

Minnesota Department of Natural Resources

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Office of the Commissioner

651-259-5555

October 2, 2012

Maureen Hackett, MD
Founder and President
Howling For Wolves
PO Box 4099
Minneapolis, MN 55343

RE: Petition for Rulemaking; "We request that the MN DNR adopt new rule to stop the 2012-2013 Minnesota wolf hunting and trapping season."

Dear Dr. Hackett:

Thank you for your petition received on August 9, 2012 requesting that the Minnesota Department of Natural Resources (DNR) "adopt a new rule and stop the 2012 – 2013 wolf hunting and trapping season."

Your petition raised concerns in several areas including (1) the Minnesota Wolf Management Plan, (2) wolf depredation control, (3) wolf pack dynamics, (4) wolf population trends, (5) enforcement issues, (6) ecological relationships, (7) wolf season development, and (8) tribal interests. Attached to this letter is a document that addresses each of these subject areas.

Wolf numbers in Minnesota exceed biologists' expectations for a recovered wolf population. Given that the wolf population in Minnesota is recovered and that a hunting and trapping season will not negatively impact this self-sustaining population, DNR respectfully denies your petition to adopt a new rule.

Thank you for your interest in the management of wolves in Minnesota.

Sincerely,



Tom Landwehr
Commissioner

Attachment

c.: E. Boggess, Fish and Wildlife Division Director

On August 9, 2012, the Minnesota Department of Natural Resources (DNR) received a hand-delivered copy of a petition requesting that the DNR adopt a new rule to stop the 2012-2013 Minnesota wolf hunting and trapping season. That petition raised a number of issues or concerns that could be grouped under the following categories: 1) the Minnesota Wolf Management Plan; 2) wolf depredation control; 3) wolf pack dynamics; 4) wolf population trends; 5) enforcement issues; 6) ecological relationships; 7) wolf season development; and 8) tribal interests. DNR responses to those issue or concerns are provided below.

The Minnesota Wolf Management Plan

The petition accurately portrays the Minnesota Wolf Management Plan as a document based on consensus recommendations of a diverse group of potentially affected interests around the issue of wolf management. However, it goes on to state that DNR has not implemented key elements of that plan and alleges that “The basic management activities laid out in the Wolf Management Plan have not been done.” and that “...the DNR has abandoned the Wolf Management Plan and is rushing to a public wolf trapping and hunting season.”

DNR Response: The DNR has implemented all key elements of the Minnesota Wolf Management Plan (Wolf Plan). The DNR convened the “Minnesota Wolf Management Roundtable” (Wolf Roundtable) in 1998 to provide broad public input into the State’s wolf management following federal delisting. Delisting was anticipated to occur within a few years of that time based on recovery of populations in the western Great Lakes region that were expected to meet all Recovery Plan criteria. The Wolf Roundtable group reached consensus on a set of recommended actions related to wolf management. Implementation of many of those recommendations required additional statutory authority and appropriations to fund key new management provisions. In 1999 and 2000, the DNR brought the Roundtable recommendations forward to the Minnesota Legislature and in 2000 the Legislature adopted a wolf management bill, largely based on the Roundtable recommendations. It also directed the DNR to prepare a wolf management plan. The DNR revised a 1999 draft wolf management plan to reflect the legislative action of 2000, and completed the Wolf Plan in early 2001(MN DNR 2001). During subsequent budget years, the DNR also successfully sought increased appropriations and reallocated internal resources to implement the provisions of the Wolf Plan.

The DNR continues to follow and implement the provisions of the 2001 Minnesota Wolf Plan, in combination with state law. At the time the Wolf Plan was finalized, state statute required and the Wolf Plan reflected a five-year waiting period from when wolves were federally de-listed to when the state could legally establish a public harvest season. Minnesota was unique in all the wolf range states in the U.S. in having a State statute requiring a waiting period before a season could be authorized. Attempted delisting of the western Great Lakes population of wolves was first initiated by the U.S. Fish and Wildlife Service in 2003, but was delayed by legal challenges until wolves were eventually delisted in March of 2007. That initial delisting was negated 18 months later on procedural issues not related to wolf recovery or conservation. Wolves were again briefly delisted in 2009, but that delisting rule was later withdrawn, again on procedural grounds. Most recently, wolves were delisted in January of 2012.

During previous delistings, Minnesota demonstrated that the State could responsibly manage this recovered resident wildlife species as it does other wildlife species. The primary difference in the latest delisting was that the Minnesota statute that deferred consideration of a season for five years after federal delisting was repealed in 2011. While the petition characterizes this as happening behind closed doors during the state government shutdown, the Legislature actually passed this provision twice, first in an omnibus bill passed in May during the regular session (that bill was later vetoed for reasons unrelated to wolves), and again in July in the special session.

Once wolves were federally delisted in January of 2012, the DNR proposed a limited season and sought additional authorities from the Legislature for wolf applications, licensing, and other specific aspects of season management. There was much public notice, interest, and debate on this topic, and the Legislature eventually passed and the Governor signed legislation providing additional authorities for wolf licenses, applications, and harvest regulations (Minnesota Laws of 2012, Chapter 277).

When the Wolf Plan was adopted in 2001, federal wolf delisting from the Endangered Species Act was anticipated to be imminent. All delisting criteria established by the wolf recovery plan for the western Great Lakes region had been reached in the late 1990s. At that time, a five-year waiting period before considering a season on a species that had only recently met recovery goals made sense. In the intervening 11 years, wolf populations in the western Great Lakes region have continued to increase beyond recovery goals, wolves have been delisted and under state management on two separate occasions and the State has successfully implemented the wolf plan. Because of that, a five-year waiting period before implementing a wolf season no longer serves the purpose originally envisioned in the plan and, in fact, it makes more sense from a federal monitoring perspective to be able to monitor the full range of state management following delisting, including any impacts of a harvest season.

Although the Wolf Plan described the framework for wolf management by the DNR, all implementation must fall within the authorities and resources provided by state law. The DNR has and will continue to implement the provisions of the Wolf Plan related to research, monitoring, wolf damage control, enforcement, and public information. As called for in the Wolf Plan, the DNR supports and funds a wolf research biologist, a wolf management specialist, and three designated lead wolf conservation officers, as well as nearly 70 other conservation officers located in or near the wolf range. The State continues to monitor wolf populations through dedicated surveys and annual indices, as called for in the Wolf Plan. The State continues to compensate landowners for wolf-related losses and has implemented wolf damage control provisions, as called for in the Wolf Plan.

The DNR will continue to monitor and manage wolves consistent with the goal of the Wolf Plan to ensure the long-term survival of the wolf and resolve conflicts between wolves and humans.

Wolf Depredation Control

The petition states that the DNR has "...no data to show that randomly hunting non-problem wolves provides a solution to livestock depredation problems..." and alleges that the DNR is

“...recklessly risking the health of the Minnesota wolf population to satisfy special interest groups.” It goes on to allege that not following the Minnesota Wolf Management Plan could “...cause an increase of wolf-livestock problems as a result of a premature wolf hunting season.”

DNR Response: As stated above, the DNR is managing wolf depredation as prescribed in the 2001 Minnesota Wolf Management Plan. The 2012 wolf hunting and trapping season is not a primary tool for wolf depredation management. However, information gained from this inaugural season could help to inform future seasons that could have more of a depredation management focus.

Upon delisting of the wolf from the Endangered Species Act (ESA), the DNR has implemented wolf depredation management policies as outlined in state law and the Wolf Plan. Addressing wolf-human conflicts is an important component of the Wolf Plan. A key provision to address wolf-human conflicts is to continue using depredation trapping as a management tool in areas where depredations have occurred to reduce potential for further livestock loss. Trapping of depredating wolves has been effective throughout the wolf recovery process in helping to address wolf-human conflicts and may also help maintain higher tolerance for wolves on the landscape.

Although not a primary objective of the 2012-13 wolf season, the DNR plans to explore the potential future use of wolf hunting and trapping seasons as a tool to manage wolf population numbers in zones or areas where depredation conflicts are chronic or high. The information gained from this year’s wolf season will help inform future decisions regarding the potential use of public harvest of wolves as a component of an adaptive and integrated approach to managing wolf depredations.

The suggestion that hunting will provide an increased risk of depredation conflict is unfounded. It assumes that harvest will be biased toward alpha wolves, that pack ‘dysfunction’ will commonly result, and that remaining wolves will cause conflicts at higher rates than otherwise may have occurred. Total population size, proximity to livestock, and natural prey abundance and vulnerability are the primary factors that have and will continue to influence depredation levels. Furthermore, alpha wolves represent only a small to moderate proportion (perhaps 25-30 percent) of a wolf population and, given the likelihood that they are less vulnerable to public harvest than younger more inexperienced or dispersing wolves, they will likely represent an even smaller proportion of the harvest (Fuller 1989, Adams et. al., 2008, Webb et. al., 2011). Hence, there is no evidence that public harvest will lead to ‘abnormal’ or high levels of depredation conflict. Nevertheless, we will continually evaluate wolf population and harvest attributes in relation to depredation conflicts and adjust harvest and other wolf management actions in a manner that ensures overall wolf population viability while minimizing wolf and human conflicts.

Wolf Pack Dynamics

The petition states that if many alpha pairs are lost due to being killed through human hunting, the consequences on the wolf population is unpredictable and suggests that without older wolf leaders, the younger pack members may actually cause more livestock problems. The petition

cites Haber (1996) who suggested that a negative aspect of human exploitation of wolves might be that an open season could lead to higher depredation due to changes in pack dynamics.

DNR Response: Haber presents one of the contested theories of wolf pack dynamics. Many studies show that wolf populations consist of dynamic packs that are continually forming and dissolving, with a high turnover of offspring (Mech 1987, 1995, 1997, Fritts and Mech 1981, Peterson et. al., 1984, Messier 1985, Fuller 1989, Mech et. al., 1998). Wolf caused mortality occurs for a variety of reasons and pack disruptions occur frequently from many different causes. A wolf may be killed by other wolves, disease, vehicles, for depredation control, or through public harvest. Changes to wolf packs occur frequently, regardless of whether the population is hunted or not. Wolves commonly outbreed and turnover of individuals in packs is high (Mech et. al., 1998). Few wild wolves, even in un-hunted populations, live past seven years of age (Mech 2006) and turnover of alpha individuals occurs frequently. Furthermore, in wolf populations near their biological carrying capacity, as is the case for Minnesota, natural mortality is comparatively high, resulting from density-dependent processes acting in the population (e.g., interspecific strife, starvation). As stated earlier, we will continue to evaluate wolf population and harvest attributes in relation to depredation conflicts and adjust harvest and other wolf management actions in a manner that ensures overall wolf population viability while minimizing wolf and human conflicts.

Wolf Population Trends

The petition reiterates the fact that there has been no significant change in wolf population size or distribution since 1998, based on DNR surveys in 1998, 2004, and 2008. It goes on to conclude that therefore the Minnesota wolf population does not need to be controlled by a hunting and trapping season. The petition also notes that the Wolf Plan called for a comprehensive statewide estimate of wolf distribution and numbers were to be completed during the first and fifth years following federal delisting and that annual changes in wolf distribution and abundance were to be monitored to look for trends on a yearly basis between the statewide population assessments and makes the claim that this has not been done. The petition went on to state that the population was to be monitored for five years without interference from hunting and trapping for a better assessment of the health of the wolf population and to assess the effects of the delisting itself.

DNR Response: The DNR has made no claim that a hunting and trapping season is needed to control the wolf population. In fact, the limited season proposed for 2012 is expected to have no significant impact on the Minnesota wolf population. The season is based on the fact that wolf populations, like other game species, will support a sustainable, regulated harvest. The wolf population has not significantly increased in range or numbers over the last ten years in the absence of a public harvest, and research supports the sustainability of wolf harvests up to 30 percent of a population.

Regarding wolf surveys and monitoring, wolves were first delisted in 2007 and the formal wolf population survey, as called for in the Wolf Plan, was completed in 2007-08. Wolves were again delisted in 2012 and a formal wolf population survey, as called for in the Wolf Plan, is scheduled for 2012-13 using the method employed since the late 1970s (Fuller et. al., 1992). As noted

above, the results of the past three surveys indicate that the wolf population has been numerically stable over the past ten or more years. Annual indices to wolf abundance, as called for in the Wolf Plan, have been conducted, and they also indicate stable to statistically insignificant increases in the wolf population.

In addition to these periodic statewide population surveys, the DNR conducts two wolf surveys (fall scent station survey and winter track survey) to obtain annual population trend information. The DNR also tracks data on depredation incident frequency. The DNR has also been researching alternative methods for conducting wolf population monitoring, and we will continue to utilize a sound scientific process for conducting and evaluating wolf survey needs and methods.

In historic terms, the Minnesota wolf population has increased from an estimated 1,000 individuals in 1976 to nearly 3,000 today, and the estimated wolf range in the state expanded by approximately 225 percent (from approximately 15,000 sq mi [38,850 sq km] to approximately 34,000 sq mi [88,060 sq km]) from 1970 to the late 1990s. The results of the past three surveys indicate that the wolf population has been relatively numerically stable over the past ten or more years (Berg and Benson 1998, Erb and Benson 2004, Erb 2008). The estimated density of wolves in Minnesota in the last survey was 4.1 wolves/100km², which remains, with a few localized exceptions, one of the highest wolf densities ever recorded.

The annual trend surveys provide indices of abundance by monitoring wolf presence/absence at designated locations along survey routes. During the last five-year interval, both surveys indicate a relatively stable population, though both survey indices from 2011 were the highest ever recorded since the surveys began (Erb 2012a, Erb 2012b). Through time, data from the different monitoring methods has provided generally consistent results.

The wolf density in northern Minnesota is strongly influenced by the density or availability of deer (Fuller 1989), though ‘self-regulation’ undoubtedly plays a significant role in established wolf populations (Cariappa et. al., 2011). The high density and recent stability of Minnesota’s wolf population has been well documented (see above). Although Mech (2001) had earlier predicted the population would expand in both range and distribution, based primarily on deer populations in Minnesota, other factors related to reduced forest cover, higher road density, and higher human population density in areas not colonized by wolves likely explain the lack of continued range expansion.

There was never any stated goal of the Wolf Plan to impose a five-year wait to allow the wolf population “...to be monitored for five years without interference from hunting and trapping for a better assessment of the health of the wolf population and to assess the effects of the delisting itself.” as stated in the petition. The Wolf Plan simply recognized that the U.S. Fish and Wildlife Service (USFWS) would continue to monitor the status of wolves in Minnesota and other areas where wolves were delisted for a period of five years post-delisting to ensure that recovery goals are maintained, as they do for all recently delisted species. Should Minnesota or any state manage wolves in a manner that results in population declines below the 1992 Recovery Plan goals, the USFWS has authority to re-list the species.

Five years have elapsed since the wolf was first delisted in Minnesota and we have had nearly two years to assess the effects of delisting itself. While we recognize that wolves were re-listed and delisted multiple times since 2007, the biological status of Minnesota's wolves has stayed strong. Given that there will continue to be a five-year federal post-delisting monitoring period, it will arguably provide a stronger indication of the viability of state management of wolves to have that monitoring include the effects of a regulated hunting and trapping season than to wait until after the federal monitoring of the success of recovery has expired.

Enforcement Issues

The petition argued that reduced fines for illegally killing wolves and lesser criminal culpability may lead to more illegal wolf kills. It also implied that the DNR had not followed the identified need in the Wolf Plan for increased enforcement resources to ensure that enforcement of various provisions of the Wolf Plan is adequate, and to respond to depredation complaints.

DNR Response: Wolf enforcement resources are in place, as called for in the Wolf Plan. The DNR has and will continue to invest significant resources into enforcing wolf related statutes and laws. Regarding penalties, even though wolves are legally classified under Minnesota statutes as small game, fines and penalties for illegally taking wolves are consistent with those for deer (classified as big game species by law).

The DNR Division of Enforcement has been involved in enforcing wolf laws throughout the period wolves were listed under the ESA. The DNR has always had a greater presence and involvement in investigating and enforcing wolf laws than the federal government, even while wolves were federally protected. The Minnesota Wolf Management Plan identified additional enforcement staffing needs for wolf plan implementation. At the time that the Wolf Plan was finalized the DNR Division of Enforcement had many vacancies across the state and in the wolf range. As Enforcement vacancies were filled, three lead wolf conservation officers (Grand Rapids, Roseau, and Virginia, Minnesota) were designated to oversee implementation of Wolf Plan enforcement and related depredation needs. These officers help conduct and oversee the fulfillment of the Enforcement needs outlined in the Wolf Plan by the approximately 70 Minnesota DNR Conservation Officers located in or near the wolf range. While wolves were federally protected, the USFWS had one Enforcement officer stationed in the Minnesota wolf range at Duluth, Minnesota.

It is always difficult to assess the extent of illegal killing of wildlife, including wolves. While we know some occurs, we also know that it has not been significant enough to limit wolf recovery and know that the USFWS considered this factor in the process of removing ESA protections for wolves in Minnesota. It is also plausible that illegal killing of wolves will actually decline under state management. The species was under complete federal protection for decades after it had met federal recovery goals for wolf populations in Minnesota and private citizens had no individual recourse to address conflicts with wolves. Under state management citizens now have some rights to protect property and sustainably take wolves under managed seasons. The DNR remains committed to bringing necessary enforcement efforts to bear and to evaluating impacts of all forms of mortality on wolf populations.

Fines for illegally taking a wolf were reduced by the Legislature in 2012 to make them consistent with those for illegal taking of game species, rather than the previous higher fines and restitution values for illegal taking of an endangered or threatened species. This is because wolves are no longer a threatened species. The penalties are still substantial and provide a significant deterrent to illegal actions.

Ecological Relationships

The petition cites potential ecosystem benefits from wolves, based on studies in the West (Beschta and Ripple) and suggests that having a hunting season may somehow limit those benefits related to predator and prey interactions. The petition also cites potential ecotourism benefits of wolves and again suggests that having a season would somehow limit the potential for those benefits.

DNR Response: Wolves and their relationships with prey are well studied. The DNR agrees that wolves provide important ecosystem functions, but disagree that the wolf hunt will diminish these ecosystem functions. Wolves are not under extreme threat in Minnesota and the DNR remains committed to the long-term survival of the wolf in Minnesota.

Wolves have been heavily researched in Minnesota and nearby Isle Royale for decades and efforts have been made to document wolf-mediated trophic cascades (Rooney and Anderson 2009). These effects have been detected in the Great Lakes region and one of the first studies that demonstrated the top-down effects of wolves on their prey was on Isle Royale (McLaren and Peterson 1994). Nelson and Mech (2006) made observations that in areas of higher wolf densities and lower deer densities, there was greater recruitment of saplings than in areas with more deer. In an area of northeastern Minnesota with declining deer numbers, there were higher deer densities at the edges of wolf pack territories than within the core territories themselves (Mech 1977). These buffers between pack territories can act as prey reservoirs and demonstrate behavioral shifts of ungulates in response to wolf activity. This was further supported by a higher mortality for wolves as a result of conflicts with neighboring packs (Mech 1994).

While studies of wolves in western states occurred more recently and after the absence of wolves for 50 or more years, Minnesota has always had wolves. In Minnesota, the primary prey base for wolves (white-tailed deer) is largely influenced by humans through habitat manipulation and managed hunting. We cannot simply extrapolate findings from those of wolves in western North America in completely different environments and where they have recently been established and apply them to wolves in Minnesota. The ecological influence of wolves is important to Minnesota's landscape, and will be maintained with the maintenance of viable wolf populations. Wolves can and do contribute to the overall biodiversity of Minnesota, but control and influence on white-tailed deer populations is dominated by winter severity and hunter harvest (DelGuidice 2006) in combination with availability of suitable habitat, not by wolf predation.

The recent publication by Levi et. al., (2012) suggests the importance of predation on community ecology and the role of emerging zoonotic diseases. However, it has not been demonstrated scientifically that field manipulations to predator populations will influence the incidence of

Lyme disease and, as stated previously, the level of harvest authorized by the DNR will have no effect on overall predator populations.

The potential role of disease influence on the Minnesota wolf population is important and has been a high priority for the DNR. We began comprehensively assessing disease prevalence in Minnesota's wolf population to gather baseline information in 2010. A total of 442 wolves were sampled over a two year period to document the prevalence of diseases and parasites in Minnesota's wolf population. Results indicated serologic exposure of wolves to eight diseases (DNR unpublished data). Disease exposure prevalence doesn't indicate the importance these diseases play in the population dynamics of wolves, but we will continue to evaluate disease trends over time to identify emerging disease issues and evaluate the role they play in wolf populations. Because the planned regulated wolf harvest is expected to have no population influence on wolves in Minnesota, we don't expect the season to be a factor in influencing disease patterns in Minnesota.

Wolf Season Development

The petition alleges that the statutory requirement for public comment has not been met and that the online survey was specific to the season and did not cover other issues, such as the previously agreed to five-year hunting and trapping moratorium. It goes on to say the DNR has not been communicating with the public about the public's opinion on wolves and the public's opinion on a hunting season.

DNR Response: The DNR has been publicly discussing a regulated wolf season since announcing our intentions to propose a season at a press conference in early January. The DNR continued to have press briefings and issue press releases at various stages of the process as additional details of the proposed season were developed. The Legislature, which along with the Governor represents the citizens of Minnesota, also had numerous hearings on the wolf season issue and that resulted in additional media coverage and public discussion. Once legal authorities were passed by the Legislature and signed by the Governor, the DNR announced a proposal for implementation of the 2012 season and formally requested public comments on the details of that season through an online survey instrument. The survey did not ask about whether to have a season or whether to wait an additional five years because those issues had already been thoroughly vetted through the legislative process. The DNR received abundant public input in response to our request for comments and that input was considered and incorporated into the final rule setting the parameters of the season.

In the delisting rulemaking process, the USFWS analysis included the possibility of the state of Minnesota implementing a wolf season and concluded that, as long as the DNR maintains a recovered wolf population above population goals established, this "would ensure the wolf's continued survival" (76 FR 81703, December 28, 2011).

We recognize the diverse attitudes of stakeholders in regard to wolf management in Minnesota. There have been a number of surveys of public attitudes of wolves in Minnesota. Generally these surveys have indicated an increase in positive perceptions toward wolves in Minnesota (Kellert 1985, 1999). However, a more localized survey in Northwestern Minnesota found more

rural residents had slightly unfavorable attitudes toward wolves and that wolves cause unacceptable levels of damage to livestock (Chavez et. al., 2005). Schanning (2005) reported “pragmatic/utilitarian” beliefs regarding wolves among Minnesota residents and that there was a significant level of fear about wolves from the respondents.

Changes in public attitudes in Minnesota have evolved considerably from when wolves were once thought of as “vermin” and were totally unprotected under state and federal laws. This change has taken time, but has resulted in more favorable acceptance of wolves as part of Minnesota’s unique and diverse landscape. The DNR is committed to working to educate people about wolves and their role to continue to develop more balanced attitudes toward this important species. We firmly believe that a responsible and highly regulated management of wolves and wolf-human conflicts will help to improve those attitudes over time. This is the approach that has restored many game species across North America where they were once eliminated by overexploitation. At the same time, we can manage wolves for all interests like we do for the North American black bear, whose status in Minnesota was once similar to the wolf, but now represents a valuable resident of Minnesota that is highly appreciated for its esthetic, ecological, and recreational value.

Tribal Interests

The petition points out the cultural significance of the wolf to tribes and alleges that Tribal concerns about wolf hunting and trapping were not considered in setting up the wolf season.

DNR Response: The DNR recognizes the cultural significance of wolves to the Indian Bands in Minnesota and respects Tribal authorities. The DNR also agrees that wolf recovery represents a tremendous conservation success and is committed to assuring the long-term survival of the wolf and resolving conflicts between wolves and humans.

The DNR was in communication with Tribes on wolf season issues throughout the legislative process and when finalizing the season proposal. Once statutory authorities were in place, the DNR provided the Bands with a summary of the State’s wolf season proposal for their review and comment and considered Tribal responses when finalizing the State’s seasons.

The State respects authorities of the Tribes to regulate wolf hunting on their lands and for some Bands to regulate wolf hunting and trapping by Tribal members in ceded territories with court-affirmed tribal hunting and fishing rights. The DNR also modified the State’s hunting season structure by creating zones with separate quotas so that we could be responsive to any harvest declarations the Bands might make.

The DNR will continue to work with Tribes regarding wolf management in Minnesota through established protocols and other means to work cooperatively and communicate regularly regarding ongoing aspects of wolf conservation in Minnesota.

Minnesota DNR Summary

The DNR takes its State Trust responsibilities very seriously and works for all interests in conservation of wildlife in Minnesota. Providing for sustainable hunting and fishing is an important part of that responsibility that was underscored by the 1998 amendment to the Minnesota Constitution, approved by 75 percent of the voters, affirming that “Hunting and fishing and the taking of game and fish are a valued part of our heritage that shall be forever preserved for the people and shall be managed by law and regulation for the public good.” (Constitution of the State of Minnesota, Article XIII, Sec. 12).

The Minnesota Wolf Management Plan illustrates this thorough and careful consideration of the conservation of wolves and consideration of the range of human interests in wolves, while addressing the conflicts that occur between wolves and humans. All of the primary elements of the Wolf Plan have been fully implemented. Globally, the hunting or trapping of wolves has rarely been a conservation threat (Boitani 2003). Regulated seasons can be designed to have little influence on wolf population trends and there is a wide safety margin for ensuring that regulated seasons on wolves do not put the wolf population at risk (Adams et. al., 2008). The Minnesota wolf population has been stable for more than a decade, is well over the minimum population goal established in the Wolf Plan, and is more than twice the recovery goal in the 1992 federal Eastern Timber Wolf Recovery Plan.

Minnesota’s wolf population can sustainably support regulated hunting and trapping while continuing to provide ecological and human enjoyment values associated with wolves. Information from the 2012-2013 season will help inform an adaptive approach to future wolf seasons as we continue to ensure the long-term conservation of wolves and resolution of conflicts between wolves and humans in Minnesota.

LITERATURE CITED

- Adams, L. G., R. O. Stephenson, B. W. Dale, R. T. Ahgook, and D. J. Demma. 2008. Population dynamics and harvest characteristics of wolves in the central Brooks Range, Alaska. *Wildlife Monographs*. 170.
- Berg, W., and S. Benson. 1998. Updated wolf population estimate for Minnesota, 1997-98. Pages 85-98 *in* B. Joselyn editor. *Summaries of wildlife research findings, 1998*. Minnesota Department of Natural Resources, St. Paul.
- Boitani, L. 2003. Wolf conservation and recovery. Pages 317-340 *in* Mech, L. D. and Boitani, L. editors. *Wolves: Behavior, Ecology and Conservation*. Illinois: Univ. Chicago Press.
- Cariappa, C.A., J.K. Oakleaf, W.B. Ballard, and S.B. Breck. 2011. A reappraisal of the evidence for regulation of wolf populations. *Journal of Wildlife Management* 75:726-730.
- Chavez, A. S., E. M. Gese, and R. S. Krannich. 2005. Attitudes of rural landowners toward wolves in northwestern Minnesota. *Wildlife Society Bulletin*. 33:517-527.

- DelGiudice, G. D., J. Fieberg, M. R. Riggs, M. Carstensen Powell, and W. Pan. 2006. A long-term age-specific survival analysis of female white-tailed deer. *Journal of Wildlife Management* 70.
- Erb, J. 2008. Distribution and abundance of wolves in Minnesota, 2007-2008. Minnesota Department of Natural Resources, St. Paul, MN.
- Erb, J. 2012a. Carnivore Scent Station Survey Summary. 2011. Minnesota Department of Natural Resources, Grand Rapids, MN.
- Erb, J. 2012b. Furbearer Winter Track Survey Summary, 2011. Minnesota Department of Natural Resources, Grand Rapids, MN.
- Erb, J. and S. Benson. 2004. Distribution and abundance of wolves in Minnesota, 2003-04. Minnesota Department of Natural Resources, Grand Rapids, MN.
- Fritts, S. H. and L. D. Mech. 1981. Dynamics, movements, and feeding ecology of a newly protected wolf population in northwestern Minnesota. *Wildlife Monographs*. 80.
- Fuller, T.K. 1989. Population dynamics of wolves in north central Minnesota. *Wildlife Monographs*. 105.
- Fuller, T.K., W.E. Berg, G.L. Radde, M.S. Lenarz, and G.B. Joselyn. 1992. A history and current estimate of wolf distribution and numbers in Minnesota. *Wildlife Society Bulletin* 20:42-54.
- Haber, G. C. 1996. Biological, conservation, and ethical implications of exploiting and controlling wolves. *Conservation Biology*. 10:1068-1081.
- Kellert, S.R. 1985. The public and the timber wolf in Minnesota. Unpublished Report. Yale University School of Forestry and Environmental Studies. New Haven, CT.
- Kellert, S.R. 1999. The public and the wolf in Minnesota, 1999. Unpublished report of the International Wolf Center, dated June, 1999.
- Levi, T. A. M. Kilpatrick, M. Mangel, and C. C. Wilmers. 2012. Deer, predators, and the emergence of Lyme disease. *Proceedings of The National Academy of Sciences*. 109: 10942-10947.
- Mech, L. D. 1977. Wolf-pack buffer zones as prey reservoirs. *Science* 198:320-321.
- Mech, L. D. 1987. Age, season, and social aspects of wolf dispersal from a Minnesota pack. Pages 55-74 *in* B.D. Chepko-Sade and Z. Halpin editors. *Mammalian dispersal patterns*. University of Chicago Press, Chicago.

- Mech, L.D. 1994. Buffer zones of territories of gray wolves as regions of intraspecific strife. *Journal of Mammalogy*. 75:199-202.
- Mech, L. D. 1995. A ten-year history of the demography and productivity of an Arctic wolf pack. *Arctic* 48:329-332.
- Mech, L. D. 1997. *The arctic wolf: ten years with the pack*. Stillwater, MN: Voyageur Press.
- Mech, L. D. 2001. Managing Minnesota's recovered wolves. *Wildlife Society Bulletin*. 29:70-77.
- Mech, L. D. 2006. Estimated age structure of wolves in northeastern Minnesota. *Journal of Wildlife Management* 70:1481-1483.
- Mech, L. D., Adams, L. G., Meier, T. J., Burch, J. W., and Dale, B. W. 1998. *The wolves of Denali*. Minneapolis, MN: University of Minnesota Press.
- Messier, F. 1985. Solitary living and extra territorial movements of wolves in relation to social status and prey abundance. *Canadian Journal of Zoology*. 63:239-245.
- Minnesota Department of Natural Resources. 2001. *Minnesota wolf management plan*. Prepared by the Section of Wildlife, dated February 2001.
- Nelson, M. E. and Mech, L. D. 2006. A 3-decade dearth of deer (*Odocoileus virginianus*) in a wolf (*Canis lupus*)-dominated ecosystem. *American Midland Naturalist* 155:373-382.
- Rooney, T. P. and D. P. Anderson. 2009. Are wolf mediated trophic cascades boosting biodiversity in the Great Lakes region? Pages 205-215 *in* A.P. Wydeven, T. R. Van Deelen, and E.J. Heske editors. *Recovery of Gray Wolves in the Great Lakes Region of the United States: An Endangered Species Success Story*. Springer, New York, NY, USA.
- Peterson, R. O., J. D. Woolington, and T. N. Bailey. 1984. *Wolves of the Kenai Peninsula, Alaska*. *Wildlife Monographs* 88.
- Schanning, K. 2005. *The state of the wolf project: Minnesota survey results*. Ashland. Sigurd Olson Environmental Institute, Northland College.
- Webb, N. F., J. R. Allen, and E. H. Merrill. 2011. Demography of a harvested population of wolves (*Canis lupus*) in west-central Alberta, Canada. *Canadian Journal of Zoology* 89:744-752.