest among Ojibwe tribal members in harvesting ma’iingan as furbearers or for spiritual or other purposes.

Resources to support Minnesota wolf management

The Minnesota DNR’s wolf program requires dedicated staff and funding. Costs have increased over time, including for monitoring wolf populations, conducting research, and coordinating and implementing wolf management. Wolf plan implementation will depend on funding and will require tradeoffs among plan priorities and other resource needs throughout the course of the ten-year plan.
The divisions of Fish and Wildlife and Enforcement have direct responsibility for wolves, while other divisions play an indirect role through their own conservation work. The Large Carnivore Specialist, Furbearer and Wolf Research Scientist, and many conservation officers conduct specific wolf management functions at a cost of $350,000-$500,000 per year.

Funding is primarily from the Wolf Management and Monitoring Account established by the legislature in 2013 for wolf management, research, damage control, enforcement, and education. Wolf license and applications fees (2012-2014 only) and $0.50 from each deer license sold fund the account. Legislation was amended in 2017 to remove the deer license portion as of July 1 the year after ESA delisting. The account has roughly $1,200,000 as of July 1, 2021. In the absence the 2022 federal court decision to return ESA protections to wolves in Minnesota, the Wolf Management and Monitoring Account would have been depleted by July 1, 2024 if it remained entirely dependent on revenue from deer hunting licenses.

Minnesota DNR also relies on partnerships to conduct wolf management and monitoring. USDA-WS is the primary agency conducting wolf depredation management through an annual cooperative agreement, and they assist with wolf research trapping efforts as well. Wolf depredation control is augmented by state certified wolf control trappers under the Minnesota predator control program (MS 97B.671).

Wolf monitoring and research have been conducted by organizations including the U.S. Geological Survey, National Park Service, University of Minnesota, DNR staff at Camp Ripley, and many tribal agencies in northern Minnesota. There is no estimate for the cumulative cost of this work, but without these essential partnerships, the Minnesota DNR would have more limited data from which to estimate and conserve wolf populations.

**Wolf depredation and predation**

Addressing loss of domestic animals and concerns over the impacts to big game species are important components of wolf management in Minnesota.

**Livestock depredation**

Since 2007, the Minnesota DNR and USDA WS have implemented a cooperative management program to address depredation conflicts. Livestock mortality rates inside and outside wolf range are similar: according to USDA WS and the MDA, less than 2% of farms in wolf range experience wolf-livestock depredation annually; however, individual producers can experience significant losses. The level of depredation impact has been relatively stable since the late 1990s but fluctuates year to year.

As discussed in a previous section, livestock producers can implement strategies to prevent or minimize wolf depredation impacts prior to an active depredation event. Non-lethal practices have been adopted primarily through individual investments, although there has been limited recent grant funding for conflict prevention through a pilot program funded and administered by MDA and USDA-WS. Additional public and private partnerships could better support implementation and evaluation of best practices for reducing or preventing wolf depredation incidents. To support some of the cost share or matching...
fund requirements for grants, contributions from NGOs and other donations have helped support programs to purchase or install fences. When verified incidents do occur, lethal control and reimbursement of financial losses comprise the current response, augmented by non-lethal methods as appropriate.

Alternative approaches to mitigate livestock depredation, such as insurance and cooperative damage management programs, exist and should be considered among the suite of tools to incentivize coexistence of livestock agricultural practices and wolves, and to equitably distribute the costs of ‘working landscapes’. The current approach to wolf depredation management was established in 1978 when wolves were reclassified as threatened under the ESA. Conflicts increased with a growing wolf population through the late 1990s, likely creating reliance on the approach. Although other wildlife damage programs in Minnesota emphasize technical guidance and individual practices, the wolf program relies on government-funded control and compensation. Given that wolf depredation management is more intensive than for most other species in the state, alternative systems should be considered going forward.

Predator/prey relationships in Minnesota

Minnesota is fortunate to have functioning predator-prey systems that include wolves, bears, moose, and deer, among other species. How or whether these species should be managed in a “balanced” way often depends on one’s point of view. These species are intricately linked, influencing each other’s behavior, survival, and reproductive success, and contributing to annual variation in their numbers. Habitat and weather conditions, parasites, disease, and many other factors also influence these interactions.

As the Minnesota DNR strives to balance the needs of these species and the interests of Minnesotans, management strategies need to address challenging tradeoffs. These tradeoffs should be deliberated through public processes (e.g., during the development of deer population goals). In addition, communication about management actions that benefit one species to the detriment of another should explain the impacts and the reasoning behind the decision.

Wolf population objectives

Determining an appropriate population level and distribution is complex. While consistent statewide approaches are generally preferred, flexibility is needed to address regional or local issues.

Population level

The USFWS Recovery Plan for the Eastern Timber Wolf (revised 1992) established a recovery goal of 1,251-1,400 wolves, to ensure their continued survival in Minnesota. To provide a buffer above this, the Minnesota DNR identified a minimum population level of 1,600 wolves in the 2001 plan. No maximum population goal was established. Feedback from the public, WPAC, and WTC indicated the origin and meaning of this previous wolf population objective was not clearly conveyed in the previous Plan. To clarify, this number was not intended as a management objective (i.e., management activities would not
be taken to reduce the population to that level). Rather, if the population were to decline toward 1,600, efforts would be made to identify the cause and management actions would be implemented to reverse the population decline. It is also important to identify and understand declining population trends should they occur, regardless of the absolute population size.

The wolf population has not been below 1,600 since the late 1980s. It was estimated as high as 3,020 in the early 2000s, but with a reduced deer population has stabilized at about 2,700 wolves. Minnesota’s wolf population has likely occupied all larger patches of suitable habitat and faces no known major or immediate threats to population persistence. Wolves have slowly established a presence in new parts of the state during the last decade. Areas such as southeastern Minnesota could potentially support wolves, but only a few individuals have been observed on occasion. In addition to considering biological factors supporting long-term wolf survival, the state considers stakeholder preferences, local or regional issues, the ecological and cultural factors, and the importance of Minnesota’s wolf population within in the Great Lakes region. In the Minnesota DNR’s 2019 opinion survey, livestock producers and deer hunters preferred fewer wolves, while residents as a whole preferred more or the same number of wolves.

**Population distribution**

The geographic distribution of wolves is equally important and directly related to a numerical population objective. Minnesota’s population is a regional asset, part of a “meta population” tied geographically to the wolf population surrounding the upper Great Lakes and a southern extension of wolf population in Ontario and Manitoba, Canada. Wolf range in Minnesota has expanded slightly since the 2001 plan. Although not without challenges, wolves have demonstrated they can successfully inhabit a larger portion of the state than previously expected, but with potential increases in human-wolf conflicts. Support for wolves varies depending on landscape features and community characteristics; however, a well-connected and broadly distributed population generally supports long-term wolf conservation in Minnesota and beyond.

If desired, wolf zones are a strategy available to support different population and social objectives. Concepts could include the following:

- **Management zone**: Most of Minnesota will be considered a management zone, where standard implementation of state laws and wolf management rules would be in effect. Areas could be open to hunting or trapping if a season is established, and standard depredation policies would be in place.

- **Protection zone**: Large landscapes with a resource protection purpose could be restricted to any wolf taking (e.g., Voyageurs National Park, the Boundary Waters Canoe Area Wilderness, Minnesota State Parks, Scientific and Natural Areas, tribal reservations as determined by tribal governments). This would offer complete protection for wolves except in defense of human life, under state laws that allow killing wolves to protect domestic animals on private lands, or applied to wolves that exhibit repeated abnormal or aggressive behavior.

- **Research zone**: Areas could be defined by permitted research where wolf-take or other policies would be temporarily modified or restricted to assess effectiveness of management activities,
Wolf research and monitoring needs

Population monitoring is critical for informing and evaluating wildlife conservation and management. Monitoring can take many forms and needs can vary geographically and over time; although monitoring must be sufficient to inform decisions, it also needs to be flexible. The WTC identified the following principles to guide wolf monitoring.

- Monitoring methods (e.g., technologies, statistical analysis options) evolve frequently, so approaches should be adaptable and responsive to geographic and temporal changes and needs.
- Successful, large-scale monitoring requires collaboration among state, federal, tribal, university, and other entities. However, funding sources and approaches vary widely and can be inconsistent (e.g., depending on whether wolves are federally protected) and unreliable (e.g., grants, gifts). Consistent and dependable funding should be available for agencies participating in the Minnesota DNR’s agreed-upon wolf monitoring protocol.
- Distinct management zones (e.g., for population or harvest management) should require monitoring and data collection protocols adequate to assess management effects.

State-funded wolf research should prioritize informing or reducing uncertainty associated with key conservation and management decisions, with research results transparently conveyed to the public.

IV. Goals, objectives, and strategies

The goals in this plan are long-term, outcome-oriented purpose statements. Public, tribal, and other stakeholder and partner input was instrumental in formulating these goals.

- Goal 1. Maintain a well-connected and resilient wolf population
- Goal 2. Collaborate with diverse partners to collectively support wolf plan implementation
- Goal 3. Minimize and address human-wolf conflicts while recognizing diverse wolf values
- Goal 4. Inform and engage the public about wolves in Minnesota and their conservation
- Goal 5. Conduct research to inform wolf management
- Goal 6. Administer the wolf program to fulfill agency responsibilities and public and partner needs

Below each of the goals, this plan lists objectives and strategies:

- Objectives are activities or outputs that support plan goals that can be tracked to determine progress through the life of the plan.
• Strategies are specific, actionable statements describing how the Minnesota DNR will achieve its goals and objectives.

Goal 1. Maintain a well-connected and resilient wolf population

Objective 1A. Conduct wolf population monitoring and research

• Strategy: Annually and as needed with the Minnesota DNR standing wolf technical committee, discuss monitoring results and make any recommended changes to wolf monitoring methods and plans, and discuss wolf research results and priorities (see Goal 5).

• Strategy: Monitor the geographic distribution of wolves and population abundance.
  o During any period in which the federal post-delisting monitoring (PDM) plan/protocol is in effect, monitoring frequency and methods will at least minimally meet those PDM requirements.
  o For the first 2 years after this wolf plan is adopted, annual population estimates (using current methods) will be obtained, as has been the case since 2012.
  o Within two years of this plan’s adoption, the standing wolf committee will review current protocols and make recommendations regarding future monitoring methods and frequency.
  o If a harvest season occurs, hunters/trappers will be required to submit a tooth from any harvested wolf for aging and to participate in a hunter/trapper harvest effort survey.
  o Data on at least one independent population trend indicator will be collected annually (e.g., an existing track survey or a new method).

• Strategy: If a population decline of concern occurs (e.g., falls below 1,600 or a declining trend if below 2,000), the standing wolf committee will discuss the appropriate level of concern, and as necessary recommend research needs and potential solutions to understand and address the concern.

• Strategy: As opportunities arise, collect blood and tissue samples to assess wolf population status and health.
  o The standing wolf committee will develop protocols for collecting biological samples from wolves captured as part of monitoring, research, or depredation control, to facilitate pooled analysis (e.g., population genetics, wolf health) using this disparate information.
  o If a harvest season occurs, data requirements will be similar to those during the 2012-14 seasons. Hunters and trappers will be required to submit all wolves to registration stations for carcass inspection and data collection. Data will be collected to identify location of harvest, sex of animal, and details on methods of harvest, as well as to collect biological samples (e.g., teeth, reproductive tracts of females, other tissues or parasites), record body measurements, and to apply a pelt tag demonstrating that the wolf had been registered appropriately.
Objective 1B. Maintain a population comparable to recent estimates (2,200-3,000, well above the federal recovery goals) and distributed across the majority of current wolf range

- Strategy: Coordinate with the standing wolf committee to evaluate population levels in relation “concern thresholds” and implement progressive mitigating actions if a multiyear declining statewide population trend drops below 2,000.
  - Before population reaches the minimum acceptable level, initiate research to understand contributing factors.
  - Implement management actions designed to reverse trends.
- Strategy: Provide an opportunity for additional public input on wolf management if the statewide population point estimate exceeds 3,000 over multiple, consecutive years and public concerns about negative impacts attributable to wolves concurrently increase.

<table>
<thead>
<tr>
<th>Population level and trend</th>
<th>&lt;1,600</th>
<th>1,600 – 2,000</th>
<th>2,000 – 2,200</th>
<th>2,200 – 3,000</th>
<th>&gt;3,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation measures to reverse decline; does not preclude control of wolves for public safety, livestock depredation</td>
<td>Steadily declining</td>
<td>Local/short-term declines</td>
<td>Present across range</td>
<td>Present across range</td>
<td>Expanding range</td>
</tr>
<tr>
<td>Implement enhanced monitoring and research to determine population decline and contributing factors</td>
<td></td>
<td></td>
<td>Consider more frequent population monitoring, disease surveillance, or other research to assess population status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimal population level with current occupied wolf range; more frequent monitoring if there is a season</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Consider additional public engagement and management actions to address depredation or other public concerns</td>
</tr>
</tbody>
</table>

* Based on previous mid-winter population estimate and other indices of population trends
Goal 2. Collaborate with diverse partners to collectively support wolf plan implementation

Objective 2A. Coordinate and consult with sovereign tribal nations

- Strategy: Annually and additionally as needed, communicate with tribal biologists to plan wolf conservation and management.
- Strategy: Establish a process for consultation with tribal nations on substantive changes in wolf conservation and management.

Objective 2B. Collaborate on research and monitoring activities with tribal and institutional partners

- Strategy: Involve the WTC and other key partners in a standing wolf technical committee leveraging expertise across institutions involved in wolf research and monitoring.
- Strategy: Work closely with the deer, elk and moose committees established by the DNR to evaluate role of wolf predation on these populations to inform wolf management.

Objective 2C. Collaborate on wolf planning and management with tribal and institutional partners, private entities and NGOs

- Strategy: Continuously improve wolf depredation coordination with MDA and USDA-WS and affected stakeholders to help minimize potential wolf-livestock conflict.
- Strategy: Work proactively with livestock producer organizations and interested parties to identify methods, resources, and funding to coordinate and implement preventative wolf depredation practices at key locations and identify best practices for livestock producers.
- Strategy: Communicate wolf conservation objectives so they are incorporated into habitat and other resource management planning (e.g., USFS, state, or county forest management plans).
- Strategy: Communicate with wolf managers from neighboring states and provinces to exchange information about wolf populations and support wolf conservation across boundaries.
- Strategy: Assure that wolf monitoring information adequately addresses USFWS five-year PDM plan reporting requirements to evaluate recovery and listing status.

Objective 2D. Collaborate on wolf education with tribal and institutional partners and NGOs

- Strategy: On an annual basis, provide current and scientifically based information regarding wolves and wolf management in Minnesota that can be used by DNR and other organizations in Minnesota that conduct wolf education and provide information to a variety of audiences.
- Strategy: Partner with organizations to develop materials and programs that are available as resources to share and educate people about wolves.
  - Email newsletters to subscribers with information about wolves and wolf conservation on a quarterly basis.
Goal 3. Minimize and address human-wolf conflicts while recognizing diverse wolf values

Objective 3A. Prevent and reduce human-wolf conflict

- Strategy: Provide information directly and through partners on avoiding human-wolf conflict, including on wolf ecology/behavior and on human practices for successful coexistence.
- Strategy: Share best practices and provide technical guidance to livestock producers and pet owners on preventative and non-lethal wolf depredation deterrence methods.

Objective 3B. Implement statewide mitigation of wolf damage and related conflicts

- Strategy: Continue support for MDA compensation program by providing best information for investigators to identify wolf damage for depredation claims. Train as needed an adequate number of investigators and Conservation Officers trained by the DNR and USDA WS.
- Strategy: At request of tribal governments, allow co-investigation by tribal officers and Minnesota DNR Conservation Officers of wolf damage and conflict in and adjacent to tribal reservations.
- Strategy: When allowed, provide effective state directed wolf control, including the use of private certified wolf trappers, in response to verified claims of damage to livestock or pets.
  - Remove the use of two different zones for wolf depredation control in Minnesota to enable consistent response to wolf depredation conflicts. Recommend legislative action to eliminate the distinction between current depredation zones (i.e., remove zone B depredation zone and apply wolf depredation management consistently across the state, retain control and take of wolves currently defined by 97B.645 for remainder of the state).
  - Following removal of zones B designations, identify provisions for control of wolves in areas where chronic wolf depredation conflicts occur (i.e., repeated depredations over two years or multiple incidents in a calendar year) when prevention has been ineffective.

Objective 3C. Provide information on conflicts

- Strategy: Develop an online integrated wolf depredation conflict information system to inform the public of claims, compensation, nonlethal and mitigation strategies tracking, and wolf control numbers/details.

Goal 4. Inform and engage the public about wolves in Minnesota and their conservation

Objective 4A. Provide baseline information on wolves to diverse audiences statewide

- Strategy: Annually publish a wolf committee report to communicate wolf population monitoring activities, management actions, and recommendations.
Objective 4B. Involve communities in wolf research, monitoring and management

- Strategy: Identify the best ways to reach various audiences by understanding where they get information. Implement strategies that effectively communicate wolf information.
- Strategy: Identify public reporting (e.g., an online wolf sighting application) and community science (sometimes called citizen science) opportunities related to wolves, to involve the public and contribute to research and monitoring.
- Strategy: Conduct regular public engagement on wolf management, using multiple methods involving diverse stakeholders, through wolf-focused opportunities and as part of related efforts (e.g., deer, elk or moose planning).

Goal 5. Conduct research to inform wolf management

Objective 5A. Collaborate with agency and academic institutions and NGOs to improve shared understanding and information about wolves

- Strategy: Engage the standing wolf technical committee as a research collaborative for identifying information needs and research priorities and to work toward shared consensus on data collection and interpretation.
- Strategy: State-funded wolf research will prioritize projects designed to inform, or reduce uncertainty associated with, key wolf conservation and management decisions.

Objective 5B. Improve ability to estimate wolf population in response to management actions or changing conditions

- Strategy: Identify limitations with current wolf population survey and assess opportunities for improvement.
- Strategy: Review, evaluate, or develop potential alternative methods for monitoring the wolf population.

Objective 5C. Evaluate Minnesotans’ values, beliefs, attitudes and behaviors regarding wolves and wolf management

- Strategy: Periodically conduct scientific surveys of relevant stakeholder groups, including all Minnesota residents, especially before major wolf policy decisions.
- Strategy: Pursue research opportunities to better understand the sources of human conflicts about wolves and methods to reduce them.
Objective 5D. Conduct research to more effectively address wolf depredation through non-lethal and cost-effective means

- Strategy: Design or support studies to address information gaps about tools to reduce or mitigate the impacts of wolf depredation (e.g., conduct research on the effectiveness and return on investment of non-lethal and other depredation management methods).

Objective 5E. Conduct research to evaluate wolf management strategies that support healthy prey populations

- Strategy: When permitted, design or support studies to address information gaps about the impacts of wolf predation on moose and deer.
- Strategy: When permitted, evaluate wolf control in reversing trends in moose population declines.

Goal 6. Administer the wolf program to fulfill agency responsibilities and public and partner needs

Objective 6A. Deliver effective, transparent wolf governance and decision-making

- Strategy: Develop a transparent and scientifically-informed process to make decisions about potential wolf harvest seasons (see season decision framework in Appendix 2)
- Strategy: As included in the season decision framework, coordinate with sovereign tribal nations on any decisions regarding wolf hunting or trapping on nontribal land within reservation boundaries and land adjacent to reservations.

Objective 6B: Secure funds to implement agency wolf management and support synergistic partner efforts

- Strategy: Broaden the funding sources that support wolf management, aligned with department efforts.
  - Advocate for revenue sources in addition to wolf and deer season fees (e.g., a wildlife conservation stamp).
  - Provide base wolf program funding through a combination of General Fund and Game and Fish Fund appropriations, reflecting the breadth of Minnesotans who value wolves.
  - Communicate applied wolf monitoring and research priorities to potential funding agents and sources (e.g., LCCMR).
  - Include in Outdoor Heritage Fund applications projects that protect, restore, and enhance habitat and resources that support wolves.
- Strategy: Maintain current funding sources that support strategies defined throughout the plan.
Strategy: Parallel to declines in the Wolf Management and Monitoring Account, work with the DNR wolf technical committee to identify program components to curtail or modify in the event adequate, base-level funding is not available (e.g., reduce the frequency of population monitoring).

Objective 6C: Explore policy and funding options for evolving wolf depredation control and compensation

- Strategy: Evaluate, and if found promising propose, new policies and actions to reduce damage compensation from state funds (e.g., compensation in lieu of control, premiums for wolf depredation compensation payments, pay for protection tax policies or incentives, enhanced insurance policies).
- Strategy: Provide producer incentives for preferred, cost-effective strategies. Identify grant funding to support a certified wolf conservation farm program for implementing preventative strategies.
- Strategy: Practice continuous improvement of wolf depredation management techniques by identifying farms of highest risk, repeated damage, and factors that increase risk of depredation.

V. Performance Measures

The Minnesota DNR will track and report publicly its progress implementing strategies in the plan. Performance measures are quantitative metrics commonly used to foster transparency and accountability and can also inform management decisions. Specific performance measures (Table 4) were selected to reflect the full scope of goals in this wolf management plan, with an emphasis on objectives anticipated to have broad public interest. Selected measures were also chosen based on efficiency of measurement for regular communication of management activities and tracking of overall progress toward goals in plan implementation.

Table 4. Key performance measures

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Measure</th>
</tr>
</thead>
</table>
| Goal 1. Maintain a well-connected and resilient wolf population | Objective 1B. Maintain a population comparable to recent estimates (2,200-3,000, well above the federal recovery goals) and distributed across the majority of current wolf range | Annual or other regular estimate of wolf population
Estimate of occupied wolf range (mi²) |
<table>
<thead>
<tr>
<th>Goal 2. Collaborate with diverse partners to collectively support wolf plan implementation</th>
<th>Objective 2A. Coordinate and consult with sovereign tribal nations</th>
<th>Objective 2C. Collaborate on wolf planning and management with tribes and institutional partners, private entities and NGOs</th>
<th>Annual communications and coordination with partners to assess development and implementation of strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Objective 2D. Collaborate on wolf education with tribal and institutional partners and NGOs</td>
<td>Biennial review and update of general wolf information coordinated through partners</td>
<td>The number of referrals to partner websites</td>
</tr>
<tr>
<td>Goal 3. Minimize and address human-wolf conflicts while recognizing diverse wolf values</td>
<td>Objective 3A. Prevent and reduce human-wolf conflict</td>
<td>The number of farms with chronic wolf depredation</td>
<td>The number of farms using non-lethal prevention strategies based on farms visited by USDA-WS</td>
</tr>
<tr>
<td>Goal 4. Inform and engage the public about wolves in Minnesota and their conservation</td>
<td>Objective 4B. Involve interested individuals in wolf research, monitoring and management.</td>
<td>The number of opportunities for involving members of the public in wolf monitoring and research</td>
<td>The number of opportunities for public input on wolf management</td>
</tr>
<tr>
<td>Goal 5. Conduct research to inform wolf management</td>
<td>Objective 5B. Improve ability to estimate wolf population</td>
<td>Analysis and report of wolf monitoring, with adoption of appropriate recommendations</td>
<td></td>
</tr>
<tr>
<td>Goal 6. Administer the wolf program to fulfill agency responsibilities and public and partner needs</td>
<td>Objective 6B. Secure funding to administer wolf management program</td>
<td>Development and recommendation of diverse and resilient funding mechanisms sufficient to administer wolf management, research, and education as identified in wolf plan</td>
<td></td>
</tr>
</tbody>
</table>
Appendices

Appendix 1. Input report

To be inserted – summary of tribal, public and technical committee input.
Appendix 2. Proposed Season Decision Framework

A. Purpose

The mission of the Minnesota Department of Natural Resources (DNR) is to work with Minnesotans to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life. MS 97B.646 directs the DNR to “in consultation with the commissioner of agriculture, ... adopt a wolf management plan that includes goals to ensure the long-term survival of the wolf in Minnesota, to reduce conflicts between wolves and humans, to minimize depredation of livestock and domestic pets, and to manage the ecological impact of wolves on prey species and other predators.”

Departmental decisions about future seasons will occur only after completion of the update to the 2001 wolf management plan and in recognition of any federal ESA listing status. Particularly complex social and biological factors underlie a future decision, so the DNR has developed this framework as an appendix to the plan update to describe in greater detail how the DNR’s season-related decisions will be made in the future if wolves are once again removed from the federal ESA. Therefore, this document assumes overall wolf management is implemented per the plan itself, and does not reiterate the full suite of strategies upstream or independent of a season decision. The framework also proactively describes critical factors that require consideration and deliberation to hold a season, including communication, season design, and harvest levels.

It is essential to emphasize that this decision framework will not prescribe an outcome (i.e., whether a season will ultimately be implemented). Rather it focuses on the factors that will be considered and the process that will be followed, supporting transparency and efficiency for making season-related decisions, in consultation with the public and the DNR’s management partners.

B. Background and assumptions

Decisions to hold regulated wolf hunting and trapping seasons rest on several key assumptions about DNR’s legal authorities under state and federal statute; information sufficiency about wolf population dynamics, harvest reporting, and monitoring; public opinion about wolf hunting and trapping; tribal perspectives; and DNR’s historical experiences pertaining to wolf harvest. The following information provides a starting point for any discussion about wolf hunting and trapping seasons.

- Minnesota DNR has authority to prescribe wolf seasons under MS 97B.645, after ESA delisting.
- There have been a number of delisting and subsequent listing decisions as a result of court rulings, including current litigation challenging the most recent wolf delisting decision.
- There is an abundance of data and research to inform a decision about wolf season implementation.
- DNR implemented a wolf season for three years (2012-2014) in a manner that maintained the wolf population above recovery levels.
- Harvest levels can be controlled through a regulated season structure.
• Wolves have significant cultural and social value in Minnesota. The value of and relationship with Ma’iingan (Anishinaabe) or Šuáktokça (Dakota) is important for indigenous Minnesotans.
• Minnesotans are divided in their support for a wolf season.
  o Nearly 50% of Minnesotans oppose and 41% support a wolf hunting season. Opposition is higher for a wolf trapping season with nearly 60% of Minnesotans opposed and 30% in support.
  o High support for a season exists among deer hunters and livestock producers, and presumably other un-surveyed sub-groups (e.g., trappers, other hunters).

C. Guiding principles

The DNR offers the following guiding principles for its approach to making a future decision about holding regulated wolf hunting and trapping seasons.

• Conservation and stewardship – Wolf season decisions will promote responsible stewardship, be consistent with long-term wolf population viability, and maintain ecological function. Allowable harvest levels will be consistent with population levels identified in Objective 1b of the 2022 Minnesota Wolf Management Plan. If implemented, any harvest must be regulated and monitored responsibly.
• Tribal involvement – Tribal governments must be consulted regarding the potential for a season, with a goal of identifying and pursuing a mutually acceptable decision.
• Science – The decision whether to have a season will be informed by best available science.
• Monitoring – Adequate population monitoring methods should be in place. Monitoring methods and principles would be drafted by the Wolf Technical Team and included in the Wolf Management Plan.
• Public involvement and input – Perspectives regarding social, cultural, biological, and economic considerations related to wolf conservation and management will be solicited and considered in the decision process.
• A wolf season proposal will define the purpose(s) and have measurable objectives.

D. Framework

This framework has been developed as a proposed means to publicly discuss, develop, and communicate recommended principles and considerations that can be used by the State of Minnesota to inform a future decision about whether to hold a wolf season, and if a season is determined appropriate, to meet management objectives and frame how to structure/implement a season.

Decision phase I. The DNR will consider the following criteria in determining whether to implement a wolf season:

Criterion 1: Is there is a legal basis to implement a season?

• A season may only occur after wolves have been removed from ESA protections.
- M.S. 97B.645 and 97B.647 establish the Commissioner’s authority to prescribe a season and provide a mechanism for implementation. Statute also requires an opportunity for public comment before prescribing open seasons and restrictions on taking wolves.

- Assure recognized treaty obligations are met.

**Criterion 2: Does adequate information exist to inform the decision?**

- Available biological information should include:
  - Recent Minnesota wolf population survey data, including:
    - A recent population estimate with an associated margin of error.
    - Survey data that indicate no statistically significant declining trend in population size or distribution of wolves that is of current ecological concern.
    - The population estimate exceeds 1,600 (minimum population estimate in the 2022 Plan to consider a season; a buffered amount above the Minnesota-specific 1992 federal recovery criterion of 1,251-1,400 wolves).
    - Any harvest would not negatively impact the state’s ability to maintain a population consistent with wolf plan goals.

- Available social information should include:
  - Recent representative attitude surveys and self-selected public input.
  - Public and stakeholder engagement has been conducted on a specific proposal or range of alternatives (must meet requirement of M.S 97B.645, Subd. 9 to “provide opportunity for public comment”).

- Available intergovernmental information should include:
  - Under *Minnesota Statutes, Chapter 10.65*, meaningful and timely consultation with all tribes in Minnesota has occurred to facilitate mutual understanding and inform decision making on a proposed season, with the goal of achieving mutually beneficial solutions.

**Criterion 3: Would the proposed season support one or more of the following objectives defined in the plan, acknowledging there are tradeoffs among objectives?**

- To reduce prey impacts/conserve prey species
- To reduce depredation on domestic animals.
- To manage the wolf population (e.g. manage disease outbreak or local population concerns).
- To provide social and cultural opportunities.

Potential objectives of harvest could focus on providing outdoor opportunity and/or addressing conservation or management concerns related to wolves or species with which they interact. Harvest seasons undertaken to address a conservation or management concern should be designed, conducted, documented, and monitored as part of a transparent management or research plan or proposal. At the same time, any season should maintain the ecological function of wolves and not affect the recreational opportunities of wildlife viewers.
Decision phase II. If the DNR implements a wolf season, the season structure will incorporate the following components:

- Population components:
  - Wolf harvest will not cause long-term, statewide population decline.
  - Localized declines may occur based on management objectives.
  - Harvest rate will be dependent on statewide population size, trend, and distribution. May be adjusted locally to address management objectives.

- Geographic components:
  - Harvest will be coordinated with tribal nations in a way that acknowledges and respects tribal sovereignty and tribes’ role in wildlife management within ceded territories, while also balancing non-tribal private property interests and public access.
  - Zones may be used to manage harvest in relation to off-reservation treaty rights.
  - Zones may be used to address different management objectives by landscape region.
  - Zones may be established to evaluate wolf harvest impacts or for other research purposes.

- Responsive management approach:
  - Each year, regulations and seasons will be modified if needed, based on population trends, changing management objectives, or in response to changing socioeconomic interests.

E. Implementation recommendations (only relevant if the state decides to hold a season)

The following are recommendations offered by the DNR to demonstrate transparency and facilitate dialogue, in the case of a future decision to implement a season.

Communication and continued engagement

- Transparency:
  - Information used and any management objectives for a season will be communicated publicly, using a combination of effective communications tools. (e.g., through email announcement to GovDelivery subscribers or other appropriate contact lists, webpage postings, and by news release).

- Engagement:
  - Regular engagement opportunities will gather public feedback on the season decision and implementation.

Season design

- Allocation:
  - Permit numbers determined based on harvest goal and reliable data on expected success rates of different users groups/methods.
• Equitable harvest allocation if different seasons/methods are permitted.

**Timing:**
- Harvest seasons occur after Nov. 1 and before Feb. 1 (i.e., outside primary reproductive season with prime pelt conditions, and when potential conflict with other outdoor user groups is minimized to the extent possible).

**Monitoring:**
- Post-season surveys are conducted to collect detailed data on harvest effort.
- Mandatory harvest registration and carcass collection to collect information on harvest date and method, and the age, sex, health, and location of wolves.

**Closing season:**
- Ability to close season quickly when allowable harvest is reached.
- Harvest is monitored daily and season closed based on trends in registration that indicate harvest goal will be met.

**Harvest levels**

- Allowable harvest levels will be informed by research:
  - Prior to implementation, harvest scenarios will be fully evaluated using best available information. Considerations of all anthropogenic mortality will inform overall level allowed for wolf harvest.

- Allowable harvest will correlate positively with population size within the following parameters:
  - No harvest if the population point estimate (previous winter, or most recent) is less than 1,600, unless in specified zones as part of an approved research program.
  - Maximum harvest rate based on Objective 1b of Minnesota Wolf Management Plan, except if part of an approved limited-duration or limited-area management program.

- A wolf technical committee, in coordination with tribal biologists, will recommend harvest levels to the DNR annually. The committee will consider available data and clearly document its rationale.

- Season evaluation and analysis:
  - Summarize data of metrics described in season design.
  - Produce report of annual season information and outcomes.

**Exceptions:** If management-focused harvest objectives (e.g., see Criterion 3 in Section D above and adjustments in Section F below) are established/approved, deviations from Season Design and Harvest Level section guidelines above may occur. Table A-1, below, indicates potential levels of harvest that could be considered while also ensuring long-term viability of the wolf population.

**Table A.1. Potential harvest rates, by population level, if season management is implemented**

<table>
<thead>
<tr>
<th>Population level and trend</th>
<th>&lt;1,600 Trending downward</th>
<th>1,600 – 2,000 Trending downward</th>
<th>2,000 – 2,200 Trending upward</th>
<th>2,200 – 3,000 stable</th>
<th>&gt;3,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest level considerations**</td>
<td>0</td>
<td>&lt; 5%</td>
<td>5-10%</td>
<td>10-20%</td>
<td>20%+</td>
</tr>
</tbody>
</table>
Studies have suggested <30% anthropogenic mortality is generally sustainable for wolf populations to persist. Therefore, potential harvest rates would need to consider annual fluctuations in human-related mortality unrelated to a hunting/trapping season. Any actual proposed harvest rate would vary based on knowledge of other sources of other anthropogenic mortality, such as wolves taken for depredation control and would be vetted by a wolf technical committee.

F. Adjustment to season framework

- If significant adjustments are proposed to this framework, the DNR will consult the Wolf Research and Management Committee and conduct tribal consultation and public engagement as needed. Foreseeable adjustments significant enough to warrant this review could include changes to management objectives, harvest level guidance, or management zones/buffers.
Appendix 3. Select list of post-2001 wolf research publications from Minnesota/annotated bibliography


Mech, L.D., and S.M. Barber-Meyer. 2020. Sixty Years of White-tailed Deer (Odocoileus virginianus) Yarding in a Wolf (Canis lupus) and Deer System. The Canadian Field-Naturalist 133(4)
https://doi.org/10.226521/cfn.v133i4.2136


Minnesota Department of Natural Resources. 2001. Minnesota wolf management plan. Minnesota Department of Natural Resources, St. Paul.


DOI:10.1080/09524622.2021.2006083


Appendix 4. Post delisting guidelines for addressing wolf-human conflicts in Minnesota

Note: Although much of this guidance applies while wolves are listed under the federal Endangered Species Act, not all options are available unless wolves are delisted because the federal law would supersede state laws. It is included to provide more specific guidance of wolf-human conflicts to consider for prevention and mitigation of wolf-human conflict that is not detailed in this plan.

The Minnesota Department of Natural Resources (Minnesota DNR), through engagement with the public and the committees formed to update Minnesota's Wolf Management Plan, developed these guidelines to provide an overview of policies and procedures to support wolf conflict situations. The purpose is to summarize policies and procedures that guide the Department's efforts in addressing wolf-human conflict and to reduce conflicts between wolves and livestock. All parties have an interest in preventing and reducing the severity of conflicts when they occur. These guidelines suggest a variety of measures livestock producers can take to reduce the wolf-livestock conflicts and summarizes the procedures for directed wolf control when conflicts occur.

The guidance draws on a diversity of perspectives expressed by people throughout the state for protecting wolf populations and reducing conflict. These values include maintaining a healthy and resilient wolf population, providing technical guidance and resources for preventing conflict to support livestock producers where conflicts occur, and reducing loss of wolves and the potential impacts associated with wolves in areas that have conflict. The guidance in this document lays out the DNR approach to increase the transparency and accountability of the Department’s activities and management actions related to wolves.

Although Minnesota law enables individuals and the DNR to take action to protect livestock and pets from wolf conflict, additional guidance is needed to provide detail on tools and actions DNR uses to reduce wolf-livestock interactions to support wolf conservation and address human-wolf conflict. The goal of the tools and approaches described in this document are to take steps to reduce the potential for wolf depredations on livestock while continuing to promote responsible wolf stewardship. To increase tolerance for wolves and encourage coexistence with wolves in a human dominated landscape, some tools will increase public awareness of the challenges associated with livestock production, living in wolf country, and reducing conflict with recreational activities in parts of Minnesota where wolf populations occur.

Approximately two-thirds of Minnesota’s wolf population shares a landscape where livestock occur and nearly all of wolf range overlaps with places where people live and recreate. Everyone should be aware of the possibility of wolf-human conflict when living and recreating in Minnesota’s wolf range. Proactive steps can be taken to be best prepared when participating in activities that could result in negative interactions with wolves.

These guidelines describe a variety of prevention measures that can assist livestock producers and pet owners to evaluate best methods to consider for their particular situation. Although no single or combination of prevention measures guarantee against conflict, the DNR supports the application of these methods to help reduce conflict. The guidelines also describe the criteria for and implementation
of lethal removal of wolves and claims for compensation payments available for livestock killed by wolves administered by the MDA.

**Wolf management responsibilities**

The Minnesota DNR Section of Wildlife has primary responsibility for the management of wolves in Minnesota, and the Minnesota DNR Division of Enforcement, in addition to protecting public safety and natural resources, enforce natural resource laws and regulations. Minnesota conservation officers (COs) are also primary investigators in wolf depredation claims. The DNR has entered into a cooperative services agreement with USDA-Wildlife Services (WS) to assist with wolf depredation conflict. During periods when wolves are not under federal ESA protection, DNR Wildlife and Enforcement also administer a directed predator control program where private certified trappers are authorized to take wolves where conflicts occur.

Tribal authorities have responsibility over all wolf management activities on lands owned or managed by the respective tribe within reservation boundaries. Minnesota DNR manages wolf conflicts occurring on properties that are within reservation boundaries owned by non-tribal entities in coordination with tribal staff.

The MDA administers a program to reimburse livestock owners for verified losses caused by wolves. Additionally, MDA administers a grant program for Minnesota livestock producers to deploy strategies that help reduce wolf-livestock conflict.

**Wolf conflict prevention measures**

Minnesota’s diverse landscape supports a robust wolf population. Sometimes challenges arise where human activities intersect with places where wolves live, whether on public land or in people’s back yards. Most wolf-human conflicts in Minnesota, besides livestock interactions, occur in association with dogs.

**Human safety**

The likelihood of wolves attacking people is extremely low. Wolves typically avoid people and areas of human activity. Millions of people live and recreate in parts of Minnesota where wolves occur without incident. Incidents of wolf attack on humans have involved sick or habituated wolves that have contributed to the wolf’s abnormal or unusual behavior. Even though the risk of wolves attacking people is low, people should not intentionally attract or feed wolves, and should always maintain a safe distance.

(Text box)

MS 97B.645. Subd. 4. Harassing wolves.

To discourage wolves from contact or association with people and domestic animals, a person may, at any time and without a permit, harass a wolf that is within 500 yards of people, buildings, dogs, livestock, or other domestic pets and animals. A wolf may not be purposely attracted, tracked, or searched out for the purpose of harassment. Harassment that results in physical injury to a wolf is prohibited.

(Text box)
MS 97B.645. Subd. 3. Destroying wolves in defense of human life.
A person may, at any time and without a permit, take a wolf in defense of the person's own life or the life of another. A person who destroys a wolf under this subdivision must protect all evidence and report the taking to a conservation officer as soon as practicable but no later than 48 hours after the wolf is destroyed.

Wolves and pets
Wolves kill pets occasionally when they encounter them. A number of dogs are attacked or killed by wolves each year in Minnesota. Wolves are territorial and recognize dogs as competitors because they are a closely related species. Wolves can be most aggressive during the spring and summer months when they are raising pups at dens or rendezvous sites, or near locations where they make a kill, and can also be more aggressive during the winter breeding season.

There are ways to reduce conflicts between wolves and dogs by taking some precautions. Do not leave dogs unattended in yards or allow them to range freely in areas where wolves occur. Keep pets on a leash or under verbal control when walking or recreating in areas where wolves occur. When hunting with dogs, avoid areas of high wolf activity and learn to identify wolf sign to avoid or leave areas when you observe it. Avoid feeding deer. Awareness of these actions will help protect dogs from attack by wolves.

An owner of a domestic pet may, at any time and without a permit, shoot or destroy a wolf when the wolf is posing an immediate threat to a domestic pet under the supervision of the owner. A person who destroys a wolf under this subdivision must protect all evidence and report the taking to a conservation officer as soon as practicable but no later than 48 hours after the wolf is destroyed.

Wolves and livestock
Wherever wolves and domestic animal range overlaps, some depredation occurs. In Minnesota, the conflict has been a management problem for livestock producers and agencies responsible for wolf conservation. Both opponents and supporters of wolf recovery have closely monitored the extent of the problem. Wolf conflict management in Minnesota administered by agencies involved in wolf management has historically been primarily focused on the removal of depredating wolves to address recent or ongoing depredation events. Conversely, the proactive prevention of livestock losses has generally been left to individual livestock producers, although state (MDA) and federal (USDA-WS) funding have contributed to preventative conflict reduction efforts in recent years. This paradigm has been in place throughout the recovery phase of wolf conservation in Minnesota; a more formal integrated approach should provide broader acceptance for addressing future problems.

The University of Minnesota conducted a study in the late 1990’s to assess management practices that could prevent wolf depredation. Although no methods were identified that are certain to prevent wolf depredation, the study illustrated that removing depredating wolves was effective at preventing additional losses at the farm. In addition, some farmers and ranchers support practices that they think...
help reduce livestock depredation by wolves, including maintaining a healthy herd, use of guard animals, and calving and lambing in areas where they can be closely monitored near human activity.

As wolf recovery has expanded to additional parts of the United States, more emphasis has been placed on the use of non-lethal wolf depredation prevention methods, especially in areas of small recolonizing wolf populations. As these tools have become more common in use, the pros and cons of many methods have become more evident. Although few if any will prevent all wolf-livestock conflict, any implementation that can reduce the loss of livestock, economic impacts to producers, and number of wolves killed should be considered by wolf management interests.

DNR encourages livestock producers in Minnesota to use preventative measures to reduce the likelihood for conflict. However, best strategies for reducing wolf depredation incidents may not be cost effective or always effective. Nonetheless, non-lethal methods that reduce the incidence of wolf-livestock conflicts can be implemented before conflict with livestock and wolves occur. Implementation of these practices can be improved by providing technical guidance and identifying funding partnerships for farmers to help implement these strategies. Some strategies that have been found to be effective are listed here:

**Wolf-livestock depredation prevention toolbox**

1. Human Activity
   - Increased human activity in and around pastures occupied by livestock. Check on livestock on a daily basis and check perimeter for wolf activity. Monitor livestock for changes in behavior and condition. The presence of human activity can be a disturbance to wolves and help detect the presence of wolves to increase activity or implementation of additional strategies.

2. Proper carcass disposal
   - Promptly remove any dead animals from farms to limit attracting wolves from scavenging on carcasses.
   - Minnesota Board of Animal Health requires proper disposal within 72 hours by burying, burning, or composting. Use a rendering service if available.

3. Fencing
   - Use fencing that limits wolf movement in or out of a pasture.
     - Permanent – woven-wire or electric
     - Temporary or portable – fladry/turbo fladry

4. Guard animals
   - Donkeys, guard dogs, or other animals may be appropriate depending on the application

5. Scare devices
   - Lights and audible devices that can be placed in pastures or calving and lambing areas to scare wolves away

6. Calving and lambing activities near barnyard
   - Concentrate activity in area where it is more protected and can be closely monitored.
State and federal wolf depredation mitigation grants

The Minnesota Legislature first funded Wolf-Livestock Conflict Prevention Grants in 2017. The program is administered by MDA and is available to livestock producers through a competitive grant application process. Although the Minnesota Legislature only funded these grants for two years, MDA received a grant from the U.S. Fish and Wildlife Service (USFWS) to continue to award grants to producers. The grant must be matched, depending on the grant application requirements, by the producer and can be utilized for the tools listed that support measures demonstrated to effectively reduce wolf-livestock conflicts.

Minnesota DNR directed wolf control

From 1975-2011, while wolves were listed under the ESA, wolf damage management was primarily conducted by the federal government, by the USFWS from 1975-1986 and by WS (under USFWS and Minnesota DNR authorization) up to the present. While wolves were under state and tribal management in 2012-2014, WS continued to be the primary agency to control depredating wolves under a cooperative agreement with the Minnesota DNR. Under state management, private landowners can take depredating wolves under certain conditions and state-certified wolf controllers are authorized to assist livestock producers with wolf depredation control.

When conflict does occur, State law allows individuals to take wolves, under certain conditions, and use of targeted lethal control is authorized under state directed wolf control.

When dead or wounded livestock or other domestic animals are identified and cause of death or injury is suspected to be wolves, livestock producers can report claims to Minnesota DNR Conservation Officers (COs); USDA-WS; and in Kittson County, the Sheriff’s Department. Trained investigators play a crucial role in determining wolf claims and recommending management actions to reduce wolf damage to livestock. When a determination is made of active wolf depredation conflicts, targeted wolf removal is provided by WS or state-certified wolf control trappers. Where permitted under applicable regulations and federal, state, or tribal authorizations, wolves are removed as humanely as possible using foot-hold traps, cable devices, and shooting.

Wolf depredation compensation payments

In 1977, the Minnesota Legislature established a compensation program to pay farmers for verified livestock losses by wolves. The Minnesota Department of Agriculture (MDA) receives an appropriation...
of $350,000 each biennium to reimburse wolf depredation claims made by livestock producers. Over the
last 10 years, the MDA has paid between 80-140 claims worth approximately $100,000-$250,000 per
year.

To be reimbursed for livestock lost to wolves, an assessment of livestock losses and eligibility for
payment of compensation is completed that includes WS, COs or approved investigators, MDA, and
county extension agents.

---

**START**

1. Discovery of loss by producer
2. Report to investigator within 48 hours

---

**Investigator**

3. Investigation of loss on farm
4. Claim form completed and sent to MDA with findings

---

**MDA**

5. Claim form checked for completeness and investigation findings reviewed
6. Claim form set to Extension for market value

---

**Extension**

7. Market value of killed livestock determined
8. Claim form completed and returned to MDA with market value

---

**MDA END**

7. Claim denied
8. Producer notified

---

**MDA END**

9. Completed claim form processed for payment
Appendix 5. Wolf attitudes summary report

To be inserted upon final publication

https://files.dnr.state.mn.us/fish_wildlife/wildlife/wolves/summary_attitude_report.pdf
Appendix 6. List of tribal wolf management documents

To be further developed, examples include:

- LLBO council resolution (1998)
- LLBO tribal note (2021)
- Wolf (Ma’iingan) Management Plan Red Lake Band of Chippewa Indians
- Red Lake council resolution
- White Earth council proclamation