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2 **Wolf Management Plan Update**

3 **Executive Summary**

4 To be developed

5 **Contents**

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

34 Goal 6. Administer the wolf program to fulfill agency responsibilities and public and partner
35 needs 27

36 V. Performance Measures 28

37 Appendices..... 1

38 Appendix 1. Input report..... 1

39 Appendix 2. Proposed Season Decision Framework..... 2

40 A. Purpose 2

41 B. Background and assumptions 2

42 C. Guiding principles 3

43 D. Framework 3

44 E. Implementation recommendations (only relevant if the state decides to hold a season) .. 5

45 F. Adjustment to season framework 7

46 Appendix 3. Select list of post-2001 wolf research publications from Minnesota/annotated
47 bibliography 1

48 Appendix 4. Post delisting guidelines for addressing wolf-human conflicts in Minnesota 5

49 Wolf management responsibilities 6

50 Wolf conflict prevention measures..... 6

51 Minnesota DNR directed wolf control 9

52 Wolf depredation compensation payments 9

53 Appendix 5. Wolf attitudes summary report 11

54 Appendix 6. List of tribal wolf management documents..... 12

55

56 **I. Introduction**

57 **Vision for wolves**

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

64 **Plan purpose and structure**

65 To support the vision above, this plan describes goals, objectives and strategies for Minnesota’s
66 approach to wolf stewardship. Wolves connect with all parts of the Minnesota DNR’s mission.

<p>(Text box) The Minnesota DNR “shall 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.” –Minnesota Statutes 97B.646</p>	<p>(Text box) The mission of the 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.</p>
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67 Minnesotans differ greatly in how they value wolves and want them conserved and managed. This is
68 perhaps truer for wolves than any other wildlife species in the state. This plan’s goals seek to
69 incorporate the diverse views of Minnesotans, while adhering to the statutes guiding Minnesota wolf
70 management and supporting the Minnesota DNR’s mission. Importantly, the plan emphasizes
71 cooperation and collaboration with tribal, federal, and state governments; non-governmental
72 organizations; and other partners. This plan will guide wolf management for 10 years, and will be
73 evaluated and revised if necessary five years after adoption. In support of the plan’s goals, management
74 actions are continually adapted to current conditions, trends, and the best scientific information.

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

84 **Plan context**

85 The Minnesota DNR is responsible for conservation and management of the state’s wildlife, including
86 wolves. Although the state had been actively supporting wolf conservation for decades, the Minnesota
87 DNR, in consultation with the Minnesota Department of Agriculture (MDA), adopted its first wolf
88 management plan in 2001. The 2001 plan was initiated in response to the U.S. Fish and Wildlife Service’s
89 (USFWS) recommendation to remove federal Endangered Species Act (ESA) protections for the gray
90 wolf. In 1992, the USFWS set a population recovery goal for Minnesota at 1,251 to 1,400 wolves; by
91 2001 the population was roughly double the upper end of that goal. The 2001 plan provided a
92 framework to accomplish a goal the Minnesota DNR articulated in 1998 of “ensuring the long-term
93 survival of the wolf in Minnesota, and also to resolving conflicts between wolves and humans.” Although
94 it was developed in response to federal action, the 2001 plan has guided wolf management through
95 multiple ESA listing and delisting decisions.

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

103 **Planning process**

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

111 *Table 1. Plan update development process*

Date	Process component	Description	More details
2019	Internal project scoping and planning	Minnesota DNR leadership and staff developed project framework	n/a
2019	Public attitude survey	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	Appendix 5: Minnesotans’ Attitudes Toward Wolves and Wolf Management (2020)

Date	Process component	Description	More details
2019-2022	Tribal coordination and consultation	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	Appendix 1: Input summary
2020	Public input process <ul style="list-style-type: none"> • Online questionnaire and forum • Online open house 	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	Appendix 1: Input summary
2020-2022	Wolf plan advisory committee (WPAC)	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	Appendix 1: Input summary
2020-2022	Wolf technical committee (WTC)	State, federal, tribal, and NGO experts convened to review the previous wolf plan and recommend plan update strategies	Appendix 1: Input summary
2022	Public comment and review process	Draft plan posted for public review and comment	Appendix 1: Input summary
2022	Final adoption of plan		

112 **II. Background and Current Conditions**

113 **Minnesota's wolf population**

114 **Wolf population size and distribution**

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

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

124 From the late 1970s until the late 1990s, the wolf population expanded in number and distribution. The
125 highest population estimate of 3,020 wolves occurred in the winter of 2003-2004, which coincided with
126 high deer populations as indicated by hunter harvest and modeled deer density estimates. With ESA
127 protections and a growing deer population, wolves in Minnesota increased from the 1970s to late
128 1990s. Since the late 1990s, the population of wolves in Minnesota has stabilized with relatively little
129 change in number and distribution.

130 Since the late 1970s, Minnesota has conducted standardized monitoring to delineate wolf distribution
131 and estimate average territory and winter pack size. To define wolf range, delineation surveys were
132 conducted at approximately 10-year intervals (1978, 1988, 1997) before transitioning to approximately
133 5-year intervals (2003, 2007, 2012, 2017). Results indicate range and population expansion through the
134 1997-1998 survey, no range expansion from 1998-2007, and then some range expansion in both 2012
135 and 2017 (Erb et al. 2018; Figure 1). Current occupied wolf range (the area within total range occupied
136 by wolf packs) is estimated to be 28,561 mi², approximately one third of the state. From 1978-2008,
137 winter population size increased from around 1,200 to 3,000, an average rate of 3% per year. Although
138 not statistically different, population point estimates have been lower in the last decade, with the winter
139 population remaining stable the last five years at around 2,700 wolves (Figure 2).

140 Figure 1. Wolf range

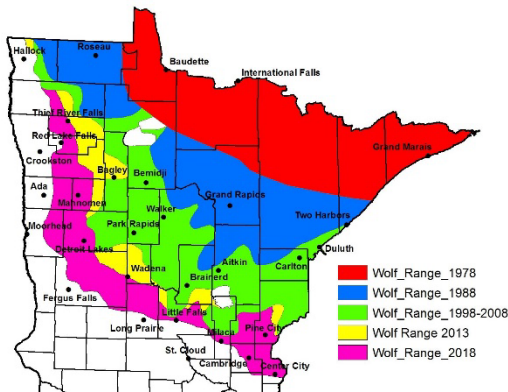
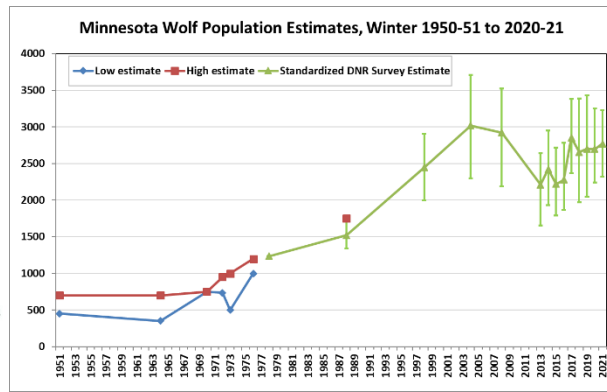


Figure 2. Wolf population estimates



141

142

143 Historical protection status and future outlook

144 Soon after the establishment of the Minnesota territory in 1849, the legislature authorized counties to
 145 pay individuals for any wolf they killed. This wolf bounty system remained in place until 1965. From
 146 1946 to 1964, residents could also obtain permits to shoot wolves from airplanes. In addition to the
 147 bounty program, state personnel were involved in wolf removal from the late 1940s through the mid-
 148 1950s, including via aerial shooting. Aerial shooting over the Boundary Waters Canoe Area was
 149 eliminated in 1950, but continued elsewhere until 1954, and other forms of wolf control (shooting and
 150 trapping) by state employees ended in 1956. In 1969, the legislature authorized a predator control
 151 program that permitted private, state-certified trappers to locally remove wolves based on evidence of
 152 livestock depredation. After wolves received federal ESA protection in 1974, management of wolf
 153 depredation on livestock and other domestic animals shifted to the USFWS.

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

164 Despite historical eradication efforts, wolves that persisted in northern Minnesota facilitated wolf
 165 recovery following passage of the ESA. Given the simultaneous increase in deer numbers, the Minnesota
 166 wolf population responded quickly with an increase in wolf numbers through range expansion,
 167 approaching its current distribution by 1998.

168 Wolf recovery in Minnesota has been regarded as a success that contributed significantly to wolf
169 recovery in other parts of the upper Great Lakes. In 1978, the USFWS Eastern Timber Wolf Recovery
170 Plan called for implementing wolf management zones, reestablishing wolves in other states, and
171 reclassifying wolves in Minnesota from endangered to threatened under the ESA. The recovery team
172 recognized the viability of the Minnesota wolf population at that time, but the Eastern Timber Wolf
173 Recovery Plan recommended establishing at least one other viable population. Emigrating wolves from
174 Minnesota subsequently recolonized portions of Wisconsin and Michigan, resulting in a self-sustaining
175 regional population now numbering more than 4,000 wolves and connected to the larger wolf
176 population in Canada. Today, of the estimated 6,000 gray wolves in the lower 48 states, nearly one-half
177 are in Minnesota.

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

186 **Influences on wolf population and range**

187 Multiple factors interact to influence wolf distribution in Minnesota.

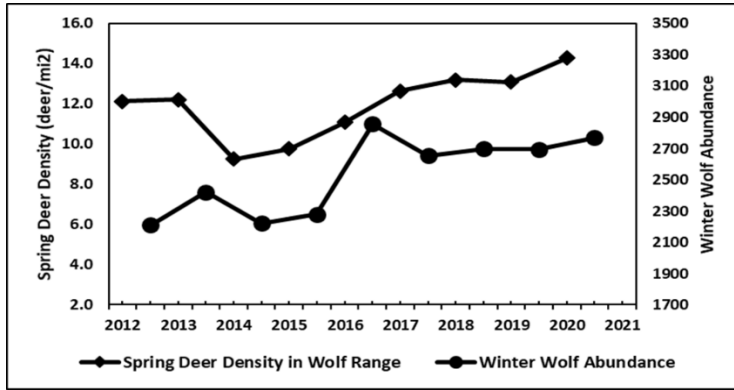
188 **Human density:** Modeling conducted in the 1980s suggested higher densities of humans and roads
189 correlated with fewer wolves. However, as wolves recolonized former range, they demonstrated more
190 tolerance of humans/roads than was previously assumed. From 1988 to 2018, the percentage of
191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

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

201 **Prey availability:** Wolves are habitat generalists and can live anywhere with sufficient prey. Although
202 wolves may supplement their diet with smaller animals such as beavers and snowshoe hares during
203 periods of the year, viable wolf populations require large ungulates (hoofed mammals) for prey. With
204 the loss of elk, bison and caribou in most of Minnesota associated with European colonization, wolves in
205 Minnesota today primarily rely on white-tailed deer, and moose where they occur. Although wolf-prey

206 dynamics can be complicated, particularly in areas with multiple prey or multiple large carnivore species,
207 recent data suggest that wolf population size is closely associated with deer density (Figure 4).

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



209
210 Research in Minnesota strongly suggests that wolves have not caused large-scale or long-term declines
211 in deer. In recent decades, deer population estimates in wolf range have substantially declined following
212 severe winters and intensive hunter harvest. However, deer can and have rebounded quickly, despite
213 relatively high wolf numbers, in response to milder winters and deer harvest strategies that reduce
214 hunting pressure. In some cases, wolf predation may prolong declines in local deer populations caused
215 by poor habitat and winter severity that cumulatively may have reduced deer hunting opportunities or
216 success at local levels. However, these effects are not evident in deer population trends throughout the
217 entirety of wolf range.

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

230 **Minnesotans' attitudes toward wolves and wolf management, and experiences living**
231 **with wolves**

232 Wolves are important to Minnesota's natural and cultural heritage. They are highly valued and
233 sometimes maligned, but capture the attention of Minnesotans from all backgrounds. This section
234 describes the Minnesota DNR's understanding of the values different people and groups assign to

235 wolves, as well as their perspectives on wolf management and key benefits and challenges of living with
236 wolves.

237 **2019-2020 study: Minnesotans’ values, beliefs, and attitudes**

238 To prepare for this wolf plan update, the Minnesota DNR in collaboration with the Minnesota
239 Cooperative Fish and Wildlife Research Unit at the University of Minnesota conducted a study in 2019-
240 2020 to assess Minnesotans’ values, beliefs, attitudes, and behaviors toward wolves and wolf
241 management (Appendix 5 contains a summary report of key findings). Given the logistics of conducting
242 scientific surveys, three groups were identified as study populations to represent a range of interests in
243 wolf management: Minnesota residents, deer hunters, and livestock producers in wolf range. Results are
244 statistically representative estimates of variables of interest for each study population. Although the
245 study did not specifically survey tribal members and other indigenous Minnesotans, it is necessary to
246 appreciate the importance of wolves for tribal nations within – and with connections to – Minnesota.
247 Some context on the cultural significance of wolves as well as tribal perspectives on their relationship
248 with wolves is provided in section III.

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

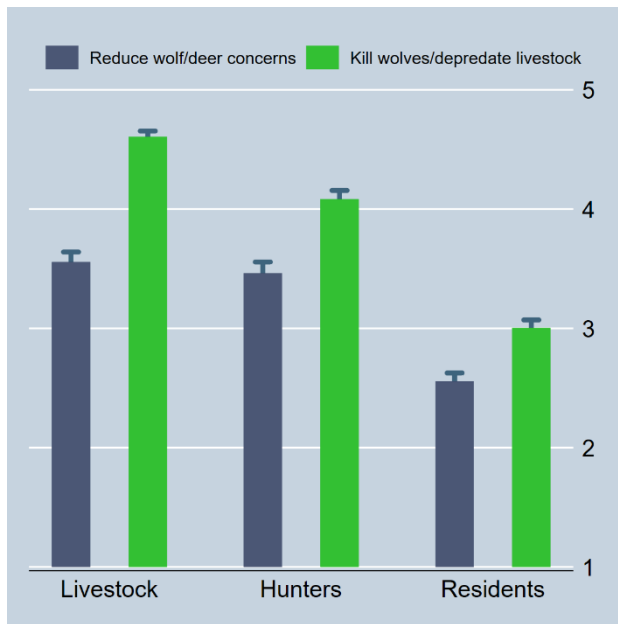
250 Individuals and groups hold a wide range of perspectives about wolves and seek different outcomes in
251 wolf policy. However, there are values common to most. For instance, Minnesotans support the long-
252 term persistence of a healthy wolf population. Most state residents (87%) – in a survey sample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

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

267 While many Minnesotans recognize the benefits of a healthy wolf population, individuals experience
268 costs or concerns unequally. Livestock producers in wolf range deal with the risk or reality of wolves
269 killing their livestock. Wolves also prey on culturally and economically significant species like white-
270 tailed deer and moose, and sometimes injure and kill pets, primarily dogs. Survey results show marked
271 differences in attitudes toward wolves and wolf policies, stemming in part from these costs, in addition
272 to personal values, ideologies, experiences, and places of residence. For instance, residents, deer

273 hunters, and livestock producers have different opinions regarding the importance of killing wolves that
 274 are attacking domestic livestock and reducing wolf populations to address concerns about deer and
 275 moose populations. Responses were recorded on a scale from 1 to 5 (1=not at all important and 5=very
 276 important). Hunters and livestock producers think it is more important to reduce wolf populations to
 277 address concerns about deer and moose impacts, on average, than Minnesota residents surveyed. A
 278 similar pattern held concerning the killing of wolves to reduce livestock depredations (Figure 5).

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



280

281 *Caption: Survey respondents were asked to rate the importance of “reducing wolf populations to address concerns about deer and moose populations” [blue], and “killing wolves in areas where they are attacking domestic livestock” [green], as potential management priorities for the Minnesota DNR. Responses are on a scale of 1 to 5 where 1 = not at all important and 5 = very important.*

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

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

298 **Wolf governance**

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

302 **Tribal authority**

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

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

321 **Federal authority**

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

328 Although the 2001 plan was developed with the recognition that wolves in Minnesota had exceeded
329 federal recovery goals and could be removed from federal ESA listing, a comprehensive plan for wolf
330 stewardship in Minnesota is important regardless of federal or state status. In 2007, the USFWS
331 removed ESA protections for wolves. Litigation resulted in the decision being overturned, and there
332 have been several listing and delisting decisions since. ESA protections for wolves were removed in
333 January 2021, triggering transition of certain responsibilities from the USFWS to the Minnesota DNR. In
334 February 2022, however, a federal court ruling reinstated ESA protections, placing wolves again under

335 the protection of the USFWS as a threatened species in Minnesota. Minnesota DNR was already
336 engaged in an update to the 2001 wolf management plan prior to either of these actions and will
337 continue to manage wolves in Minnesota regardless of their federal listing status.

338 **State authority**

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

346 **Public involvement**

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

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

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

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

372 **Public education and information**

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

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

383 **Regulated wolf hunting and trapping**

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

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

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

398 *Table 2. Minnesota wolf season information*

Year	Season	Licenses issued	Season length (days)	Target Harvest	Harvest	Success rate
2012	early hunting	3,670	16	200	147	4.6 ^a
	late hunting	1,656			67	5.1 ^a
	late trapping	797	41	253 ^b	199	29.4 ^a
	2012 totals	6,123	57	400	413	6.7
2013	early hunting	2,084	16	110	88	4.2
	late hunting	744			31	4.2
	late trapping	606	29	132 ^b	119	19.6
	2013 totals	3,434	45	220	238	6.9
2014	early hunting	2,394	15	125	124	5.2
	late hunting	790			24	3
	late trapping	736	13	126 ^b	124	16.8
	2014 totals	3,920	28	250	272	6.9

399

400 Wolf hunting and trapping remains a contentious issue. A season decision framework describing how
401 the Minnesota DNR will decide whether to establish a season upon implementation of this plan if
402 federal ESA protections are again removed and, if so, how a possible season would be structured. This
403 includes the legal requirement for the Minnesota DNR to provide opportunity for public comment if
404 there is a proposed wolf season in Minnesota.

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

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

417 **Wolf depredation management**

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

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

431 Wolf conflicts and predation on livestock and domestic animals generally increased from 1978-1998,
432 concurrent with increases in the wolf population. Since that time, verified wolf complaints have
433 occurred at about 100 locations annually, and in response approximately 180 wolves are killed annually.
434 Over the last 10 years, the MDA has paid between 80-140 claims each year at a cost of \$100,000-
435 \$250,000 per year.

436 **Wolf research and monitoring**

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

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

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

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

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

473 III. Strategic issues

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

477 **Diverse and changing wildlife values**

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

483 *Table 3. Positive and negative wolf values*

	Benefits	Challenges
Social/cultural	<ul style="list-style-type: none">• Intrinsic value of wolves• Wildlife viewing• Hunting and trapping opportunity• Ojibwe cultural significance	<ul style="list-style-type: none">• Public safety concerns• Emotional impacts (e.g., domestic animal predation)
Ecological	<ul style="list-style-type: none">• Ecological function• Predation (e.g., reduce degradation of vegetation by over browsing)	<ul style="list-style-type: none">• Predation (e.g., limit recovery of game species)
Economic	<ul style="list-style-type: none">• Economic gains (e.g., ecotourism)	<ul style="list-style-type: none">• Economic losses (e.g., livestock depredation)

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

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

500 how the majority of residents view state wolf policy and the attitudes and interests of those in the
501 minority.

502 **Tribal wolf interests**

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

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

521 **Cultural and ecological significance of ma'iinganag (wolves) to the Ojibwe**

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

530 In addition to the cultural relationship with ma'iingan, the Ojibwe have spent centuries sharing the
531 North American landscape with wolves, imparting substantial traditional ecological knowledge to inform
532 ma'iingan stewardship. Wolves are generally seen as presenting little threat to human health and safety,
533 and they are appreciated for their ecological role in maintaining the long-term health of prey
534 populations and the health and diversity of forest ecosystems. This in turn yields overall strong support
535 for maintaining wolf presence on the land.

536 This relationship with ma'iingan informs tribal policy positions, reflecting that a tied fate means health is
537 sought for the wolf community just as for the human community. It is generally felt that wolves should
538 determine their own numbers and distribution on the landscape, rather than humans making these
539 determinations. Taking a wolf's life requires serious consideration and substantial justification.
540 Recreational harvest does not meet this threshold, and policies regarding livestock depredation favor
541 preventative actions and non-lethal approaches before consideration of lethal techniques.

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

547 **Additional tribal perspectives on wolves**

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

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

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

567 **Resources to support Minnesota wolf management**

568 The Minnesota DNR's wolf program requires dedicated staff and funding. Costs have increased over
569 time, including for monitoring wolf populations, conducting research, and coordinating and
570 implementing wolf management. Wolf plan implementation will depend on funding and will require
571 tradeoffs among plan priorities and other resource needs throughout the course of the ten-year plan.

572 The divisions of Fish and Wildlife and Enforcement have direct responsibility for wolves, while other
573 divisions play an indirect role through their own conservation work. The Large Carnivore Specialist,
574 Furbearer and Wolf Research Scientist, and many conservation officers conduct specific wolf
575 management functions at a cost of \$350,000-\$500,000 per year.

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

584 Minnesota DNR also relies on partnerships to conduct wolf management and monitoring. USDA-WS is
585 the primary agency conducting wolf depredation management through an annual cooperative
586 agreement, and they assist with wolf research trapping efforts as well. Wolf depredation control is
587 augmented by state certified wolf control trappers under the Minnesota predator control program (MS
588 97B.671).

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

594 **Wolf depredation and predation**

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

597 **Livestock depredation**

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

603 As discussed in a previous section, livestock producers can implement strategies to prevent or minimize
604 wolf depredation impacts prior to an active depredation event. Non-lethal practices have been adopted
605 primarily through individual investments, although there has been limited recent grant funding for
606 conflict prevention through a pilot program funded and administered by MDA and USDA-WS. Additional
607 public and private partnerships could better support implementation and evaluation of best practices
608 for reducing or preventing wolf depredation incidents. To support some of the cost share or matching

609 fund requirements for grants, contributions from NGOs and other donations have helped support
610 programs to purchase or install fences. When verified incidents do occur, lethal control and
611 reimbursement of financial losses comprise the current response, augmented by non-lethal methods as
612 appropriate.

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

623 **Predator/prey relationships in Minnesota**

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

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

635 **Wolf population objectives**

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

638 **Population level**

639 The USFWS Recovery Plan for the Eastern Timber Wolf (revised 1992) established a recovery goal of
640 1,251-1,400 wolves, to ensure their continued survival in Minnesota. To provide a buffer above this, the
641 Minnesota DNR identified a minimum population level of 1,600 wolves in the 2001 plan. No maximum
642 population goal was established. Feedback from the public, WPAC, and WTC indicated the origin and
643 meaning of this previous wolf population objective was not clearly conveyed in the previous Plan. To
644 clarify, this number was not intended as a management objective (i.e., management activities would not

645 be taken to reduce the population to that level). Rather, if the population were to decline toward 1,600,
646 efforts would be made to identify the cause and management actions would be implemented to reverse
647 the population decline. It is also important to identify and understand declining population trends
648 should they occur, regardless of the absolute population size.

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

660 **Population distribution**

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

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

- 672 • **Management zone:** Most of Minnesota will be considered a management zone, where standard
673 implementation of state laws and wolf management rules would be in effect. Areas could be
674 open to hunting or trapping if a season is established, and standard depredation policies would
675 be in place.
- 676 • **Protection zone:** Large landscapes with a resource protection purpose could be restricted to any
677 wolf taking (e.g., Voyageurs National Park, the Boundary Waters Canoe Area Wilderness,
678 Minnesota State Parks, Scientific and Natural Areas, tribal reservations as determined by tribal
679 governments). This would offer complete protection for wolves except in defense of human life,
680 under state laws that allow killing wolves to protect domestic animals on private lands, or
681 applied to wolves that exhibit repeated abnormal or aggressive behavior.
- 682 • **Research zone:** Areas could be defined by permitted research where wolf-take or other policies
683 would be temporarily modified or restricted to assess effectiveness of management activities,

684 impacts on ungulate populations or livestock, or other specific research goals. Wolf hunting or
685 trapping and depredation policies could vary from the standard management zone provided the
686 deviations were consistent with all relevant laws and public process

687 **Wolf research and monitoring needs**

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

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

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

704 **IV. Goals, objectives, and strategies**

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

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

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

- 715 • Objectives are activities or outputs that support plan goals that can be tracked to determine
716 progress through the life of the plan.

- 717 • Strategies are specific, actionable statements describing how the Minnesota DNR will achieve its
718 goals and objectives.

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

720 **Objective 1A. Conduct wolf population monitoring and research**

- 721 • Strategy: Annually and as needed with the Minnesota DNR standing wolf technical committee,
722 discuss monitoring results and make any recommended changes to wolf monitoring methods
723 and plans, and discuss wolf research results and priorities (see Goal 5).
- 724 • Strategy: Monitor the geographic distribution of wolves and population abundance.
- 725 ○ During any period in which the federal post-delisting monitoring (PDM) plan/protocol is
726 in effect, monitoring frequency and methods will at least minimally meet those PDM
727 requirements.
- 728 ○ For the first 2 years after this wolf plan is adopted, *annual* population estimates (using
729 current methods) will be obtained, as has been the case since 2012.
- 730 ○ Within two years of this plan’s adoption, the standing wolf committee will review
731 current protocols and make recommendations regarding future monitoring methods
732 and frequency.
- 733 ○ If a harvest season occurs, hunters/trappers will be required to submit a tooth from any
734 harvested wolf for aging and to participate in a hunter/trapper harvest effort survey.
- 735 ○ Data on at least one independent population trend indicator will be collected annually
736 (e.g., an existing track survey or a new method).
- 737 • Strategy: If a population decline of concern occurs (e.g., falls below 1,600 or a declining trend if
738 below 2,000), the standing wolf committee will discuss the appropriate level of concern, and as
739 necessary recommend research needs and potential solutions to understand and address the
740 concern.
- 741 • Strategy: As opportunities arise, collect blood and tissue samples to assess wolf population
742 status and health.
- 743 ○ The standing wolf committee will develop protocols for collecting biological samples
744 from wolves captured as part of monitoring, research, or depredation control, to
745 facilitate pooled analysis (e.g., population genetics, wolf health) using this disparate
746 information.
- 747 ○ If a harvest season occurs, data requirements will be similar to those during the 2012-14
748 seasons. Hunters and trappers will be required to submit all wolves to registration
749 stations for carcass inspection and data collection. Data will be collected to identify
750 location of harvest, sex of animal, and details on methods of harvest, as well as to
751 collect biological samples (e.g., teeth, reproductive tracts of females, other tissues or
752 parasites), record body measurements, and to apply a pelt tag demonstrating that the
753 wolf had been registered appropriately.

754 **Objective 1B. Maintain a population comparable to recent estimates (2,200-3,000, well above**
 755 **the federal recovery goals) and distributed across the majority of current wolf range**

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

765 *Figure 3. Placeholder for potential graphic on population levels/distribution and responses – flexible and subject to continuing*
 766 *development*

Population level and trend	<1,600 Trending downward	1,600 – 2,000 Trending downward	2,000 – 2,200 Trending upward	2,200 – 3,000 stable	>3,000
Population distribution and trend*	Steadily declining	Local/short-term declines	Present across range	Present across range	Expanding range
Response	Mitigation measures to reverse decline; does not preclude control of wolves for public safety, livestock depredation	Implement enhanced monitoring and research to determine population decline and contributing factors	Consider more frequent population monitoring, disease surveillance, or other research to assess population status	Optimal population level with current occupied wolf range; more frequent monitoring if there is a season	Consider additional public engagement and management actions to address depredation or other public concerns
* Based on previous mid-winter population estimate and other indices of population trends					

767 **Goal 2. Collaborate with diverse partners to collectively support wolf plan**
768 **implementation**

769 *Objective 2A. Coordinate and consult with sovereign tribal nations*

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

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

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

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

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

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

- 794 • Strategy: On an annual basis, provide current and scientifically based information regarding
795 wolves and wolf management in Minnesota that can be used by DNR and other organizations in
796 Minnesota that conduct wolf education and provide information to a variety of audiences.
- 797 • Strategy: Partner with organizations to develop materials and programs that are available as
798 resources to share and educate people about wolves.
 - 799 ○ Email newsletters to subscribers with information about wolves and wolf conservation
800 on a quarterly basis.

801 **Goal 3. Minimize and address human-wolf conflicts while recognizing diverse**
802 **wolf values**

803 *Objective 3A. Prevent and reduce human-wolf conflict*

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

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

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

827 *Objective 3C. Provide information on conflicts*

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

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

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

- 834 • Strategy: Annually publish a wolf committee report to communicate wolf population monitoring
835 activities, management actions, and recommendations.

- 836 • Strategy: Provide through multiple platforms information on wolf biology, behavior and
837 population dynamics; humans’ values around wolves; wolf management activities; and living
838 with wolves.
- 839 • Strategy: Provide information and program support for internal and external partners (e.g.,
840 develop DNR-branded wolf education programming for interpretive programs at Minnesota
841 State Parks and external environmental education organizations.)
- 842 • Strategy: Transparently communicate wolf-related decision processes and outcomes in a
843 publicly accessible manner.

844

845 *Objective 4B. Involve communities in wolf research, monitoring and management*

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

854 **Goal 5. Conduct research to inform wolf management**

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

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

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

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

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

- 870 • Strategy: Periodically conduct scientific surveys of relevant stakeholder groups, including all
871 Minnesota residents, especially before major wolf policy decisions.
- 872 • Strategy: Pursue research opportunities to better understand the sources of human conflicts
873 about wolves and methods to reduce them.

874

875 *Objective 5D. Conduct research to more effectively address wolf depredation through non-lethal*
876 *and cost-effective means*

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

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

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

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

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

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

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

- 896 • Strategy: Broaden the funding sources that support wolf management, aligned with department
897 efforts.
 - 898 ○ Advocate for revenue sources in addition to wolf and deer season fees (e.g., a wildlife
899 conservation stamp).
 - 900 ○ Provide base wolf program funding through a combination of General Fund and Game
901 and Fish Fund appropriations, reflecting the breadth of Minnesotans who value wolves.
 - 902 ○ Communicate applied wolf monitoring and research priorities to potential funding
903 agents and sources (e.g., LCCMR).
 - 904 ○ Include in Outdoor Heritage Fund applications projects that protect, restore, and
905 enhance habitat and resources that support wolves.
- 906 • Strategy: Maintain current funding sources that support strategies defined throughout the plan.

907 Strategy: Parallel to declines in the Wolf Management and Monitoring Account, work with the DNR
 908 wolf technical committee to identify program components to curtail or modify in the event
 909 adequate, base-level funding is not available (e.g., reduce the frequency of population monitoring)

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

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

921 V. Performance Measures

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

929 **Table 4. Key performance measures**

930

Goal	Objective	Measure
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 (mi ²)

<p>Goal 2. Collaborate with diverse partners to collectively support wolf plan implementation</p>	<p>Objective 2A. Coordinate and consult with sovereign tribal nations</p> <p>Objective 2C. Collaborate on wolf planning and management with tribes and institutional partners, private entities and NGOs</p>	<p>Annual communications and coordination with partners to assess development and implementation of strategies</p>
	<p>Objective 2D. Collaborate on wolf education with tribal and institutional partners and NGOs</p>	<p>Biennial review and update of general wolf information coordinated through partners</p> <p>The number of referrals to partner websites</p>
<p>Goal 3. Minimize and address human-wolf conflicts while recognizing diverse wolf values</p>	<p>Objective 3A. Prevent and reduce human-wolf conflict</p>	<p>The number of farms with chronic wolf depredation</p> <p>The number of farms using non-lethal prevention strategies based on farms visited by USDA-WS</p>
<p>Goal 4. Inform and engage the public about wolves in Minnesota and their conservation</p>	<p>Objective 4B. Involve interested individuals in wolf research, monitoring and management.</p>	<p>The number of opportunities for involving members of the public in wolf monitoring and research</p> <p>The number of opportunities for public input on wolf management</p>
<p>Goal 5. Conduct research to inform wolf management</p>	<p>Objective 5B. Improve ability to estimate wolf population</p>	<p>Analysis and report of wolf monitoring, with adoption of appropriate recommendations</p>
<p>Goal 6. Administer the wolf program to fulfill agency responsibilities and public and partner needs</p>	<p>Objective 6B. Secure funding to administer wolf management program</p>	<p>Development and recommendation of diverse and resilient funding mechanisms sufficient to administer wolf management, research, and education as identified in wolf plan</p>

932 **Appendices**

933 **Appendix 1. Input report**

934 To be inserted – summary of tribal, public and technical committee input.

935 **Appendix 2. Proposed Season Decision Framework**

936 **A. Purpose**

937 The mission of the Minnesota Department of Natural Resources (DNR) is to work with Minnesotans to
938 conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to
939 provide for commercial uses of natural resources in a way that creates a sustainable quality of life. MS
940 97B.646 directs the DNR to “in consultation with the commissioner of agriculture, ... adopt a wolf
941 management plan that includes goals to ensure the long-term survival of the wolf in Minnesota, to
942 reduce conflicts between wolves and humans, to minimize depredation of livestock and domestic pets,
943 and to manage the ecological impact of wolves on prey species and other predators.”

944 Departmental decisions about future seasons will occur only after completion of the update to the 2001
945 wolf management plan and in recognition of any federal ESA listing status.

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

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

957 **B. Background and assumptions**

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

- 963 • Minnesota DNR has authority to prescribe wolf seasons under MS 97B.645, after ESA delisting.
- 964 • There have been a number of delisting and subsequent listing decisions as a result of court
965 rulings, including current litigation challenging the most recent wolf delisting decision.
- 966 • There is an abundance of data and research to inform a decision about wolf season
967 implementation.
- 968 • DNR implemented a wolf season for three years (2012-2014) in a manner that maintained the
969 wolf population above recovery levels.
- 970 • Harvest levels can be controlled through a regulated season structure.

- 971 • Wolves have significant cultural and social value in Minnesota. The value of and relationship
972 with *Ma'iingan* (Anishinaabe) or *Īuąktokąa* (Dakota) is important for indigenous Minnesotans.
973 • Minnesotans are divided in their support for a wolf season.
974 ○ Nearly 50% of Minnesotans oppose and 41% support a wolf hunting season. Opposition
975 is higher for a wolf trapping season with nearly 60% of Minnesotans opposed and 30%
976 in support.
977 ○ High support for a season exists among deer hunters and livestock producers, and
978 presumably other un-surveyed sub-groups (e.g., trappers, other hunters).

979 C. Guiding principles

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

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

997 D. Framework

998 This framework has been developed as a proposed means to publicly discuss, develop, and
999 communicate recommended principles and considerations that can be used by the State of Minnesota
1000 to inform a future decision about whether to hold a wolf season, and if a season is determined
1001 appropriate, to meet management objectives and frame how to structure/implement a season.

1002 **Decision phase I. The DNR will consider the following criteria in determining whether to**
1003 **implement a wolf season:**

1004 **Criterion 1: Is there is a legal basis to implement a season?**

- 1005 • A season may only occur after wolves have been removed from ESA protections.

- 1006 • M.S. 97B.645 and 97B.647 establish the Commissioner’s authority to prescribe a season and
1007 provide a mechanism for implementation. Statute also requires an opportunity for public
1008 comment before prescribing open seasons and restrictions on taking wolves.
1009 • Assure recognized treaty obligations are met.

1010 **Criterion 2: Does adequate information exist to inform the decision?**

- 1011 • Available biological information should include:
1012 ○ Recent Minnesota wolf population survey data, including:
1013 ■ A recent population estimate with an associated margin of error.
1014 ■ Survey data that indicate no statistically significant declining trend in population
1015 size or distribution of wolves that is of current ecological concern.
1016 ■ The population estimate exceeds 1,600 (minimum population estimate in the
1017 2022 Plan to consider a season; a buffered amount above the Minnesota-
1018 specific 1992 federal recovery criterion of 1,251-1,400 wolves).
1019 ■ Any harvest would not negatively impact the state’s ability to maintain a
1020 population consistent with wolf plan goals.
- 1021 • Available social information should include:
1022 ○ Recent representative attitude surveys and self-selected public input.
1023 ○ Public and stakeholder engagement has been conducted on a specific proposal or range
1024 of alternatives (must meet requirement of M.S 97B.645, Subd. 9 to “provide opportunity
1025 for public comment”).
- 1026 • Available intergovernmental information should include:
1027 ○ Under [Minnesota Statutes, Chapter 10.65](#), meaningful and timely consultation with all
1028 tribes in Minnesota has occurred to facilitate mutual understanding and inform decision
1029 making on a proposed season, with the goal of achieving mutually beneficial solutions.

1030 **Criterion 3: Would the proposed season support one or more of the following objectives defined in**
1031 **the plan, acknowledging there are tradeoffs among objectives?**

- 1032 • To reduce prey impacts/conserves prey species
1033 • To reduce depredation on domestic animals.
1034 • To manage the wolf population (e.g. manage disease outbreak or local population concerns).
1035 • To provide social and cultural opportunities.

1036 Potential objectives of harvest could focus on providing outdoor opportunity and/or addressing
1037 conservation or management concerns related to wolves or species with which they interact. Harvest
1038 seasons undertaken to address a conservation or management concern should be designed, conducted,
1039 documented, and monitored as part of a transparent management or research plan or proposal. At the
1040 same time, any season should maintain the ecological function of wolves and not affect the recreational
1041 opportunities of wildlife viewers.

1042

1043 **Decision phase II. If the DNR implements a wolf season, the season structure will incorporate**
1044 **the following components:**

- 1045 • Population components:
 - 1046 ○ Wolf harvest will not cause long-term, statewide population decline.
 - 1047 ○ Localized declines may occur based on management objectives.
 - 1048 ○ Harvest rate will be dependent on statewide population size, trend, and distribution.
 - 1049 May be adjusted locally to address management objectives
- 1050 • Geographic components:
 - 1051 ○ Harvest will be coordinated with tribal nations in a way that acknowledges and respects
 - 1052 tribal sovereignty and tribes’ role in wildlife management within ceded territories, while
 - 1053 also balancing non-tribal private property interests and public access.
 - 1054 ○ Zones may be used to manage harvest in relation to off-reservation treaty rights.
 - 1055 ○ Zones may be used to address different management objectives by landscape region.
 - 1056 ○ Zones may be established to evaluate wolf harvest impacts or for other research
 - 1057 purposes.
- 1058 • Responsive management approach:
 - 1059 ○ Each year, regulations and seasons will be modified if needed, based on population
 - 1060 trends, changing management objectives, or in response to changing socioeconomic
 - 1061 interests.

1062 **E. Implementation recommendations (only relevant if the state decides to hold a**
1063 **season)**

1064 The following are recommendations offered by the DNR to demonstrate transparency and facilitate
1065 dialogue, *in the case of a future decision to implement a season.*

1066 **Communication and continued engagement**

- 1067 • Transparency:
 - 1068 ○ Information used and any management objectives for a season will be communicated
 - 1069 publicly, using a combination of effective communications tools. (e.g., through email
 - 1070 announcement to GovDelivery subscribers or other appropriate contact lists, , webpage
 - 1071 postings, and by news release).
- 1072 • Engagement:
 - 1073 ○ Regular engagement opportunities will gather public feedback on the season decision
 - 1074 and implementation.

1075 **Season design**

- 1076 • Allocation:
 - 1077 ○ Permit numbers determined based on harvest goal and reliable data on expected
 - 1078 success rates of different users groups/methods.

- 1079 ○ Equitable harvest allocation if different seasons/methods are permitted.
- 1080 ● Timing:
 - 1081 ○ Harvest seasons occur after Nov. 1 and before Feb. 1 (i.e., outside primary reproductive
 - 1082 season with prime pelt conditions, and when potential conflict with other outdoor user
 - 1083 groups is minimized to the extent possible).
- 1084 ● Monitoring:
 - 1085 ○ Post-season surveys are conducted to collect detailed data on harvest effort.
 - 1086 ○ Mandatory harvest registration and carcass collection to collect information on harvest
 - 1087 date and method, and the age, sex, health, and location of wolves.
- 1088 ● Closing season:
 - 1089 ○ Ability to close season quickly when allowable harvest is reached.
 - 1090 ○ Harvest is monitored daily and season closed based on trends in registration that
 - 1091 indicate harvest goal will be met.

1092 **Harvest levels**

- 1093 ● Allowable harvest levels will be informed by research:
 - 1094 ○ Prior to implementation, harvest scenarios will be fully evaluated using best available
 - 1095 information. Considerations of all anthropogenic mortality will inform overall level
 - 1096 allowed for wolf harvest.
- 1097 ● Allowable harvest will correlate positively with population size within the following parameters:
 - 1098 ○ No harvest if the population point estimate (previous winter, or most recent) is less than
 - 1099 1,600, unless in specified zones as part of an approved research program.
 - 1100 ○ Maximum harvest rate based on Objective 1b of Minnesota Wolf Management Plan,
 - 1101 except if part of an approved limited-duration or limited-area management program.
- 1102 ● A wolf technical committee, in coordination with tribal biologists, will recommend harvest levels
- 1103 to the DNR annually. The committee will consider available data and clearly document its
- 1104 rationale.
- 1105 ● Season evaluation and analysis:
 - 1106 ○ Summarize data of metrics described in season design.
 - 1107 ○ Produce report of annual season information and outcomes.

1108 **Exceptions:** If management-focused harvest objectives (e.g., see Criterion 3 in Section D above and
 1109 adjustments in Section F below) are established/approved, deviations from Season Design and Harvest
 1110 Level section guidelines above may occur. Table A-1, below, indicates potential levels of harvest that
 1111 could be considered while also ensuring long-term viability of the wolf population.

1112 Table A.1. Potential harvest rates, by population level, if season management is implemented

Population level and trend	<1,600 Trending downward	1,600 – 2,000 Trending downward	2,000 – 2,200 Trending upward	2,200 – 3,000 stable	>3,000
Harvest level considerations**	0	< 5%	5-10%	10-20%	20%+

** 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.

1113

1114 **F. Adjustment to season framework**

- 1115 • If significant adjustments are proposed to this framework, the DNR will consult the Wolf
1116 Research and Management Committee and conduct tribal consultation and public engagement
1117 as needed. Foreseeable adjustments significant enough to warrant this review could include
1118 changes to management objectives, harvest level guidance, or management zones/buffers.

1119 **Appendix 3. Select list of post-2001 wolf research publications from**
1120 **Minnesota/annotated bibliography**

- 1121 Barber -Meyer, S.M. 2022. Are wild wolves southpaws? Including potential conservation implications.
1122 Animal Behavior and Cognition. February.
- 1123 Barber-Meyer, S.M., L. Schmidt, L.D. Mech. 2017. Gray wolf (*Canis lupus*) death by stick impalement.
1124 Northeastern Naturalist 24(2): N11-14.
- 1125 Barber-Meyer, S.M., T.J. Wheeldon, and L.D. Mech. 2021. The importance of wilderness on wolf (*Canis*
1126 *lupus*) survival and cause of death over 50 years. Biological Conservation 258(109145):1-13, DOI:
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- 1128 Barber-Meyer, S.M., and L.D. Mech. 2016. White-tailed Deer (*Odocoileus virginianus*) subsidize Gray
1129 Wolves (*Canis lupus*) during a Moose (*Alces americanus*) decline: A case of apparent competition?
1130 Canadian Field Naturalist 130(4): 308–314.
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- 1134 Barber-Meyer, S.M., and L.J. Schmidt. 2020. Fish out of water: insights from a case study of a highly
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- 1150 Brandell, E.E., P.C. Cross, M.E. Craft, D.W. Smith, E. Dubovi, M.L.J. Gilbertson, T. Wheeldon, J.
1151 Stephenson, S. Barber-Meyer, A. Kelly, B. Borg, M. Sorum, D.R. Stahler, M. Anderson, H.D. Cluff, D.
1152 MacNulty, D.E. Watts, G.H. Roffler, H. Schwantje, M. Hebblewhite, K. Beckmen, E. Almberg, and P.J.

- 1153 Hudson. 2021. Patterns and processes of pathogen exposure in gray wolves across North America.
1154 Scientific Reports.
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1156 Mech, S. Windels, and A.J. Edwards. 2017. A serosurvey of diseases of free-ranging gray wolves (*Canis*
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- 1158 Chakrabarti, S., S. T. O’Neil, J. Erb, C. Humpal, and J. K. Bump. *In Review*. Survival rates and
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- 1161 Chambers, C.M. and J. C. Whitehead. 2003. A contingent valuation estimate of the benefits of wolves in
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1243 **Appendix 4. Post delisting guidelines for addressing wolf-human**
1244 **conflicts in Minnesota**

1245 Note: Although much of this guidance applies while wolves are listed under the federal Endangered
1246 Species Act, not all options are available unless wolves are delisted because the federal law would
1247 supersede state laws. It is included to provide more specific guidance of wolf-human conflicts to
1248 consider for prevention and mitigation of wolf-human conflict that is not detailed in this plan.

1249 The Minnesota Department of Natural Resources (Minnesota DNR), through engagement with the
1250 public and the committees formed to update Minnesota’s Wolf Management Plan, developed these
1251 guidelines to provide an overview of policies and procedures to support wolf conflict situations. The
1252 purpose is to summarize policies and procedures that guide the Department’s efforts in addressing wolf-
1253 human conflict and to reduce conflicts between wolves and livestock. All parties have an interest in
1254 preventing and reducing the severity of conflicts when they occur. These guidelines suggest a variety of
1255 measures livestock producers can take to reduce the wolf-livestock conflicts and summarizes the
1256 procedures for directed wolf control when conflicts occur.

1257 The guidance draws on a diversity of perspectives expressed by people throughout the state for
1258 protecting wolf populations and reducing conflict. These values include maintaining a healthy and
1259 resilient wolf population, providing technical guidance and resources for preventing conflict to support
1260 livestock producers where conflicts occur, and reducing loss of wolves and the potential impacts
1261 associated with wolves in areas that have conflict. The guidance in this document lays out the DNR
1262 approach to increase the transparency and accountability of the Department’s activities and
1263 management actions related to wolves.

1264 Although Minnesota law enables individuals and the DNR to take action to protect livestock and pets
1265 from wolf conflict, additional guidance is needed to provide detail on tools and actions DNR uses to
1266 reduce wolf-livestock interactions to support wolf conservation and address human-wolf conflict. The
1267 goal of the tools and approaches described in this document are to take steps to reduce the potential
1268 for wolf depredations on livestock while continuing to promote responsible wolf stewardship. To
1269 increase tolerance for wolves and encourage coexistence with wolves in a human dominated landscape,
1270 some tools will increase public awareness of the challenges associated with livestock production, living
1271 in wolf country, and reducing conflict with recreational activities in parts of Minnesota where wolf
1272 populations occur.

1273 Approximately two-thirds of Minnesota’s wolf population shares a landscape where livestock occur and
1274 nearly all of wolf range overlaps with places where people live and recreate. Everyone should be aware
1275 of the possibility of wolf-human conflict when living and recreating in Minnesota’s wolf range. Proactive
1276 steps can be taken to be best prepared when participating in activities that could result in negative
1277 interactions with wolves.

1278 These guidelines describe a variety of prevention measures that can assist livestock producers and pet
1279 owners to evaluate best methods to consider for their particular situation. Although no single or
1280 combination of prevention measures guarantee against conflict, the DNR supports the application of
1281 these methods to help reduce conflict. The guidelines also describe the criteria for and implementation

1282 of lethal removal of wolves and claims for compensation payments available for livestock killed by
1283 wolves administered by the MDA.

1284 **Wolf management responsibilities**

1285 The Minnesota DNR Section of Wildlife has primary responsibility for the management of wolves in
1286 Minnesota, and the Minnesota DNR Division of Enforcement, in addition to protecting public safety and
1287 natural resources, enforce natural resource laws and regulations. Minnesota conservation officers (COs)
1288 are also primary investigators in wolf depredation claims. The DNR has entered into a cooperative
1289 services agreement with USDA-Wildlife Services (WS) to assist with wolf depredation conflict. During
1290 periods when wolves are not under federal ESA protection, DNR Wildlife and Enforcement also
1291 administer a directed predator control program where private certified trappers are authorized to take
1292 wolves where conflicts occur.

1293 Tribal authorities have responsibility over all wolf management activities on lands owned or managed by
1294 the respective tribe within reservation boundaries. Minnesota DNR manages wolf conflicts occurring on
1295 properties that are within reservation boundaries owned by non-tribal entities in coordination with
1296 tribal staff.

1297 The MDA administers a program to reimburse livestock owners for verified losses caused by wolves.
1298 Additionally, MDA administers a grant program for Minnesota livestock producers to deploy strategies
1299 that help reduce wolf-livestock conflict.

1300 **Wolf conflict prevention measures**

1301 Minnesota’s diverse landscape supports a robust wolf population. Sometimes challenges arise where
1302 human activities intersect with places where wolves live, whether on public land or in people’s back
1303 yards. Most wolf-human conflicts in Minnesota, besides livestock interactions, occur in association with
1304 dogs.

1305 **Human safety**

1306 The likelihood of wolves attacking people is extremely low. Wolves typically avoid people and areas of
1307 human activity. Millions of people live and recreate in parts of Minnesota where wolves occur without
1308 incident. Incidents of wolf attack on humans have involved sick or habituated wolves that have
1309 contributed to the wolf’s abnormal or unusual behavior. Even though the risk of wolves attacking people
1310 is low, people should not intentionally attract or feed wolves, and should always maintain a safe
1311 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.

1312 **Wolves and pets**

1313 Wolves kill pets occasionally when they encounter them. A number of dogs are attacked or killed by
1314 wolves each year in Minnesota. Wolves are territorial and recognize dogs as competitors because they
1315 are a closely related species. Wolves can be most aggressive during the spring and summer months
1316 when they are raising pups at dens or rendezvous sites, or near locations where they make a kill, and
1317 can also be more aggressive during the winter breeding season.

1318 There are ways to reduce conflicts between wolves and dogs by taking some precautions. Do not leave
1319 dogs unattended in yards or allow them to range freely in areas where wolves occur. Keep pets on a
1320 leash or under verbal control when walking or recreating in areas where wolves occur. When hunting
1321 with dogs, avoid areas of high wolf activity and learn to identify wolf sign to avoid or leave areas when
1322 you observe it. Avoid feeding deer. Awareness of these actions will help protect dogs from attack by
1323 wolves.

(Text box)

MS 97B.645. Subd. 6. Destroying wolves threatening domestic pets.

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.

1324 **Wolves and livestock**

1325 Wherever wolves and domestic animal range overlaps, some depredation occurs. In Minnesota, the
1326 conflict has been a management problem for livestock producers and agencies responsible for wolf
1327 conservation. Both opponents and supporters of wolf recovery have closely monitored the extent of the
1328 problem. Wolf conflict management in Minnesota administered by agencies involved in wolf
1329 management has historically been primarily focused on the removal of depredating wolves to address
1330 recent or ongoing depredation events. Conversely, the proactive prevention of livestock losses has
1331 generally been left to individual livestock producers, although state (MDA) and federal (USDA-WS)
1332 funding have contributed to preventative conflict reduction efforts in recent years. This paradigm has
1333 been in place throughout the recovery phase of wolf conservation in Minnesota; a more formal
1334 integrated approach should provide broader acceptance for addressing future problems.

1335 The University of Minnesota conducted a study in the late 1990's to assess management practices that
1336 could prevent wolf depredation. Although no methods were identified that are certain to prevent wolf
1337 depredation, the study illustrated that removing depredating wolves was effective at preventing
1338 additional losses at the farm. In addition, some farmers and ranchers support practices that they think

1339 help reduce livestock depredation by wolves, including maintaining a healthy herd, use of guard animals,
1340 and calving and lambing in areas where they can be closely monitored near human activity.

1341 As wolf recovery has expanded to additional parts of the United States, more emphasis has been placed
1342 on the use of non-lethal wolf depredation prevention methods, especially in areas of small recolonizing
1343 wolf populations. As these tools have become more common in use, the pros and cons of many
1344 methods have become more evident. Although few if any will prevent all wolf-livestock conflict, any
1345 implementation that can reduce the loss of livestock, economic impacts to producers, and number of
1346 wolves killed should be considered by wolf management interests.

1347 DNR encourages livestock producers in Minnesota to use preventative measures to reduce the
1348 likelihood for conflict. However, best strategies for reducing wolf depredation incidents may not be cost
1349 effective or always effective. Nonetheless, non-lethal methods that reduce the incidence of wolf-
1350 livestock conflicts can be implemented before conflict with livestock and wolves occur. Implementation
1351 of these practices can be improved by providing technical guidance and identifying funding partnerships
1352 for farmers to help implement these strategies. Some strategies that have been found to be effective
1353 are listed here:

1354 **Wolf-livestock depredation prevention toolbox**

- 1355 1. Human Activity
 - 1356 • Increased human activity in and around pastures occupied by livestock. Check on
 - 1357 livestock on a daily basis and check perimeter for wolf activity. Monitor livestock for
 - 1358 changes in behavior and condition. The presence of human activity can be a disturbance
 - 1359 to wolves and help detect the presence of wolves to increase activity or implementation
 - 1360 of additional strategies.
- 1361 2. Proper carcass disposal
 - 1362 • Promptly remove any dead animals from farms to limit attracting wolves from
 - 1363 scavenging on carcasses.
 - 1364 • Minnesota Board of Animal Health requires proper disposal within 72 hours by burying,
 - 1365 burning, or composting. Use a rendering service if available.
- 1366 3. Fencing
 - 1367 • Use fencing that limits wolf movement in or out of a pasture.
 - 1368 ○ Permanent – woven-wire or electric
 - 1369 ○ Temporary or portable – fladry/turbo fladry
- 1370 4. Guard animals
 - 1371 • Donkeys, guard dogs, or other animals may be appropriate depending on the application
- 1372 5. Scare devices
 - 1373 • Lights and audible devices that can be placed in pastures or calving and lambing areas to
 - 1374 scare wolves away
- 1375 6. Calving and lambing activities near barnyard
 - 1376 • Concentrate activity in area where it is more protected and can be closely monitored.

1377 **State and federal wolf depredation mitigation grants**

1378 The Minnesota Legislature first funded Wolf-Livestock Conflict Prevention Grants in 2017. The program
1379 is administered by MDA and is available to livestock producers through a competitive grant application
1380 process. Although the Minnesota Legislature only funded these grants for two years, MDA received a
1381 grant from the U.S. Fish and Wildlife Service (USFWS) to continue to award grants to producers. The
1382 grant must be matched, depending on the grant application requirements, by the producer and can be
1383 utilized for the tools listed that support measures demonstrated to effectively reduce wolf-livestock
1384 conflicts.

1385 **Minnesota DNR directed wolf control**

1386 From 1975-2011, while wolves were listed under the ESA, wolf damage management was primarily
1387 conducted by the federal government, by the USFWS from 1975-1986 and by WS (under USFWS and
1388 Minnesota DNR authorization) up to the present. While wolves were under state and tribal management
1389 in 2012-2014, WS continued to be the primary agency to control depredating wolves under a
1390 cooperative agreement with the Minnesota DNR. Under state management, private landowners can
1391 take depredating wolves under certain conditions and state-certified wolf controllers are authorized to
1392 assist livestock producers with wolf depredation control.

1393 When conflict does occur, State law allows individuals to take wolves, under certain conditions, and use
1394 of targeted lethal control is authorized under state directed wolf control.

1395 When dead or wounded livestock or other domestic animals are identified and cause of death or injury
1396 is suspected to be wolves, livestock producers can report claims to Minnesota DNR Conservation
1397 Officers (COs); USDA-WS; and in Kittson County, the Sheriff's Department. Trained investigators play a
1398 crucial role in determining wolf claims and recommending management actions to reduce wolf damage
1399 to livestock. When a determination is made of active wolf depredation conflicts, targeted wolf removal
1400 is provided by WS or state-certified wolf control trappers. Where permitted under applicable regulations
1401 and federal, state, or tribal

1402 authorizations, wolves are removed as humanely as possible using foot-hold traps, cable devices, and
1403 shooting.

(Text box)

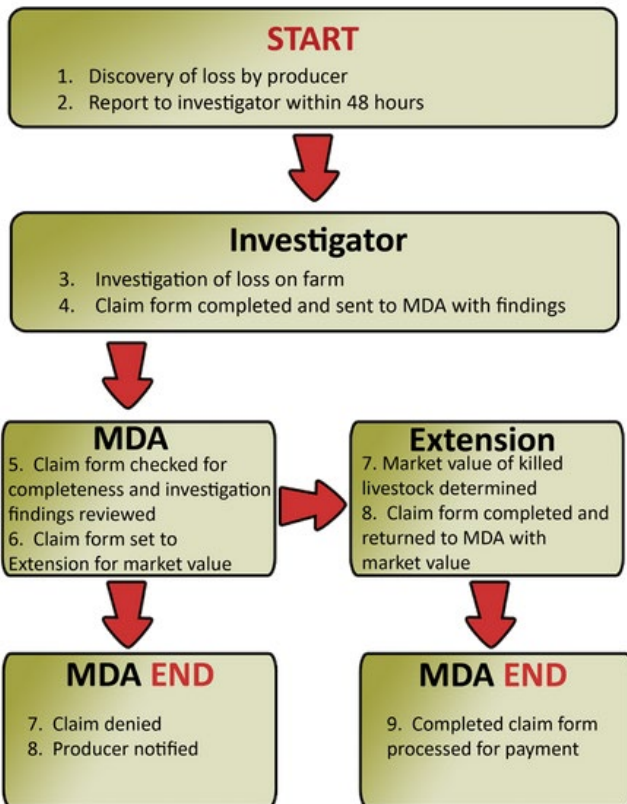
MS 97B.645. Subd. 5. Destroying wolves threatening livestock, guard animals, or domestic animals. An owner of livestock, guard animals, or domestic animals, and the owner's agents may, at any time and without a permit, shoot or destroy a wolf when the wolf is posing an immediate threat to livestock, a guard animal, or a domestic animal located on property owned, leased, or occupied by the owner of the livestock, guard animal, or domestic animal. 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.

1404 **Wolf depredation compensation payments**

1405 In 1977, the Minnesota Legislature established a compensation program to pay farmers for verified
1406 livestock losses by wolves. The Minnesota Department of Agriculture (MDA) receives an appropriation

1407 of \$350,000 each biennium to reimburse wolf depredation claims made by livestock producers. Over the
1408 last 10 years, the MDA has paid between 80-140 claims worth approximately \$100,000-\$250,000 per
1409 year.

1410 To be reimbursed for livestock lost to wolves, an assessment of livestock losses and eligibility for
1411 payment of compensation is completed that includes WS, COs or approved investigators, MDA, and
1412 county extension agents.



1413

1414 **Appendix 5. Wolf attitudes summary report**

1415 To be inserted upon final publication

1416 https://files.dnr.state.mn.us/fish_wildlife/wildlife/wolves/summary_attitude_report.pdf

1417 **Appendix 6. List of tribal wolf management documents**

1418 To be further developed, examples include:

- 1419 • Fond du Lac Band of Lake Superior Chippewa Wolf Management Plan for the Fond du Lac
- 1420 Reservation (2012)
- 1421 • Draft Eastern Timber Wolf (Ma'iingan) Management Plan for the Leech Lake Reservation (2012)
- 1422 • LLBO council resolution (1998)
- 1423 • LLBO tribal note (2021)
- 1424 • Wolf (Ma'iingan) Management Plan Red Lake Band of Chippewa Indians
- 1425 • Red Lake council resolution
- 1426 • White Earth council proclamation